ERCI-R/88-76

SEABROOK STATION
SITE-SPECIFIC OFFSITE RADIOLOGICAL EMERGENCY PREPAREDNESS ALERT AND NOTIFICATION SYSTEM QUALITY ASSURANCE VERIFICATION

Prepared for:

Federal Emergency Management Agency
Washington, D.C. 20472
Under Contract No. EMW-83-C-1217

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I. INTRODUCTION

A. Identification

1. Site Information

Seabrook Station is located in Seabrook, New Hampshire on a coastal plain about two miles inland from the Atlantic Ocean. This plain, extending from the shore to about four miles inland, is essentially flat, with no hills or valleys to impede sound propagation. The coastline itself is rocky on the north, changing to sandy beaches on the south. Over most of the southern half of the Seabrook Station plume exposure pathway emergency planning zone (plume EPZ), the beaches are separated from the mainland by 1-2 miles of uninhabited tidal estuaries and salt marshes.

Inland of the coastal plain the land gradually rises. To the north are scattered, symmetrical hills 200-300 feet in elevation. To the south, particularly along the Merrimack River in Amesbury and Merrimack, Massachusetts, hills and valleys eroded by drainage into the river are the major topographic features.

The Merrimack River flows from west to east through the southern half of the Seabrook Station plume EPZ. In the coastal plain, river banks are wide and shallow; just east of the city of Newburyport, the tidal flats are over a mile wide. Further upstream, the river has formed an irregular valley 50-75 feet deep.

The Piscataqua River, which is also the Maine-New Hampshire State line, forms a portion of the northern boundary of the plume EPZ. The Piscataqua drains Great Bay, also part of the northern boundary of the plume EPZ.

Although most of the Seabrook Station plume EPZ is populated, exceptions are the marsh and water areas along the rivers and coast and a few hilly areas inaccessible by road in the west and southwest. Year-round residential concentrations exist in: Hampton, about 3-1/2 miles north of the site; Amesbury, 5 miles SW; Newburyport, about 6-7 miles SSW; Exeter, 8 miles NW and Portsmouth, 12 miles and more to the NNE. During the summer, the 12 miles of beaches from Newbury (Plum Island) on the south through Rye Beach on the north are populated by additional seasonal residents and visitors.

Since the Seabrook Station plume EPZ has a significant influx of population during the summer period, a population distribution estimate for a summer weekend condition was used in determining the geographical areas to be covered by siren coverage of at least 70 dBC. The population distribution estimate process is included in Chapter 2 of the Design Report. This estimate, which is

representative of the peak total population for the plume EPZ, was developed for the Seabrook Station plume EPZ Evacuation Time Study and has been confirmed by subsequent population analyses. Components of the population distribution included permanent population, daily transients representative of a fair weather weekend or holiday, and a seasonal resident population. Population data were prepared for each of 480 specific grid element areas. The grid elements represent the area defined by one of 32, 11-1/4 degree directional sectors and one of 15 distance areas. The distance areas are in 1/2-mile increments from 0 to 5 miles and are in 1-mile increments from 5 to 10 miles. Therefore, the smallest grid element contains 0.02 square miles of area and the largest grid element contains 1.87 square miles of area.

Each of the grid elements was examined for population density and the geographical area of any grid element with a population density of over 2,000 persons per square mile was superimposed on a map of the plume EPZ. Smooth outlines of apparent population densities greater than 2,000 persons per square mile were then developed based on an examination of the superimposed grid elements and road map configurations. In some cases, a visual field inspection of the actual geographical area was made.

These areas of dense population are indicated on Figures 2-1 and 2-2 in the Design Report. All of these areas, except for a small area northwest of Seabrook Station between sirens SH-01 and SB-06, are covered by at least 70 dBC.

2. Governments Within the 10-Mile Emergency Planning Zone

The plume exposure pathway emergency planning zone (plume EPZ) for the Seabrook Station is an irregular shape as depicted on Figures 2-1 and 2-2 of the Design Report.

The plume EPZ of the Seabrook Station includes portions of the States of New Hampshire and Massachusetts. Table 2.1-1 in Reference 1 of this report lists the municipalities in each State which are located wholly or partly within the Seabrook Station plume EPZ. This table also depicts 1970 residential population figures and an estimated permanent residential population for 1980. Specifically, part or all of the following communities are located in the New Hampshire portion of the plume EPZ: Brentwood, East Kingston, Exeter, Greenland, Hampton, Hampton Falls, Kensington, Kingston, New Castle, Newfields, Newton, North Hampton, Portsmouth, Rye, Seabrook, South Hampton and Stratham. Part or all of the following communities are located in the Massachusetts portion of the plume EPZ: Amesbury, Merrimack, Newbury, Newburyport, Salisbury and West Newbury.

Approximately half of the total area of the Seabrook Station plume EPZ includes the Atlantic Ocean. Consequently, a substantial daily transient population during the summer period visits the beaches and other recreational facilities within the Seabrook Station plume EPZ. Coastal beaches within 10 miles of the site extend from the Plum Island Beach in Newbury, Massachusetts, to Wallis Sands

Beach in Rye, New Hampshire. These beaches are generally readily accessible to the public.[1/] Recreational boating is also prevalent during the summer months in the Hampton Harbor vicinity, concentrating on the Hampton and Blackwater Rivers. Boating activity on the Atlantic Ocean is largely concentrated within approximately two or three miles of the Hampton Harbor inlet. Boating activity within approximately 5 to 10 miles of the Seabrook Station is concentrated on the Merrimack River, approximately 6 to 7 miles south of the Seabrook Station and in Rye Harbor, about 9 miles northeast of the Seabrook Station.

The largest military installation located within the Seabrook Station plume EPZ is the Pease Air Force Base. The Pease Air Force Base is partially located in Portsmouth, New Hampshire, approximately 12 miles north-northeast of the Seabrook Station. FEMA notes that Pease Air Force Base is to be closed within the next two years. There is also the U.S. Coast Guard Merrimack River Station in Newburyport, Massachusetts. This facility is a small boat station located approximately six miles south-southwest of the Seabrook Station, responsible for search and rescue missions and pollution control.

Route 1 is a major north-south artery located within the plume EPZ. A variety of commercial uses exist along Route 1, including shopping centers, gas stations, restaurants and fast-food chains, motels, automobile dealerships and repair shops, taverns, gift shops, and building supply stores. The greatest concentrations of vehicles along this route are found in shopping centers. These major shopping facilities

include: the Seabrook Plaza, Seabrook Southgate, Hampton Court, North Hampton Village Shopping Center, Fern Crossing, Hampton Falls Shoppers Village, the Mall at Granite Square, Hampton Shop and Save, Stoneleigh Park Plaza, Seacoast Village, North Hampton Factory Outlet, White Birch Plaza, Channel Home Center, Bowla Rama Plaza, and Southgate Plaza.[1/]

A number of campsites are also located within the plume EPZ of the Seabrook Station. Figure 2.1-13 in Reference 1 of this report summarizes the estimated capacity of these facilities.

A commercial dog race track, Seabrook Greyhound Park, is located 2-1/4 miles west of the site. The facility operates year-round with an approximate average attendance of 1,250 persons per session.

B. Scope of Review

1. Emergency Plans for Offsite Response Organizations

New Hampshire Yankee's "Seabrook Station Public Alert and Notification System FEMA-REP-10 Design Report" and "Seabrook Station Public Alert and Notification System FEMA-REP-10 Design Report Addendum 1 and Addendum 2" (hereinafter collectively referred to as the Design Report) describe the public alert and notification system evaluated in this quality assurance verification.[2,7,11/]

The Seabrook Station Radiological Emergency Plan; New Hampshire Radiological Emergency Response Plan; Seabrook Plan for Massachusetts Communities; the

First District Radiological Incident Response Plan (U.S. Coast Guard) and the Department of Interior's Parker River National Wildlife Refuge Standard Operating Procedure for Emergencies at the Seabrook Nuclear Power Station are all referenced in the Design Report and are applicable to this review. These documents describe the administrative means established for notifying and providing prompt instructions to the public within the Seabrook Station plume EPZ.

2. Alert and Notification System Design Report

The physical means established for alerting the public within the Seabrook Station plume EPZ are documented in Chapter 2, Appendix A and Appendix B of the Design Report.

3. FEMA Evaluation Findings

FEMA Region I has made a final finding of adequacy for the alert and notification system for the Seabrook Station. FEMA Region I's finding of adequacy for the alert and notification system for the Seabrook Station New Hampshire was made on August 2, 1990.

FEMA Region I has evaluated the following offsite emergency preparedness exercise for the Seabrook Station:

- Federal Emergency Management Agency. 1988. "Exercise Report Seabrook Nuclear Power Station at Seabrook, New Hampshire, Licensee: Public Service of New Hampshire, Date of Exercise: June 28-29,

1988, Exercise of the Offsite Response Plans and Preparedness." September 1, 1988.[3/]

- Federal Emergency Management Agency. 1990. Letter to James M. Taylor, Executive Director for Operations, U.S. Nuclear Regulatory Commissio , from Grant C. Peterson, Associate Director, State and Local Programs and Support, transmitting a "February 1990 Review and Evaluation of the State of New Hampshire Radiological Emergency Response Plan (NHRERP) for Seabrook Station" and a "January 1990 Report on the Status of Corrective Actions, First Exercise and Drill Cycle, 1988 to 1994, of the States of Maine and New Hampshire and New Hampshire Yankee's Offsite Response Organization for the Seabrook Station." February 9, 1990.[12/]

- Federal Emergency Management Agency. 1990. Letter to James M. Taylor, Executive Director for Operations, U.S. Nuclear Regulatory Commission, from Grant C. Peterson, Associate Director, State and Local Programs and Support, transmitting a "May 1990 Review and Evaluation of the Seabrook Plan for Massachusetts Communities (SPMC)" and a "May 1990 Findings and Determinations for the Seabrook Nuclear Power Station." June 15, 1990.[13/]

II. FINDINGS FOR EVALUATION CRITERION E.6 (FEMA-REP-10)

The Design Report describing the alert and notification system in the Commonwealth of Massachusetts for the Seabrook Station was reviewed against Evaluation Criterion E.4 of NUREG-0654/FEMA-REP-1, Revision 1, Supplement 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants - Criteria for Utility Offsite Planning and Preparedness"[6/] (hereinafter referred to as NUREG-0654/FEMA-REP-1, Rev. 1, Supp. 1); Appendix 3 of NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"[8/] (hereinafter referred to as NUREG-0654/FEMA-REP-1, Rev. 1); and Evaluation Criterion E.6 in FEMA-REP-10, "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants"[5/] (hereinafter referred to as FEMA-REP-10). Evaluation Criterion E.4 in NUREG-0654/FEMA-REP-1, Rev. 1, Supp. 1, states:

> The off-site response organization shall establish administrative and physical means, and the time required for notifying and providing prompt instructions to the public within the plume exposure pathway Emergency Planning Zone (see Appendix 3 of NUREG-0654/FEMA-REP-1, Rev. 1). It shall be the licensee's responsibility to demonstrate that such means exist, regardless of who implements this requirement. The off-site response organization shall have the administrative and physical means to activate the system.[6/]

The Design Report describing the alert and notification system in the State of New Hampshire for the Seabrook Station was reviewed against Evaluation Criterion E.6 and Appendix 3 of NUREG-0654/FEMA-REP-1, Rev. 1. Evaluation Criterion E.6 in NUREG-0654/FEMA-REP-1, Rev. 1, states:

> Each organization shall establish administrative and physical means, and the time required for notifying and providing prompt instructions to the public within the plume exposure pathway Emergency Planning Zone. (See Appendix 3.) It shall be the licensee's responsibility to demonstrate that such means exist, regardless of who implements this requirement. It shall be the responsibility of the State and local governments to activate such a system.[8/]

The bases for review against the above-mentioned evaluation criterion were the corresponding acceptance criteria of FEMA-REP-10. This quality assurance verification was performed to make a determination of alert and notification system adequacy prior to conducting a demonstration of this system within the Seabrook Station plume EPZ.

Based upon this quality assurance verification, ERC Environmental and Energy Services Co., Inc. (formerly International Energy Associates Limited) concluded that the design of the alert and notification system for the Seabrook Station and its supporting procedures conform sufficiently to the acceptance criteria, as stated in FEMA-REP-10 (E.6), for Evaluation Criterion E.4 of NUREG-0654/FEMA-REP-1, Rev. 1, Supp. 1, and E.6 of NUREG-0654/FEMA-REP-1, Rev. 1, to support a FEMA finding that the alert and notification system is adequate. The Seabrook Regional Assistance Committee Chairman concurs with the findings that the Seabrook Station's alert and notification system (ANS) does meet the specific design requirements of FEMA-REP-10.

This portion of the quality assurance verification evaluates the Seabrook Station's alert and notification system against FEMA-REP-10 acceptance criteria in the following areas: the administrative means of alerting, the physical means of alerting, and the special alerting methods.

A. <u>Administrative Means of Alerting</u> (E.6.1, FEMA-REP-10)

In a press conference held on September 20, 1986, Governor Dukakis, the Governor of the Commonwealth of Massachusetts, stated that he would not submit emergency evacuation plans site-specific to the Seabrook Station. As a result, the licensee for the Seabrook Station developed the New Hampshire Yankee Offsite Response Organization (NHYORO) to implement an offsite response plan, the Seabrook Plan for Massachusetts Communities.

As a result of the two plan submissions (one for Massachusetts by the NHYORO, and one by the State of New Hampshire), this quality assurance verification review discusses separate administrative procedures established for the State of New Hampshire and the Commonwealth of Massachusetts.

The Design Report specifies those organizations or individuals responsible for recommending the activation of the Seabrook Station's alert and notification system. The design logic as shown in Figure 1 of this report was developed after a review of the applicable emergency procedures and implementing instructions from: the Seabrook Station Radiological Emergency Plan; the New Hampshire Radiological Emergency Response Plan; the Seabrook Plan for Massachusetts Communities; the Coast Guard's First District Radiological Incident Response Plan and the Department of the Interior's Parker River National Wildlife Refuge Standard Operating Procedure for Emergencies at the Seabrook Nuclear Power Station.

Current emergency procedures document the responsibilities concerning the alert and notification system activation process from the time the emergency message is conveyed

SEABROOK STATION ALERT AND NOTIFIC

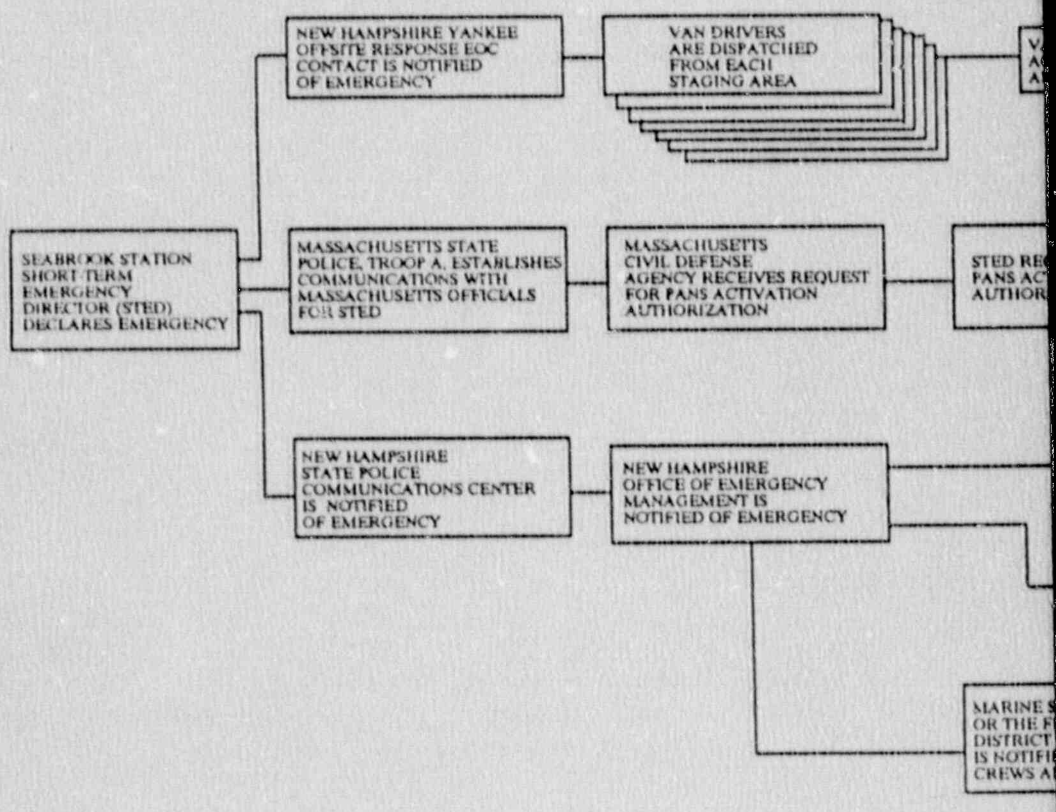
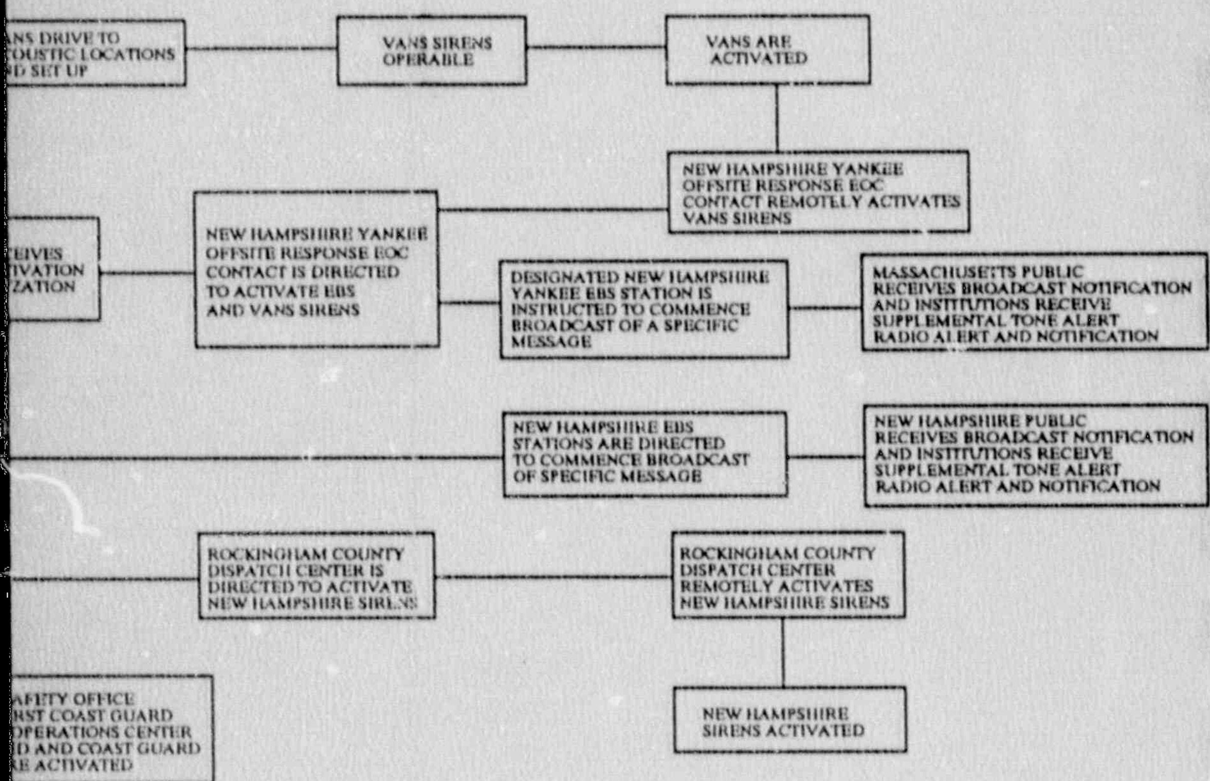


FIGURE 1

ATION SYSTEM DECISION/ACTION SEQUENCE DIAGRAM



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from the Seabrook Station control room to the States, local governments, and NHYORO warning points and to the State, local governments, and NHYORO officials responsible for making the decision to activate the Seabrook Station alert and notification system. See Figure 1.

In general, primary public alerting within the Seabrook Station plume EPZ is accomplished through the activation of both pole-mounted and Vehicular Alert and Notification System (VANS) sirens positioned throughout the plume EPZ. The primary activation points are: Rockingham County Dispatch Center in Brentwood, New Hampshire, for the New Hampshire sirens and the NHYORO Emergency Operations Center (EOC) in Newington, New Hampshire, for the Massachusetts sirens.

Each siren activation point is staffed and operational 24 hours per day, seven days a week. The New Hampshire siren system may also be activated from the Seabrook Station Control Room. A backup method is available for the primary alerting system in the Commonwealth of Massachusetts. The backup activation and control point are the VANS operators themselves. This quality assurance verification did not consider the use of any backup systems in arriving at its conclusion.

The New Hampshire Portion of the Seabrook Station Plume EPZ

In the event that Seabrook Station declares a site area emergency or a general emergency, the following actions occur:

The Seabrook Station Short-Term Emergency Director (STED) notifies the New Hampshire State Police Communications Center which notifies the New Hampshire Office of Emergency Management (NHOEM);

The NHOEM contacts the Emergency Broadcast System (EBS) radio station, explains that there is an immediate site area emergency (or general emergency) and instructs the radio station operator on the appropriate EBS message to commence broadcasting;

The NHOEM instructs the Rockingham County Dispatch Center to activate the New Hampshire siren system in coordination with the EBS broadcasts; and

The NHOEM notifies the U.S. Coast Guard that there is a site area emergency (or general emergency) at the Seabrook Station and the Coast Guard establishes a waterway safety zone.

The NHOEM notifies the U.S. Federal Aviation Administration that there is a site area emergency (or general emergency) and NHOEM requests the Federal Aviation Administration to create an air space closure and to notify aircraft.

An effort is made by the Director of the NHOEM at the New Hampshire State EOC to coordinate the activation of the Seabrook Station alert and notification system in New Hampshire at the same time as activation of the alert and notification system in Massachusetts through discussions with NHYORO and the Commonwealth of Massachusetts.

In New Hampshire, the Seacoast Operational Area Common Program Control Station (CPCS) is WOKQ. WOKQ, a 50,000-watt FM station broadcasting at 97.5 MHz from Dover, New Hampshire, operates 24 hours per day, seven days a week, and is equipped with a backup power supply. As the CPCS, WOKQ is responsible for notifying via the two-tone EBS signal, the other New Hampshire Seacoast EBS stations in the network.

Figure 1 of this report depicts the activation communication sequence for the New Hampshire EBS network. The activation of the New Hampshire EBS network is discussed in Volume 1, Section 2.1 of the State of New Hampshire Radiological Emergency Response Plan.[2/]

The Massachusetts Portion of Seabrook Station Plume EPZ

In the event that Seabrook Station declares an immediate site area emergency or general emergency, the following actions occur:

The Seabrook Station Short-Term Emergency Director (STED) notifies the NHYORO EOC Contact and establishes contact with officials of the Commonwealth of Massachusetts through the Massachusetts State Police with the request for authorization to activate the alert and notification system;

The NHYORO EOC Contact directs the dispatch of the VANS and operators through communications with each VANS staging area;

Upon receiving authorization, the STED activates the Massachusetts portion of the Seabrook Station alert and notification system through communication with and direction to the NHYORO EOC Contact;

The NHYORO EOC Contact contacts the designated EBS radio station, explains that there is an immediate site area emergency (or general emergency) and instructs the radio station operator on the appropriate EBS message to commence broadcast based on direction provided by the Seabrook Station Short Term Emergency Director; and

The NHYORO EOC Contact remotely activates the VANS sirens prior to EBS activation.

In the Commonwealth of Massachusetts, the designated EBS radio station is WLYT (also WHAV-AM). WLYT is located in Haverhill, Massachusetts. The WLYT EBS radio station is an operational station, operating 24 hours per day, seven days a week, equipped with a backup power supply. Figure 1 of this

report depicts the activation communication sequence of the designated EBS radio station for the Commonwealth of Massachusetts. The activation of the EBS network for the Massachusetts portion of the Seabrook Station plume EPZ is described more fully in Section 3.2.5 of the Seabrook Plan for Massachusetts Communities.[2/]

In the case of an escalating emergency, after the NHYORO is activated, the NHYORO Director assumes alert and notification system responsibility, including EBS activation, from the Seabrook Station Emergency Response Organization (ERO).

In the case of an escalating emergency, upon authorization from the officials of the Commonwealth of Massachusetts, the NHYORO Director directs public notifications to be made using the Seabrook alert and notification system. The Public Notification Coordinator communicates with the State of New Hampshire and the Commonwealth of Massachusetts to coordinate EBS messages and the timing for the activation of the VANS siren system with that of the New Hampshire siren system, if feasible. The EBS radio station is provided with the approved EBS message(s) and instructed to commence broadcasting.

The primary means of disseminating information and instructions to the public is through the broadcast of messages over the designated EBS radio stations.

In the event that occurrences at Seabrook Station lead to an emergency classification of alert, the designated EBS radio stations in both States are put on standby. The New Hampshire EBS radio station may, at the alert level, be activated for issuance of instruction for precautionary closing of beach areas. At the site area emergency or general emergency level, broadcasts over the designated EBS

general emergency level, broadcasts over the designated EBS radio stations are activated for both Massachusetts and New Hampshire in conjunction with siren activations.

To ensure that the designated EBS stations have been properly activated and that the correct messages have been broadcast, the New Hampshire State EOC and the NHYORO EOC have the capability to monitor the EBS broadcasts. The Director of the NHOEM and the NHYORO Public Notification Coordinator, or their designees, are assigned the responsibility of monitoring the EBS broadcasts. Once the decision has been made by the States to activate the designated EBS stations, the system provides the capability of broadcasting informational and instructional messages within 15 minutes.

A variety of communications equipment is available in both the State of New Hampshire and the NHYORO to ensure prompt and reliable communications among key personnel involved in emergency response functions. The State of New Hampshire Radiological Emergency Response Plan, supporting local plans, and the Seabrook Plan for Massachusetts Communities outline the communications equipment available during an emergency at Seabrook Station. These include the following:

Nuclear Alert System (NAS);

Civil Defense Radio Network;

National Warning System (NAWAS);

State Police Radio Network;

Commercial Telephone;

Amateur Radio Emergency Services (ARES);

Radio Amateur Communications Emergency Services (RACES);

Civil Defense National Radio System (CDNARS);

Civil Defense National Teletype System (CDNATS);

Local Community Radio Networks;

New Hampshire Yankee Offsite Response Organization Pager System;

New Hampshire Yankee Offsite Response Organization Emergency Communications System;

Medical Radio Frequency;

Marine Band Radio;

Aircraft Radio;

Dedicated Ringdown Circuits;

Cellular Telephones;

American Red Cross Frequency; and the

Massachusetts Governmental Interface (MAGI)

Vehicle Alert Communications System (VACS).

Communications links, with backup facilities, are established among Seabrook Station, the EOCs, the NHYORO emergency facilities, police, fire departments, and public health agencies, the localities in the plume EPZ, the host communities, and the other emergency response organizations. Procedures for the communications network control and use of the communications equipment are established in the respective plans and procedures. A cross-reference to information in the State, local, and utility emergency response plans relating to communication procedures is provided in Table 1-3 of the Design Report.

B. <u>Physical Means of Alerting</u> (E.6.2, FEMA-REP-10)

The Seabrook Station siren warning system was evaluated in accordance with the design evaluation methodology detailed in "Analysis of Siren System Pilot Test."[6] The primary system

design consists of 110 high-powered electronic sirens: 80 Whelen WS-3000 and 14 Whelen WS-4000 sirens in the New Hampshire portion of the plume EPZ, and 16 Dual Whelen WS-4000 sirens on the VANS vehicles to cover the Massachusetts portion of the plume EPZ.

The Whelen WS-3000 are high-powered oscillating electronic sirens rated at 122 dB at 550 Hz at 100 feet. The Whelen WS-4000 oscillating sirens are rated at 129 dB at 550 Hz. The Dual WS-4000 VANS sirens are rated at 134 dB at 550 Hz. Relevant technical information about the fixed siren system is contained in Chapter 2 of the Seabrook Station Public Alert and Notification System (PANS) Design Report and supporting documentation. Figures 2-1 through 2-4 of the Design Report depict the primary alert coverages of the 80 WS-3000 and 14 WS-4000 sirens in the State of New Hampshire, and the 16 VANS sirens in the Commonwealth of Massachusetts.

The Seabrook Station siren warning system serves as the primary mechanism to alert the general public in the event of a radiological emergency at the plant. The permanent and transient (hotels, parks, beaches, etc.) population is alerted by means of this system of 110 electronic sirens located throughout the Seabrook Station plume EPZ. The fixed sirens for the State of New Hampshire are activated by radio from the Rockingham County Dispatch Center in Brentwood, New Hampshire; the VANS are capable of radio frequency activation from the NHYORO EOC. In addition to the sirens, there is a supplemental system of tone alert radios to warn institutions (e.g. businesses, schools, hospitals, daycare centers, nursing homes, campgrounds, etc.) and special needs individuals within the Seabrook Station plume EPZ. The tone alert radios will be activated by the alert signal from the designated EBS radio stations.

1. Sirens (E.6.2.1, FEMA-REP-10)

Field tests were performed to verify and document the acoustic output ratings and operating frequencies of the sirens deployed in the system. Test data were included in Appendix B of the Design Report in two Wyle Research Test Reports [WR 88-9-(R) and WR 88-4]. Field data submitted [Table 1 of WR 88-9(R)] were used to verify the rated output of the WS-3000 siren to be 122 dB at 550 Hz at 100 feet along its axis. Field data reported in Table 1 of WR 88-4 were used to rate the output of the WS-4000 at 127 dB at 550 Hz at 100 feet and that of the VANS (Dual WS-4000) to be at 132 dB at 550 Hz at 100 feet. These values were at the lower end of the test data reported and are used in this evaluation as an added margin of conservatism.

The evaluation of the siren system design calculation procedure was conducted by:

- Verifying the licensee's computer modeling results as presented in the Design Report against the 10 dB loss per distance doubled attenuation rate in the absence of special conditions; and

- Ascertaining the adequacy of the licensee's computer predictive coverage in the presence of site-specific topographical and meteorological conditions through comparison of the licensee's result with the Outdoor Sound Propagation Model (OSPM)[6] results for specific sirens.

The Design Report states that the Seabrook Station siren warning system design takes into consideration meteorological and topographical factors and land surface conditions that affect the propagation of sound generated

by each siren. The computer model utilized to design the system, as described in Appendix B (WR 88-9) of the Design Report, calculates sound attenuation with distance due to hemispherical wave divergence, atmospheric absorption, ground effects, wind and temperature shadows, barrier attenuation, and foliage attenuations. The assumptions made, methodologies employed, and how the final siren system coverage contours were generated (in particular, the 70 dBC and 60 dBC contours) are included in WR 88-9 of Appendix B of the Design Report.

Field test data at the Seabrook Station comparing the licensee's predicted siren sound levels to actual measured siren sound levels [Tables 4 and 5 of WR 88-9(R), Table 3 of WR 88-4, and Figure 5-2 of WR 88-9 of the Design Report] indicated great conservatism in the licensee's computer predictive model. The licensee's model was shown to greatly under estimate the actual measured siren sound level by an average of over 20 dB (or 100 times in terms of sound pressure squared) on one day (March 15, 1988), 7 to 15 dB on another day (March 16, 1988), and 0.7 to 9 dB on a third day (March 25, 1988).[2/]

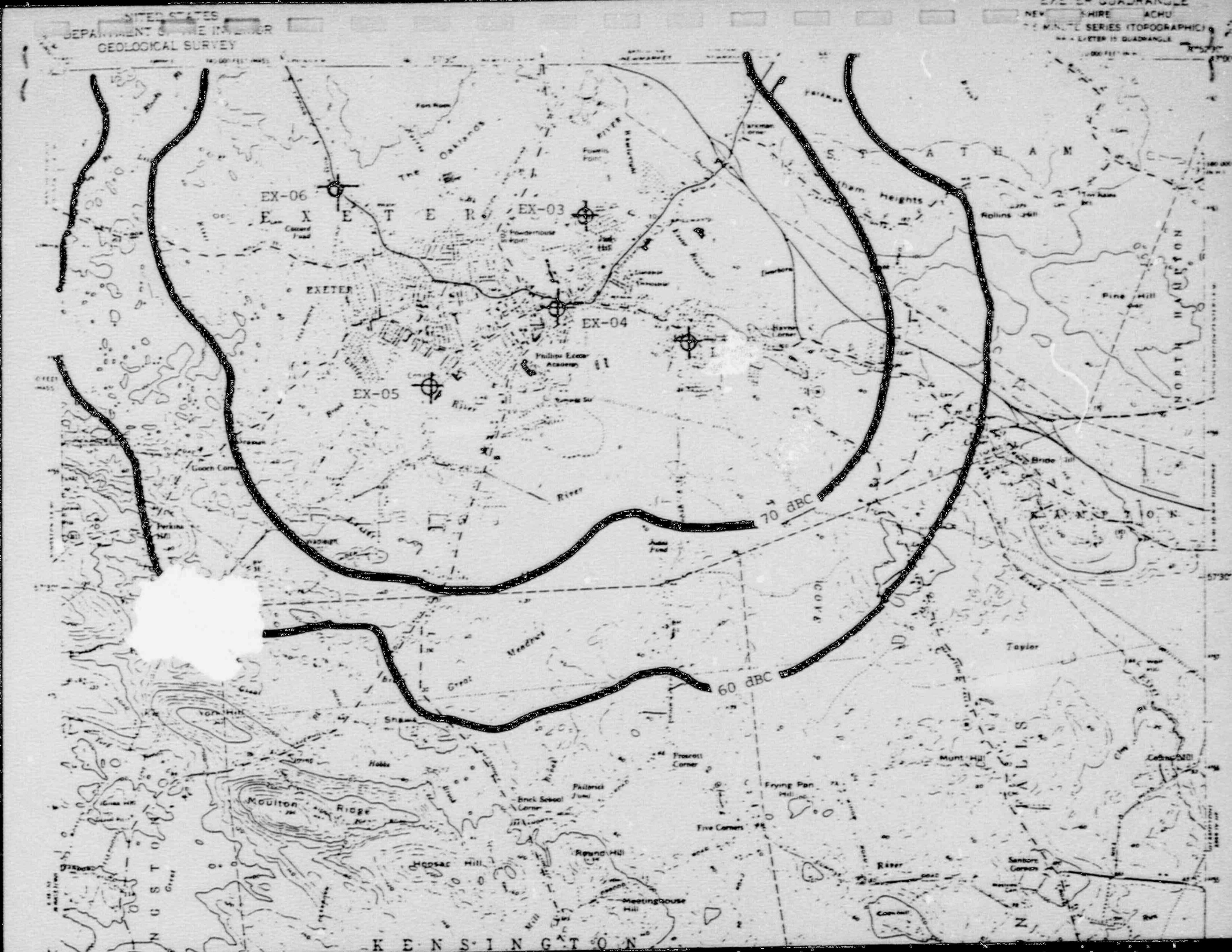
This quality assurance verification review is based on an evaluation of the presented predictions of acoustical coverage (see Figure 2-1 through Figure 2-4 of the Design Report) and seeks to ascertain whether the licensee's computer model applied adequately accounts for the site-specific terrain and weather conditions and whether the siren alerting system as designed does indeed meet the FEMA-REP-10 acceptance criteria.

Ten sirens, representative of the site-specific topographical conditions within the Seabrook Station plume EPZ, were selected for this quality assurance verification

review. The locations of the selected sirens and acoustical coverage are depicted on U.S. Geological Survey quadrangle maps for Exeter, New Hampshire, and Kingston, New Hampshire (Figures 2 and 3 of this report). At the time of this analysis, the locations of the sirens in Massachusetts was proprietary information and consequently the locations were not depicted on the U.S. Geological Survey quadrangle map for Newburyport, Massachusetts (Figure 4 of this report). These sirens are representative of the three types of sirens deployed in the Seabrook Station alert and notification system, and represent relatively populated and critical areas within the Seabrook Station plume EPZ.

Surface weather parameters, representative of site prevailing summer daytime conditions, were used in the OSPM calculations. Appendix A of this report contains Topographical Profile Charts, Topographical Input Data, OSPM Siren Sound Pressure Level Input, OSPM Meteorological Input, and OSPM Siren Sound Pressure Level Output Data for each of the 10 individual siren runs.

To compare the ranging estimates of OSPM with the design procedure for the sirens analyzed, the output dBC levels along each azimuth of the 10 sirens were classified into essentially two terrain categories: flat terrain (generally unobstructed line-of-sight) and partially hilly terrain (very slightly obstructed line-of-sight). An additional category of hilly was also used with the VANS sirens. Regressions of dBC versus the logarithm of distance were performed for the sirens over these categories.



EXETER QUADRANGLE
GEOLOGICAL SURVEY
EX-06
EX-03
EX-04
EX-05
E X E T E R
EXETER
S T R A T H A M
Stratham Heights
Rollins Hill
Pine Hill
Phillips Exeter Academy
70 dBC
60 dBC
Gooch Corner
Perkins Hill
York Hill
Moulton Ridge
Hoosac Hill
Round Hill
Meetinghouse Hill
Brick School Corner
Five Corners
Frying Pan Hill
Prescott Corner
Mount Hill
Sanborn Corners
Taylor
Cove
K E N S I N G T O N

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FIGURE 2

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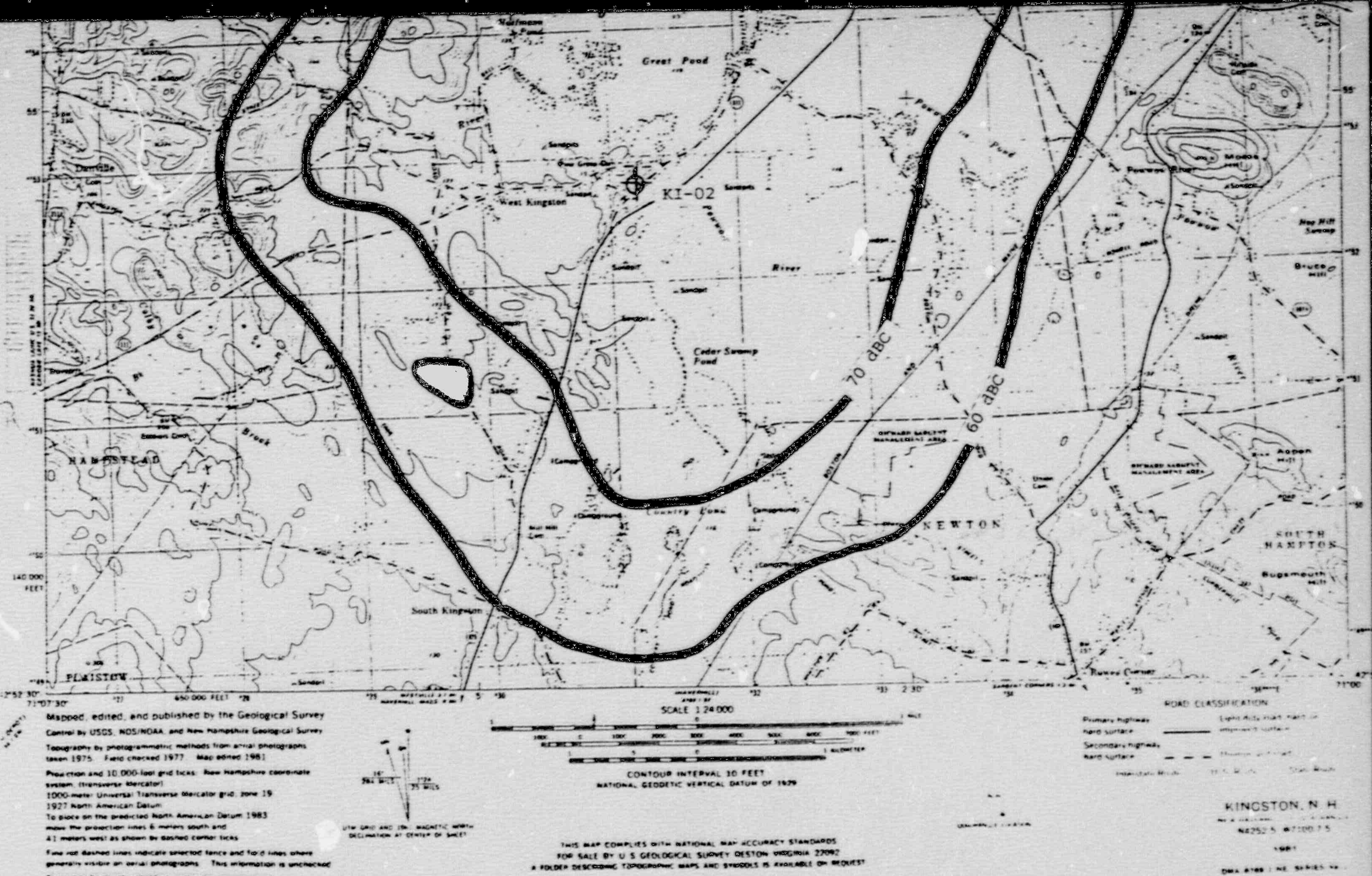
Spruce Swamp
FREMONT
BRENTWOOD
EXETER
RIVER
Pages Corner
Marshall Corner
57'30"
North Danville
Coburn Hill
Philbrick Hill
DANVILLE
Rock Rimmon
KINGSTON
Kingston
Greenwood Pond
KI-03
Kingston State Park
EAST KINGSTON
East Kingston
Great Hill



SEABROOK STATION SIREN CONTOUR PLOT

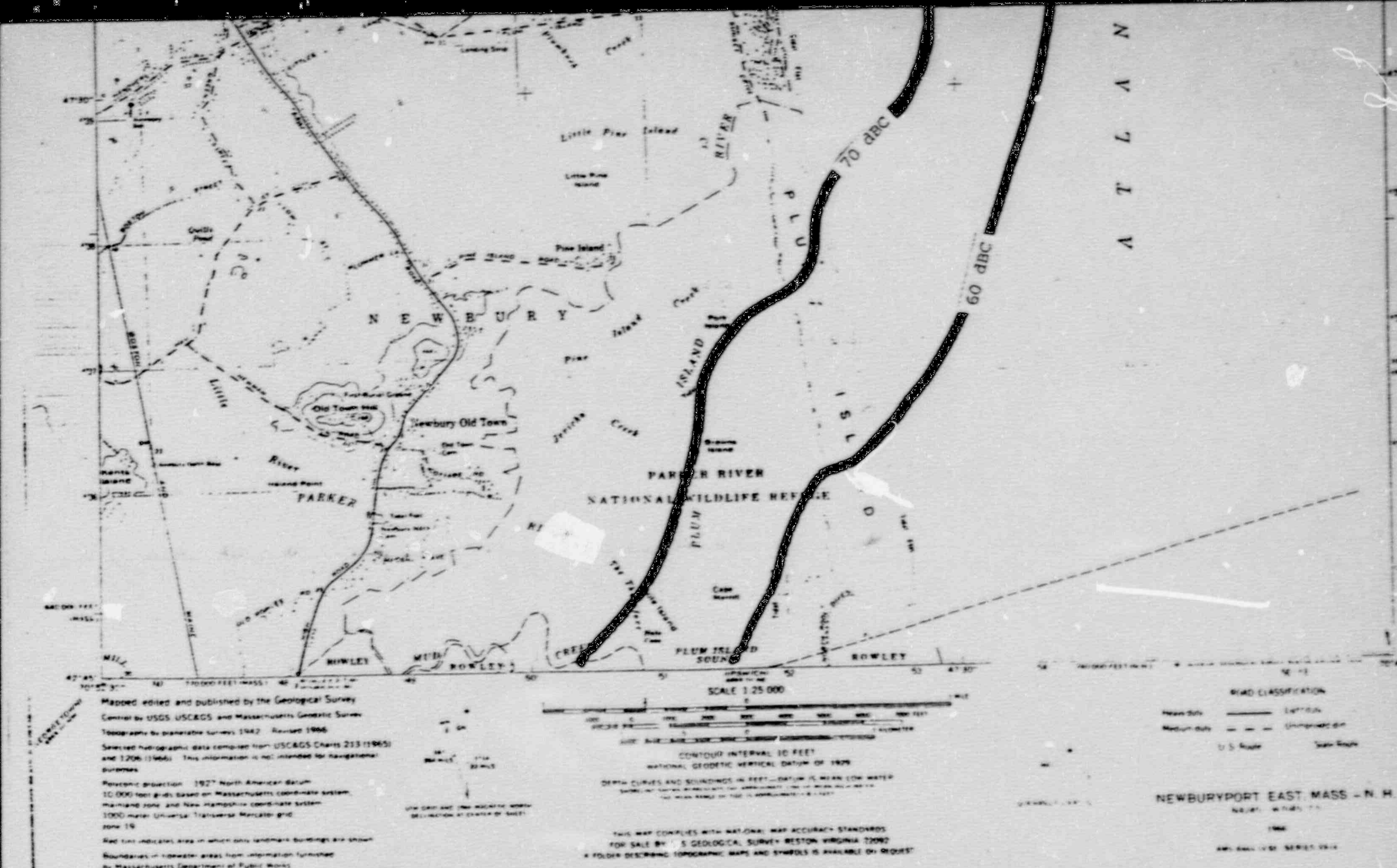
FIGURE 3

SI
APERTURE
CARD

Also Available On
Aperture Card

9009210251-03


NEWBURYPORT
MERRIMACK
RIVER
JOPPA
FLATS
SALISBURY
Salisbury
Salisbury Beach
Plum Island
Rings Island
Black Rock Creek
T I C
O C E A N



SI
APERTURE
CARD

SEABROOK STATION SIREN CONTOUR PLOT

FIGURE 4

Also Available On
Aperture Card

9009210251-04

The OSPM regression results of the siren sound pressure levels are presented in Figures 5 through 11 of this report. Since the Design Report contains no comparable range estimates for corresponding terrain classifications and since the licensee's contouring procedure essentially terminates the contour at the obstruction, only ranges for unobstructed (circular contours around the sirens) paths from Figures 2-1 to 2-4 of the Design Report were used for comparison.

The following table summarizes the estimated effective ranges of 70 dBC and 60 dBC over the various terrain classifications:

Siren Type	Procedure	Terrain	Range in ft to 70 dBC	60 dBC
WS-3000	Licensee	No Barriers	3,600	7,200
	OSPM	Flat	5,750	11,750
		Partially Hilly	4,750	8,900
	10 dBC Rate	No Barriers	3,700	7,400
WS-4000	Licensee	No Barriers	6,100	10,560
	OSPM	Flat	8,700	17,500
		Partially Hilly	6,650	12,300
	10 dBC Rate	No Barriers	5,200	10,400
VANS	Licensee	No Barriers	8,225	13,060
	OSPM	Flat	9,400	18,800
		Partially Hilly	8,300	16,000
		Hilly	5,100	8,800
	10 dBC Rate	No Barriers	7,450	14,900

Using field measurements reported in WR 88-9(R) for WS-3000 sirens (for 122 dB at 550 Hz output at 100 feet) of 78.6 dBC at 4,100 feet and 65.5 dB at 10,000 feet (the lower range of measurements), it can be seen from Figure 5

FIGURE 5

COMPARATIVE OSPM RESULTS, FLAT (WS-3000 SIREN)

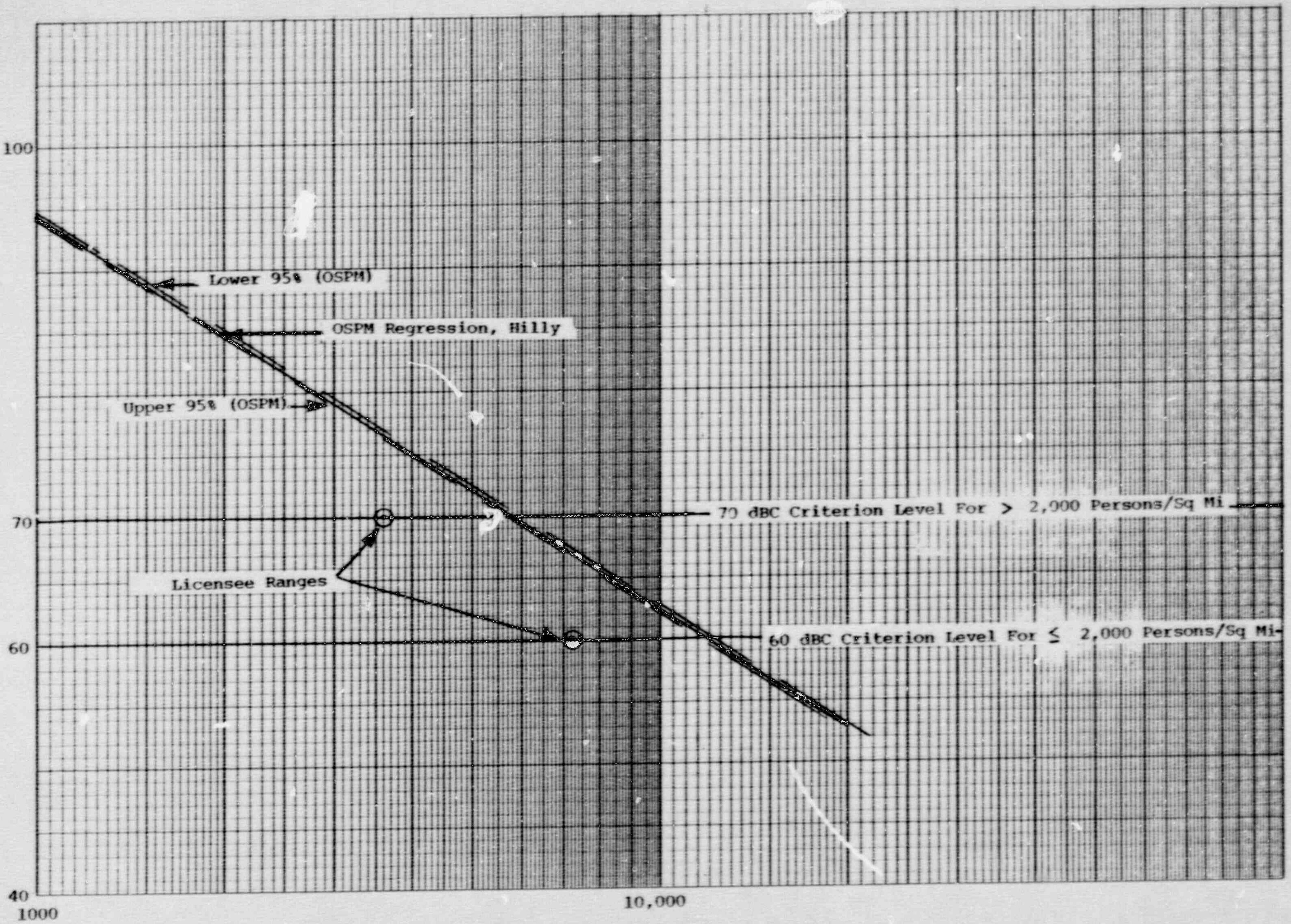


FIGURE 6

COMPARATIVE OSPM RESULTS, PARTIALLY HILLY (WS-3000 SIREN)

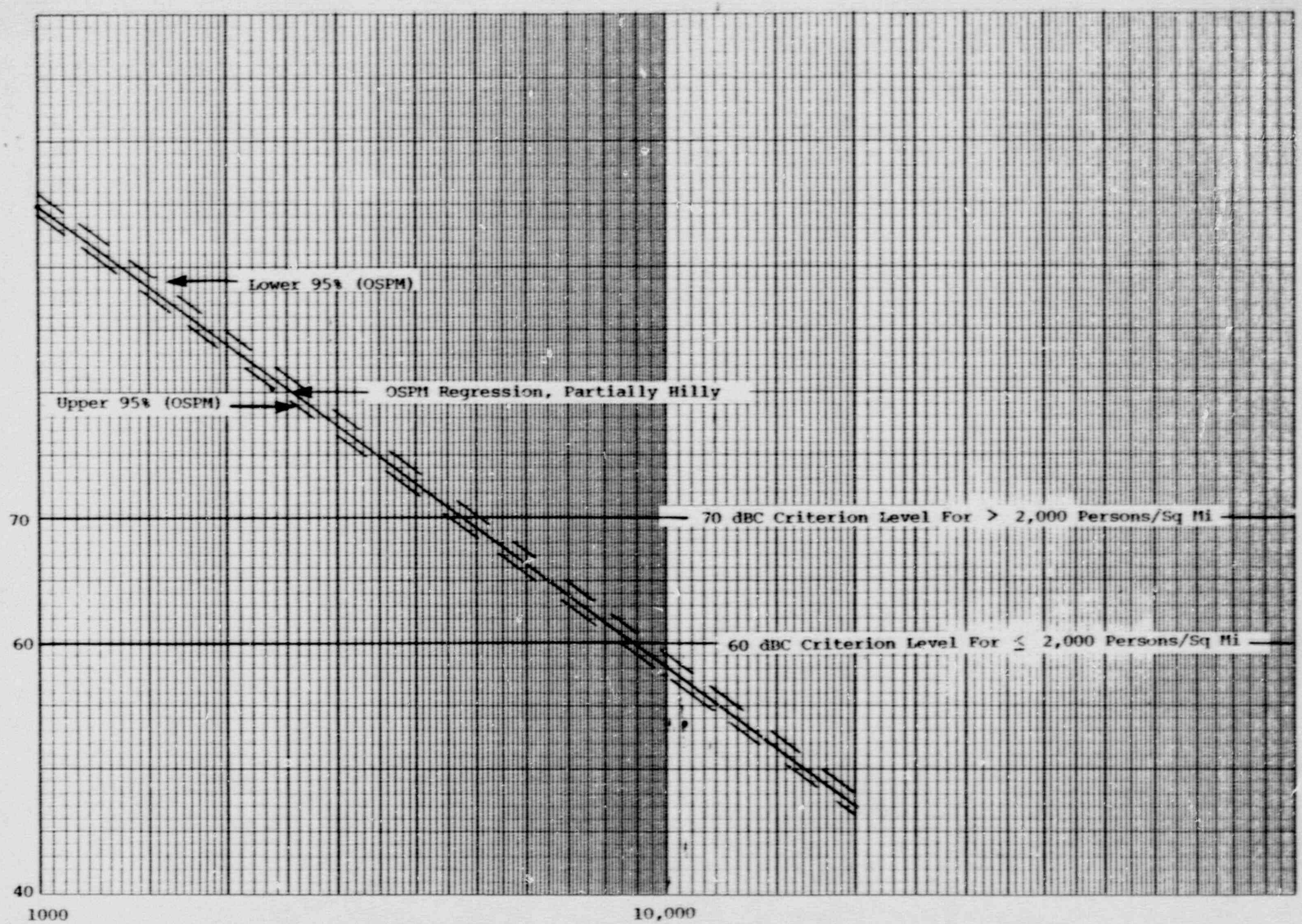


FIGURE 7

COMPARATIVE OSPM RESULTS, FLAT (WS-4000 SIREN)

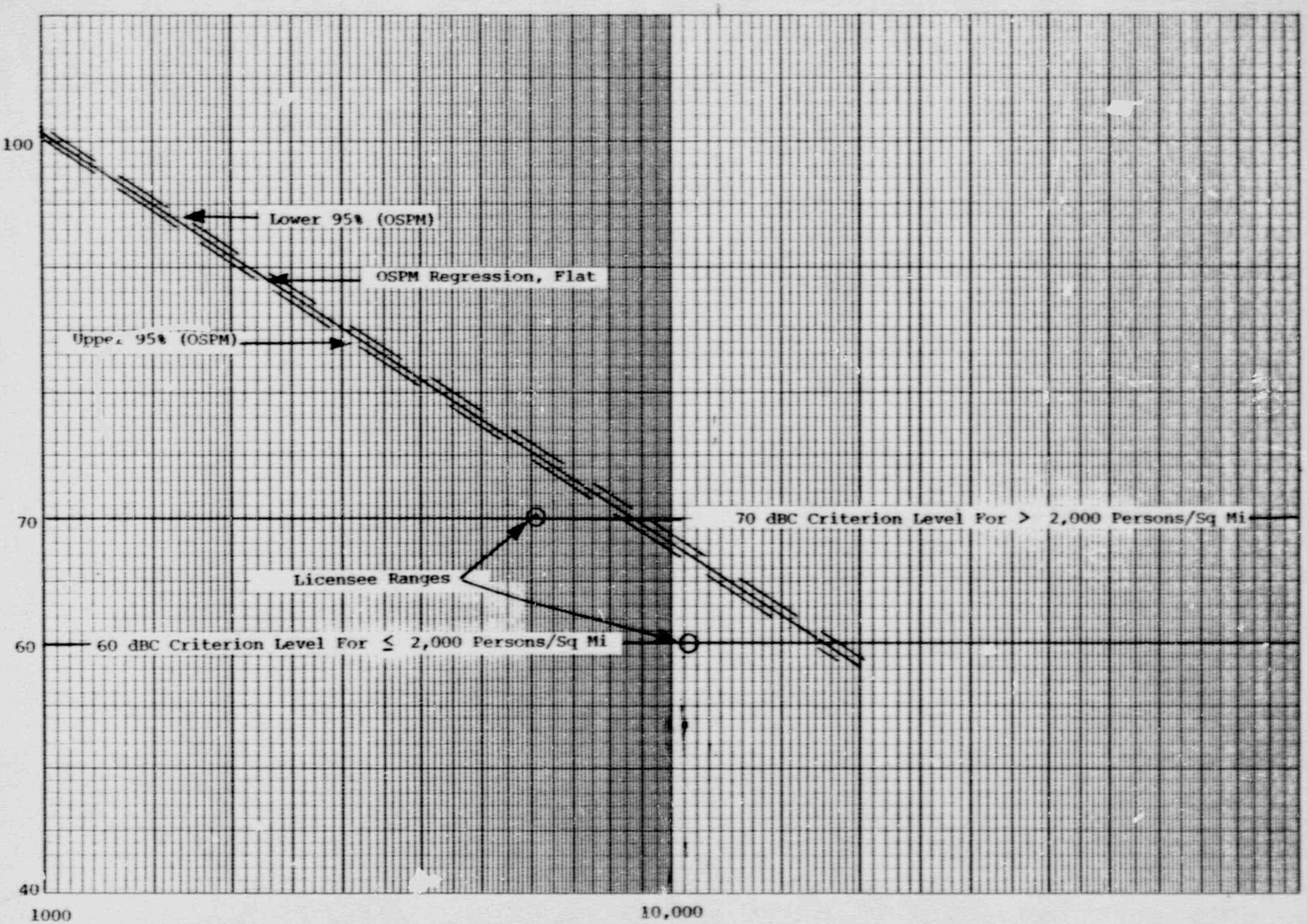


FIGURE 8

COMPARATIVE OSPM RESULTS, PARTIALLY HILLY (WS-4000 SIREN)

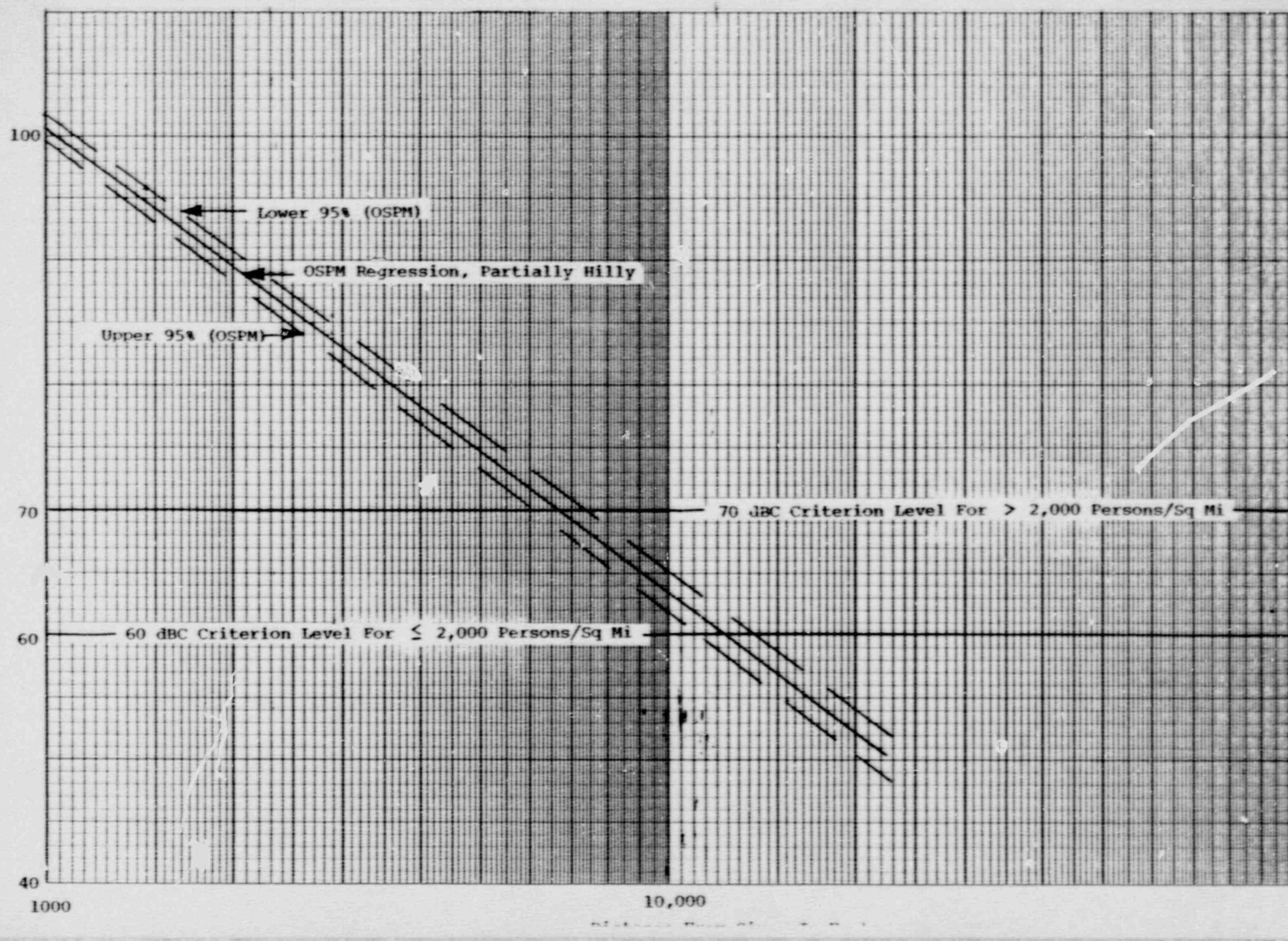
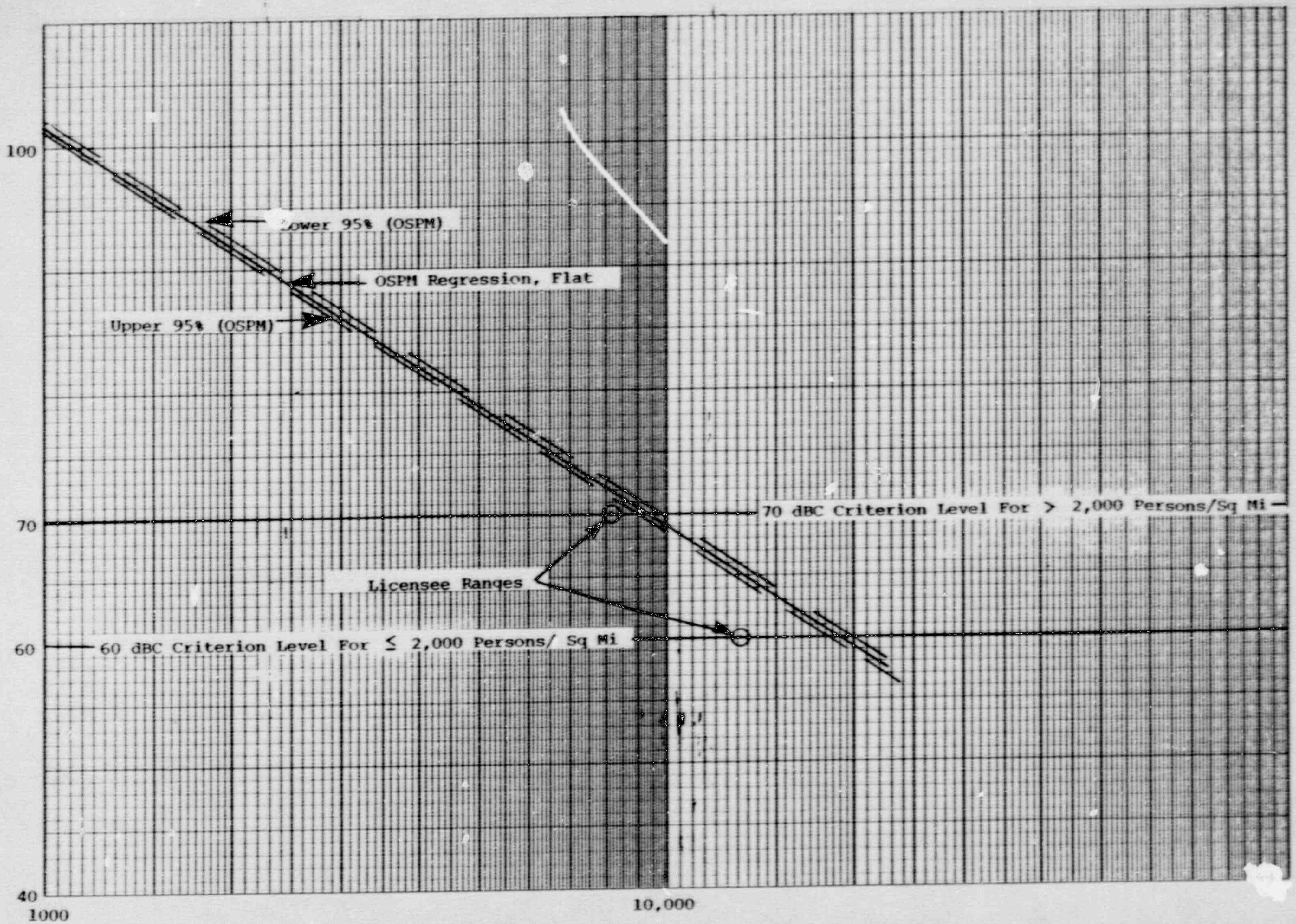


FIGURE 9

COMPARATIVE OSPM RESULTS, FLAT (VANS)



COMPARATIVE OSPM RESULTS, PARTIALLY HILLY (VANS)

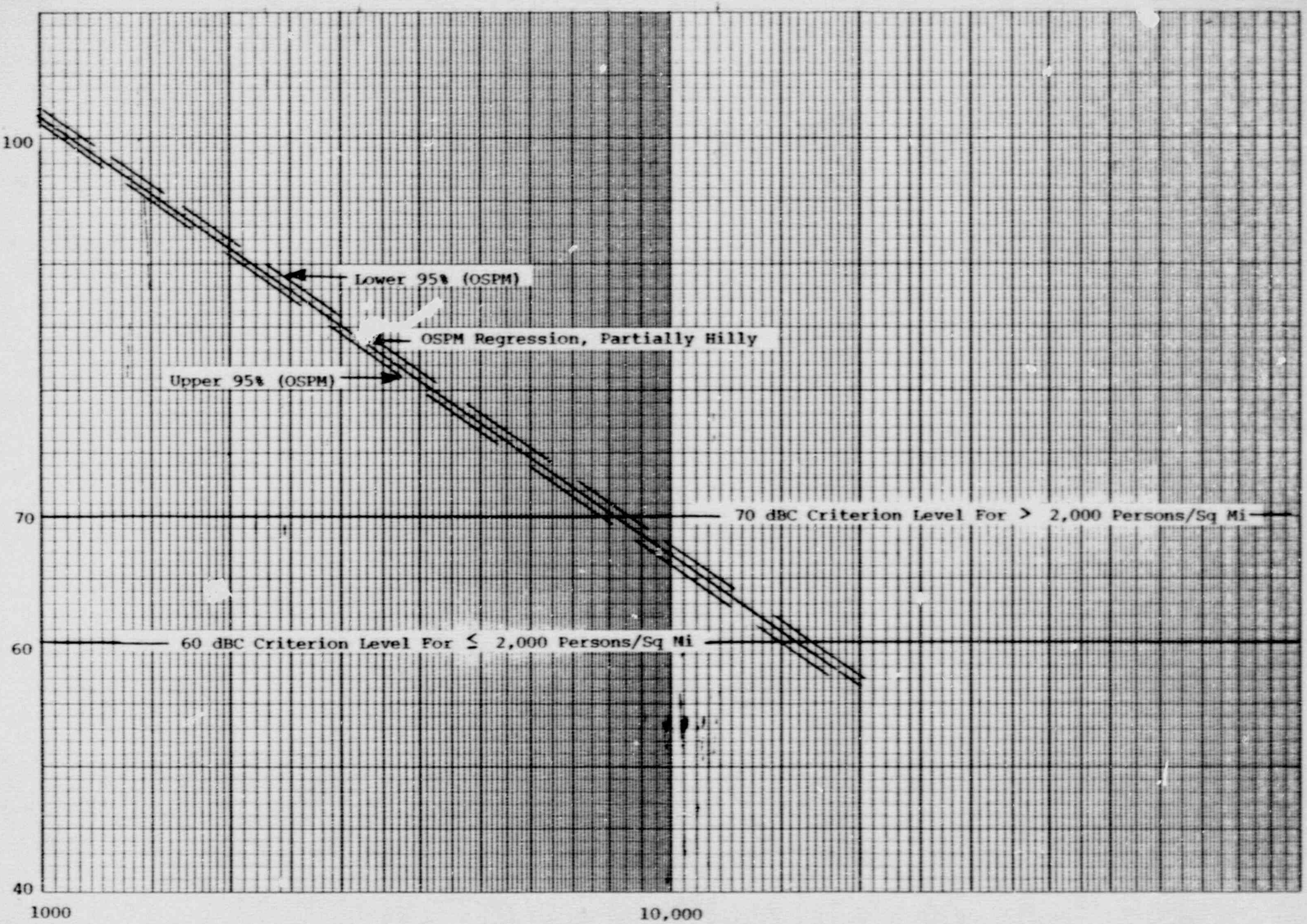
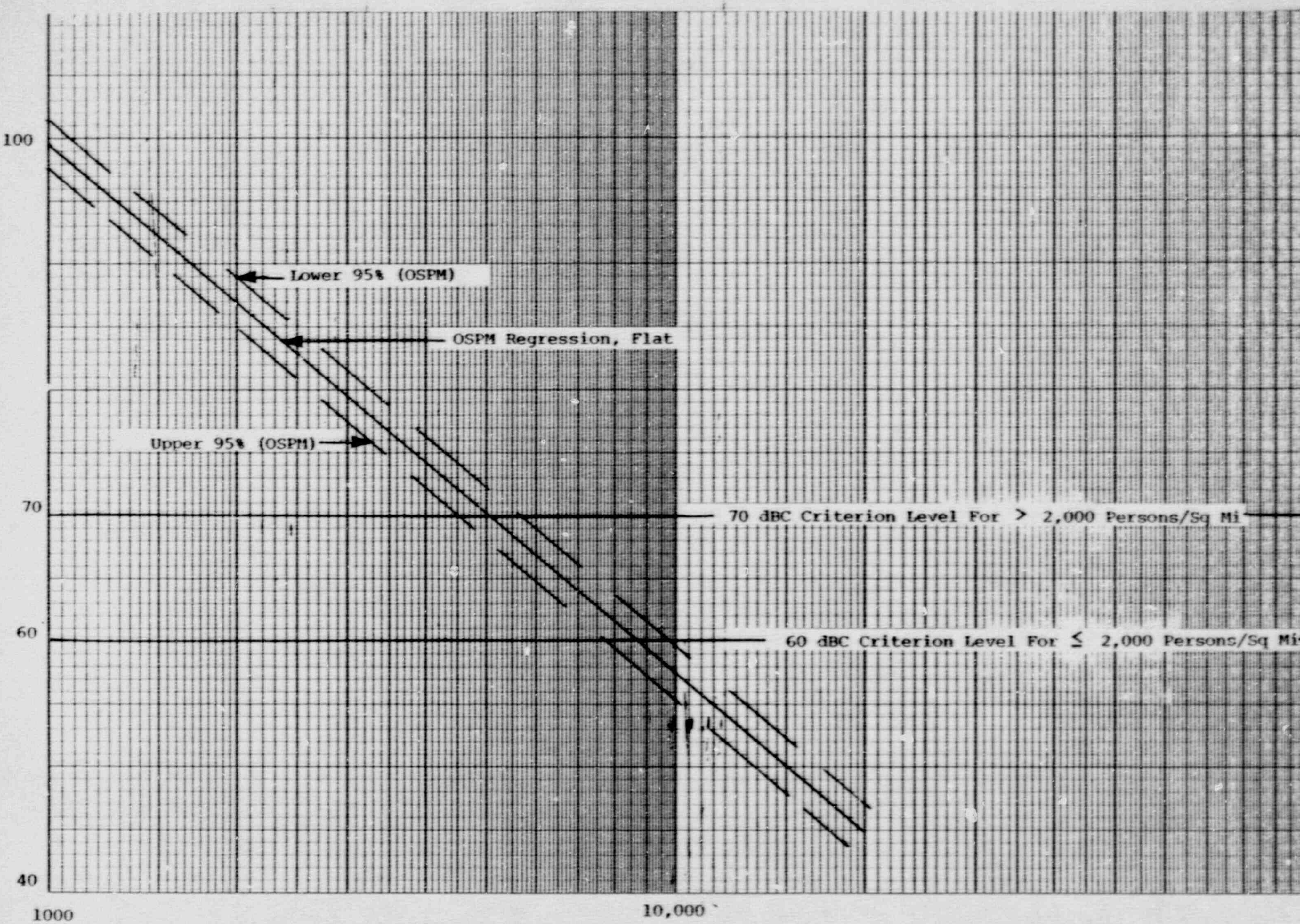


FIGURE 11

COMPARATIVE OSPM RESULTS, HILLY (VANS)



that the OSPM estimated sound levels are closer (75 and 62 dBC) to the measured levels than either the 10 dB rule (68 and 56 dBC) or the licensee's predictions (64.8 dBC and 43.9 dBC). The measured siren sound levels for the WS-4000 siren were 84 dBC at 4,100 feet, 67 dBC at 10,000 feet; OSPM regressed values at corresponding distances were 81 dBC and 68 dBC respectively whereas the 10 dB rule would have resulted in 73 dBC and 61 dBC and the licensee's predictions would be 75 dBC and 61 dBC. The measured level for the VANS was 70 dBC at 10,000 feet; compared to the OSPM prediction of 70.5 dBC for flat terrain, 69 dBC for a slightly obstructed path, and 67 dBC predicted by both the 10 dB per distance doubling rule and licensee's estimate.

Thus, some general observations can be made concerning the siren range comparisons. The 60 dBC and 70 dBC ranges estimated by the licensee are conservative compared to the OSPM results over all terrain categories and actual measurements taken at the Seabrook Station site. The licensee's computer predictive model and contouring procedure are particularly conservative (under-estimating) over relatively flat and unobstructed paths by as much as 20 dBC.

To assess the overall adequacy of the design on an area basis, for each siren located on the U.S. Geological Survey's Exeter, Kingston, and Newburyport quadrangle maps (Figures 2 to 4 of this report), the area coverages of 60 dBC and 70 dBC were numerically integrated and averaged. The results are as follows:

AVERAGE AREA
(In Square Miles)

Siren Type	70 dBC	60 dBC
WS-3000 (Exeter)	3.8	8.6
WS-4000 (Kingston)	6.7	13.8
VANS (Newburyport)	7.7	14.3

Using these results, the following average effective radii, compensating for site conditions, are derived:

EFFECTIVE RADIUS
(In Feet)

Siren	70 dBC	60 dBC
WS-3000	5,806	8,736
WS-4000	7,711	11,066
VANS	8,266	11,265

These derived radii confirm that on the average, the Design Report siren ranges are conservative when site terrain and weather conditions are taken into account.

The results of the individual OSPM runs were combined to generate a comprehensive overview of the siren sound pressure levels in the 3 quadrangles as depicted in Figures 2 to 4 of this report. A surface interpolation and contouring program utilizing the output results of the 10 sirens was used to generate the sound pressure level contours shown in Figures 2 to 4. These contours account for site-specific topographical and meteorological effects of the sirens.

Comparisons of the OSPM-predicted 60 dBC and 70 dBC contours with the contours in Figures 2-1 through 2-4 of the Design Report indicate that the coverage of the sirens

as calculated in the Design Report is very conservative for the WS-3000 and WS-4000 sirens, and conservative for the VANS sirens where there are obstructions due to the conservative contouring procedures cutting off siren contours at obstructions.

The Design Report stated that there are five geographical areas in the New Hampshire portion of the Seabrook Station plume EPZ and four geographical areas in the Massachusetts portion of the Seabrook Station plume EPZ not covered by at least 60 dBC. These areas were verified to be either uninhabited, or access-controlled points alerted through supplemental means. Based on the evaluation results discussed above, it is concluded that these nine areas would also be covered by at least 60 dBC from the primary siren system as designed if it were not for the very large conservative margin used in the licensee's conservative contouring methodology as presented in the Design Report's siren coverage contours.

In conclusion, the Seabrook Station siren alerting system is found to meet the specific design requirements of FEMA-REP-10.

2. Special Alerting (E.6.2.4, FEMA-REP-10)

To supplement the alerting provided by the siren system, tone alert radio receivers have been offered and distributed to institutions, special needs facilities, and special needs persons, within the plume EPZ by the State of New Hampshire for New Hampshire and New Hampshire Yankee for Massachusetts[9,10]. These tone alert radio receivers will be activated by a tone broadcast over the designated EBS radio stations. Because two separate EBS frequencies will be used (one each in New Hampshire and

Massachusetts), the tone alert radios in each State are tuned to their respective EBS frequencies.

The tone alert radio receivers are manufactured by Johnson Electronics. The tone alert radio receivers normally operate from AC power, but also will have back-up battery power available in the event of a power failure. Upon activation, the audio of the receiver turns on, and emergency messages from the activating station are audible. Activation also lights a signal lamp on the receiver.

A maintenance and testing program has been established to provide recipients the opportunity to verify the operation of the tone alert radio receivers. Operability tests for the tone alert radio receivers are conducted on a weekly basis by the designated EBS radio stations. Recipients have been instructed to contact New Hampshire Yankee for a replacement if the receiver does not pick up the message. The licensee is also maintaining a register of participants who have received tone alert radios. A listing of all organizations and persons refusing tone alert radios is being maintained.

A Memorandum of Understanding between the State of New Hampshire and the Coast Guard states that a Coast Guard response to an emergency at Seabrook Station would consist of control, notification, and restriction of water-borne traffic from an established dangerous area which the Coast Guard Captain of the Port, Boston, Massachusetts, designates as a safety zone (see page C-140 of the "Seabrook Plan for Massachusetts Communities").[2/] The NHOEM notifies the Coast Guard Marine Safety Office in Boston, Massachusetts, or the First Coast Guard District Operations Center of the emergency. The First Coast Guard

District Operations Center activates available Coast Guard crews to enforce the safety zone. The Coast Guard has published the First District Radiological Incident Response Plan which establishes command relationships and guidance for response activities in the event of emergency situations at any of nine nuclear plant sites (of which the Seabrook Station is one) within the jurisdiction of the First Coast Guard District. This plan is enclosed as Attachment F of the Design Report.

The licensee's predictive sound model also computes, using a ground attenuation algorithm appropriate for water, the portions of the 60 dBC contours for the Massachusetts and the New Hampshire sirens which lie over the Atlantic Ocean. Siren coverage maps, labeled Figures 2-3 and 2-4, depict the revised "over ocean" siren coverage as extending out approximately five miles. These maps are included as Attachment G to the Design Report.

The Department of Interior, Fish and Wildlife Service, has agreed, when requested by the NHYORO, to close the Parker River National Wildlife Refuge on Plum Island and notify visitors to leave the refuge. A special procedure has been approved by the licensee and Parker River National Wildlife Refuge officials. The procedure defines a concept of operations and establishes responsibilities in the event an accident at Seabrook Station results in closure of the refuge. This special procedure is enclosed as Attachment D of the Design Report.

III. FINDINGS FOR EVALUATION CRITERION N.1 (FEMA-REP-10)

FEMA'S ACCEPTANCE TEST

On May 16, 1990, the physical means (sirens) used to alert the population within the Seabrook Station plume EPZ were demonstrated to satisfy the alert and notification aspects of 44 CFR 350.9(a). This demonstration was conducted by using the methods specified in Section N.1 (a,b).2 of FEMA-REP-10.[5/] The results indicate that this portion of the Seabrook Station's alert and notification system conforms to FEMA-REP-10 and NUREG-0654/FEMA-REP-1, Rev. 1.[5,8/]

The May 16, 1990, demonstration of the Seabrook Station alert and notification system consisted of a double activation of all sirens and subsequent telephone surveys to estimate the proportion of plume EPZ households actually alerted. The first activation was initiated at approximately 1:00 p.m. Eastern Daylight Time (EDT). The second activation was initiated at approximately 1:05 p.m. EDT. A broadcast of a test message by the designated EBS radio stations (WOKQ in New Hampshire and WLYT in Massachusetts) was initiated at approximately 1:03 p.m. EDT. All sirens were reported operating during the demonstration.

The telephone survey of EPZ residences began at approximately 1:12 p.m. EDT and was completed within one hour and twelve minutes. This survey was conducted by 48 telephone interviewers, each with a separate WATS line and computer terminal.

The universe of households to be surveyed was determined by establishing a 14-mile-radius circle around the latitude and longitude of the plant. The sample incorporated a sorted master list of approximately 2,500 households (addresses and

telephone numbers) believed to be within the Seabrook Station plume EPZ.

A sufficient number of replicated subsamples were developed from this master list to ensure that the required number of telephone calls would be made, i.e., to establish the proportion of households alerted to within a 5% precision at a 95% confidence level. The method for sizing the sample to achieve this result is described in Appendix B of this report.

The questionnaire for this telephone survey is included as Figure 12 of this report.

As part of the telephone survey, a total of 328 households believed to be within the Seabrook Station plume EPZ were contacted, and the responses were collected in an automated data base. Before running the final tabulations, addresses of all households interviewed were checked on maps to validate their locations within the Seabrook Station plume EPZ.

Of the 328 addresses, eight households were found to be outside the plume EPZ. Therefore, data were tabulated on the 320 respondent households that were located within the plume EPZ. There were 46 respondents at households who were away from home at the time of the demonstration. These 46 respondents were not included in the alerting analysis. In summary, data were tabulated on 320 households within the plume EPZ, of which 274 were eligible, i.e., home at the time of the activation.

FIGURE 12

47090
Chilton Research Services
Radnor, Pennsylvania

Study #8510
May 16, 1990

OMB #3067-0103 (FEMA 9/90)
FEMA NUCLEAR POWER PLANT ALERTING
AND NOTIFICATION SYSTEM: PUBLIC TELEPHONE
SURVEY
SEABROOK STATION

Time Began ____________AM ____________PM

Time Ended ____________AM ____________PM

Interview #________________ (1-5)

Zip Code ________________ (6-10)

Sample Type ________________ (11)

RECORD BEFORE DIALING -Telephone # ________________________________
(Area Code) (Exchange) (Number) (12-21)

CHECK AREA CODE FOR CORRECT INTRODUCTION:

IF AREA CODE IS 508 (MA) READ THIS INTRODUCTION:

Hello, my name is ________________________. We're calling households from Chilton Research Services in cooperation with New Hampshire Yankee as part of a survey. This survey is sponsored by The Federal Emergency Management Agency of the United States Government.

Your answers are voluntary and will be kept strictly confidential.

IF AREA CODE IS 603 (NH) READ THIS INTRODUCTION:

Hello, my name is ________________________. We're calling households from Chilton Research Services in cooperation with New Hampshire Yankee and the State of New Hampshire Office of Emergency Management as part of a survey. This survey is sponsored by The Federal Emergency Management Agency of the United States Government.

Your answers are voluntary and will be kept strictly confidential.

1. First of all, is this (REPEAT # DIALED)?

	Yes	1
TERMINATE AND DIAL AGAIN	No	2

2. There was a test today of the Seabrook Station siren system. Did you, or any other member of this household, hear this test today? 22-

SKIP TO Q. 4	Yes	1
SKIP TO Q. 4A	No	2
CONTINUE	Heard from another source	3
ASK IF ANY OTHER HOUSEHOLD MEMBER IS MORE KNOWLEDGEABLE	Don't Know	8

. What did you or your household hear? (DO NOT READ. CIRCLE ALL THAT APPLY)

(23-25)

SKIP TO Q. 4	A siren	1
	Neighbor told me	2
	Other family member told me	3
	EBS on radio	4
	Other (SPECIFY) ______	9
CONTINUE	Don't Know	Y

. Did you hear . . . (READ LIST. CIRCLE ALL THAT APPLY)

(30-32)

	A Siren	1
	From a Neighbor	2
	From Another Family Member	3
	Emergency Broadcast message on radio	4
	Or by means of something else (SPECIFY) ______	9
DO NOT READ	Don't Know	Y

(IF "HEARD EMERGENCY SIGNAL" ASK Q. 4 BELOW; OTHERWISE SKIP TO Q. 4A)

Were you at home or away from home when you heard or were made aware of this test?

37-

SKIP TO Q. 5	Home	1
	Away From Home	2

(IF "DID NOT HEAR EMERGENCY SIGNAL")

4A. Were you at home at anytime between 1:00 and 1:15 this afternoon?

38-

Yes	1
No	2
Don't Know	Y

5. Did your household receive the 1990 Emergency Plan Information Calendar which tells you what to do in the event of an emergency at the Seabrook Station? The 1990 Emergency Plan Information Calendar was mailed to you in December, 1989. Do you remember receiving this calendar?

41-

Yes	1
No	2
Don't Know	Y

6. Because we need to determine whether or not you live within the 10 mile Emergency Planning Zone of the Seabrook Station, would you please give me this address? (PAUSE FOR ANSWER)

ADDRESS:

____

____

and the nearest intersection (or cross street) to this house.

____

Also, what community is this?

____

On behalf of Chilton Research Services and the Federal Emergency Management Agency, I would like to thank you for your time and for giving us this valuable information. We estimated this survey would take two to three minutes. If you wish to comment on the length or any other aspect of this survey, write to the Federal Emergency Management Agency, Room 633, 500 C Street, Washington, D.C. 20472.

Of these remaining 274 households, 89.8% (246) indicated that they had heard the sirens during the demonstration. By using the estimated number of households within the plume EPZ (44,860 from References 9 and 10 of this report) in the confidence interval expression in Appendix B of this report, an estimated 95% confidence interval for the proportion of the total plume EPZ population alerted that ranges from 85.6% to 92.8% can be derived. In other words, at the 95% confidence level, between 85.6% and 92.8% of the households within the Seabrook Station EPZ would have reported being alerted by the siren alerting system.

The sample of 320 households was also used to estimate the proportion of households within the plume EPZ that stated they received information about what to do in a real emergency at the Seabrook Station. Of these 320 households, 71.9% (230) responded that they had received the information, 22.2% (71) responded that they had not received the information, and 5.9% (19) did not know or refused to state whether they had received the information. Using the approach discussed previously, the following estimates for the entire plume EPZ population resulted (at the 95% confidence interval):

- Between 66.7% and 76.5% of the households would have reported receiving the information,

- Between 18.0% and 27.0% of the households would have responded that they had not received the information; and

- Between 3.8% and 9.1% of the households would not have known or would have refused to state whether they had received the information.

The State of New Hampshire and New Hampshire Yankee have established a routine testing program which consists of silent tests and siren activations. Following are the results of their test programs:

The State of New Hampshire

Type of Test	Date(s)	Average Operability
Silent test	1989-90	99.2%*
Silent test	1989-90	98.6%**
Siren activation	4/90 #1	90.4%
Siren activation	4/90 #2	98.9%
Siren activation	4/90 #3	91.4%
Siren activation	5/90 #1	95.7%
Siren activation	5/90 #2	100.0%
Average of tests		96.3%

New Hampshire Yankee

Type of Test	Date(s)	Average Operability
Silent test	1990	95.6%***
Siren activation	5/90 #1	100.0%
Siren activation	5/90 #2	100.0%
Average of tests		98.5%

* There were two separate silent test programs during 1989. This data represents one program of 26 silent tests conducted every two weeks from 1/27/89 to 1/12/90.

** This is New Hampshire's 1989-1990 silent test data from 12/11/89 to 5/17/90 and represents 143 silent tests.

*** The VANS were not operational until January 3, 1990. The silent test data represents 66 silent tests conducted from January 4 through May 3, 1990.

In conclusion, no areas of the Seabrook Station siren alerting system were identified as needing enhancements.

IV. FINDINGS FOR EVALUATION CRITERIA E.5, F.1, N.2, N.3, AND N.5 (FEMA-REP-10)

Those aspects of the alert and notification system addressing evaluation criteria E.5, F.1, N.2, N.3, and N.5 of NUREG-0654/FEMA-REP-1, Rev. 1 and E.3, F.1, N.2, N.3, and N.5 of NUREG-0654/FEMA-REP-1, Rev. 1, Supp. 1 have been reviewed by FEMA and found to be adequate as documented in findings submitted to NRC on February 9, 1990[12/] and June 15, 1990.[13/]

REFERENCES

1. Public Service of New Hampshire. 1985. "Seabrook Station Final Safety Analysis Report, Chapter 2, Site Characteristics." VSMF Data Control Services. 1985.

2. New Hampshire Yankee Division, Public Service of New Hampshire. 1988. "Seabrook Station Public Alert and Notification System FEMA-REP-10 Design Report." April 30, 1988.

3. Federal Emergency Management Agency. 1988. "Exercise Report Seabrook Nuclear Power Station at Seabrook, New Hampshire, Licensee: Public Service of New Hampshire, Date of Exercise: June 28-29, 1988." September 1, 1988.

4. Nuclear Regulatory Commission and Federal Emergency Management Agency. 1988. "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants - Criteria for Utility Offsite Planning and Preparedness." NUREG-0654/FEMA-REP-1. Revision 1. Supplement 1. October 1988.

5. Federal Emergency Management Agency. 1985. "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants." FEMA-REP-10. November 1985.

6. International Energy Associates Limited. 1983. "Analysis of Siren System Pilot Test." IEAL-333. November 2, 1983.

7. New Hampshire Yankee. 1988. "Seabrook Station Public Alert and Notification System FEMA-REP-10 Design Report Addendum 1." October 14, 1988.

8. Nuclear Regulatory Commission and Federal Emergency Management Agency. 1980. "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." NUREG-0654/FEMA-REP-1. Revision 1. November 1980.

9. "New Hampshire Radiological Emergency Response Plan." Volume 20, Revision 3. February, 1990. Page 1.5-4.

10. "Seabrook Plan for Massachusetts Communities." Volume 1, Revision 1. Page 1. December, 1989.

11. New Hampshire Yankee. 1990. "Seabrook Station Public Alert and Notification System FEMA-REP-10 Design Report Addendum 2." March 30, 1990.

12. Federal Emergency Management Agency. 1990. Letter to James M. Taylor, Executive Director for Operations, U.S. Nuclear Regulatory Commission, from Grant C. Peterson, Associate Director, State and Local Programs and Support, transmitting a "February 1990 Review and Evaluation of the State of New Hampshire Radiological Emergency Response Plan (NHRERP) for Seabrook Station" and a "January 1990 Report on the Status of Corrective Actions, First Exercise and Drill Cycle, 1988 to 1994, of the States of Maine and New Hampshire and New Hampshire Yankee's Offsite Response Organization for the Seabrook Station." February 9, 1990.

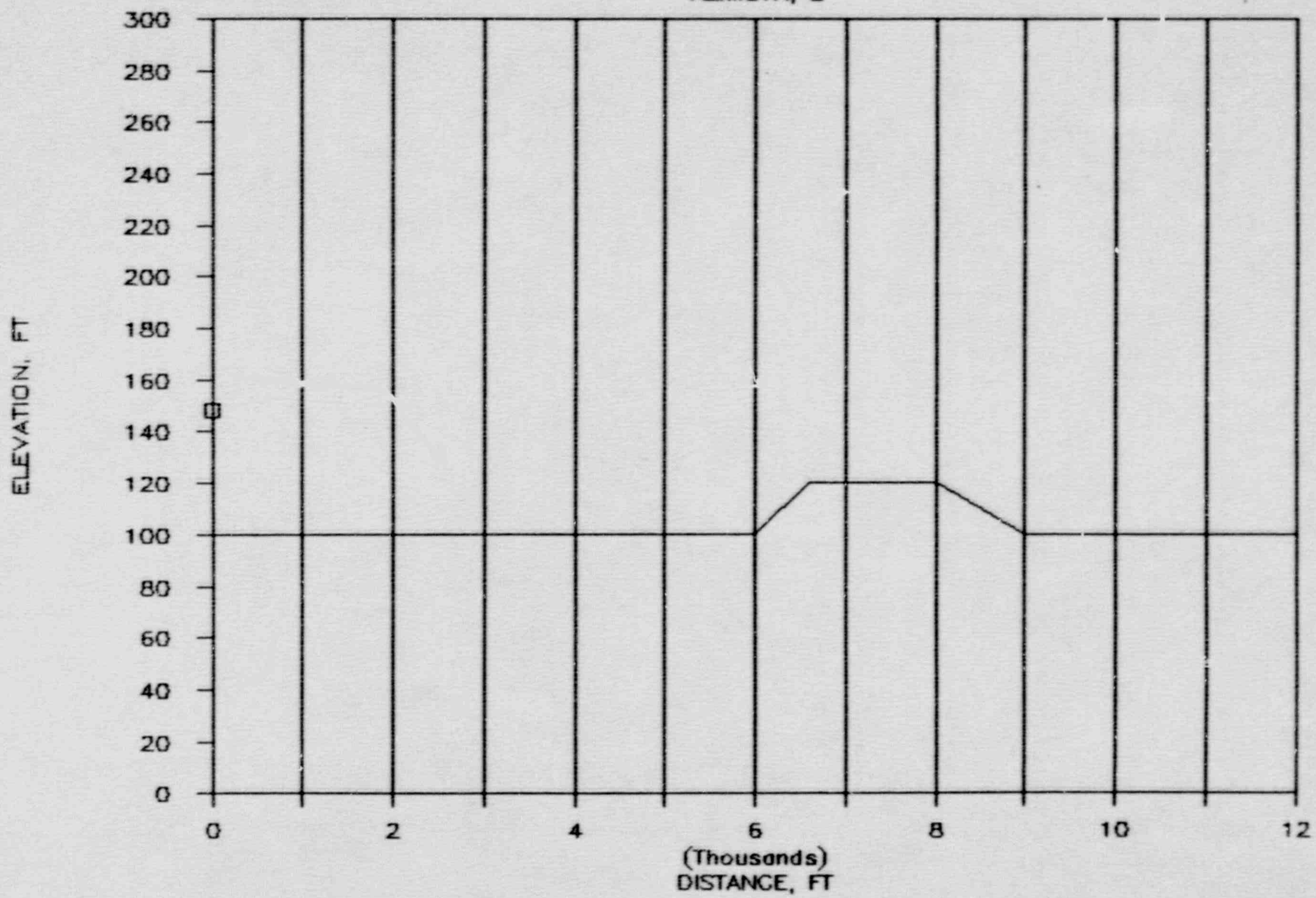
13. Federal Emergency Management Agency. 1990. Letter to James M. Taylor, Executive Director for Operations, U.S. Nuclear Regulatory Commission, from Grant C. Peterson, Associate Director, State and Local Programs and Support, transmitting a "May 1990 Review and Evaluation of the Seabrook Plan for Massachusetts Communities (SPMC)" and a "May 1990 Findings and Determinations for the Seabrook Nuclear Power Station." June 15, 1990.

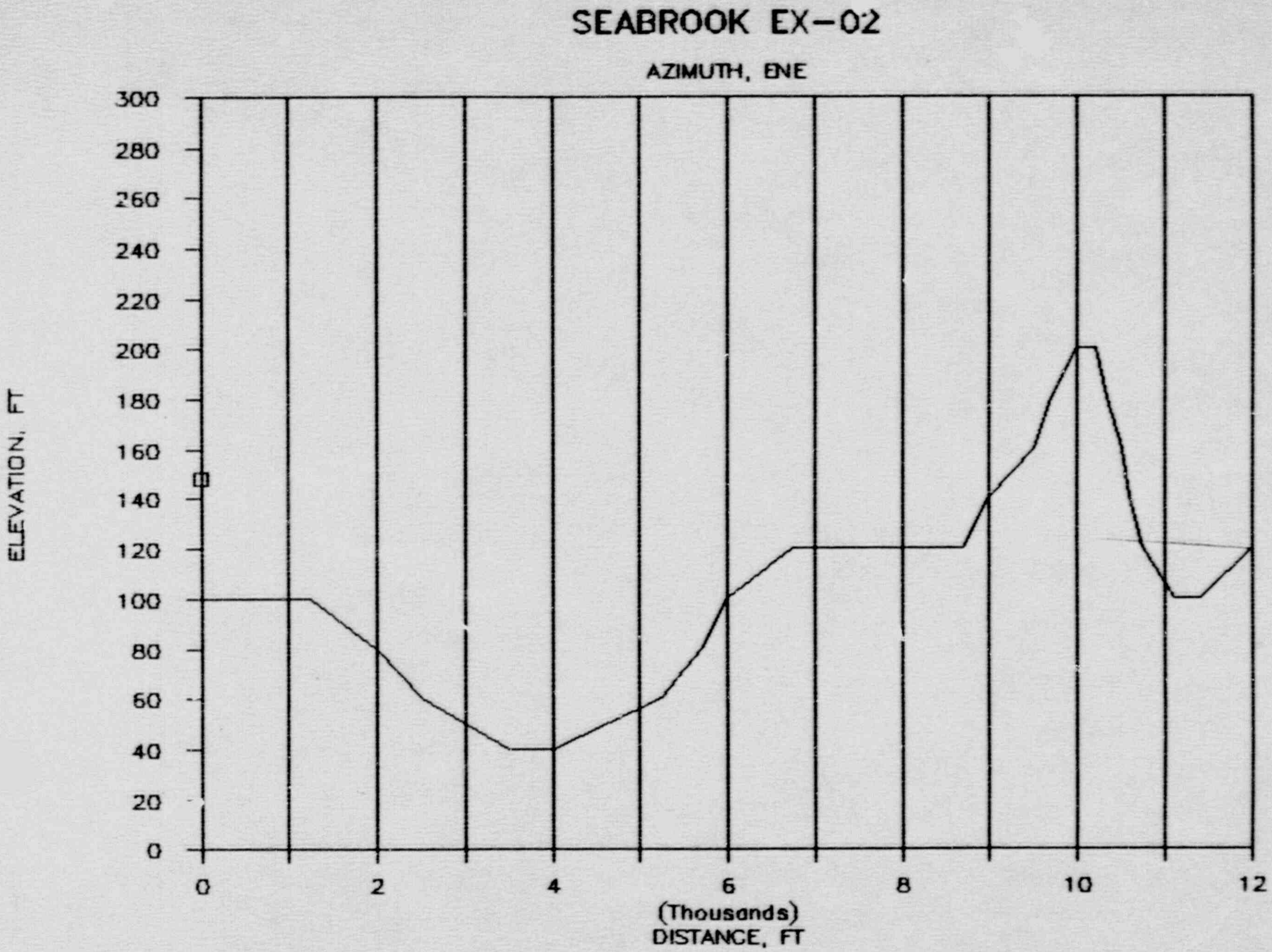
APPENDIX A

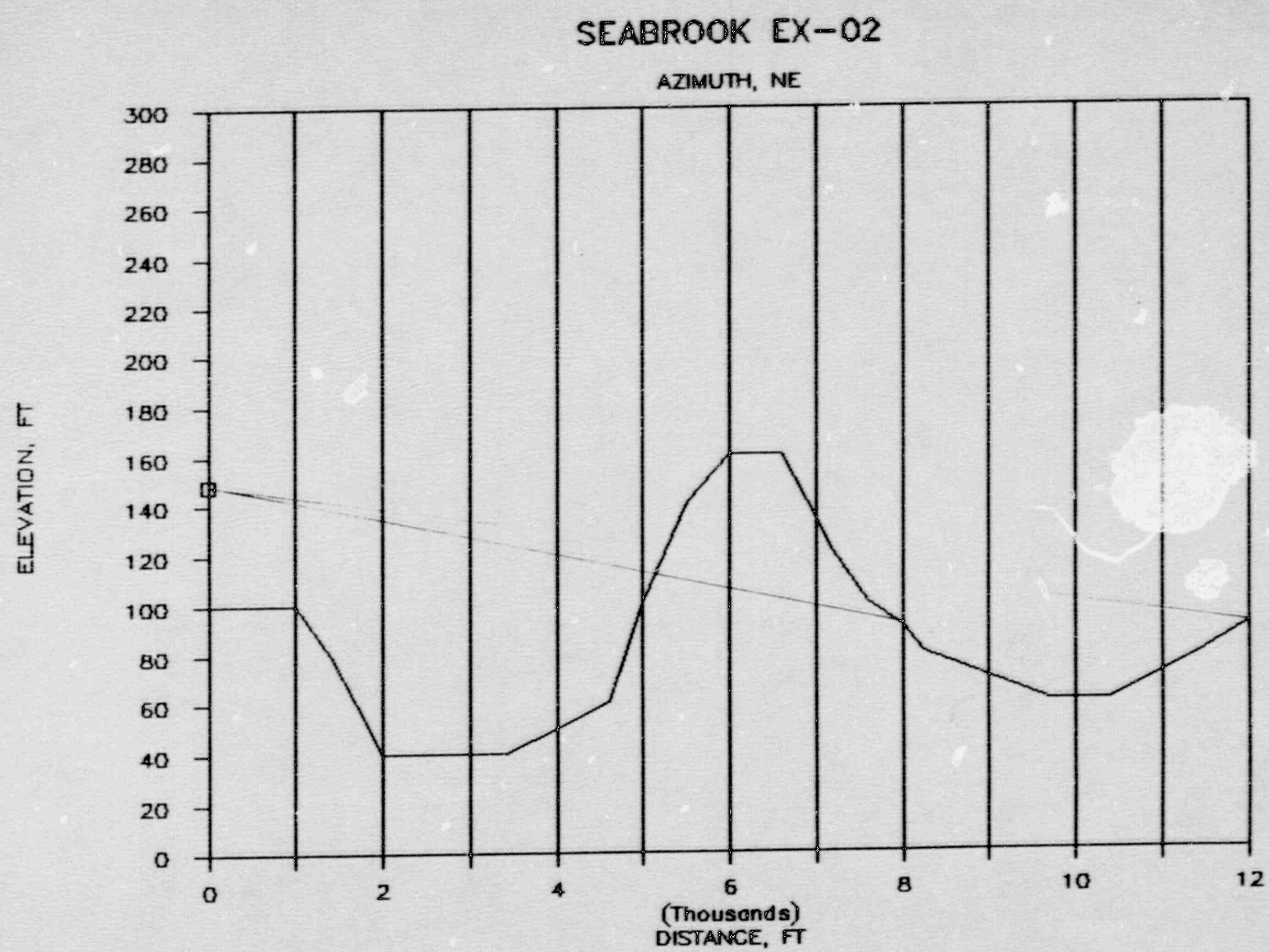
Topographical Profile Charts
Topographical Input Data
OSPM Siren Sound Pressure Level Input Data
OSPM Meteorological Input Data
OSPM Siren Sound Pressure Level Output Data

SEABROOK EX-02

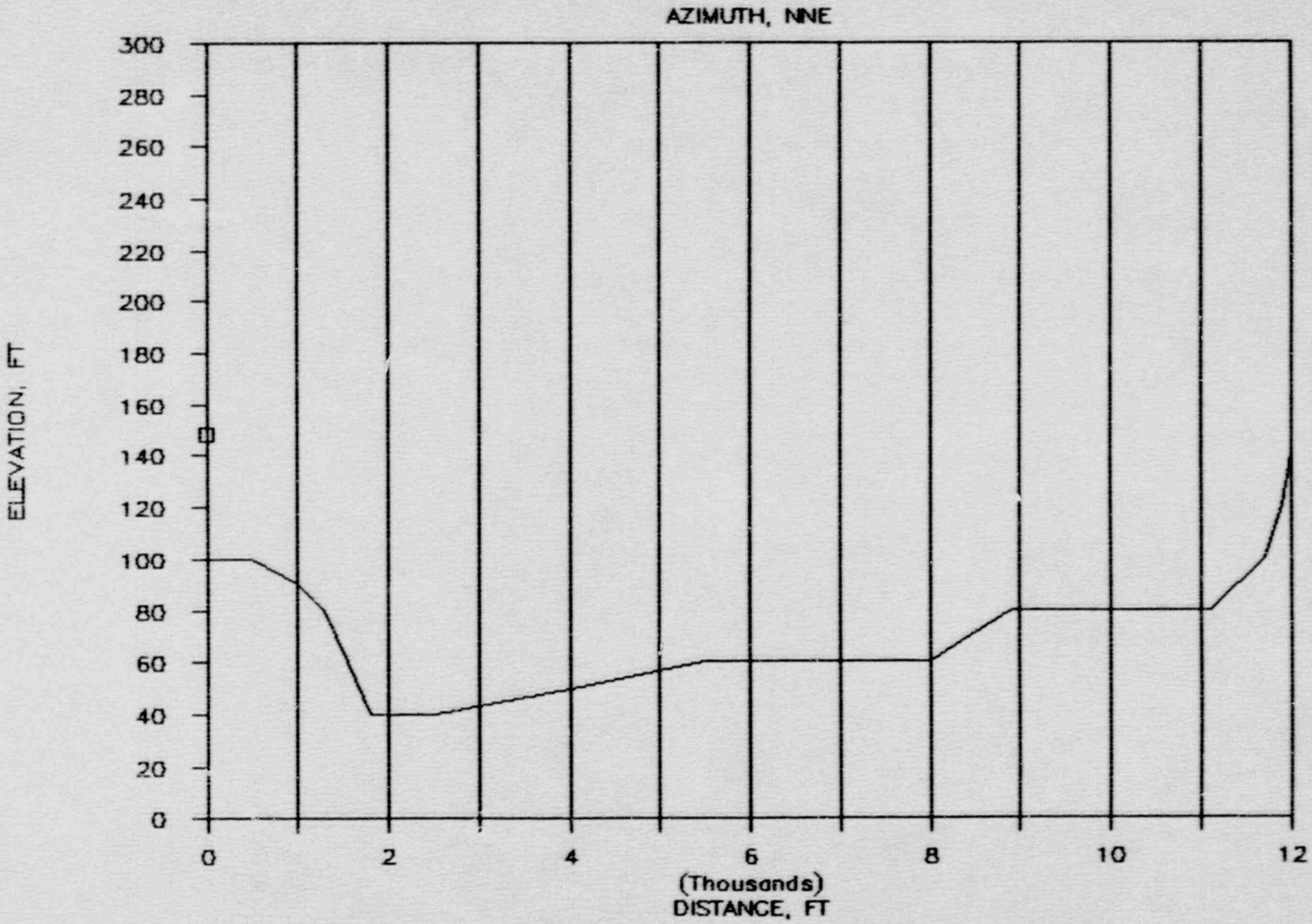
AZIMUTH, E



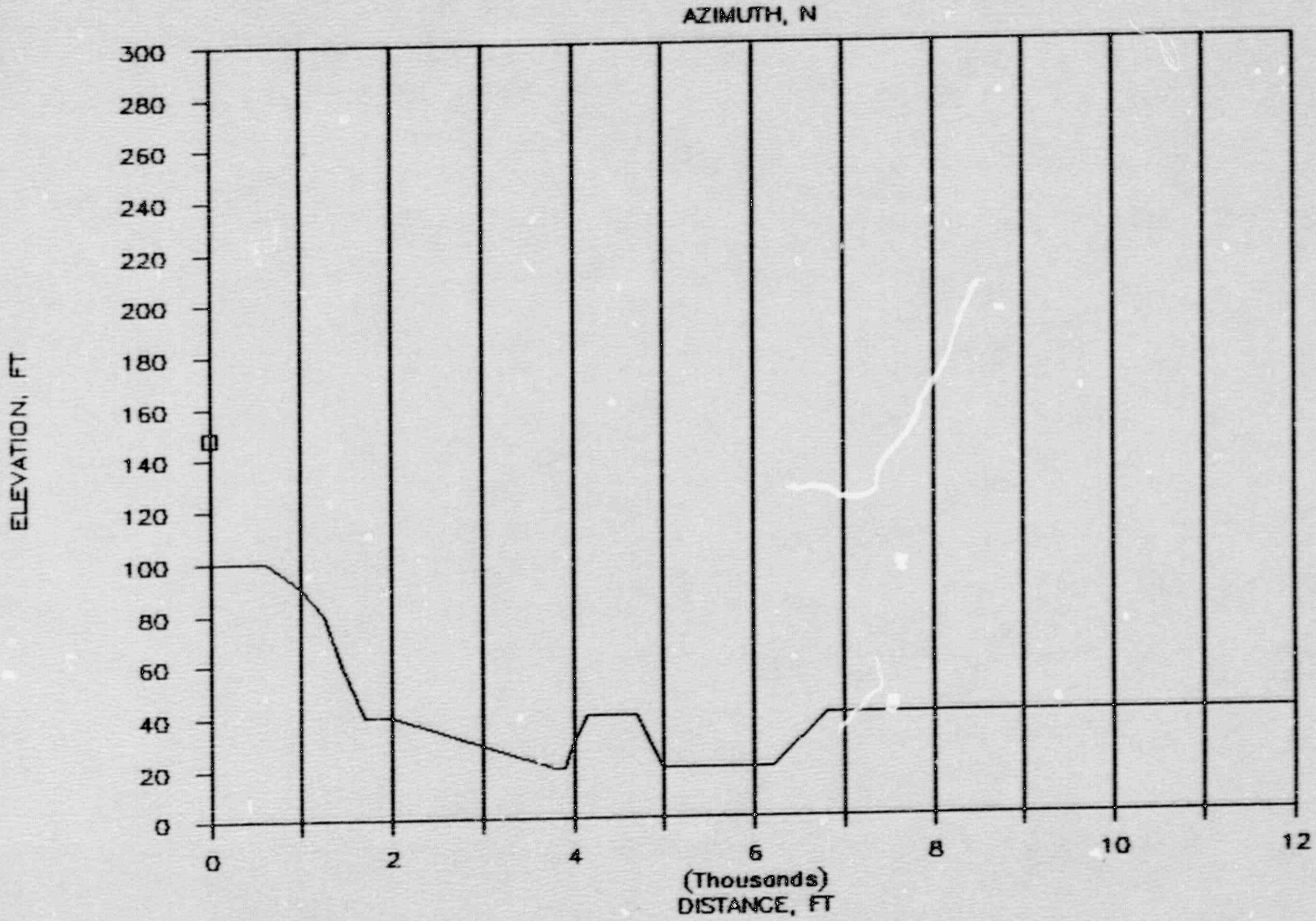

SEABROOK EX-02
AZIMUTH, ENE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

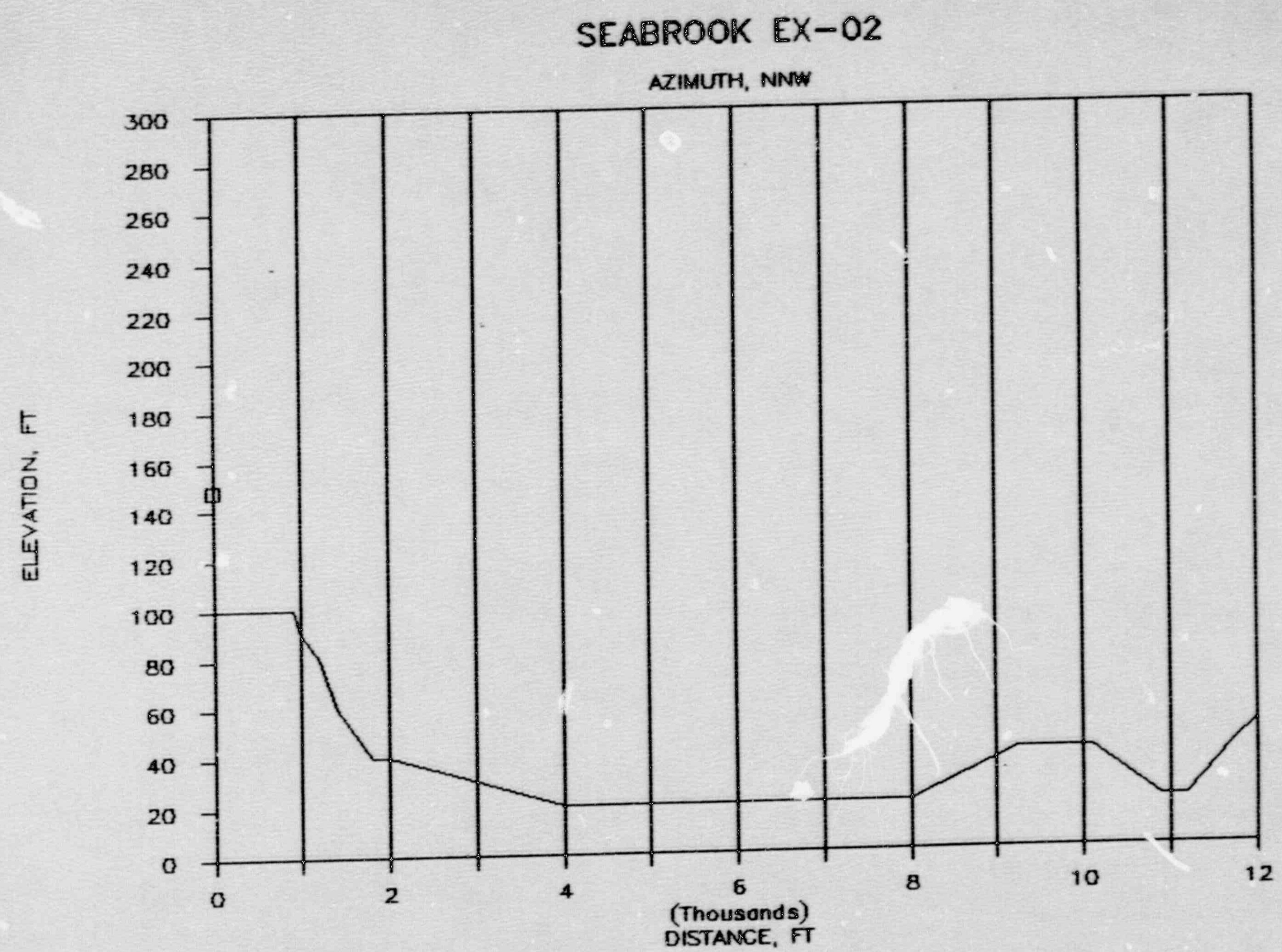

SEABROOK EX-02
AZIMUTH, NE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK EX-02



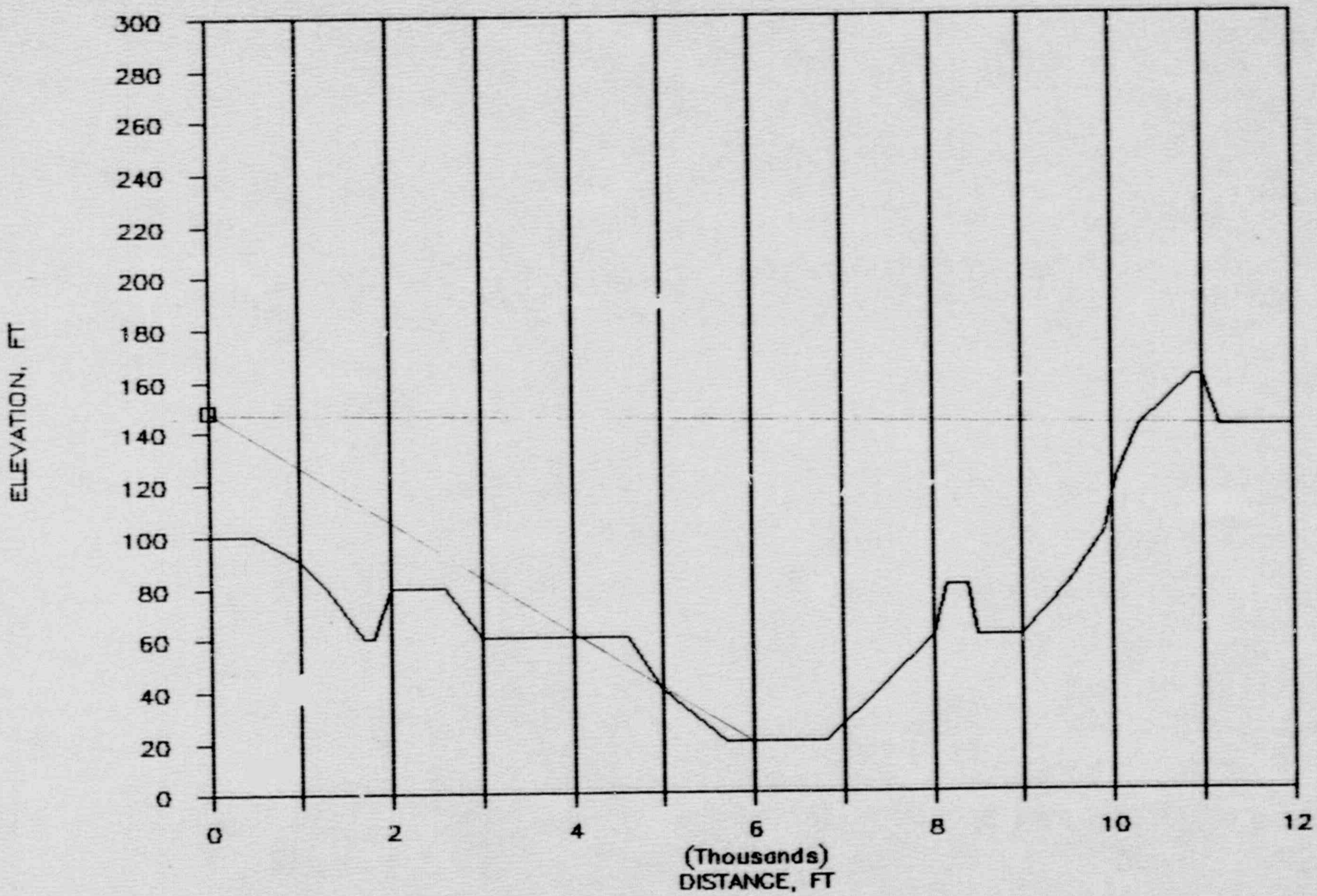
SEABROOK EX-02

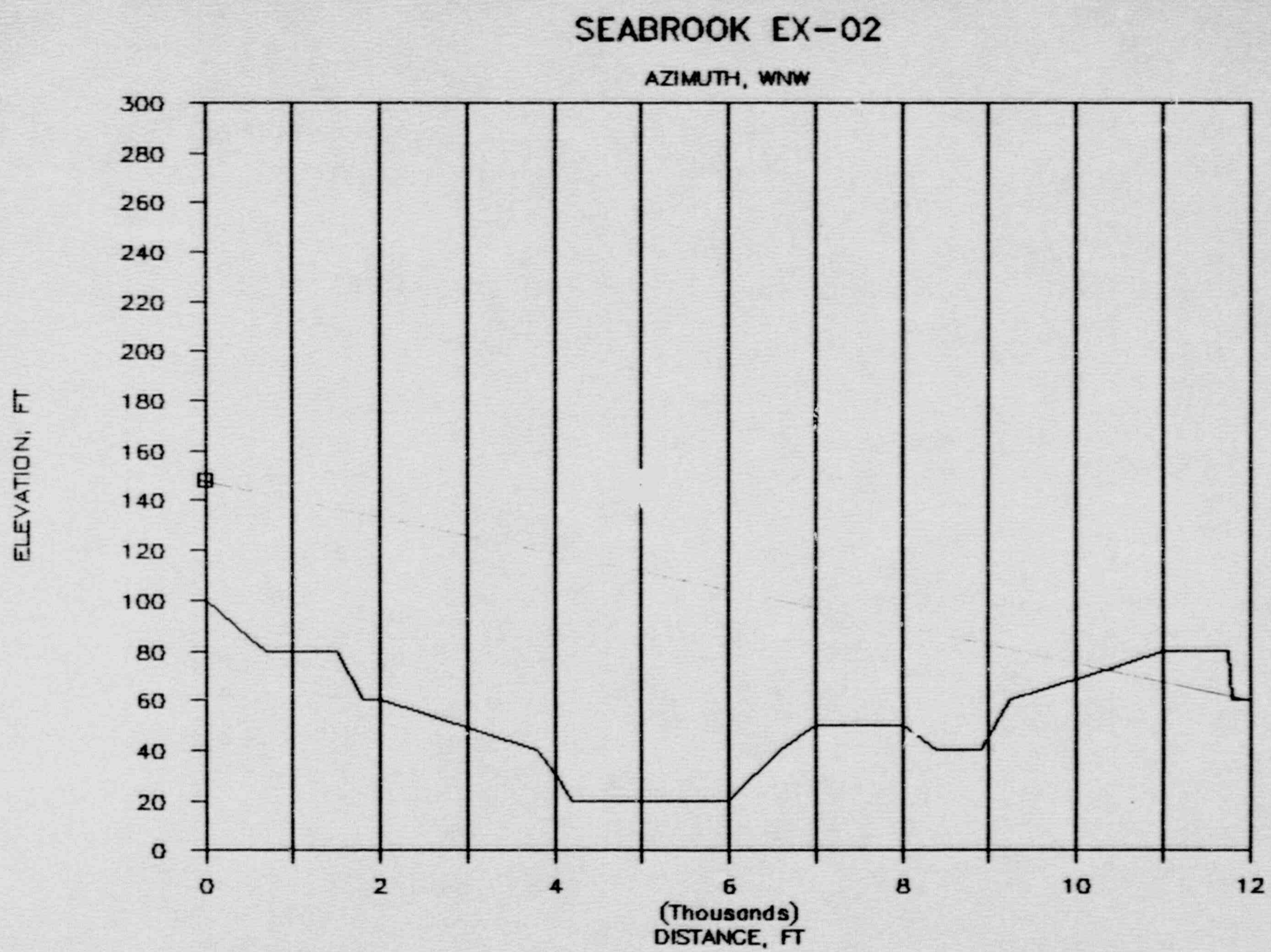


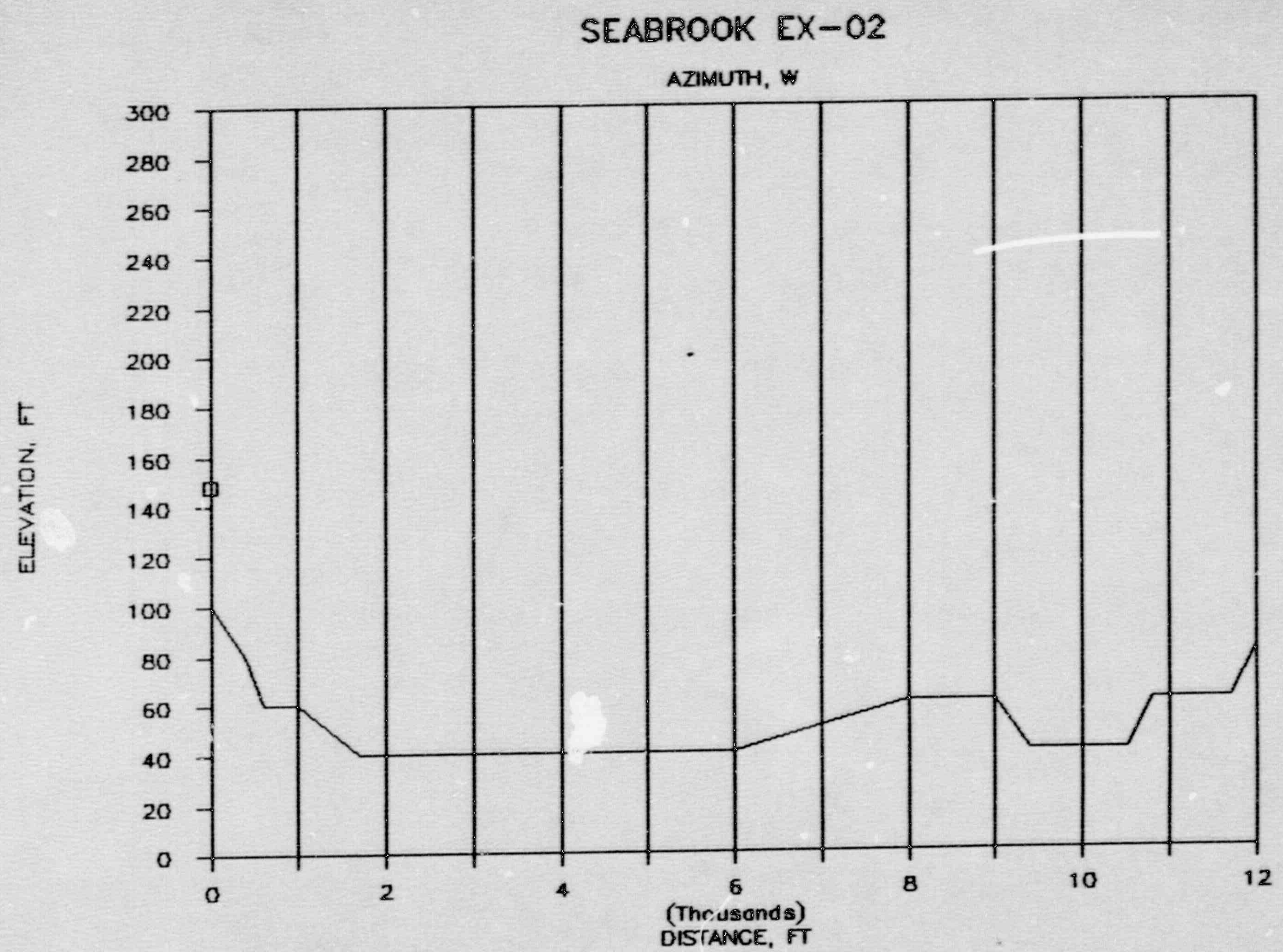

SEABROOK EX-02
AZIMUTH, NNW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK EX-02

AZIMUTH, NW




SEABROOK EX-02
AZIMUTH, WNW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT



SEABROOK EX-02
AZIMUTH, W
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
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20
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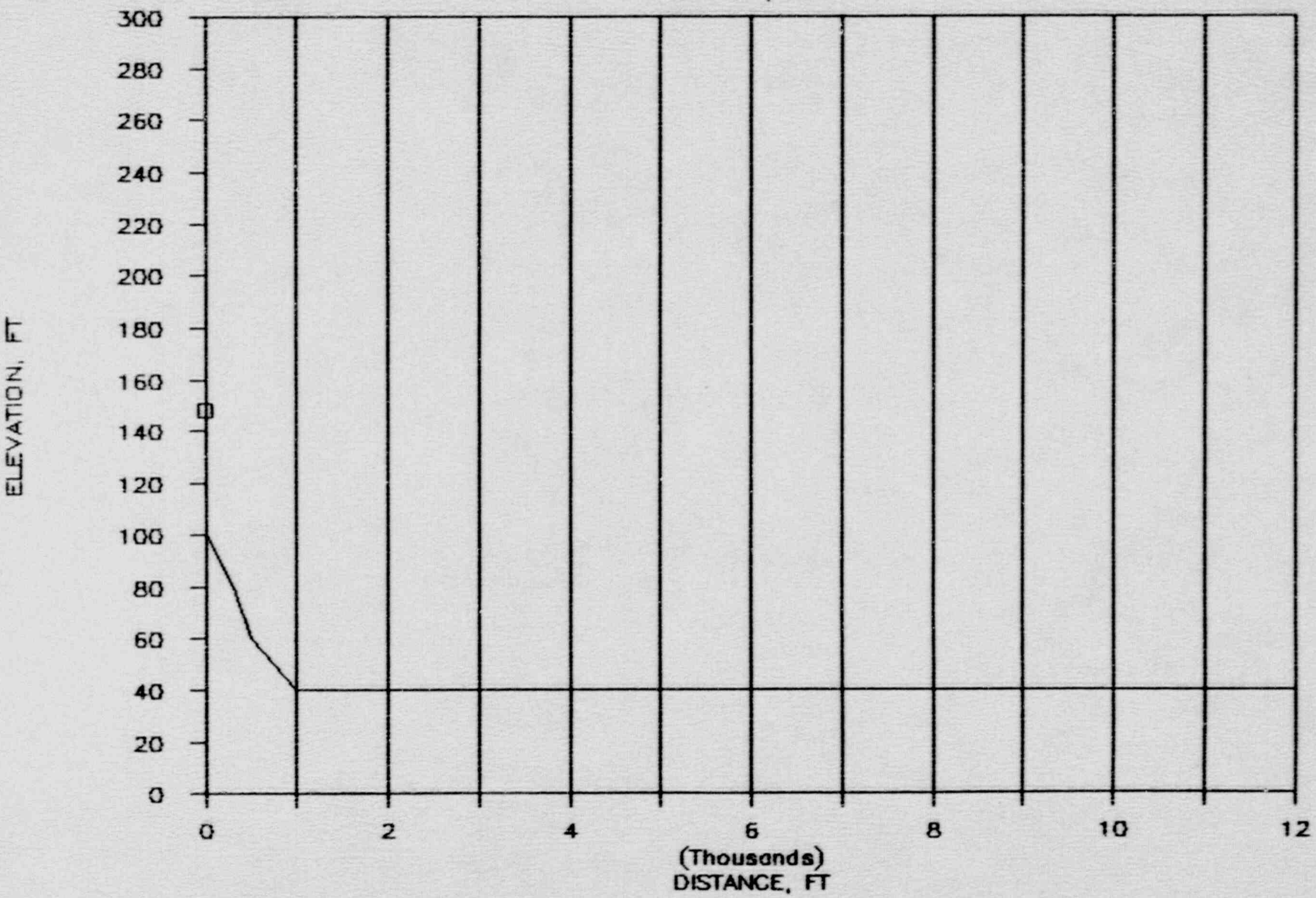
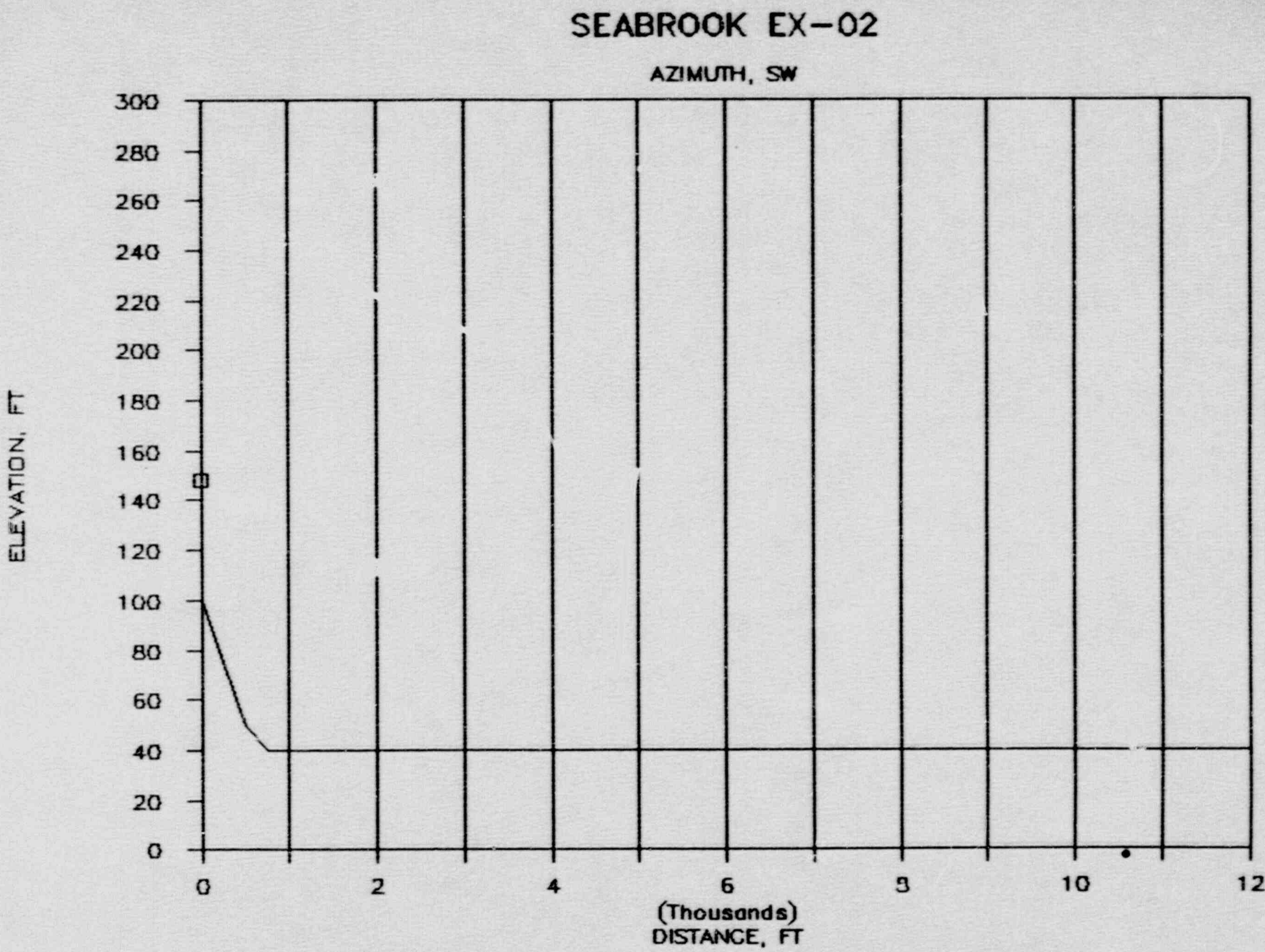
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK EX-02

AZIMUTH, WSW




SEABROOK EX-02
AZIMUTH, SW
ELEVATION, FT
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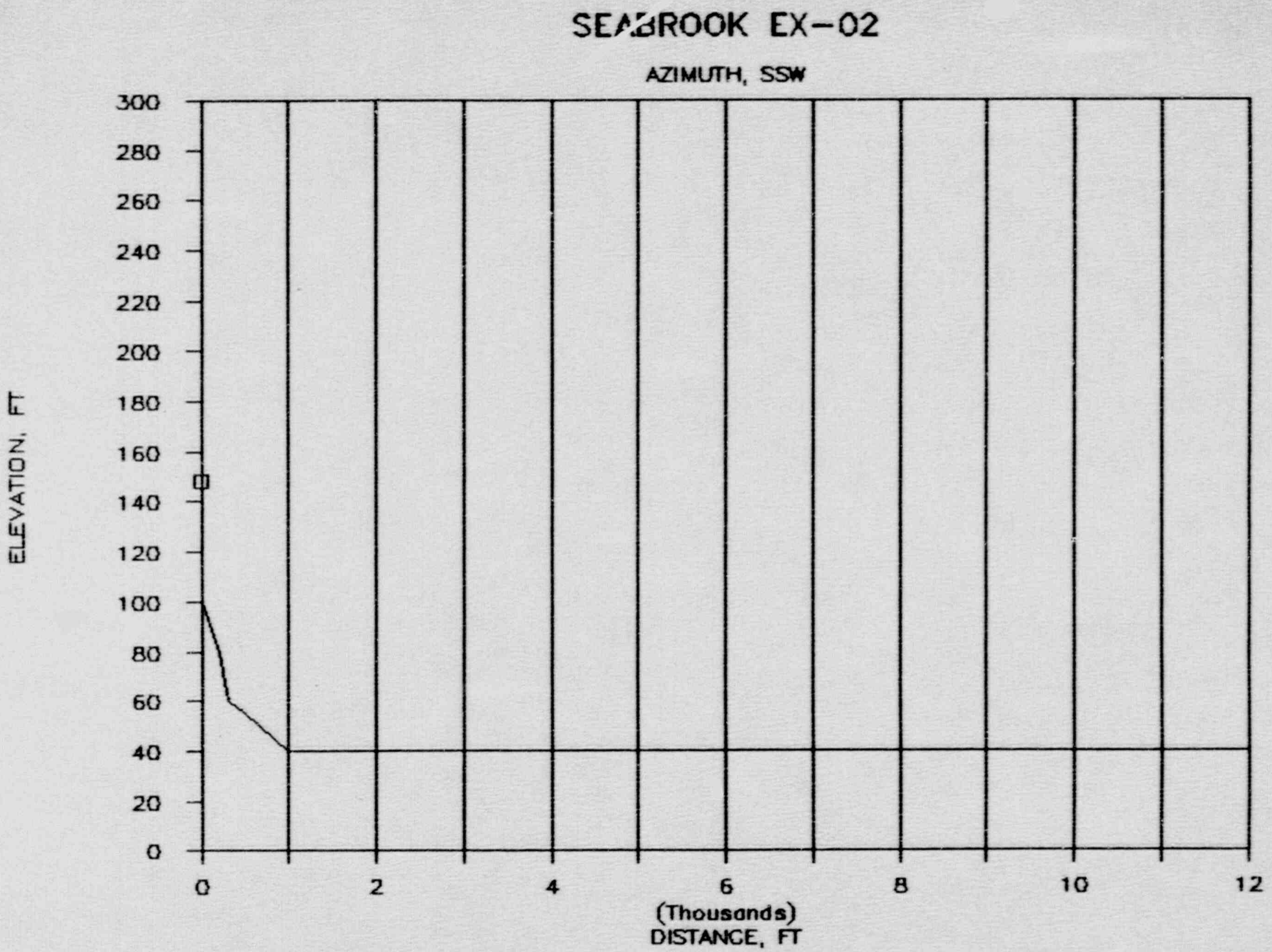
(Thousands)
DISTANCE, FT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AZIMUTH, SSW
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180
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ELEVATION, FT
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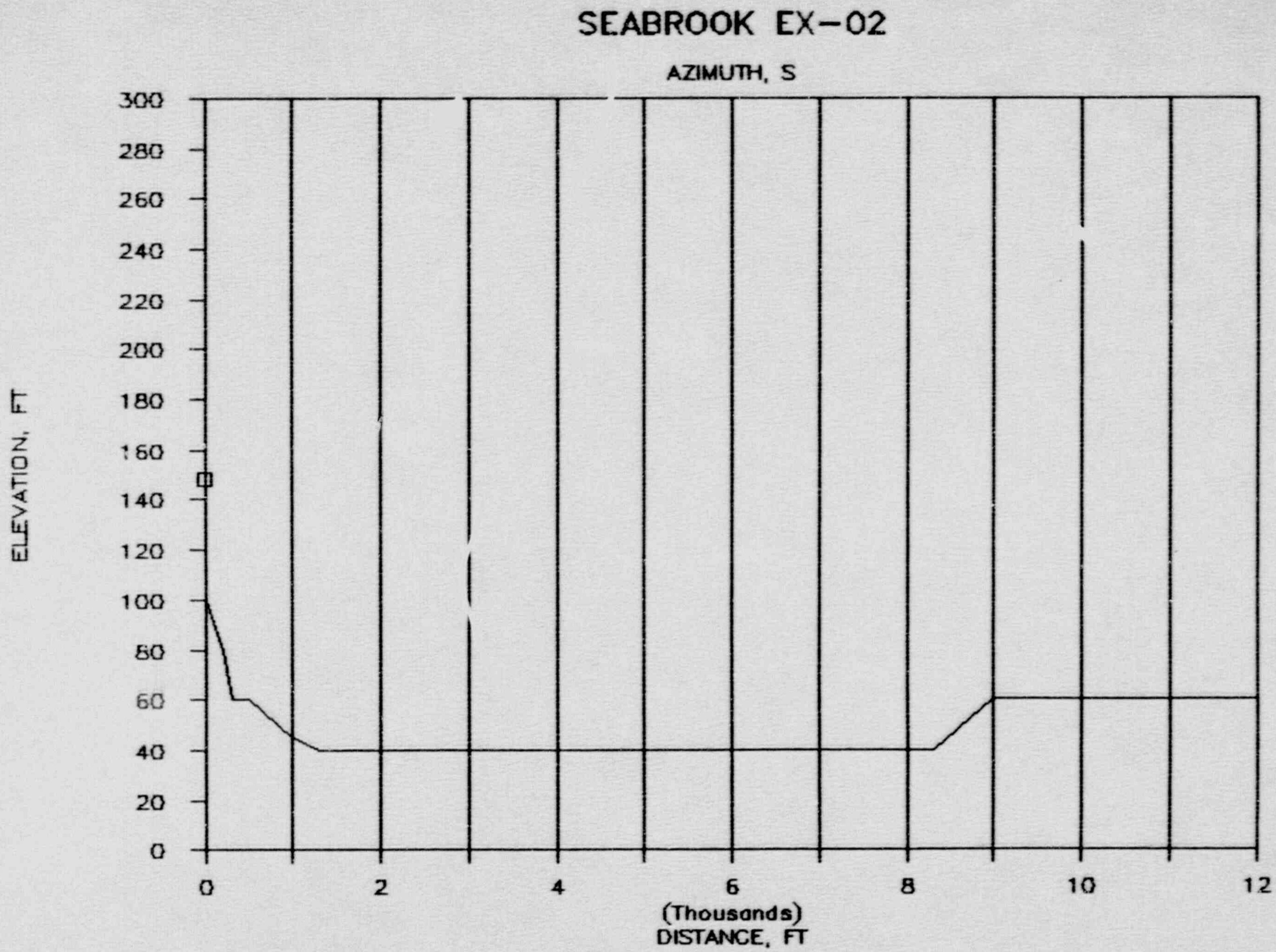
(Thousands)
DISTANCE, FT


SEABROOK EX-02
AZIMUTH, S
ELEVATION, FT
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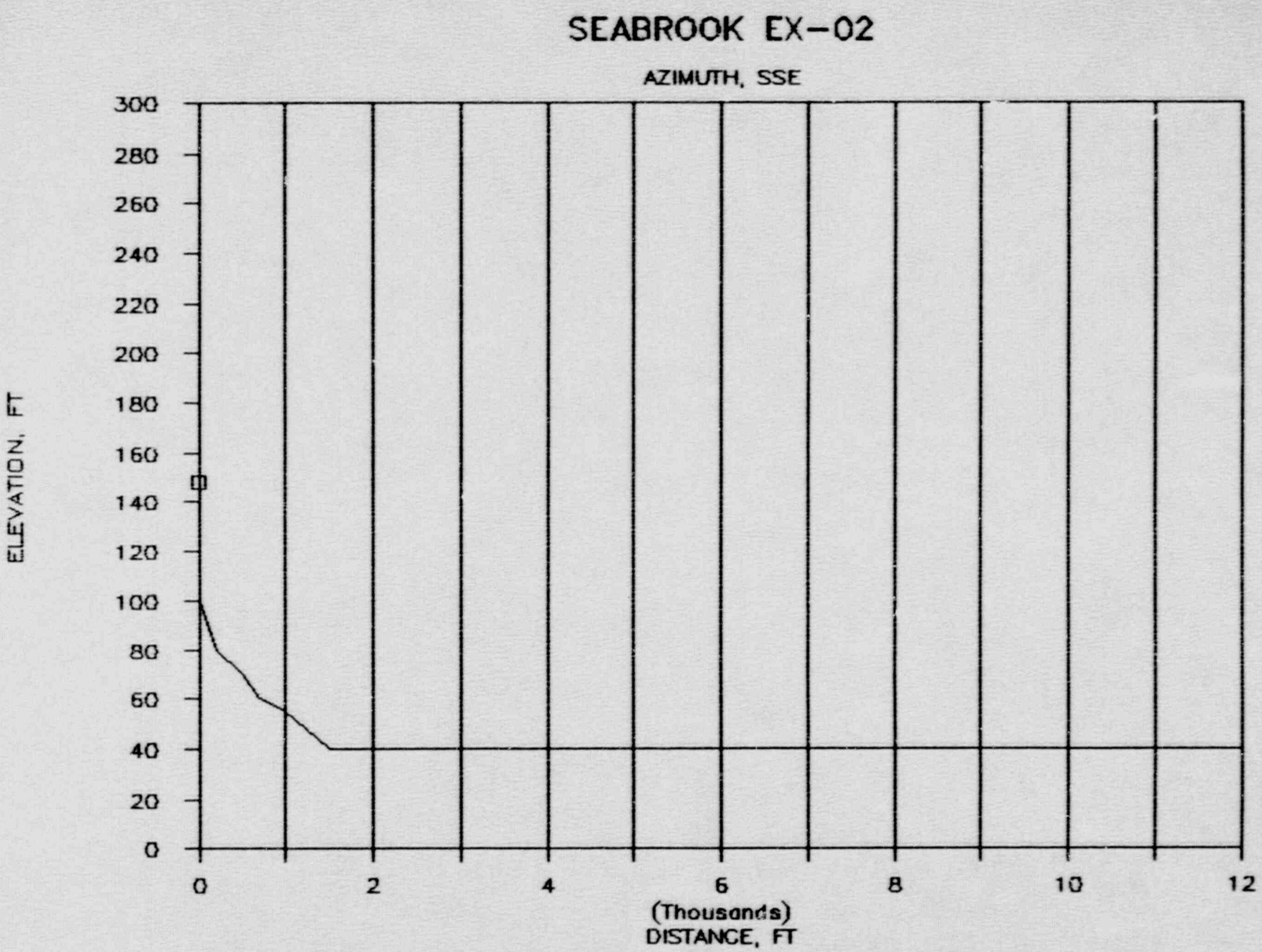
(Thousands)
DISTANCE, FT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AZIMUTH, SSE
ELEVATION, FT
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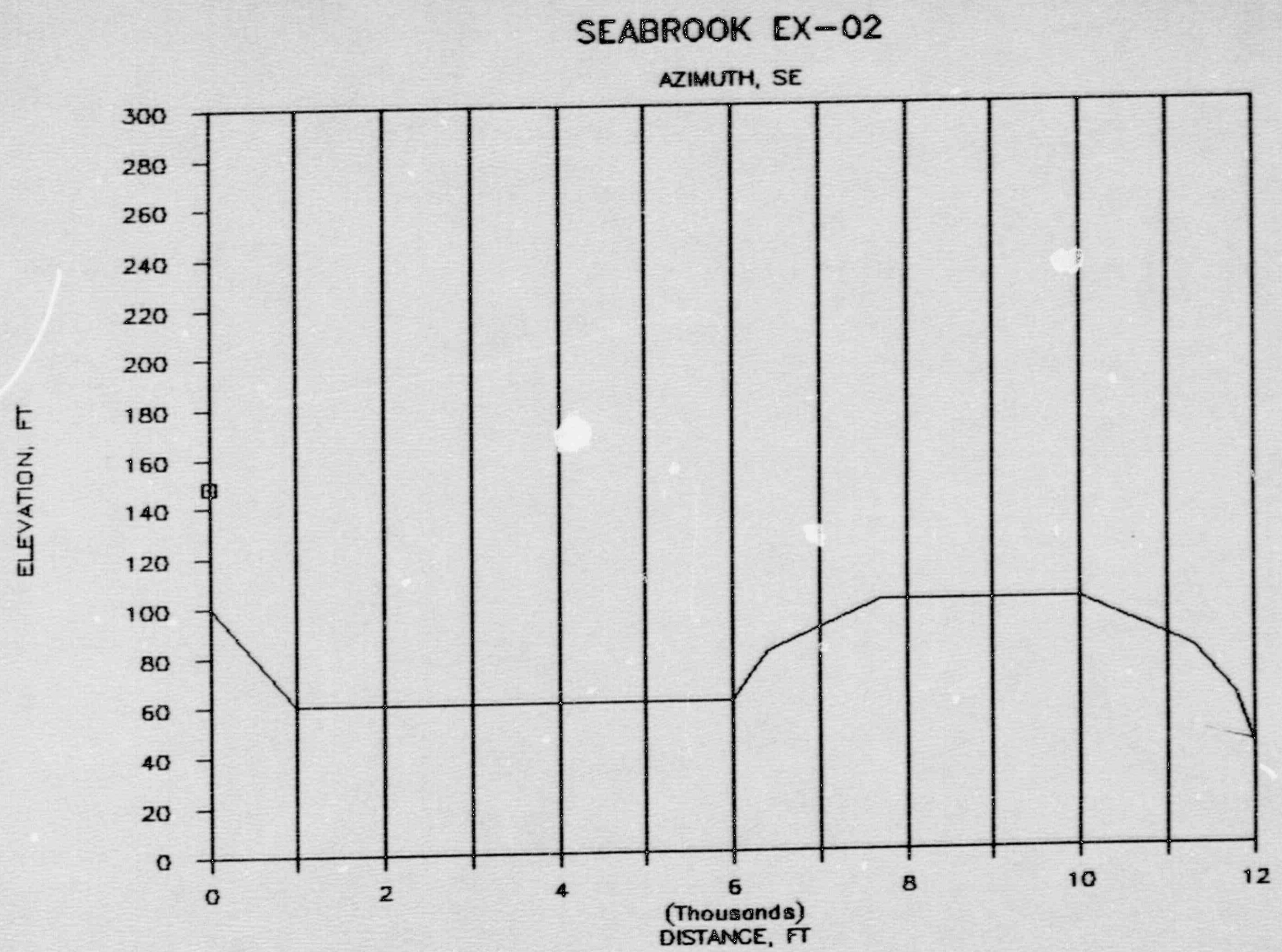
(Thousands)
DISTANCE, FT


SEABROOK EX-02
AZIMUTH, SE
ELEVATION, FT
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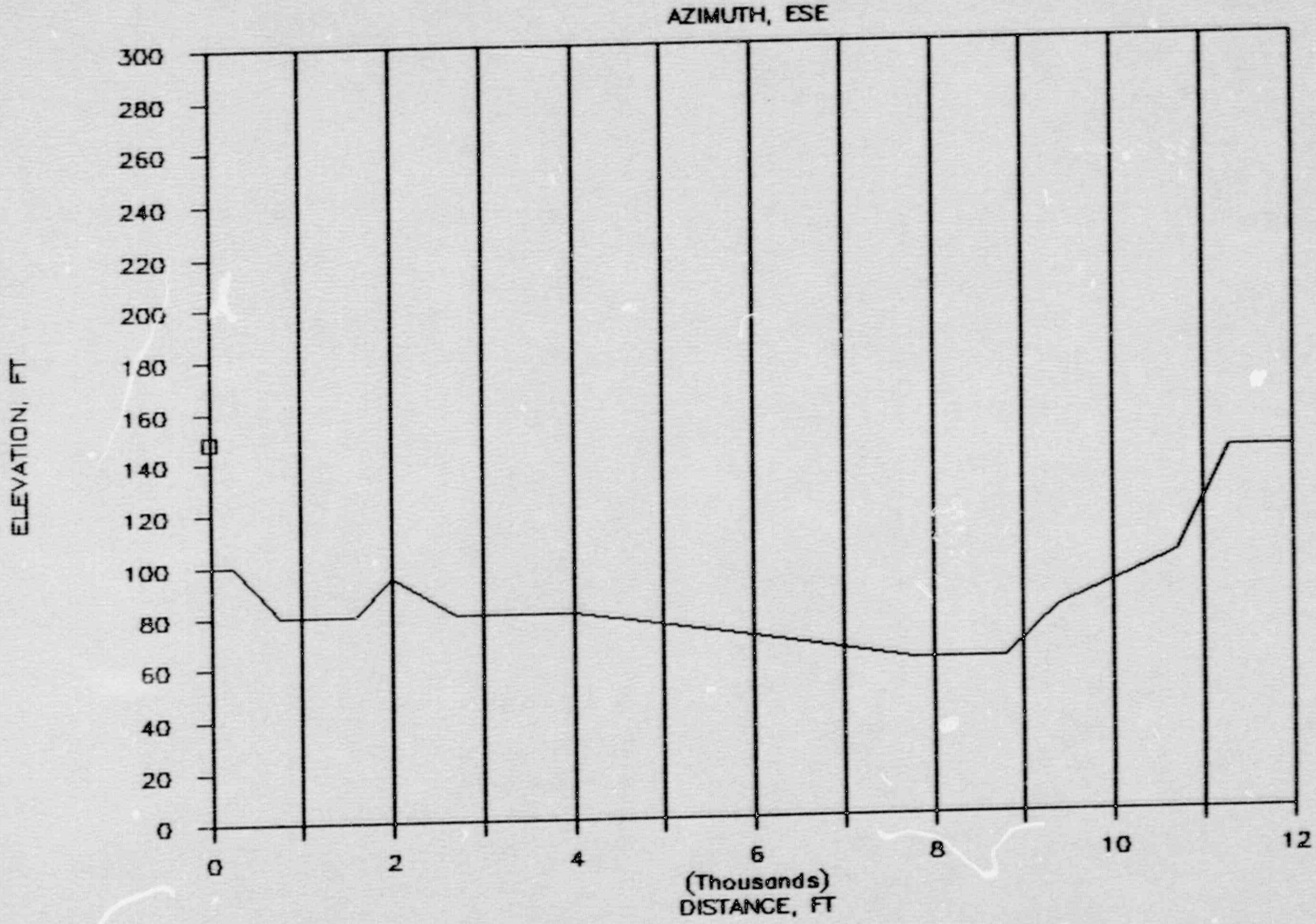
(Thousands)
DISTANCE, FT

SEABROOK EX-02



NEW HAMPHSIRE YANKEE

EX-02

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	100.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	100.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	100.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	100.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	100.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	120.00	SOFT	0.	NO	0.	0.
7	12000.	90.00	100.00	SOFT	0.	NO	0.	0.
8	500.	67.50	100.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	100.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	80.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	40.00	SOFT	0.	NO	0.	0.
12	6000.	67.50	100.00	SOFT	0.	NO	0.	0.
13	8000.	67.50	120.00	SOFT	0.	NO	0.	0.
14	12000.	67.50	120.00	SOFT	0.	YES	10000.	200.
15	500.	45.00	100.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	100.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	40.00	SOFT	0.	NO	0.	0.
18	4000.	45.00	50.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	160.00	SOFT	0.	NO	0.	0.
20	8000.	45.00	90.00	SOFT	0.	YES	6000.	160.
21	12000.	45.00	90.00	SOFT	0.	YES	6000.	160.
22	500.	22.50	100.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	90.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	40.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	50.00	SOFT	0.	NO	0.	0.
26	6000.	22.50	60.00	SOFT	0.	NO	0.	0.
27	8000.	22.50	60.00	SOFT	0.	NO	0.	0.
28	12000.	22.50	140.00	SOFT	0.	NO	0.	0.
29	500.	.00	100.00	SOFT	0.	NO	0.	0.
30	1000.	.00	90.00	SOFT	0.	NO	0.	0.
31	2000.	.00	40.00	SOFT	0.	NO	0.	0.
32	4000.	.00	30.00	SOFT	0.	NO	0.	0.
33	6000.	.00	20.00	SOFT	0.	NO	0.	0.
34	8000.	.00	40.00	SOFT	0.	NO	0.	0.
35	12000.	.00	40.00	SOFT	0.	NO	0.	0.
36	500.	337.50	100.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	90.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	40.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	20.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	20.00	SOFT	0.	NO	0.	0.
41	8000.	337.50	20.00	SOFT	0.	NO	0.	0.

42	12000.	337.50	50.00	SOFT	0.	NO	0.	0.
43	500.	315.00	100.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	50.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	80.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	60.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	20.00	SOFT	0.	YES	4600.	40.
48	8000.	315.00	60.00	SOFT	0.	NO	0.	0.
49	12000.	315.00	140.00	SOFT	0.	YES	10900.	160.
50	500.	292.50	85.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	80.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	60.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	30.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	20.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	50.00	SOFT	0.	NO	0.	0.
56	12000.	292.50	60.00	SOFT	0.	YES	11750.	80.
57	500.	270.00	70.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	60.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	40.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	40.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	40.00	SOFT	0.	NO	0.	0.
62	8000.	270.00	60.00	SOFT	0.	NO	0.	0.
63	12000.	270.00	80.00	SOFT	0.	NO	0.	0.
64	500.	247.50	60.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	40.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	40.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	40.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	40.00	SOFT	0.	NO	0.	0.
69	8000.	247.50	40.00	SOFT	0.	NO	0.	0.
70	12000.	247.50	40.00	SOFT	0.	NO	0.	0.
71	500.	225.00	50.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	40.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	40.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	40.00	SOFT	0.	NO	0.	0.
75	6000.	225.00	40.00	SOFT	0.	NO	0.	0.
76	8000.	225.00	40.00	SOFT	0.	NO	0.	0.
77	12000.	225.00	40.00	SOFT	0.	NO	0.	0.
78	500.	202.50	55.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	40.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	40.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	40.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	40.00	SOFT	0.	NO	0.	0.
83	8000.	202.50	40.00	SOFT	0.	NO	0.	0.
84	12000.	202.50	40.00	SOFT	0.	NO	0.	0.
85	500.	180.00	60.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	45.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	40.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	40.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	40.00	SOFT	0.	NO	0.	0.
90	8000.	180.00	40.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	60.00	SOFT	0.	NO	0.	0.
[illegible]	500.	157.50	70.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	55.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	40.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	40.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	40.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	40.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	40.00	SOFT	0.	NO	0.	0.
99	500.	135.00	80.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	60.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	60.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	60.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	60.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	100.00	SOFT	0.	NO	0.	0.
105	12000.	135.00	40.00	SOFT	0.	YES	10000.	100.
106	500.	112.50	90.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	80.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	95.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	80.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	70.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	60.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	140.00	SOFT	0.	NO	0.	0.

NEW HAMPHSIRE YANKEE

EX-02

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
1	WS-3000	119.3	121.3	.0	.0	.0	.0	120.0	115.0	105.0	100.0	9.4

XO= .00 YO= .00 ZO= 148.00 HEIGHT ABOVE GROUND= 48.00

NEW HAMPHSIRE YANKEE

EX-02

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

NEW HAMPHSIRE YANKEE

EX-02

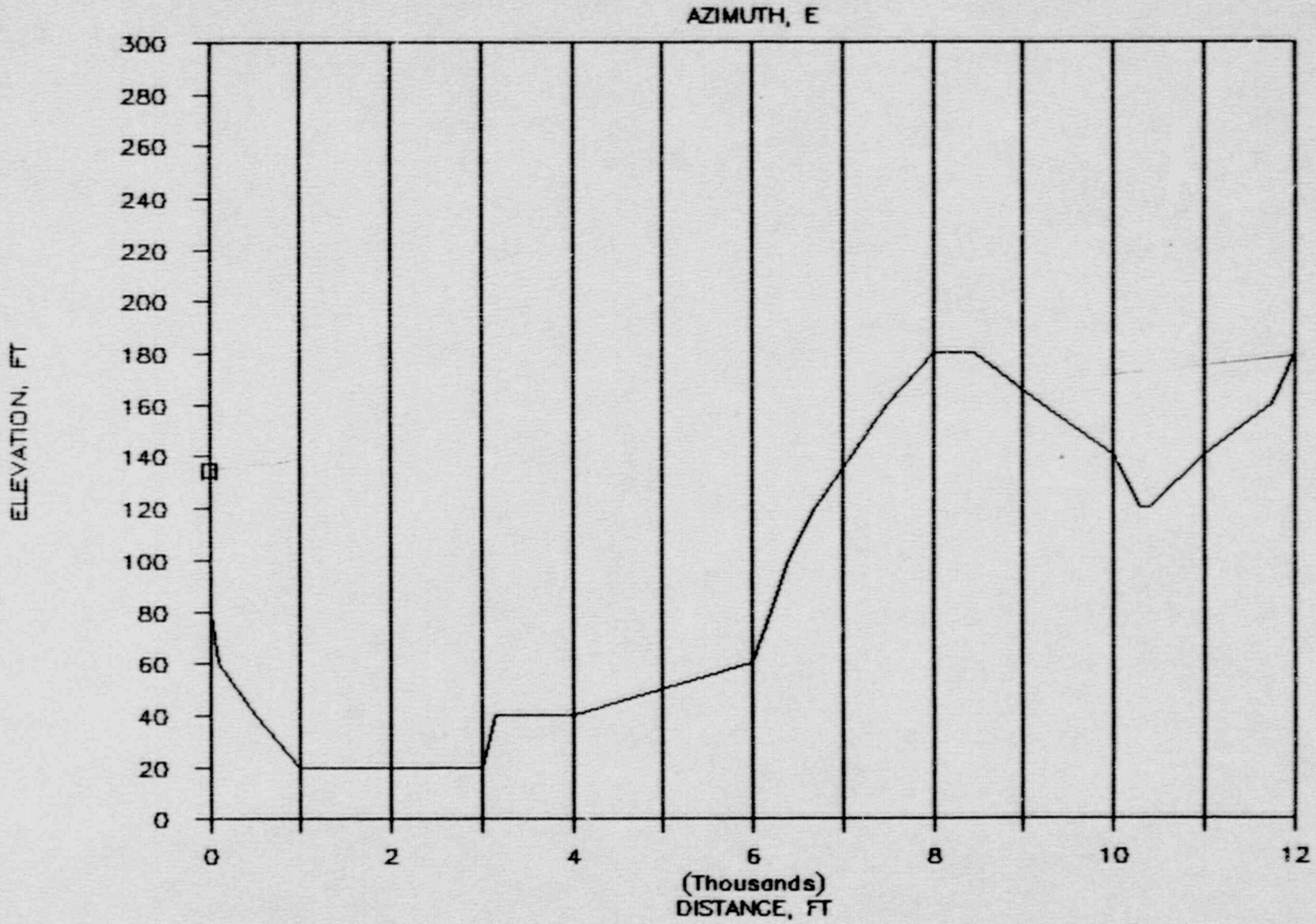
SOUND PRESSURE LEVELS IN DBC

UNDER MET CONDITION 1

DISTANCE IN FEET

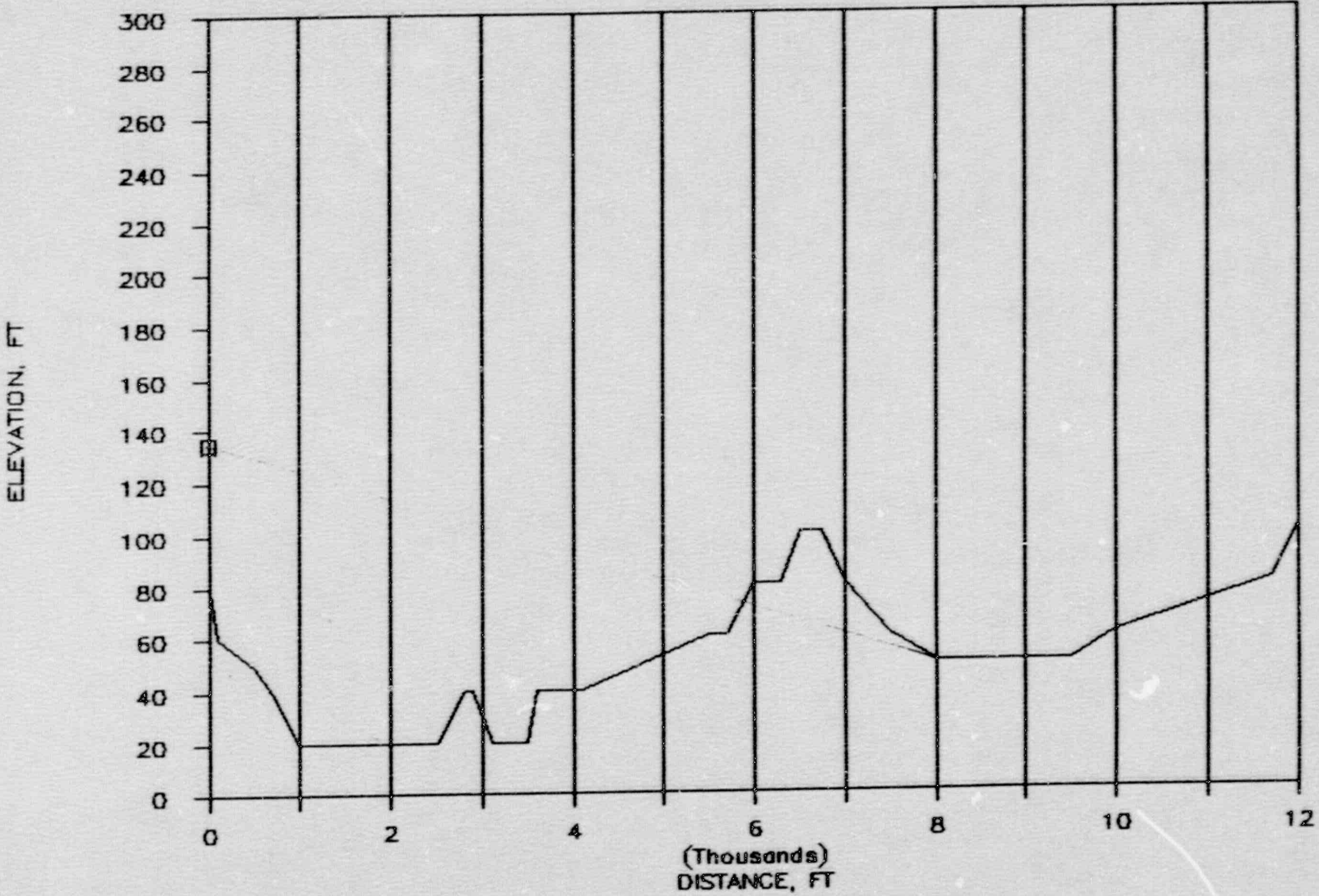
AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	105.0	92.4	82.4	75.0	68.2	60.7	46.5
ENE	105.0	92.4	82.4	75.0	68.8	61.5	35.1
NE	105.0	92.4	82.3	75.0	69.5	53.1	44.0
NNE	105.0	92.4	82.3	75.0	69.5	64.6	55.7
N	105.0	92.4	82.3	75.0	69.5	64.6	55.7
NNW	105.0	92.4	82.3	75.0	69.5	64.6	55.7
NW	105.0	92.4	82.4	75.0	64.2	64.6	49.1
WNW	104.9	92.4	82.4	75.0	69.5	64.6	46.2
W	104.8	92.3	82.3	75.0	69.5	64.6	55.7
WSW	104.8	92.3	82.3	75.0	69.5	64.6	55.7
SW	104.7	92.3	82.3	75.0	69.5	64.6	55.7
SSW	104.8	92.3	82.3	75.0	69.5	64.6	55.7
S	104.8	92.3	82.3	75.0	69.5	64.6	55.7
SSE	104.8	92.3	82.3	75.0	69.5	64.6	55.7
SE	104.9	92.3	82.4	75.0	69.5	64.0	42.5
ESE	104.9	92.4	82.4	75.0	68.8	61.5	47.6

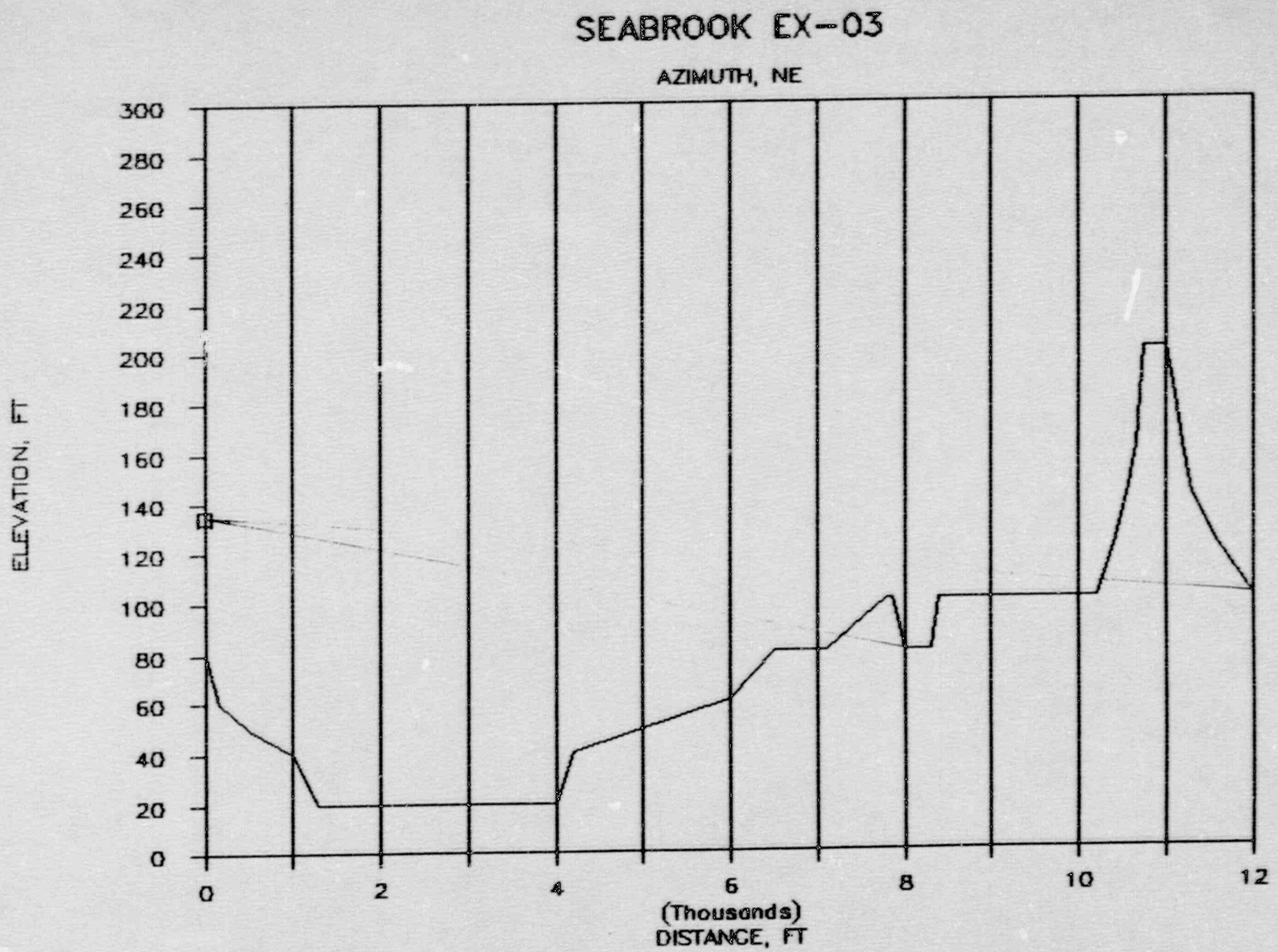
SEABROOK EX-03



SEABROOK EX-03

AZIMUTH, ENE




SEABROOK EX-03
AZIMUTH, NE
ELEVATION, FT
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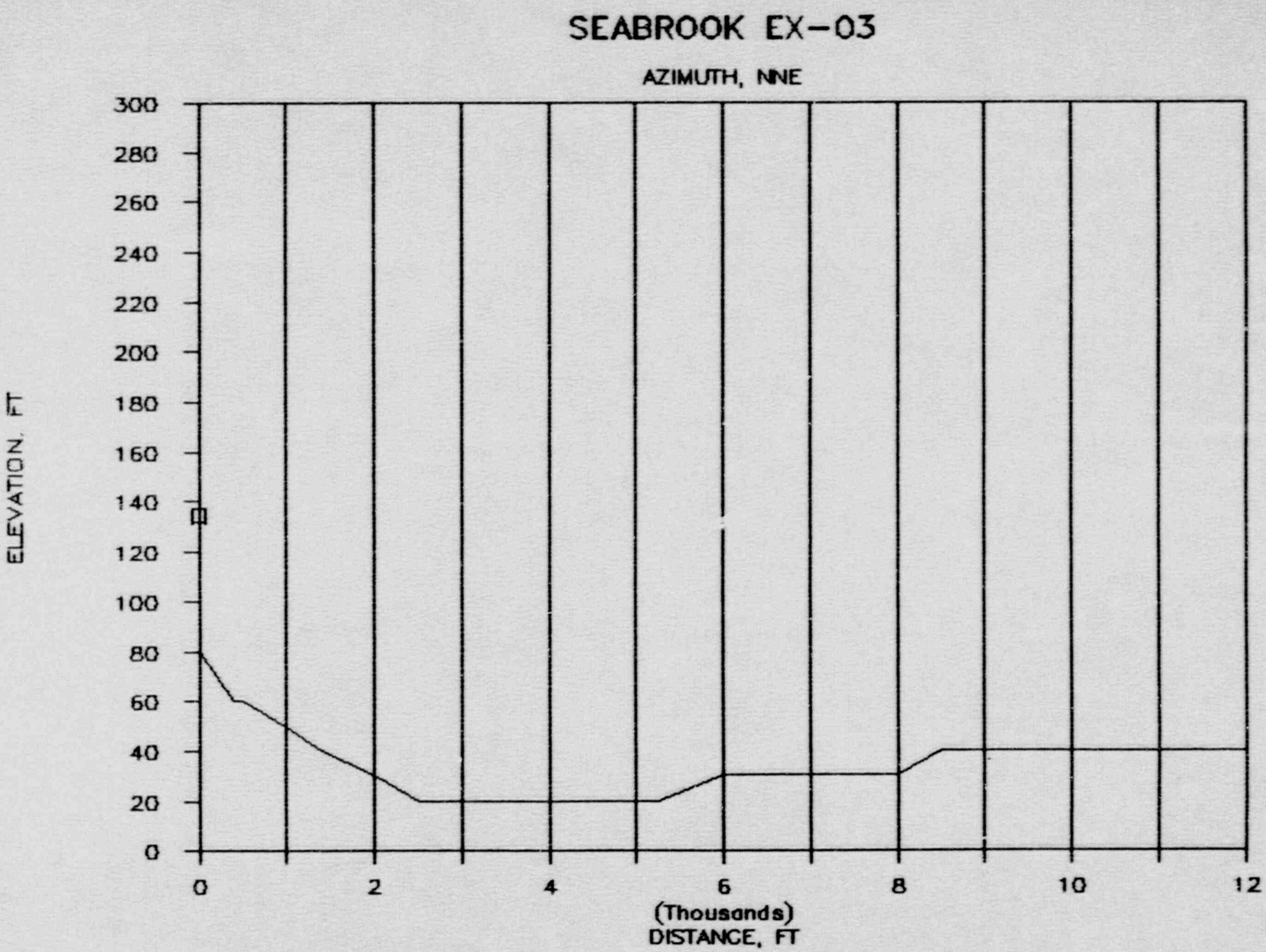
(Thousands)
DISTANCE, FT



SEABROOK EX-03
AZIMUTH, NNE
ELEVATION, FT
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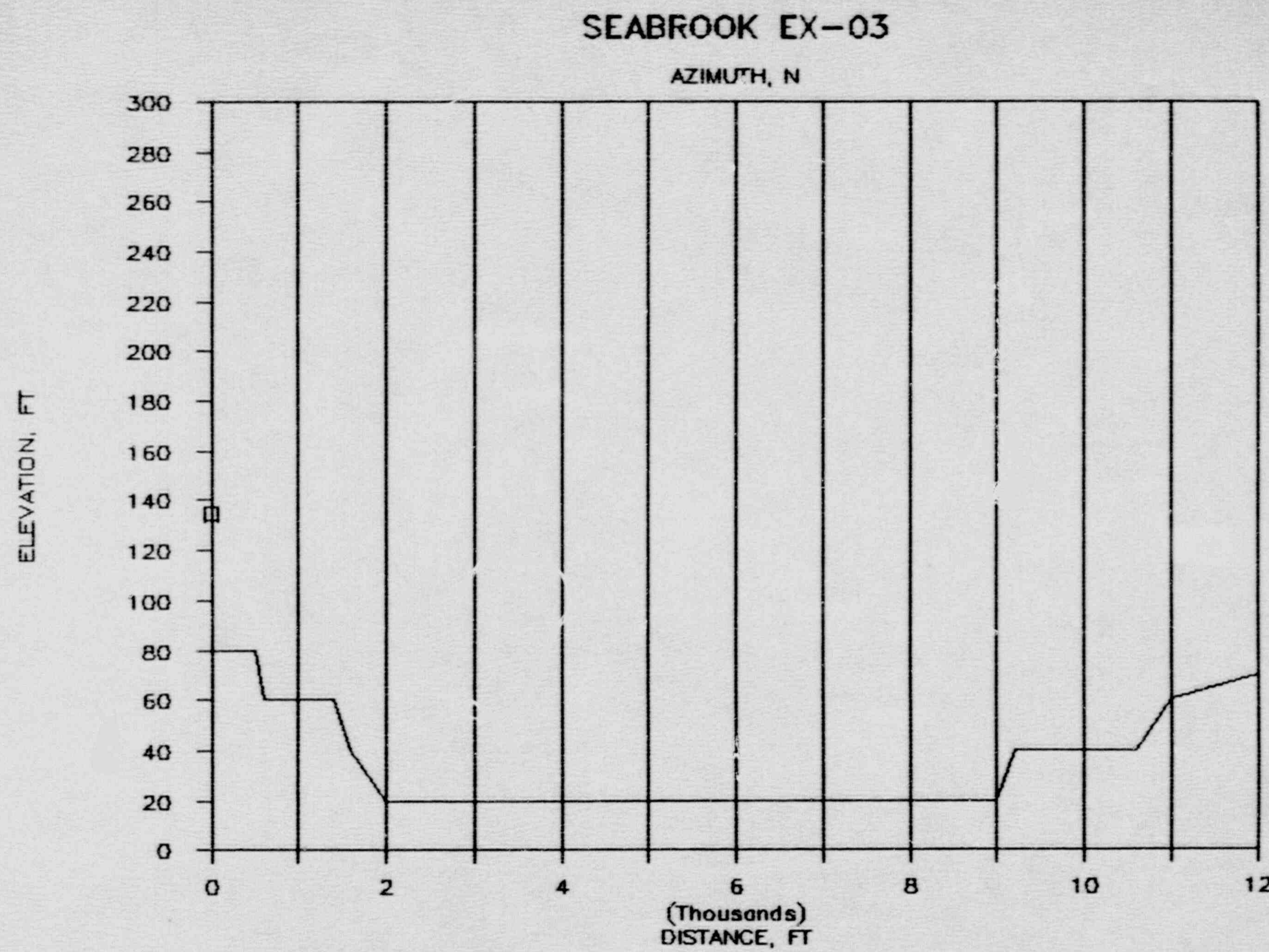
12
(Thousands)
DISTANCE, FT



SEABROOK EX-03
AZIMUTH, N
ELEVATION, FT
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220
200
180
160
140
120
100
80
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0
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4
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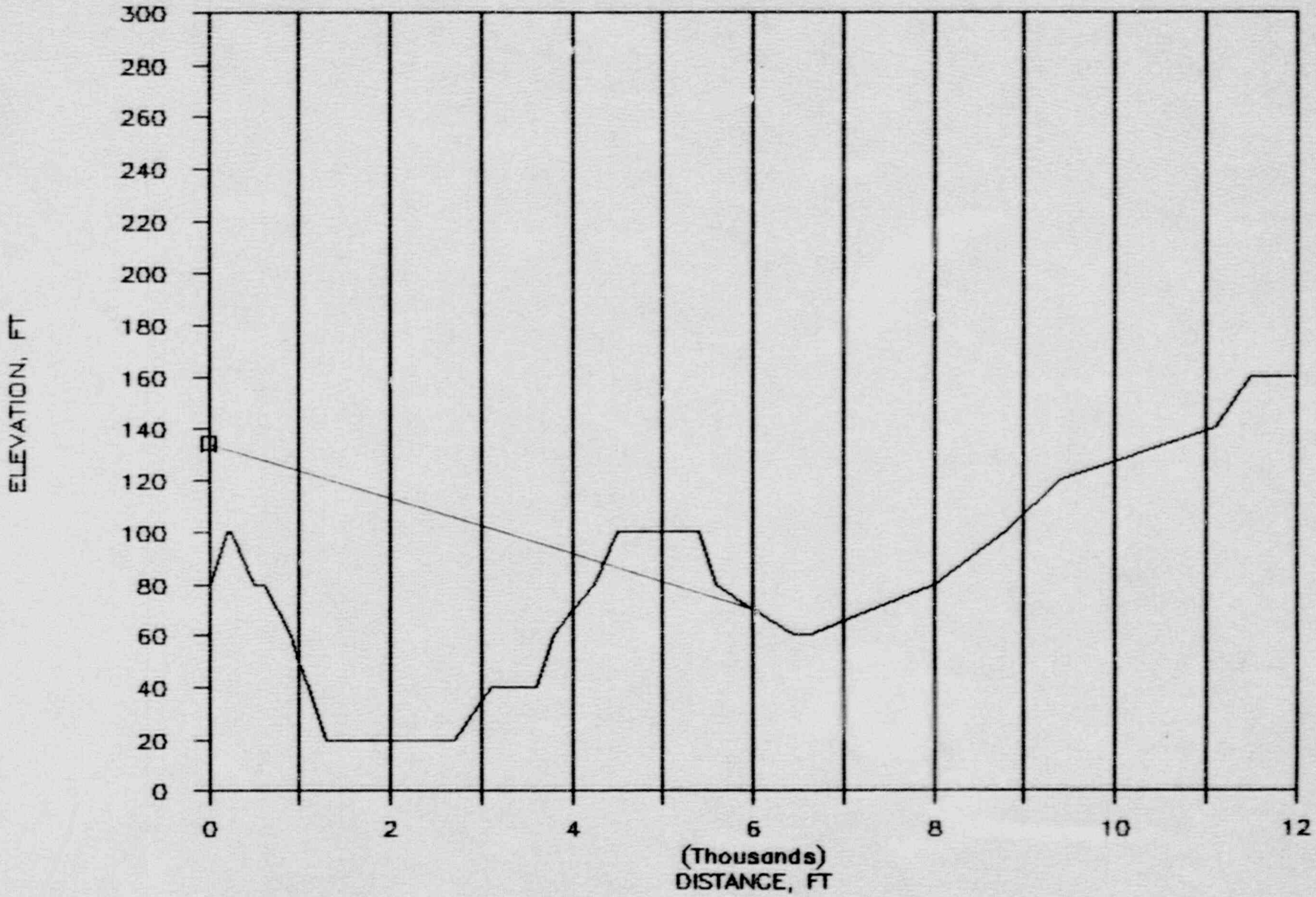
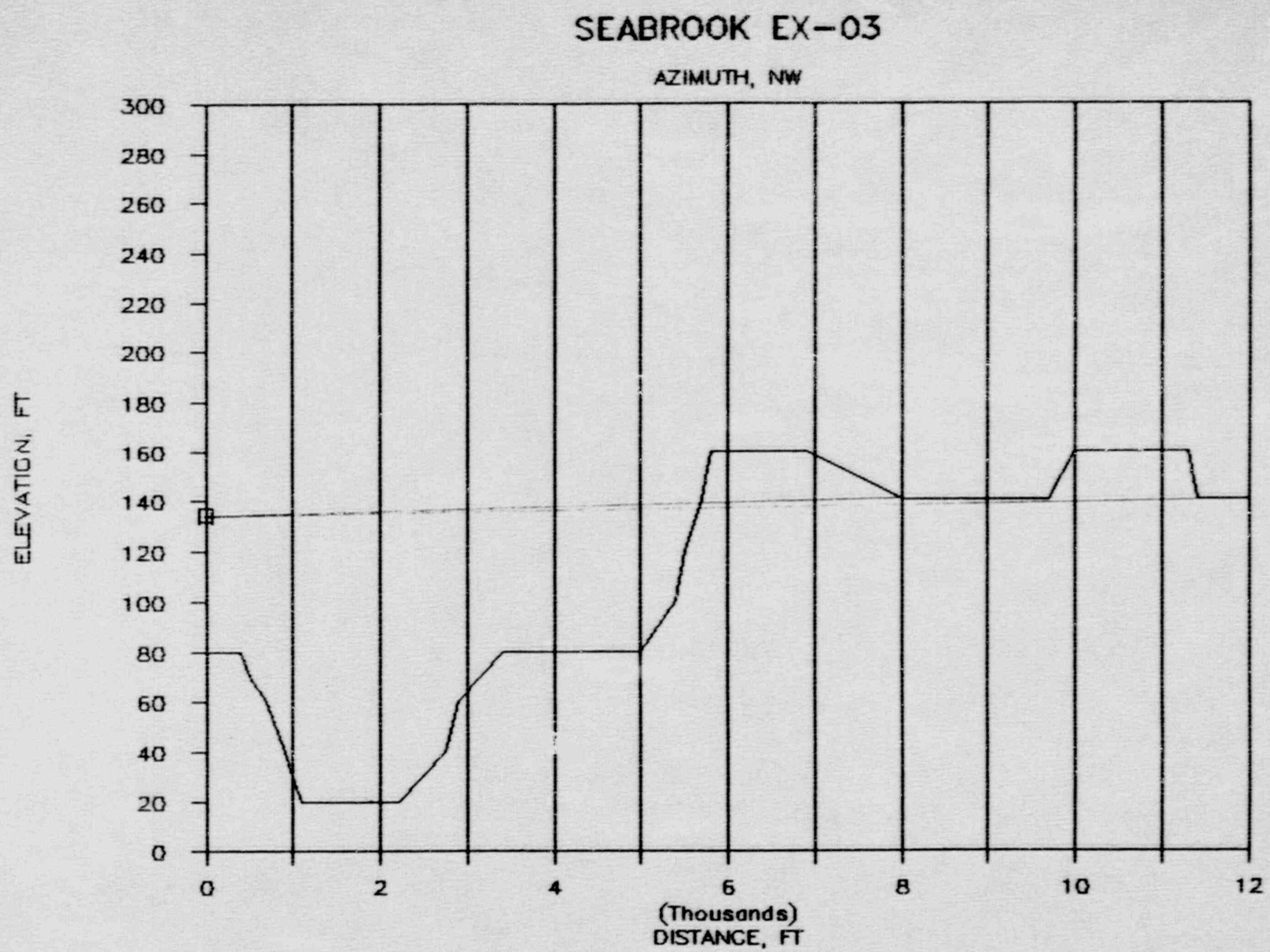
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK EX-03

AZIMUTH, NNW




SEABROOK EX-03
AZIMUTH, NW
ELEVATION, FT
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220
200
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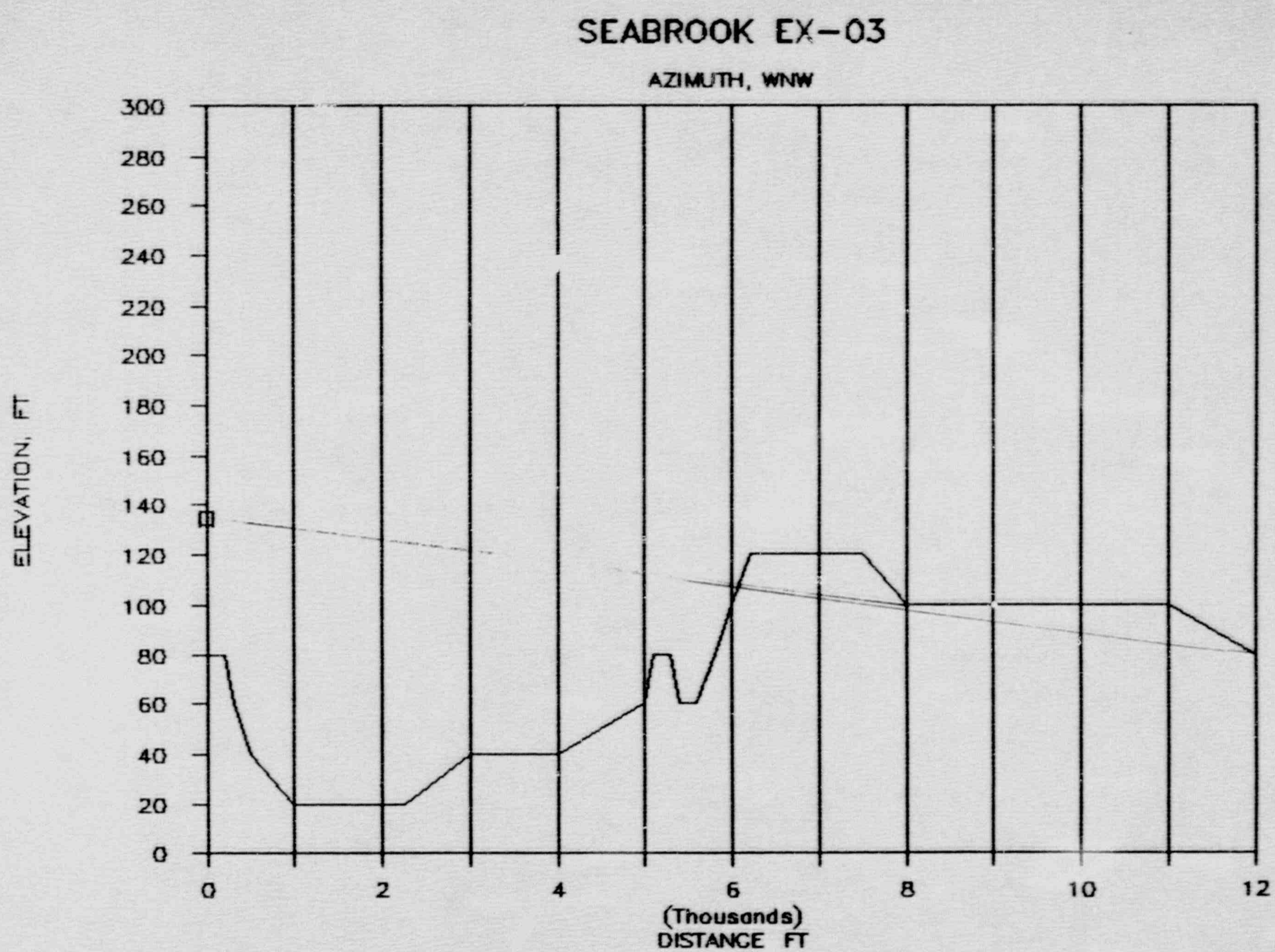
12
(Thousands)
DISTANCE, FT


SEABROOK EX-03
AZIMUTH, WNW
ELEVATION, FT
300
280
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240
220
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60
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20
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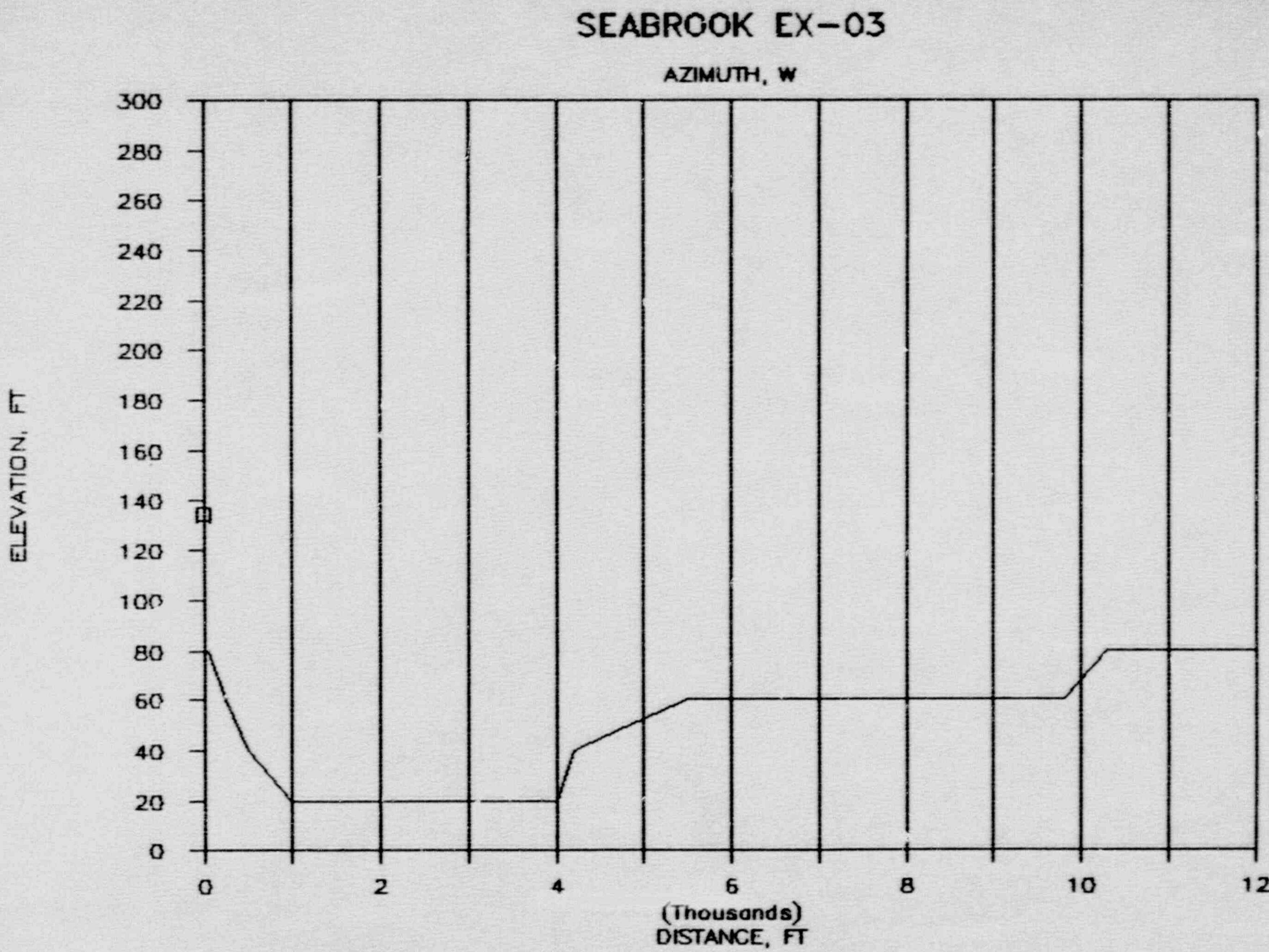
6
8
10
12
(Thousands)
DISTANCE FT



SEABROOK EX-03
AZIMUTH, W
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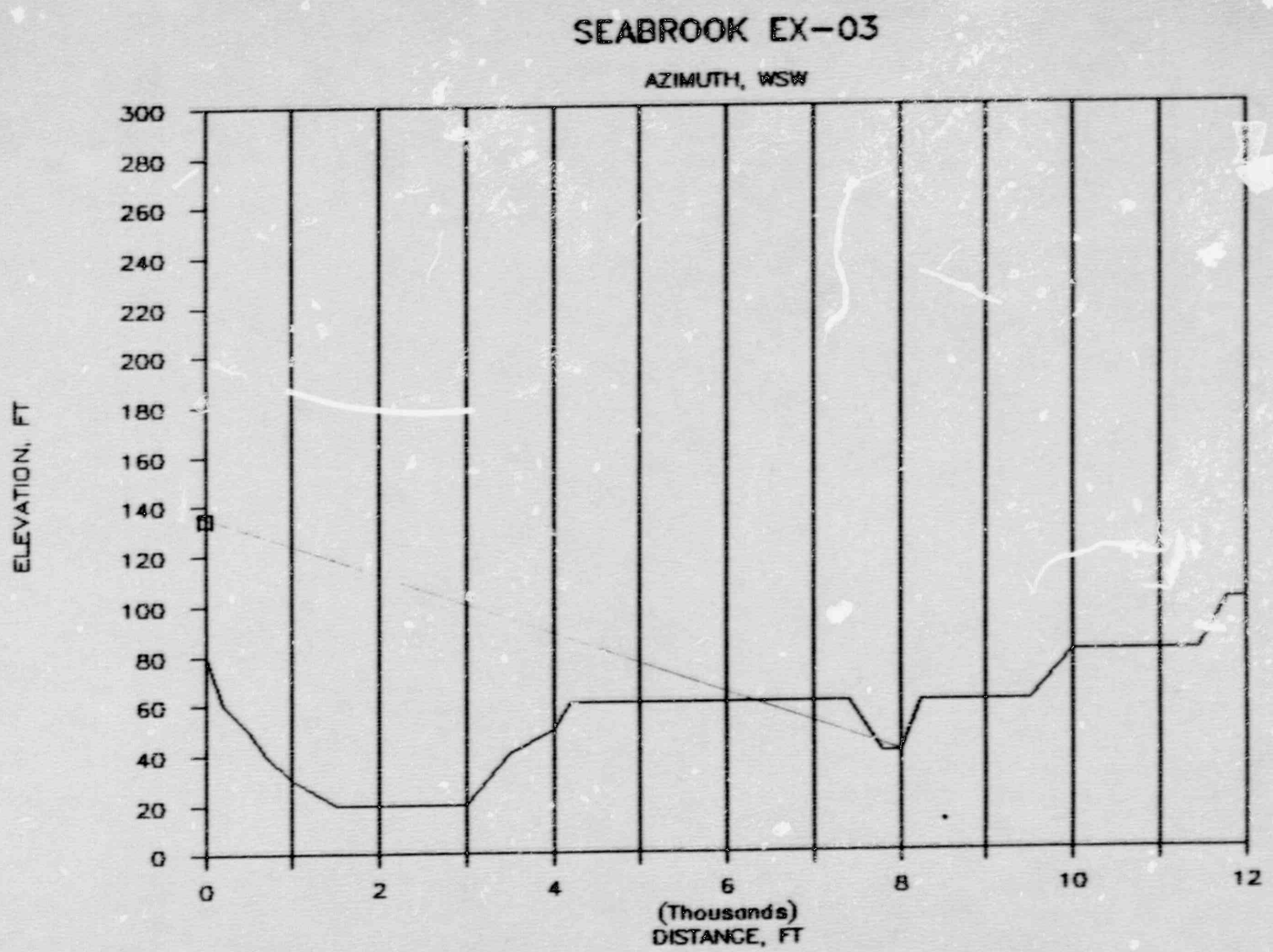
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
ELEVATION, FT
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK EX-03
AZIMUTH, WSW
ELEVATION, FT
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0
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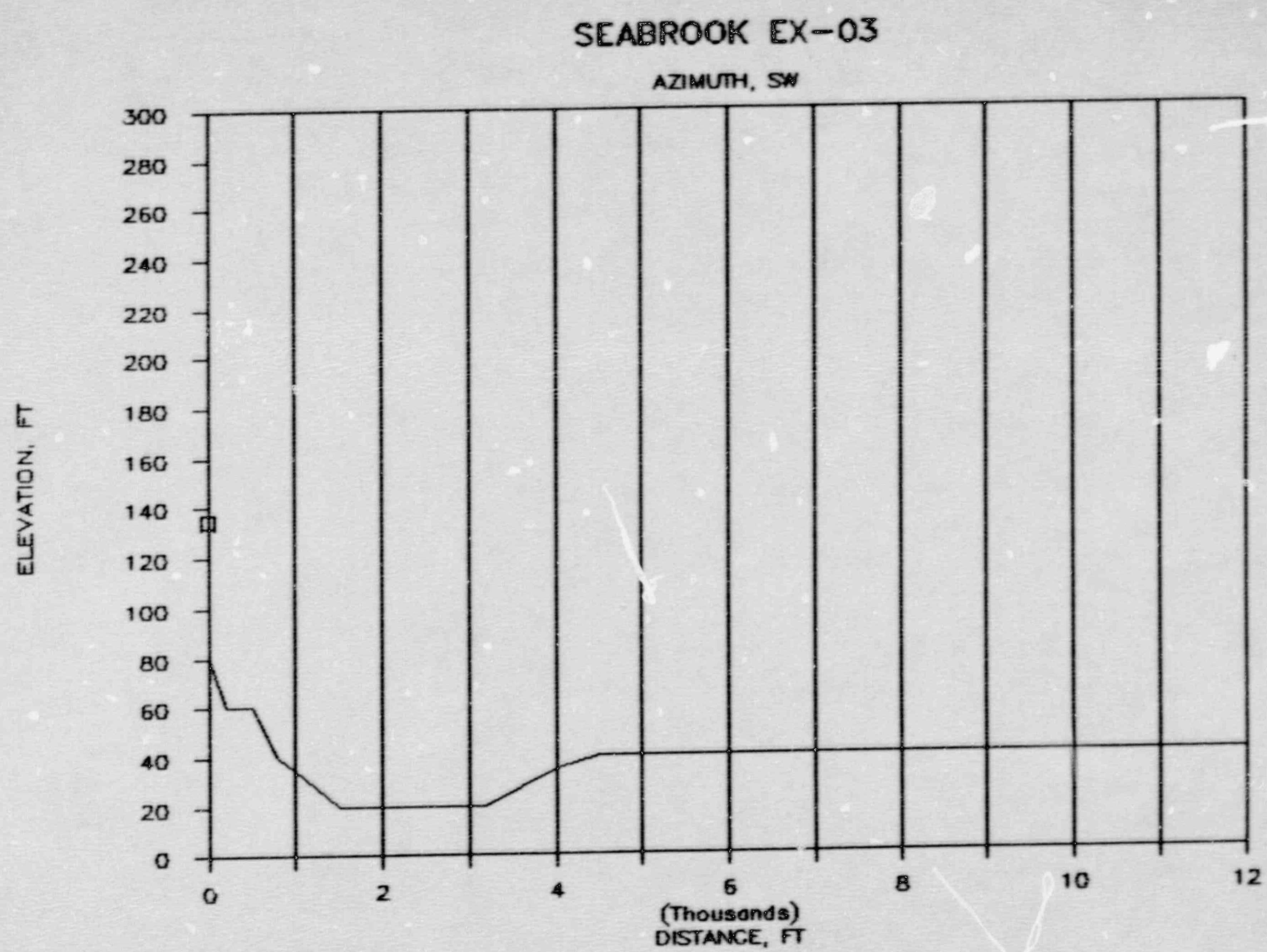
12
(Thousands)
DISTANCE, FT


SEABROOK EX-03
AZIMUTH, SW
ELEVATION, FT
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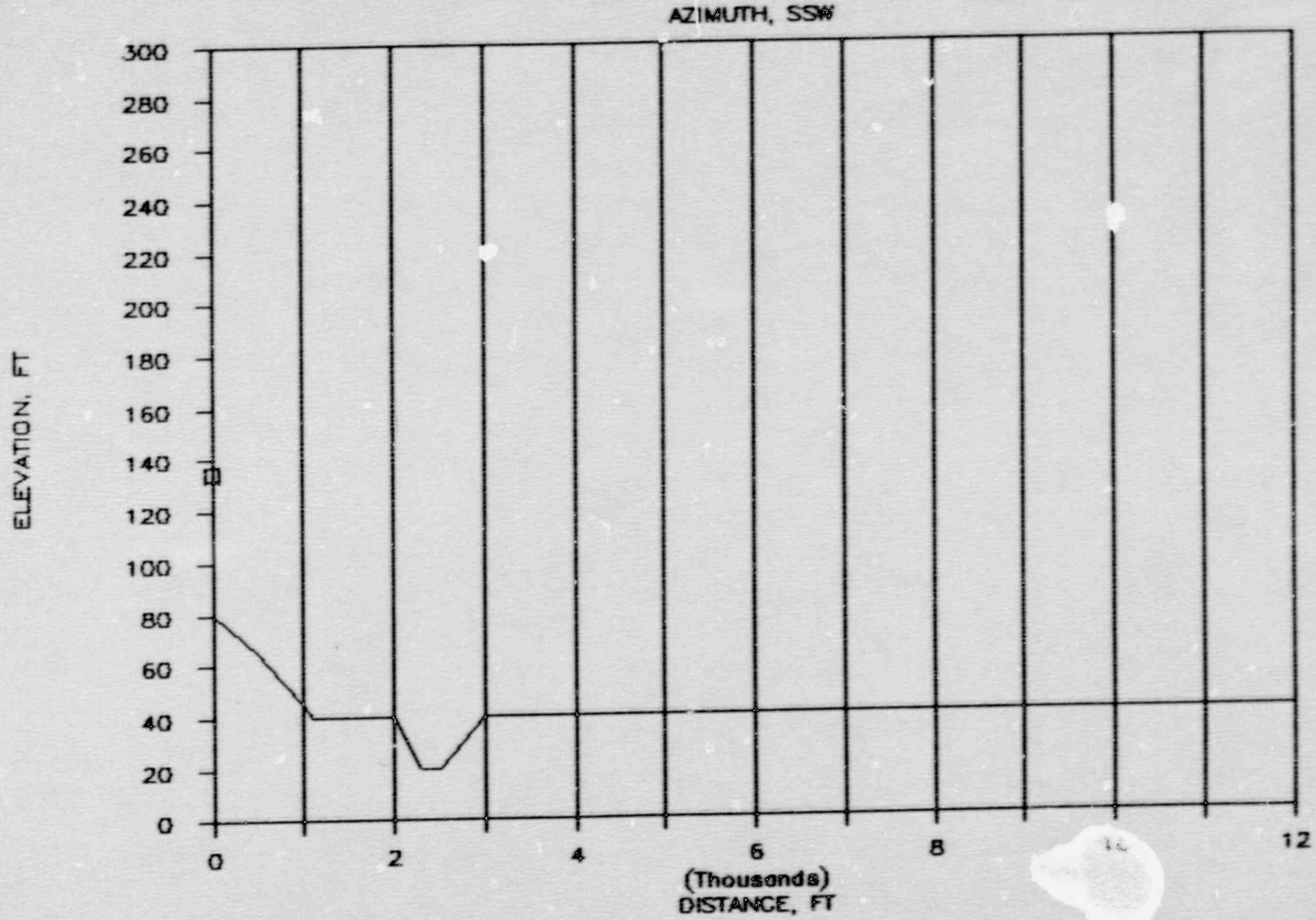
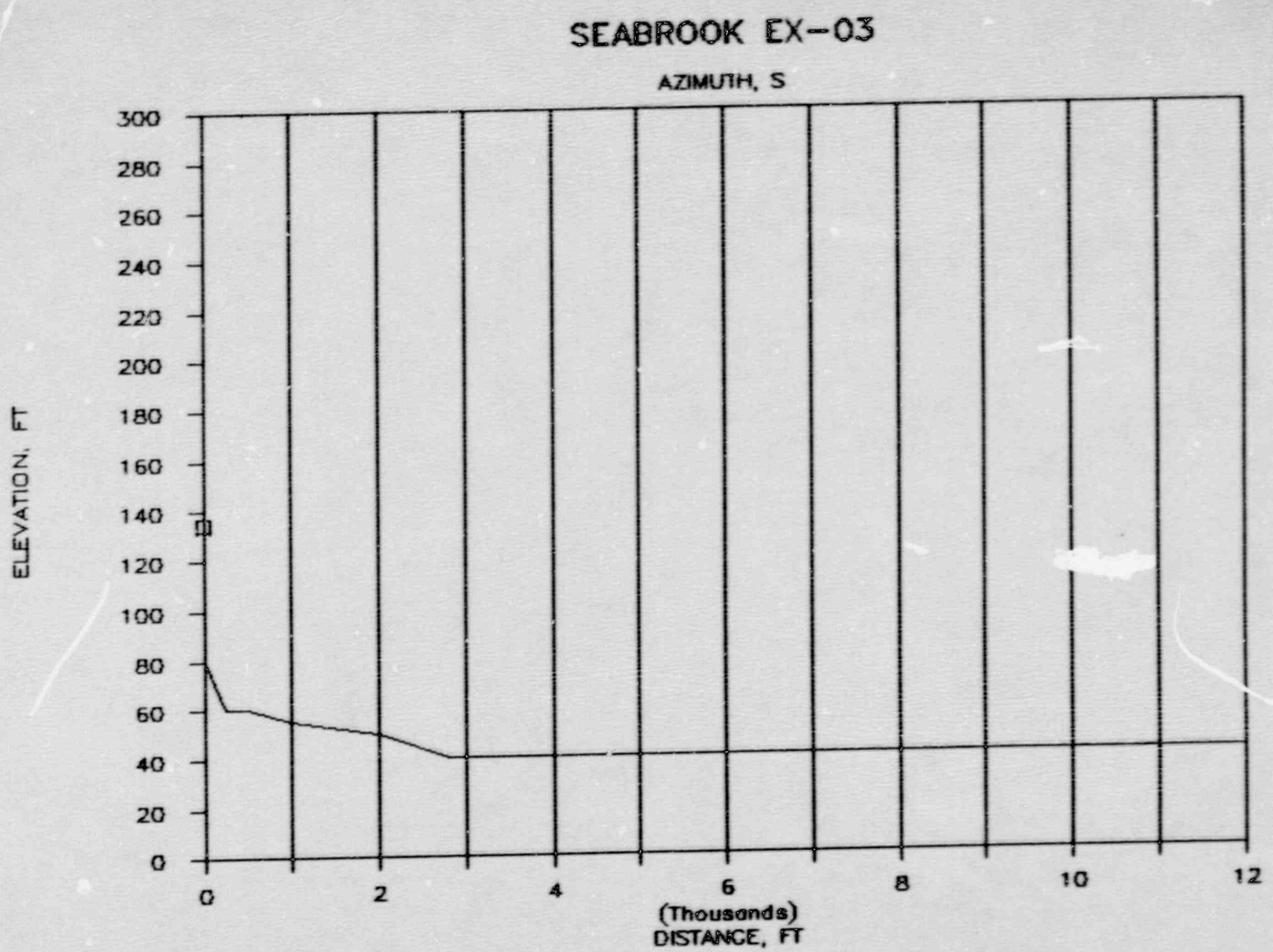
(Thousands)
DISTANCE, FT

SEABROOK EX-03




SEABROOK EX-03
AZIMUTH, S
ELEVATION, FT
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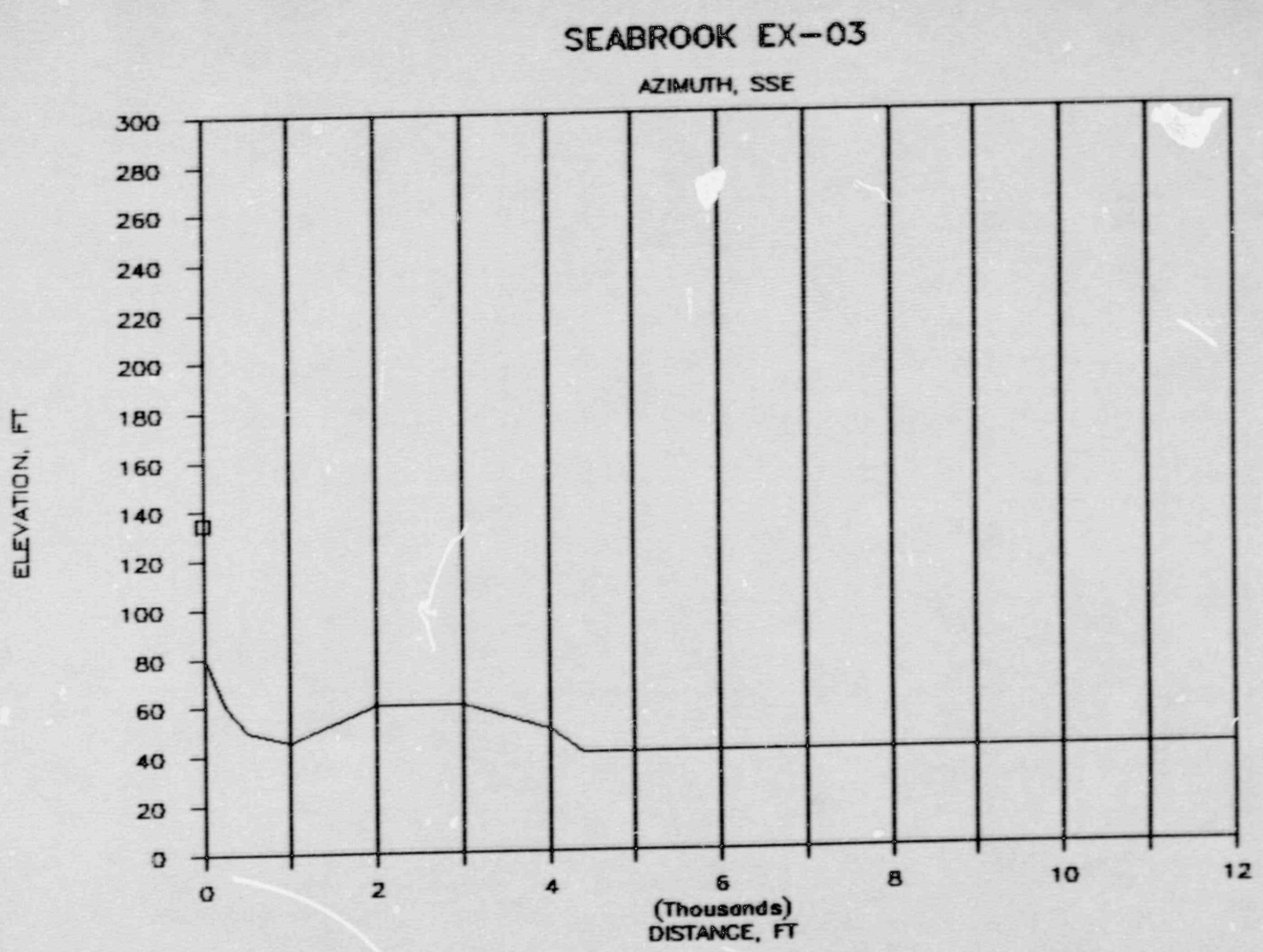
12
(Thousands)
DISTANCE, FT


SEABROOK EX-03
AZIMUTH, SSE
ELEVATION, FT
300
280
260
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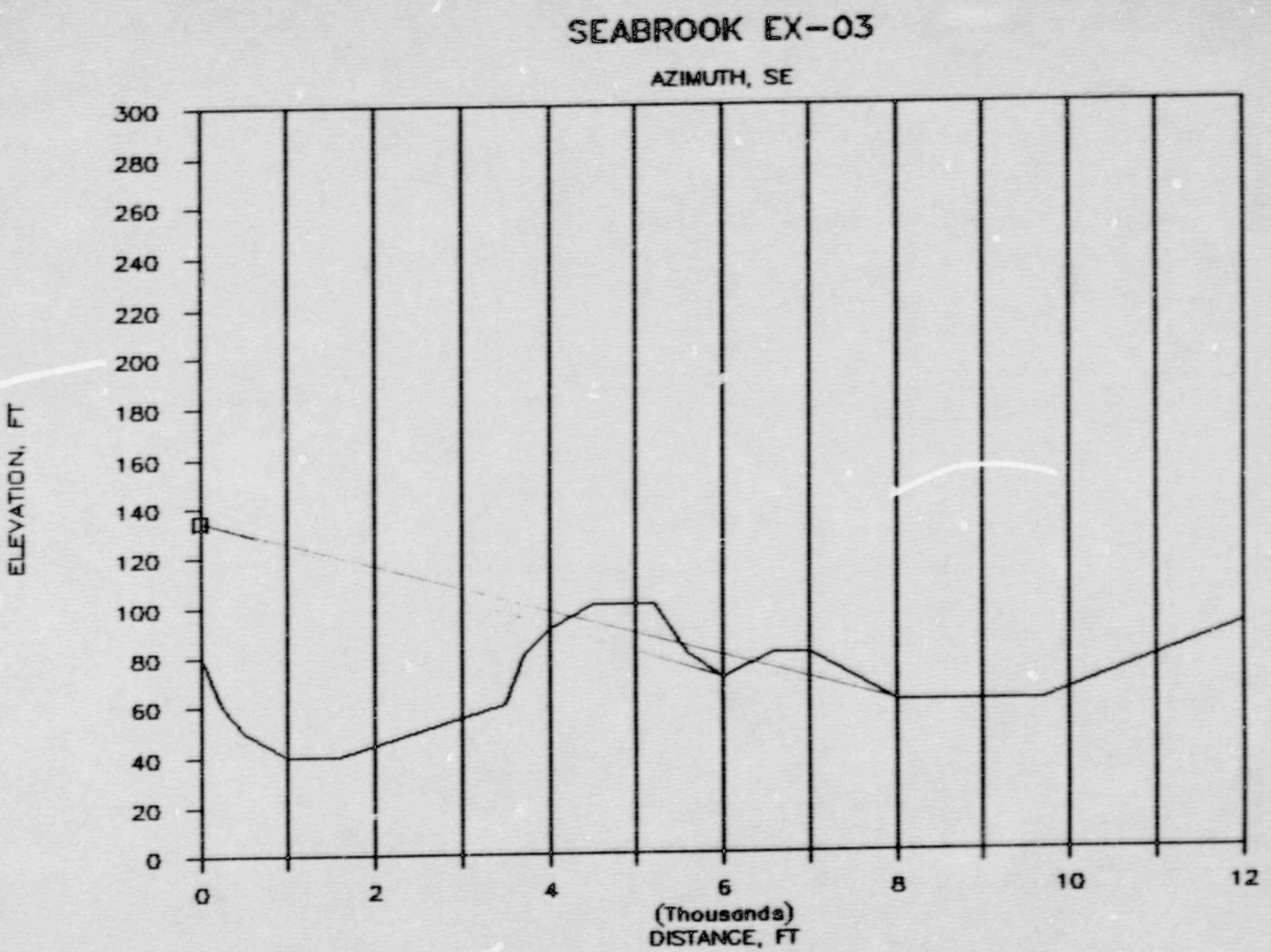
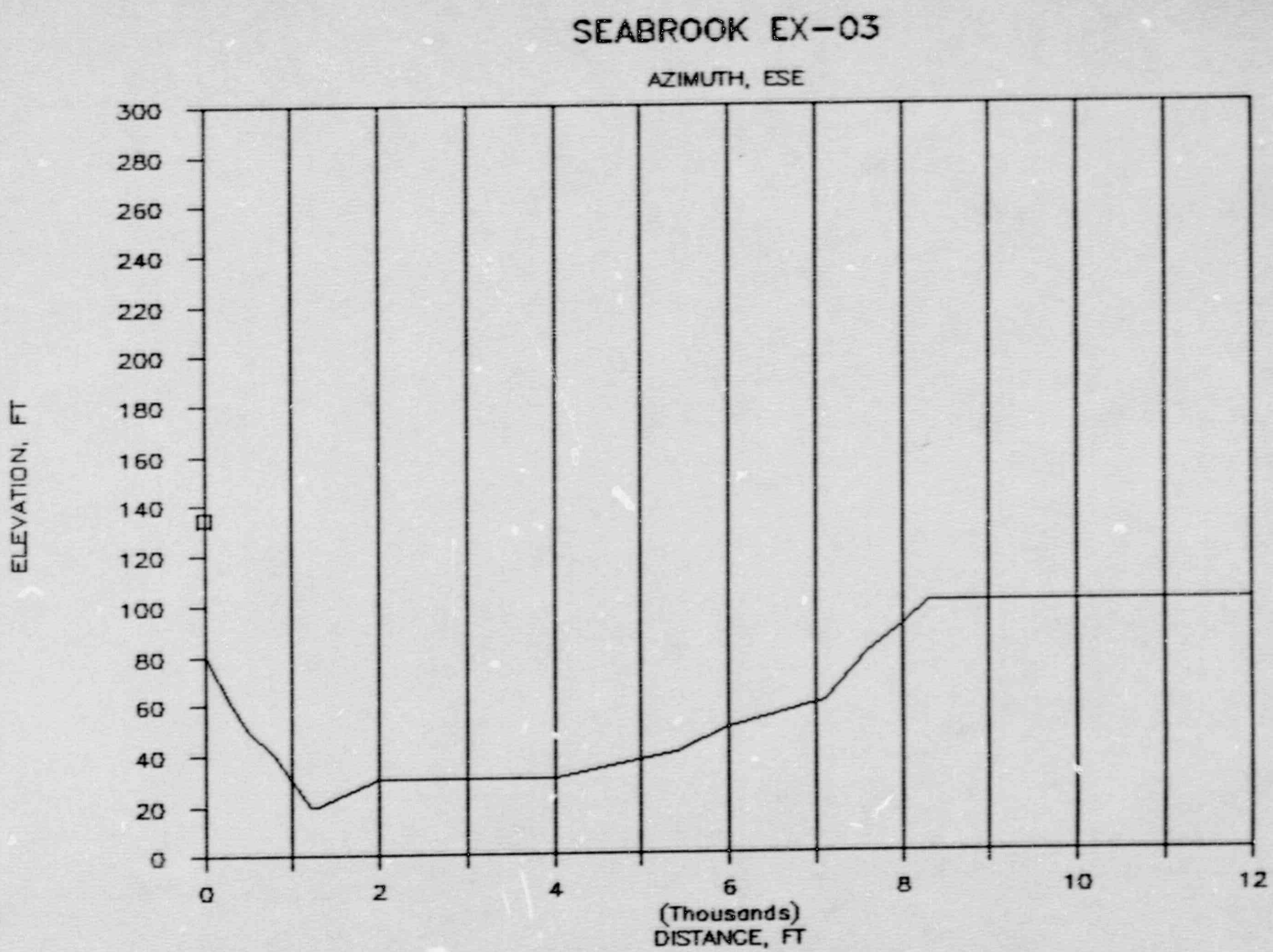
2
4
6
8
10
12
(Thousands)
DISTANCE, FT



SEABROOK EX-03
AZIMUTH, SE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK EX-03
AZIMUTH, ESE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

NEW HAMPHSIRE YANKEE

EX-03

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	40.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	20.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	20.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	40.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	60.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	180.00	SOFT	0.	NO	0.	0.
7	12000.	90.00	180.00	SOFT	0.	YES	8000.	180.
8	500.	67.50	50.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	20.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	20.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	40.00	SOFT	0.	NO	0.	0.
12	6000.	67.50	80.00	SOFT	0.	NO	0.	0.
13	8000.	67.50	50.00	SOFT	0.	YES	6500.	100.
14	12000.	67.50	100.00	SOFT	0.	NO	0.	0.
15	500.	45.00	50.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	40.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	20.00	SOFT	0.	NO	0.	0.
18	4000.	45.00	20.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	60.00	SOFT	0.	NO	0.	0.
20	8000.	45.00	80.00	SOFT	0.	YES	7800.	100.
21	12000.	45.00	100.00	SOFT	0.	YES	10750.	200.
22	500.	22.50	60.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	50.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	30.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	20.00	SOFT	0.	NO	0.	0.
26	6000.	22.50	30.00	SOFT	0.	NO	0.	0.
27	8000.	22.50	30.00	SOFT	0.	NO	0.	0.
28	12000.	22.50	40.00	SOFT	0.	NO	0.	0.
29	500.	.00	80.00	SOFT	0.	NO	0.	0.
30	1000.	.00	60.00	SOFT	0.	NO	0.	0.
31	2000.	.00	20.00	SOFT	0.	NO	0.	0.
32	4000.	.00	20.00	SOFT	0.	NO	0.	0.
33	6000.	.00	20.00	SOFT	0.	NO	0.	0.
34	8000.	.00	20.00	SOFT	0.	NO	0.	0.
35	12000.	.00	70.00	SOFT	0.	NO	0.	0.
36	500.	337.50	80.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	50.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	20.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	70.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	70.00	SOFT	0.	YES	5400.	100.
41	8000.	337.50	80.00	SOFT	0.	NO	0.	0.

42	12000.	337.50	160.00	SOFT	0.	NO	0.	0.
43	500.	315.00	70.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	30.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	20.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	80.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	160.00	SOFT	0.	NO	0.	0.
48	8000.	315.00	140.00	SOFT	0.	YES	5800.	160.
49	12000.	315.00	140.00	SOFT	0.	YES	5800.	160.
50	500.	292.50	40.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	20.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	20.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	40.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	100.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	100.00	SOFT	0.	YES	7500.	120.
56	12000.	292.50	80.00	SOFT	0.	YES	7500.	120.
57	500.	270.00	40.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	20.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	20.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	20.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	60.00	SOFT	0.	NO	0.	0.
62	8000.	270.00	60.00	SOFT	0.	NO	0.	0.
63	12000.	270.00	80.00	SOFT	0.	NO	0.	0.
64	500.	247.50	50.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	30.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	20.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	50.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	60.00	SOFT	0.	NO	0.	0.
69	8000.	247.50	60.00	SOFT	0.	YES	7400.	60.
70	12000.	247.50	100.00	SOFT	0.	NO	0.	0.
71	500.	225.00	60.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	35.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	20.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	35.00	SOFT	0.	NO	0.	0.
75	6000.	225.00	60.00	SOFT	0.	NO	0.	0.
76	8000.	225.00	40.00	SOFT	0.	NO	0.	0.
77	12000.	225.00	40.00	SOFT	0.	NO	0.	0.
78	500.	202.50	65.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	45.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	40.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	40.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	40.00	SOFT	0.	NO	0.	0.
83	8000.	202.50	40.00	SOFT	0.	NO	0.	0.
84	12000.	202.50	40.00	SOFT	0.	NO	0.	0.
85	500.	180.00	60.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	55.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	60.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	40.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	40.00	SOFT	0.	NO	0.	0.
90	8000.	180.00	40.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	40.00	SOFT	0.	NO	0.	0.
92	500.	157.50	50.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	45.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	60.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	50.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	40.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	60.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	40.00	SOFT	0.	NO	0.	0.
99	500.	135.00	50.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	60.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	40.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	90.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	70.00	SOFT	0.	YES	5200.	100.
104	8000.	135.00	60.00	SOFT	0.	YES	5200.	100.
105	12000.	135.00	90.00	SOFT	0.	NO	0.	0.
106	500.	112.50	50.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	30.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	30.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	30.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	50.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	90.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	100.00	SOFT	0.	NO	0.	0.

NEW HAMPHSIRE YANKEE

EX-03

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
1	WS-3000	119.3	121.3	.0	.0	.0	.0	120.0	115.0	105.0	100.0	9.4

XO= .00 YO= .00 ZO= 135.00 HEIGHT ABOVE GROUND= 55.00

NEW HAMPHSIRE YANKEE

EX-03

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

NEW HAMPHSIRE YANKEE

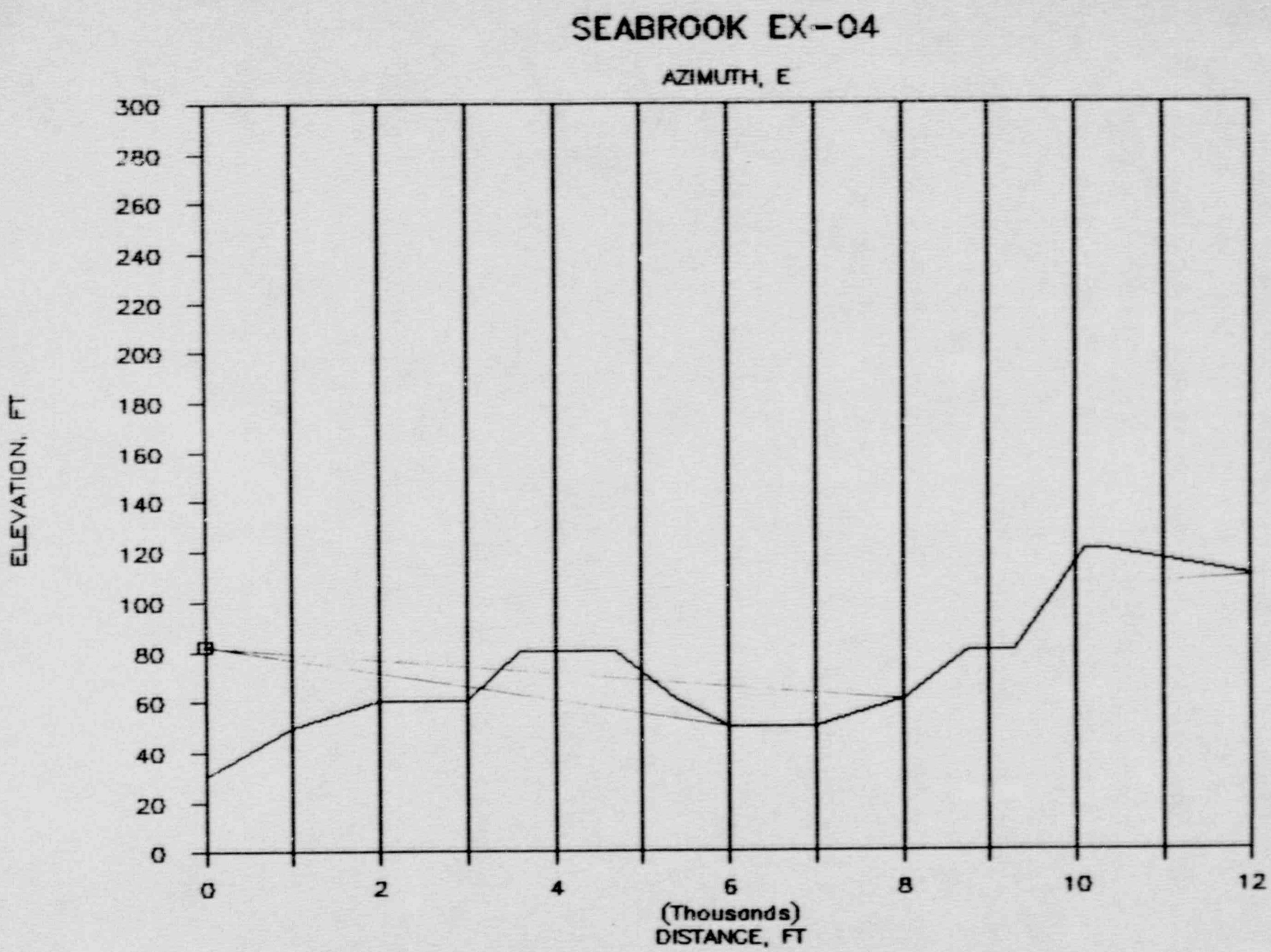
EX-03

SOUND PRESSURE LEVELS IN DBC

UNDER MET CONDITION 1

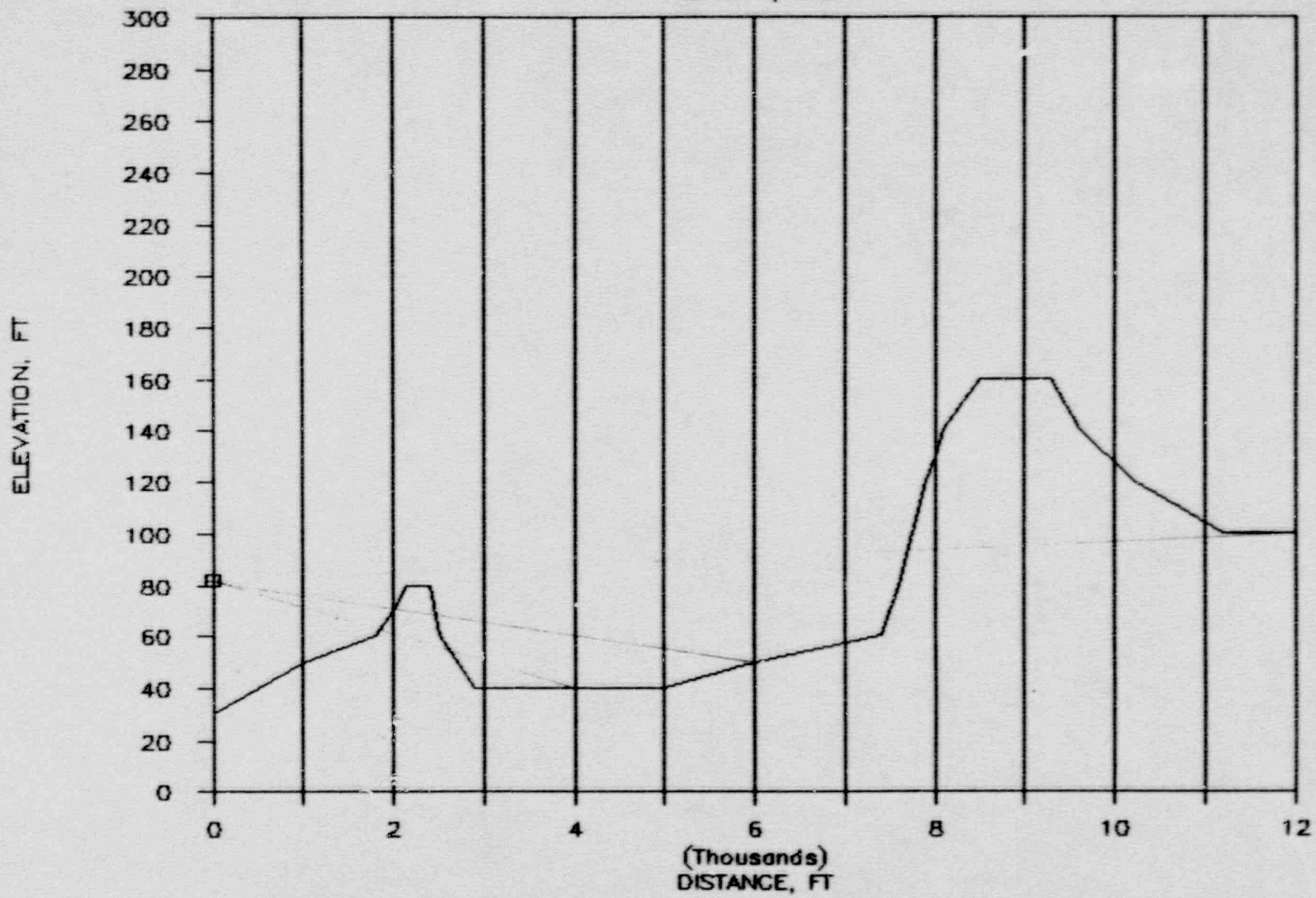
DISTANCE IN FEET

AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	105.7	94.1	84.8	76.8	70.7	63.2	44.2
ENE	105.7	94.1	84.8	76.8	70.9	55.3	50.4
NE	105.7	94.1	84.8	76.8	70.9	55.4	37.7
NNE	105.8	94.1	84.8	76.8	70.9	65.8	56.6
N	105.8	94.1	84.8	76.8	70.9	65.8	56.6
NNW	105.8	94.1	84.8	76.8	62.1	65.8	56.6
NW	105.8	94.1	84.8	76.8	70.9	59.5	50.9
WNW	105.7	94.1	84.8	76.8	70.9	58.0	51.1
W	105.7	94.1	84.8	76.8	70.9	65.8	56.6
WSW	105.7	94.1	84.8	76.8	70.9	59.4	56.6
SW	105.8	94.1	84.8	76.8	70.9	65.8	56.6
SSW	105.8	94.1	84.8	76.8	70.9	65.8	56.6
S	105.8	94.1	84.8	76.8	70.9	65.8	56.6
SSE	105.7	94.1	84.8	76.8	70.9	65.8	56.6
SE	105.7	94.1	84.8	76.8	63.2	60.4	53.7
ESE	105.7	94.1	84.8	76.8	70.9	63.9	50.4


SEABROOK EX-04
AZIMUTH, E
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

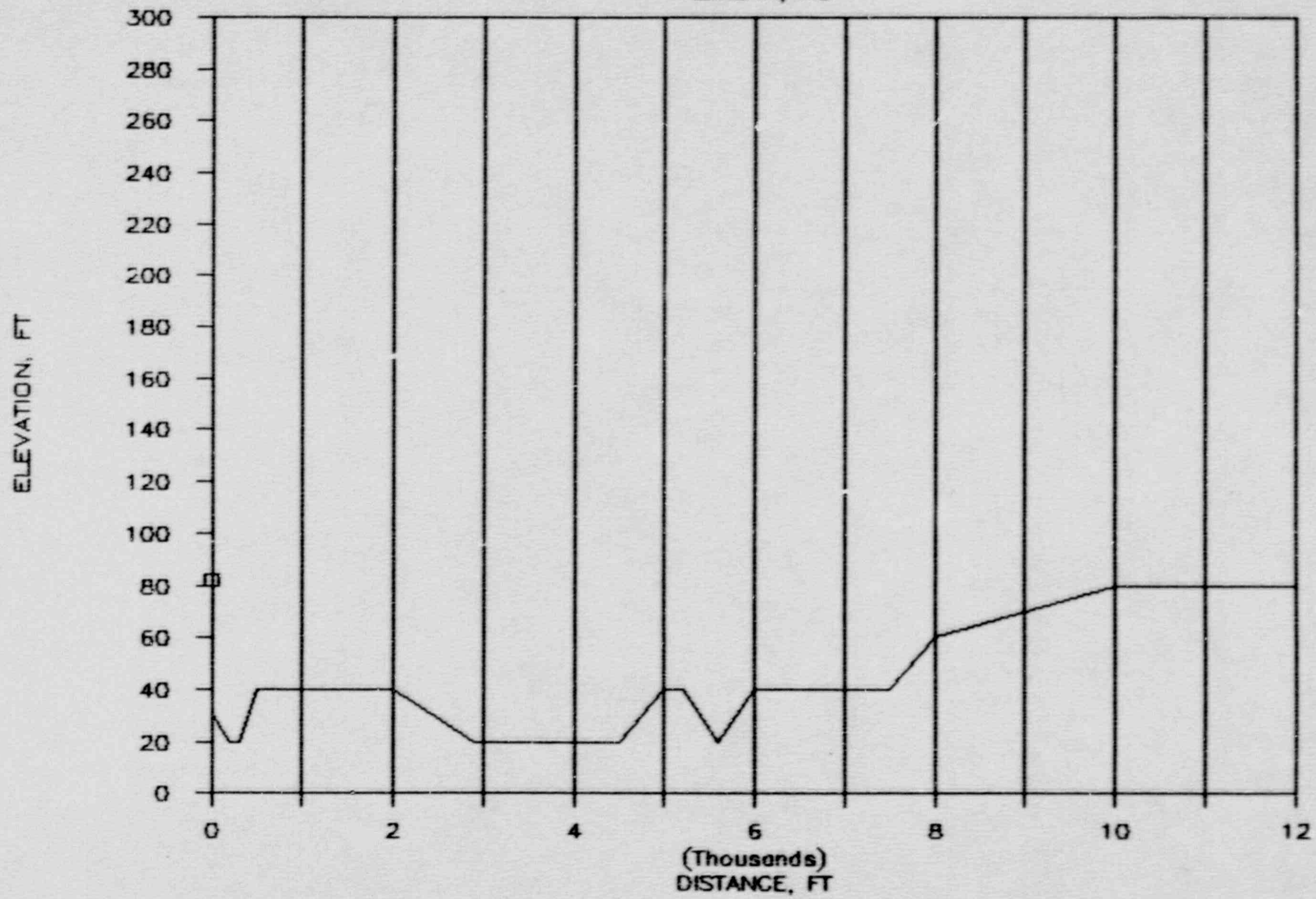
SEABROOK EX-04

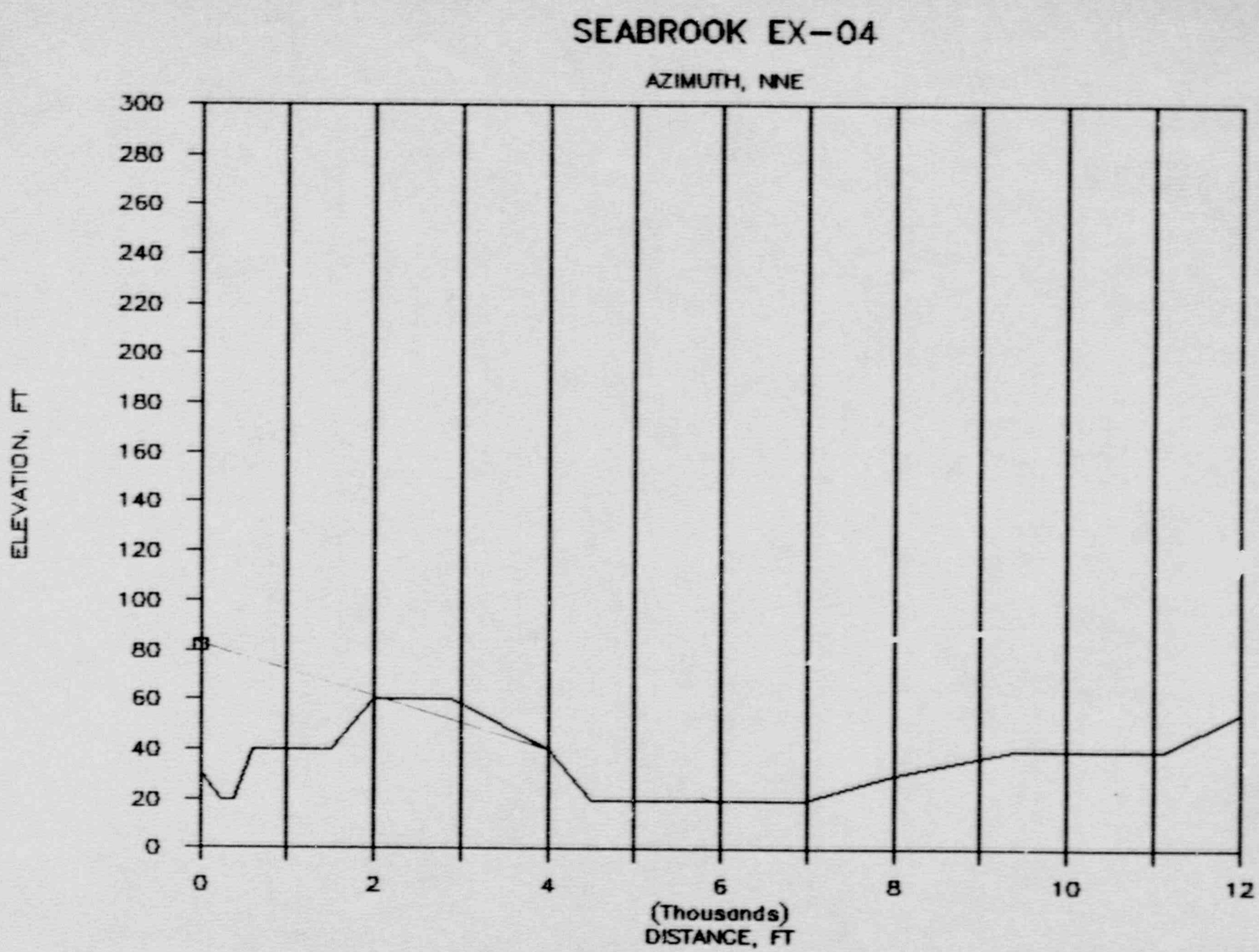
AZIMUTH, ENE



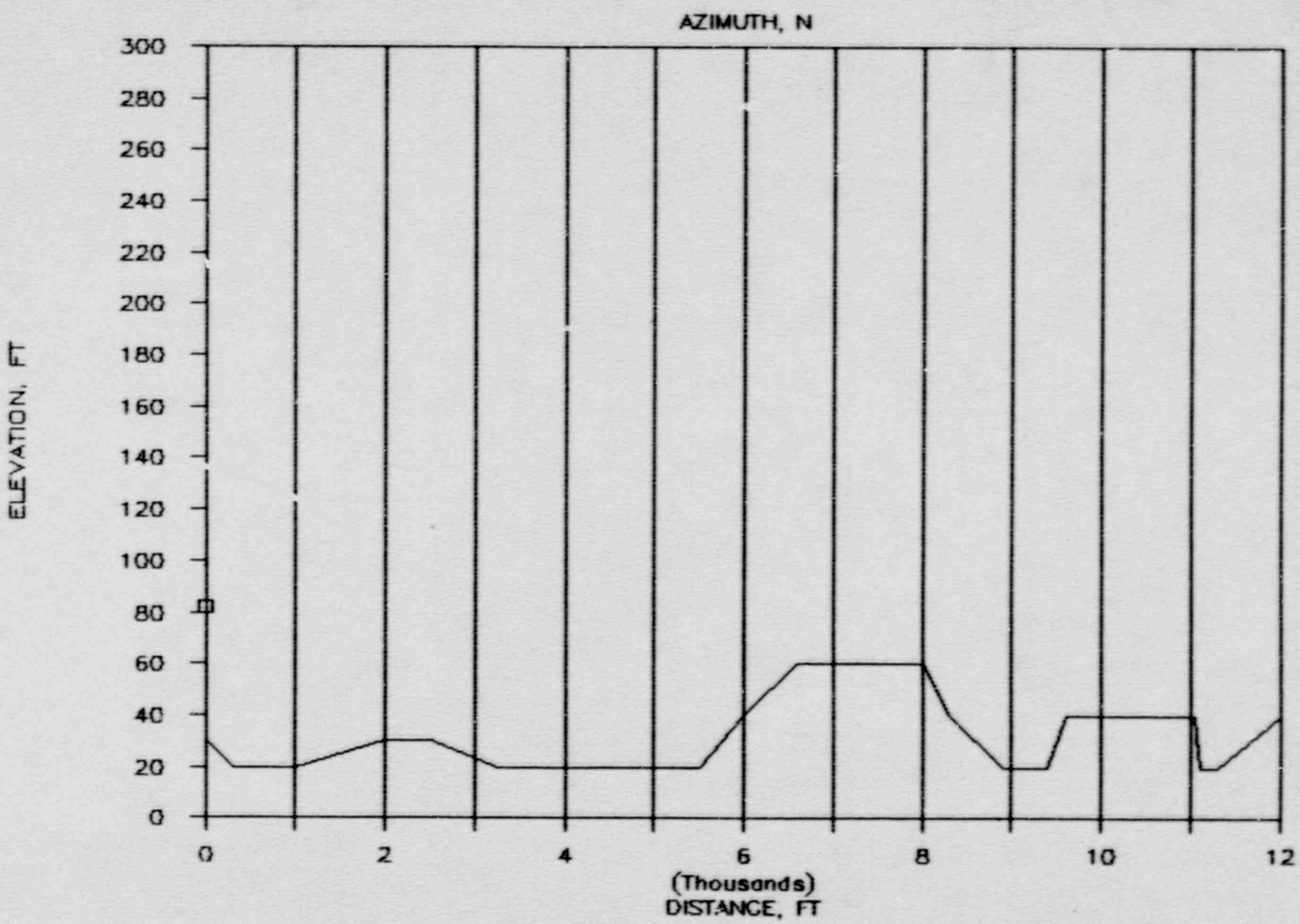
SEABROOK EX-04

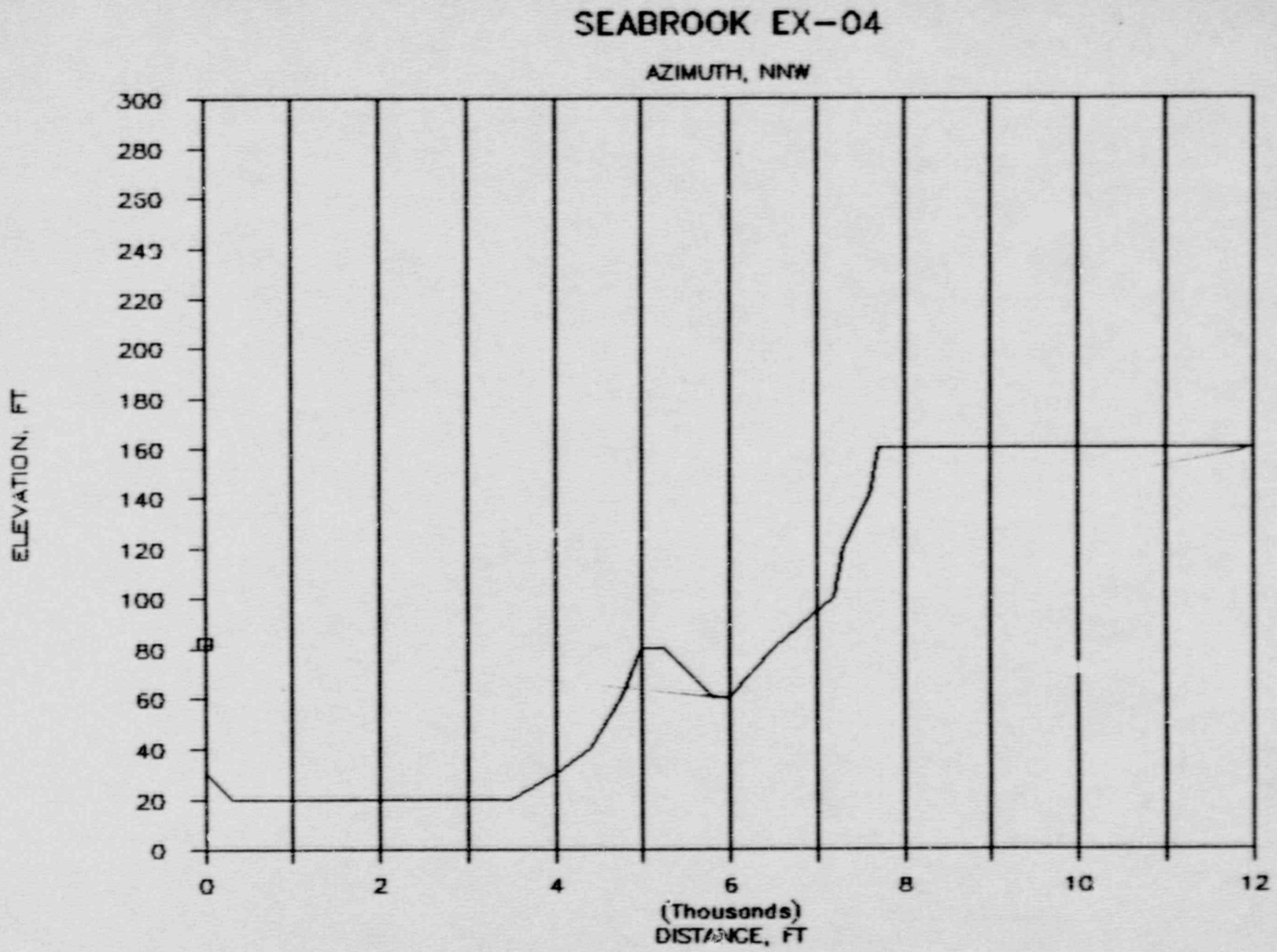
AZIMUTH, NE

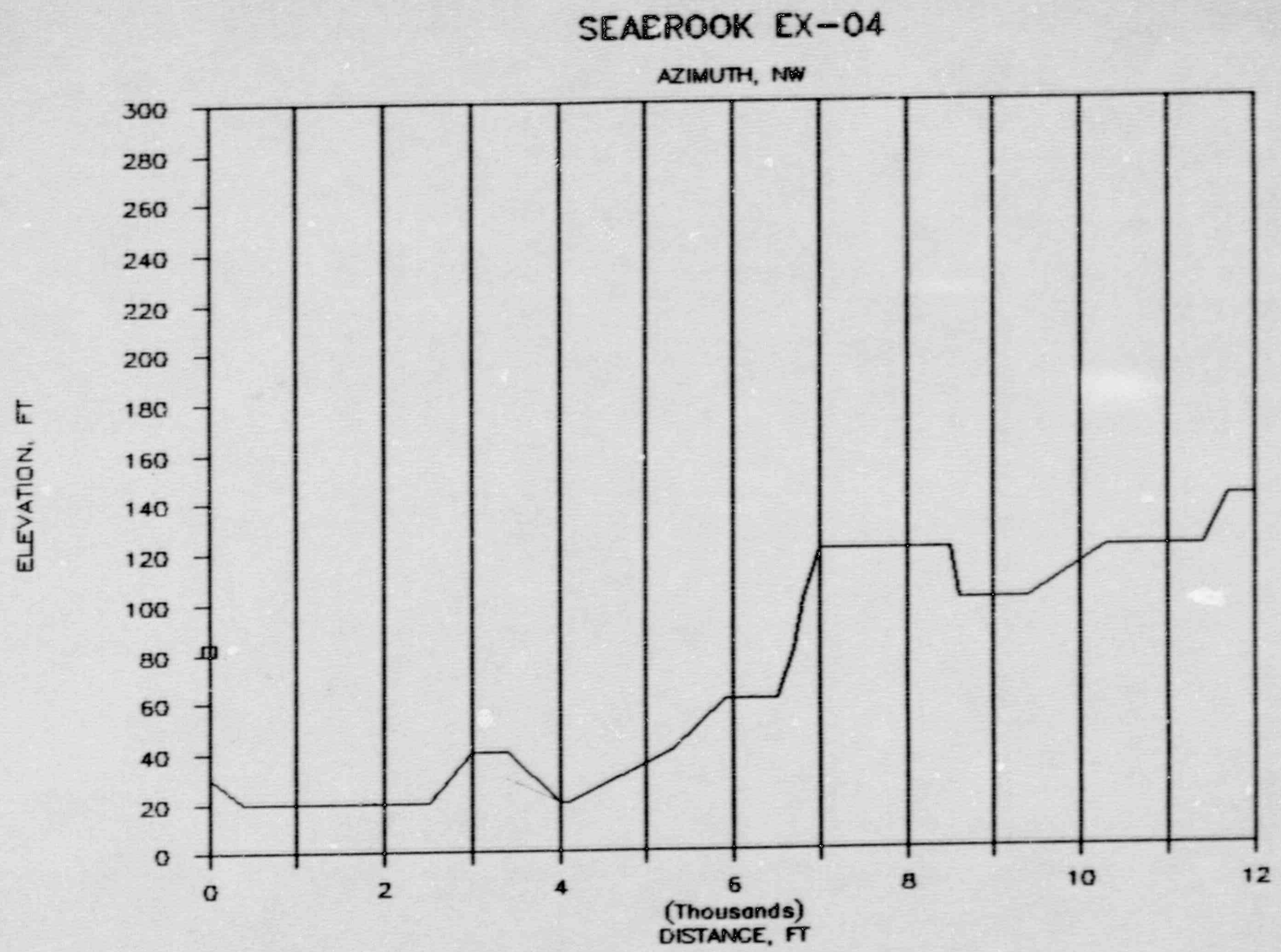


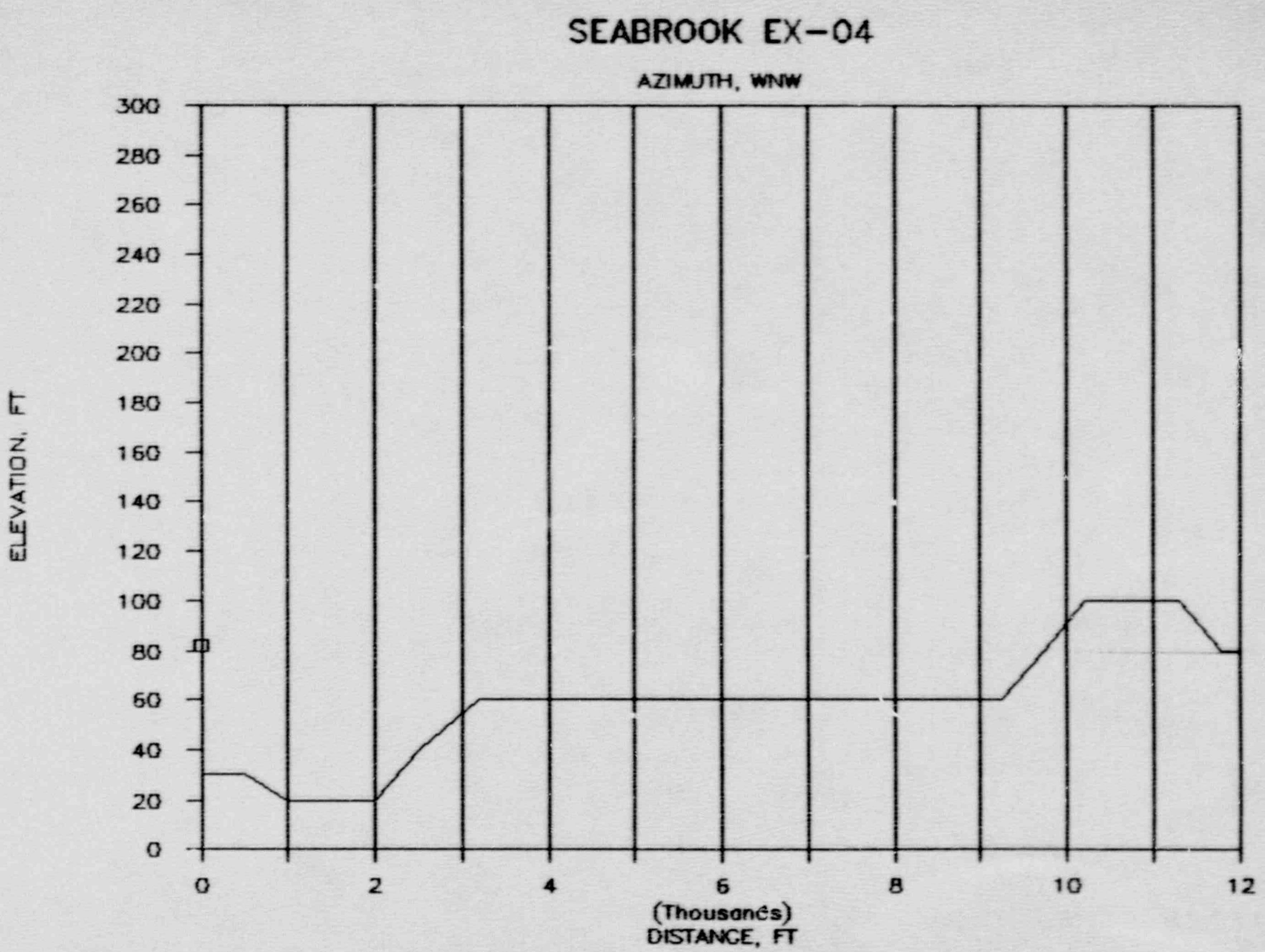

SEABROOK EX-04
AZIMUTH, NNE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

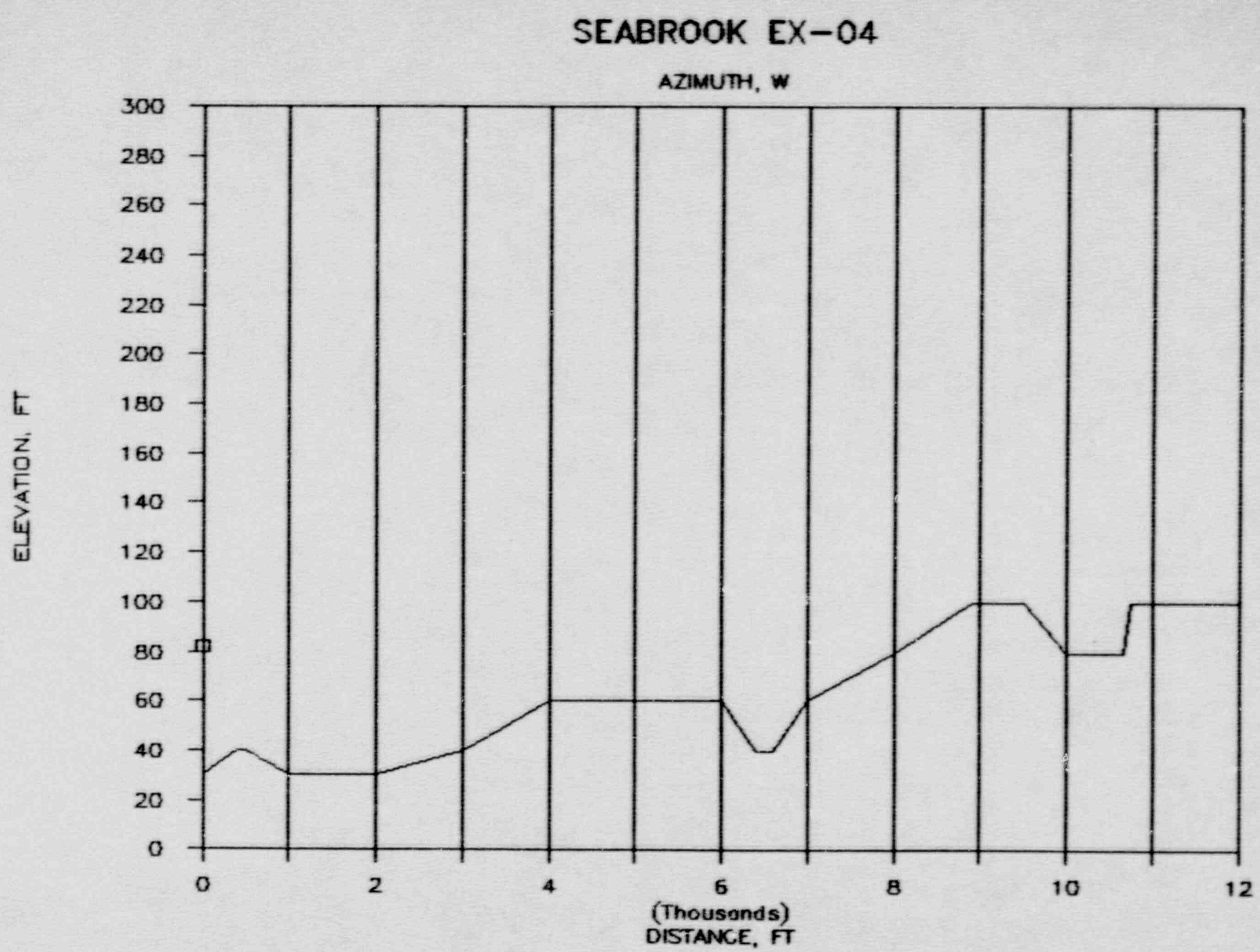
SEABROOK EX-04



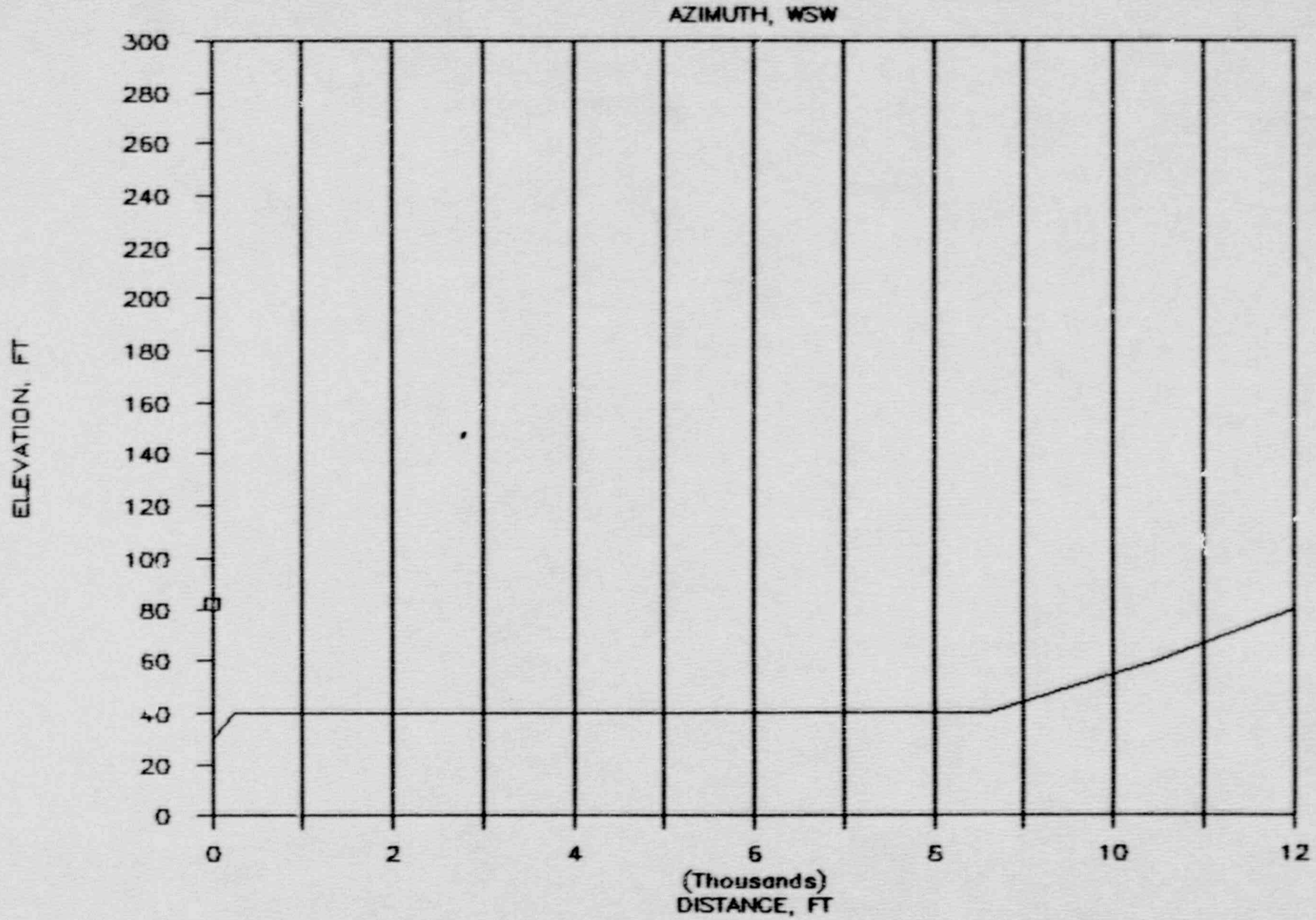

SEABROOK EX-04
AZIMUTH, NNW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

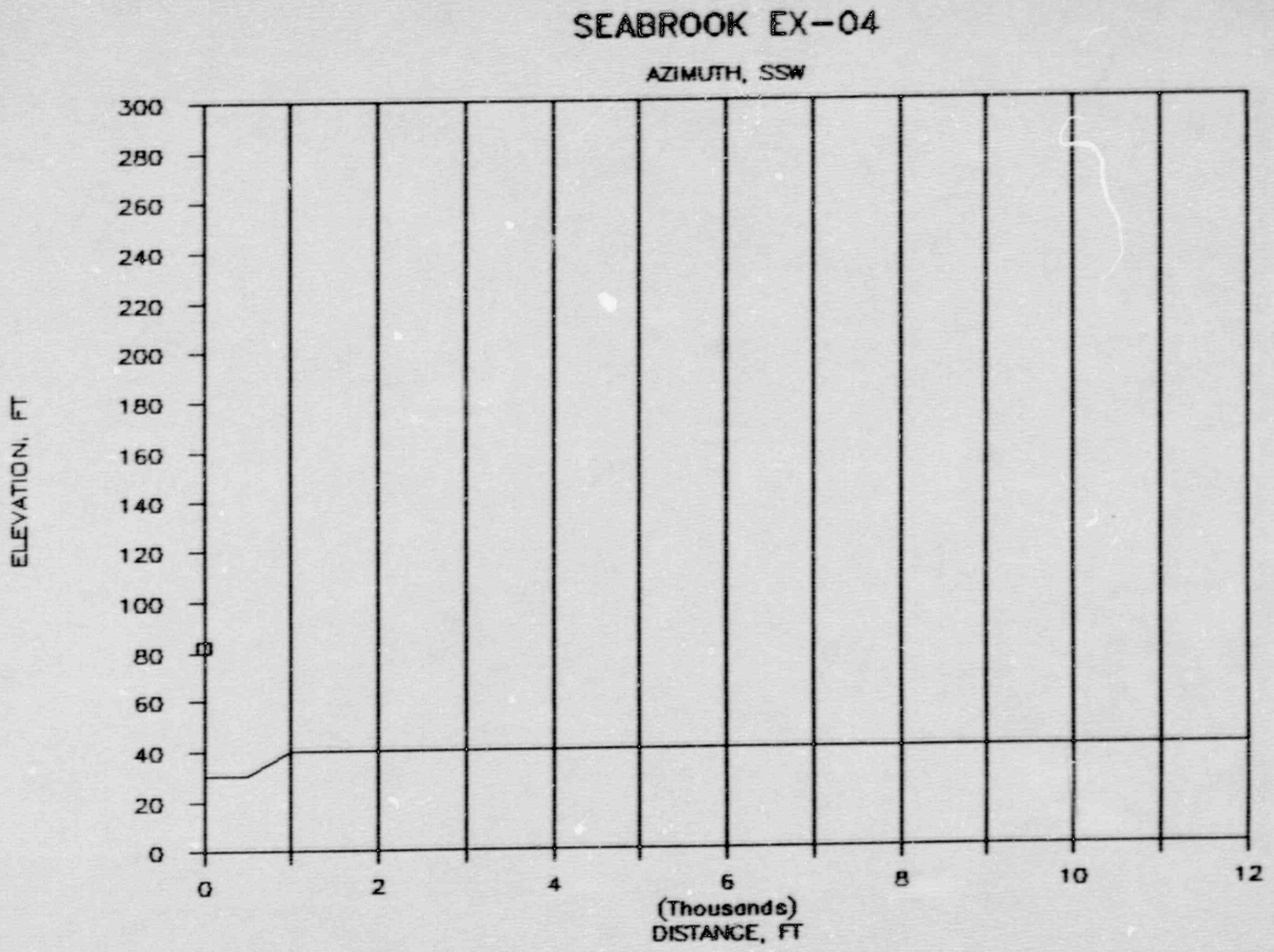

SEAEROOK EX-04
AZIMUTH, NW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK EX-04
AZIMUTH, WNW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

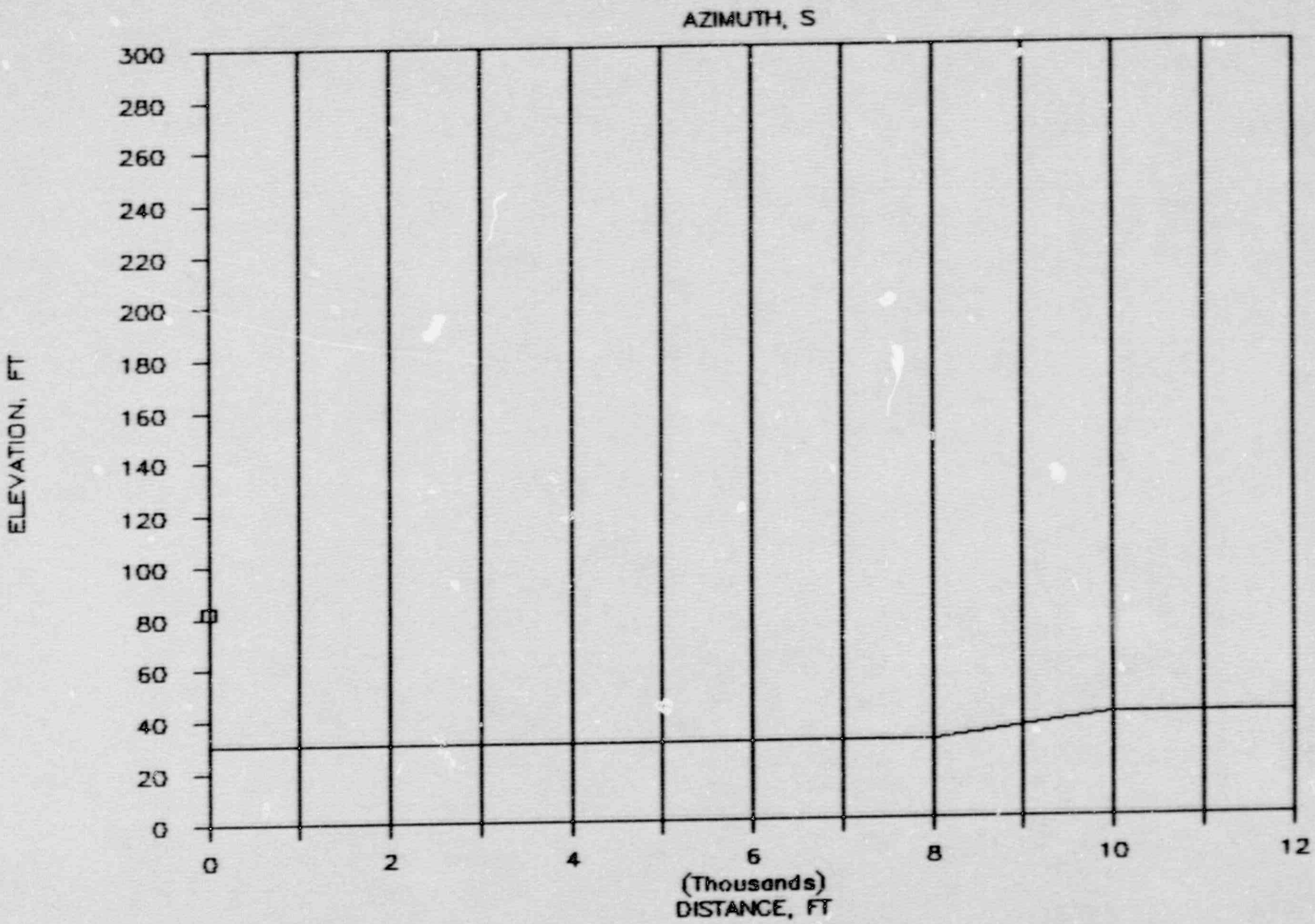

SEABROOK EX-04
AZIMUTH, W
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

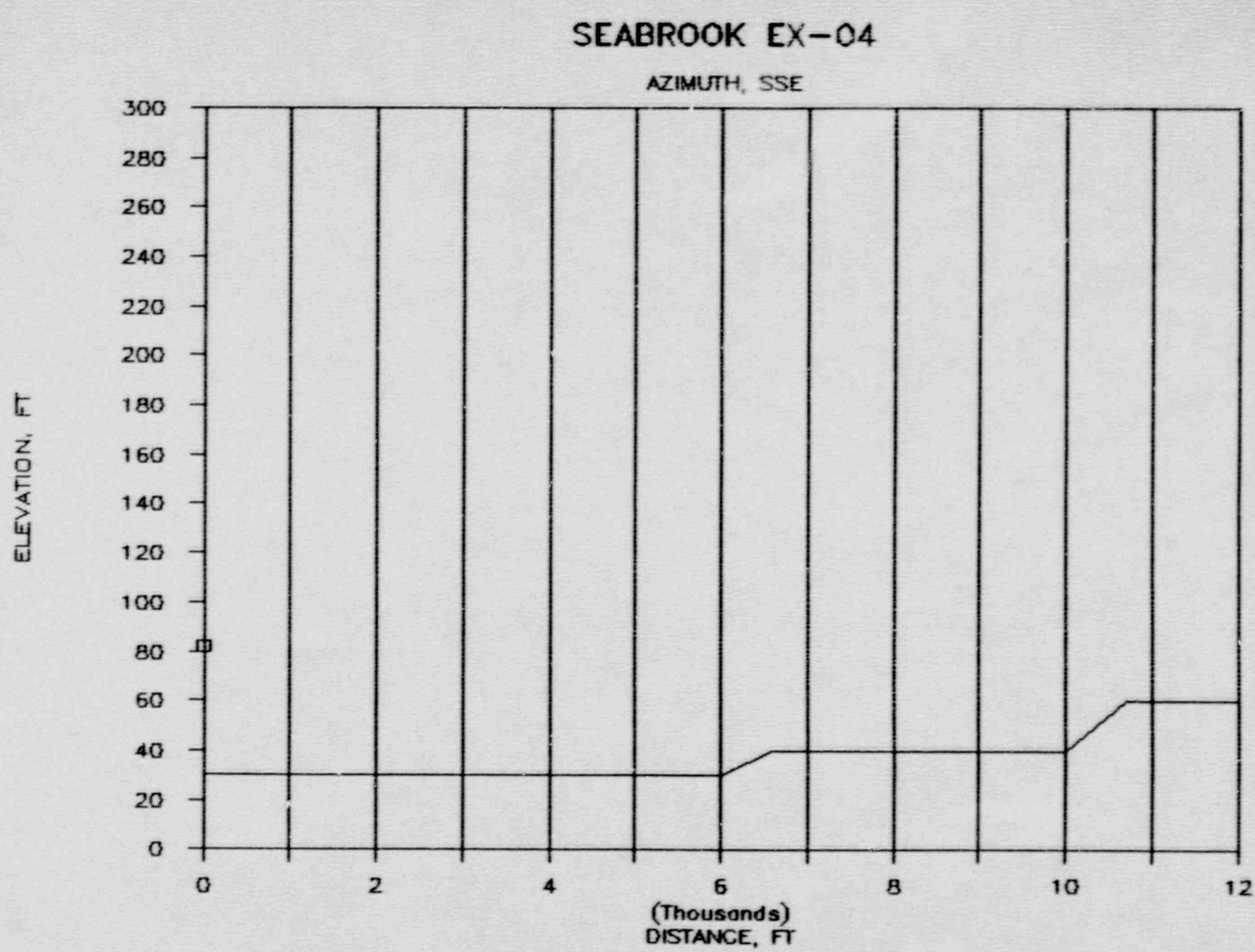
SEABROOK EX-04



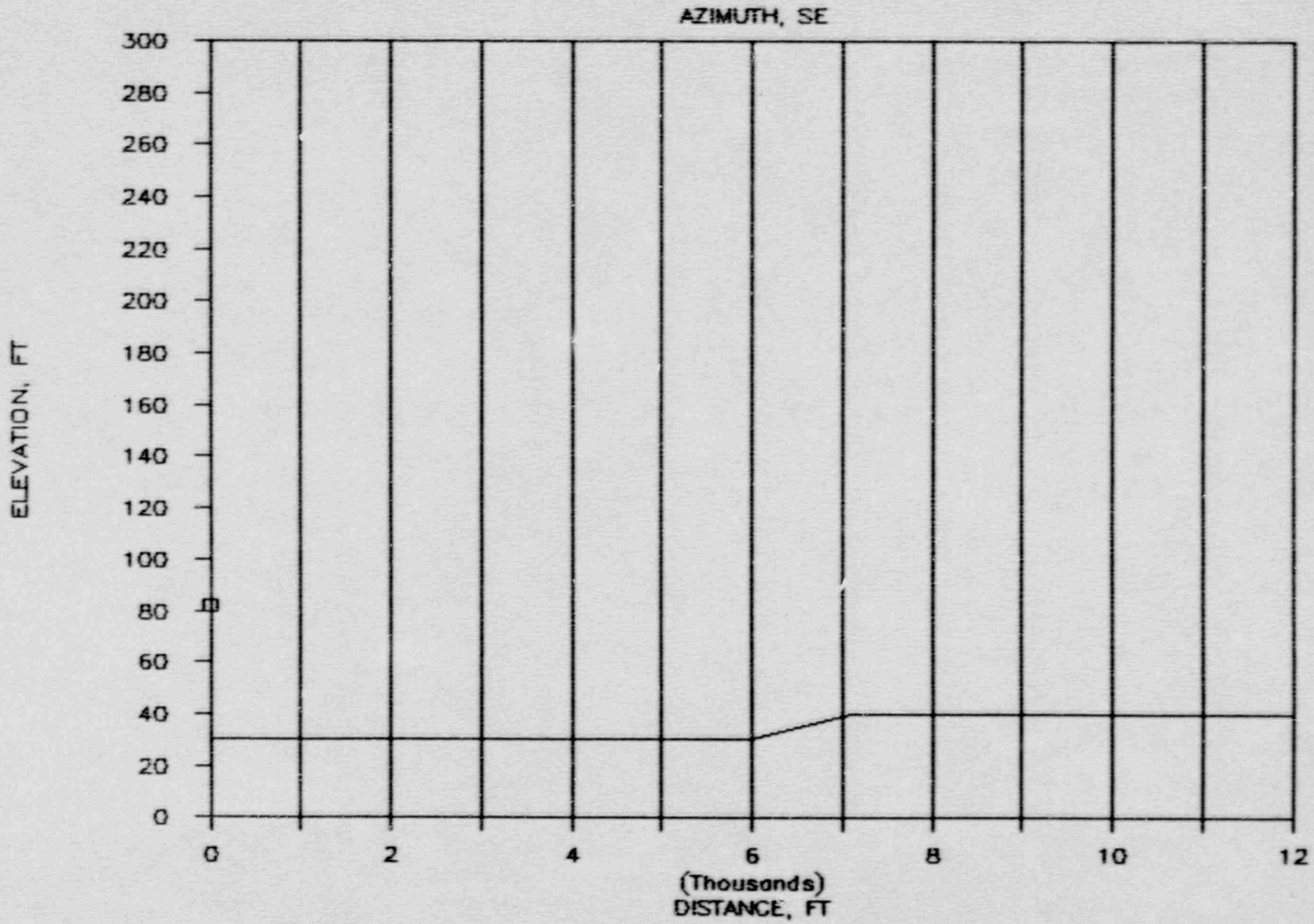

SEABROOK EX-04
AZIMUTH, SSW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK EX-04



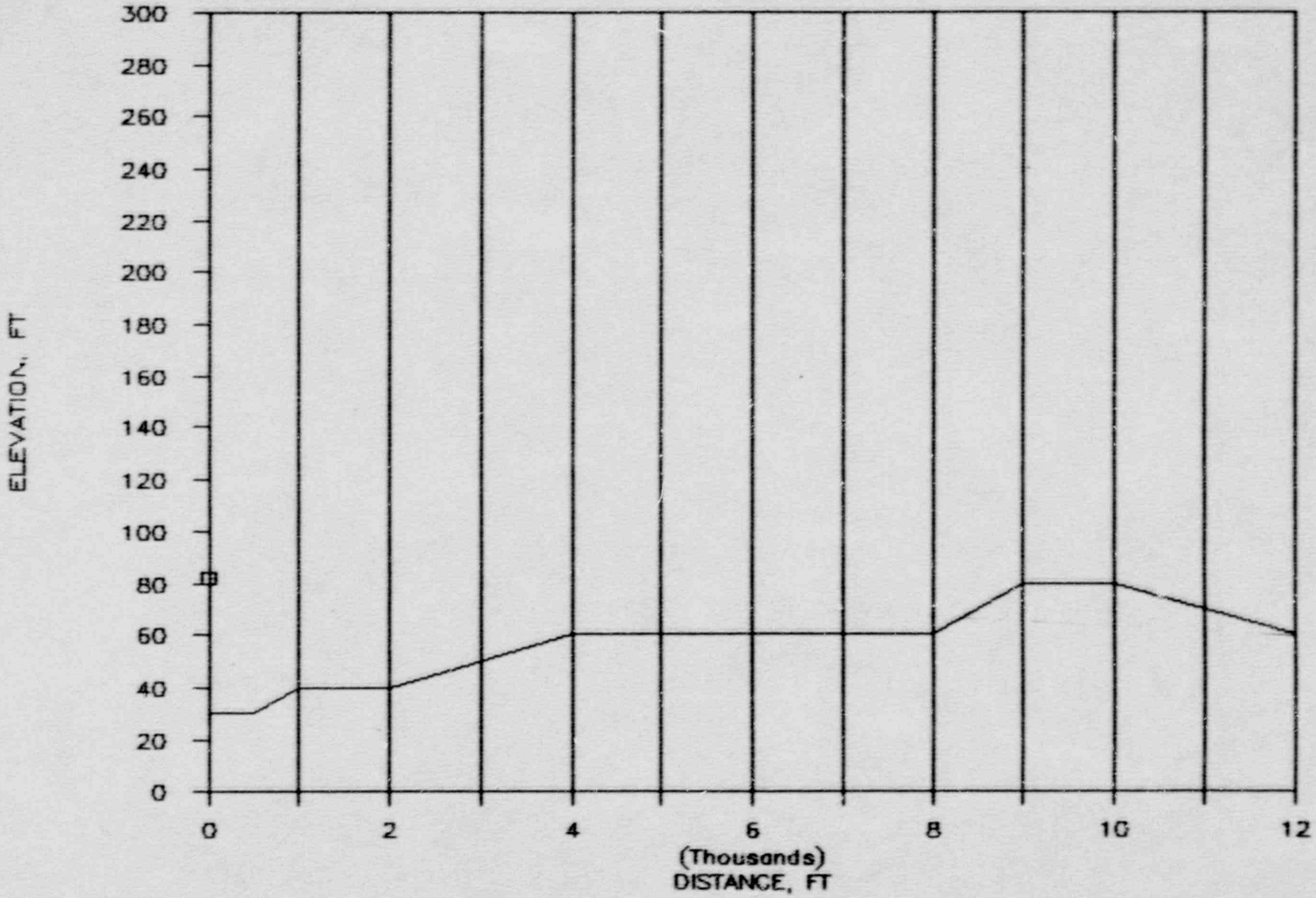

SEABROOK EX-04
AZIMUTH, SSE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK EX-04



SEABROOK EX-04

AZIMUTH, ESE



NEW HAMPHSIRE YANKEE

EX-04

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	40.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	50.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	60.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	80.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	50.00	SOFT	0.	YES	4700.	80.
6	8000.	90.00	60.00	SOFT	0.	YES	4700.	80.
7	12000.	90.00	110.00	SOFT	0.	YES	10100.	120.
8	500.	67.50	40.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	50.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	70.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	40.00	SOFT	0.	YES	2400.	80.
12	6000.	67.50	50.00	SOFT	0.	YES	2400.	80.
13	8000.	67.50	130.00	SOFT	0.	NO	0.	0.
14	12000.	67.50	100.00	SOFT	0.	YES	8500.	160.
15	500.	45.00	40.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	40.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	40.00	SOFT	0.	NO	0.	0.
18	4000.	45.00	20.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	40.00	SOFT	0.	NO	0.	0.
20	8000.	45.00	60.00	SOFT	0.	NO	0.	0.
21	12000.	45.00	80.00	SOFT	0.	NO	0.	0.
22	500.	22.50	30.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	40.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	60.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	40.00	SOFT	0.	YES	2900.	60.
26	6000.	22.50	20.00	SOFT	0.	YES	2900.	60.
27	8000.	22.50	30.00	SOFT	0.	NO	0.	0.
28	12000.	22.50	55.00	SOFT	0.	NO	0.	0.
29	500.	.00	20.00	SOFT	0.	NO	0.	0.
30	1000.	.00	20.00	SOFT	0.	NO	0.	0.
31	2000.	.00	30.00	SOFT	0.	NO	0.	0.
32	4000.	.00	20.00	SOFT	0.	NO	0.	0.
33	6000.	.00	40.00	SOFT	0.	NO	0.	0.
34	8000.	.00	60.00	SOFT	0.	NO	0.	0.
35	12000.	.00	40.00	SOFT	0.	NO	0.	0.
36	500.	337.50	20.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	20.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	20.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	30.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	60.00	SOFT	0.	YES	5250.	80.
41	8000.	337.50	160.00	SOFT	0.	NO	0.	0.

42	12000.	337.50	160.00	SOFT	0.	YES	7700.	160.
43	500.	315.00	20.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	20.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	20.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	20.00	SOFT	0.	YES	3400.	40.
47	6000.	315.00	60.00	SOFT	0.	NO	0.	0.
48	8000.	315.00	120.00	SOFT	0.	NO	0.	0.
49	12000.	315.00	140.00	SOFT	0.	NO	0.	0.
50	500.	292.50	30.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	20.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	20.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	60.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	60.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	60.00	SOFT	0.	NO	0.	0.
56	12000.	292.50	80.00	SOFT	0.	YES	10200.	100.
57	500.	270.00	40.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	30.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	30.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	60.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	60.00	SOFT	0.	NO	0.	0.
62	8000.	270.00	80.00	SOFT	0.	NO	0.	0.
63	12000.	270.00	100.00	SOFT	0.	NO	0.	0.
64	500.	247.50	40.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	40.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	40.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	40.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	40.00	SOFT	0.	NO	0.	0.
69	8000.	247.50	40.00	SOFT	0.	NO	0.	0.
70	12000.	247.50	80.00	SOFT	0.	NO	0.	0.
71	500.	225.00	35.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	40.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	40.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	40.00	SOFT	0.	NO	0.	0.
75	6000.	225.00	40.00	SOFT	0.	NO	0.	0.
76	8000.	225.00	40.00	SOFT	0.	NO	0.	0.
77	12000.	225.00	80.00	SOFT	0.	NO	0.	0.
78	500.	202.50	30.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	40.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	40.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	40.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	40.00	SOFT	0.	NO	0.	0.
83	8000.	202.50	40.00	SOFT	0.	NO	0.	0.
84	12000.	202.50	40.00	SOFT	0.	NO	0.	0.
85	500.	180.00	30.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	30.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	30.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	30.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	30.00	SOFT	0.	NO	0.	0.
90	8000.	180.00	30.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	40.00	SOFT	0.	NO	0.	0.
92	500.	157.50	30.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	30.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	30.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	30.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	30.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	40.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	60.00	SOFT	0.	NO	0.	0.
99	500.	135.00	30.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	30.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	30.00	SOFT	0.	NO	0.	0.
102	4000.	[illegible]5.00	30.00	SOFT	0	NO	0.	0.
103	6000.	135.00	30.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	40.00	SOFT	0.	NO	0.	0.
105	12000.	135.00	40.00	SOFT	0.	NO	0.	0.
106	500.	112.50	30.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	40.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	40.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	60.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	60.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	60.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	60.00	SOFT	0.	YES	9000.	80.

NEW HAMPHSIRE YANKEE

EX-04

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
1	WS-3000	119.3	121.3	.0	.0	.0	.0	120.0	115.0	105.0	100.0	9.4

XO= .00 YO= .00 ZO= 82.00 HEIGHT ABOVE GROUND= 52.00

NEW HAMPHSIRE YANKEE

EX-04

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

NEW HAMPSHIRE YANKEE

EX-04

SOUND PRESSURE LEVELS IN DBC

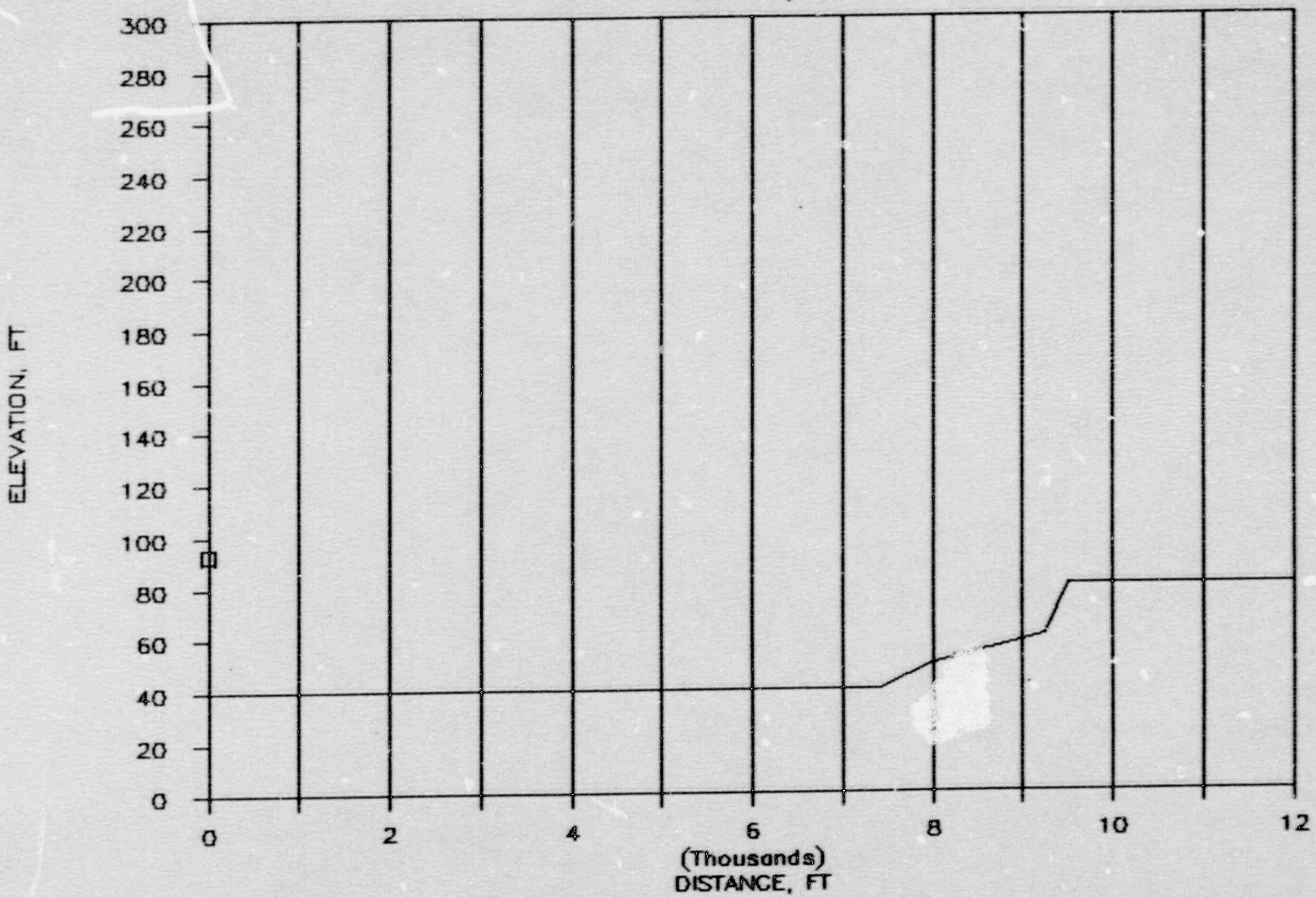
UNDER MET CONDITION 1

DISTANCE IN FEET

AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	105.5	93.4	83.8	76.1	62.4	57.1	42.7
ENE	105.5	93.4	83.8	68.7	64.9	62.9	39.0
NE	105.5	93.4	83.8	76.1	70.3	65.2	52.8
NNE	105.5	93.4	83.8	70.8	65.3	65.3	56.2
N	105.5	93.4	83.8	76.1	70.3	65.3	56.2
NNW	105.5	93.4	83.8	76.1	63.3	65.3	50.0
NW	105.5	93.4	83.8	70.1	70.3	65.3	56.2
WNW	105.5	93.4	83.8	76.1	70.3	65.3	50.1
W	105.5	93.4	83.8	76.1	70.3	65.3	56.2
WSW	105.5	93.4	83.8	76.1	70.3	65.3	56.2
SW	105.5	93.4	83.8	76.1	70.3	65.3	56.2
SSW	105.5	93.4	83.8	76.1	70.3	65.3	56.2
S	105.5	93.4	83.8	76.1	70.3	65.3	56.2
SSE	105.5	93.4	83.8	76.1	70.3	65.3	56.2
SE	105.5	93.4	83.8	76.1	70.3	65.2	52.8
ESE	105.5	93.4	83.8	76.1	70.2	62.9	44.0

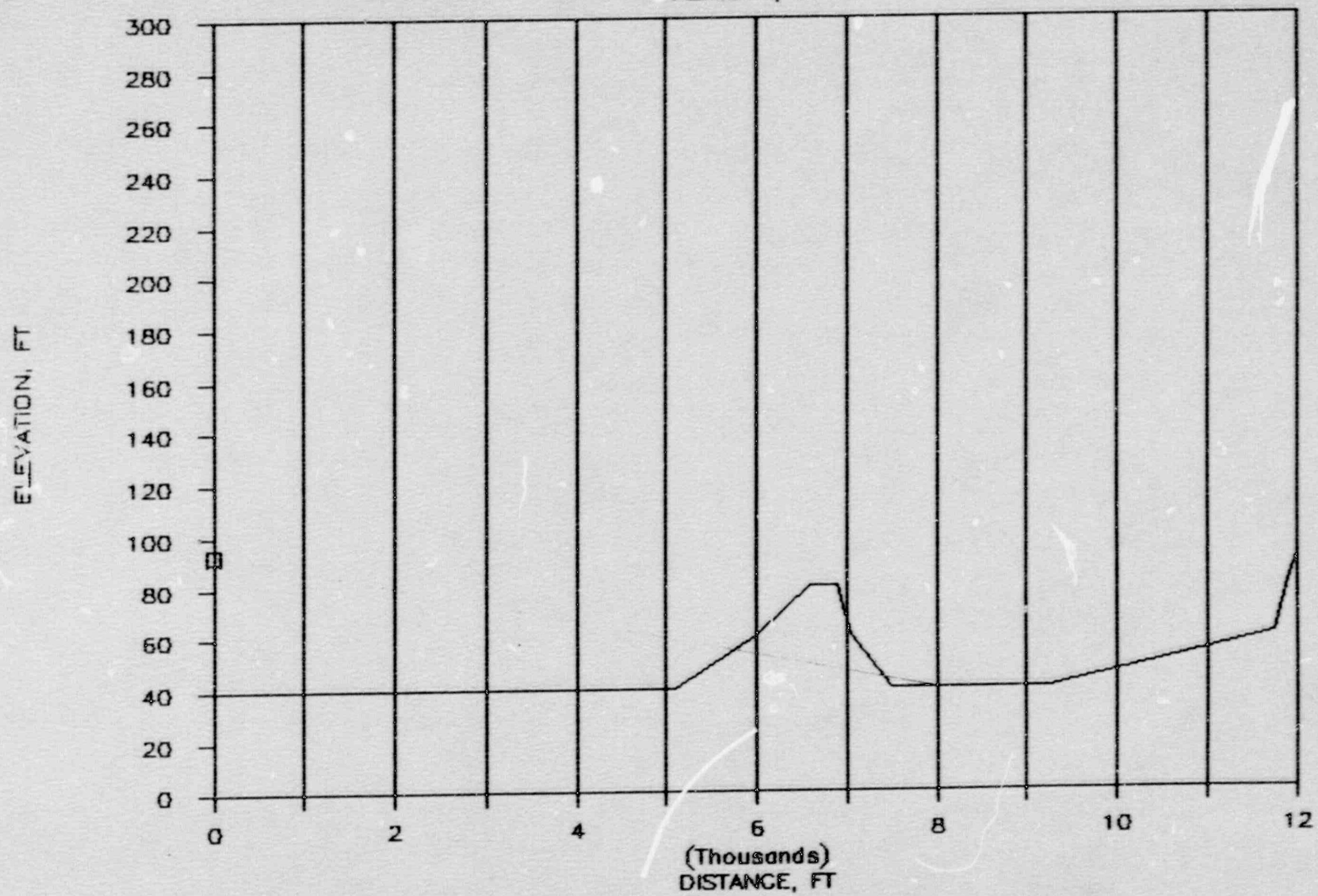
SEABROOK EX-05

AZIMUTH, E



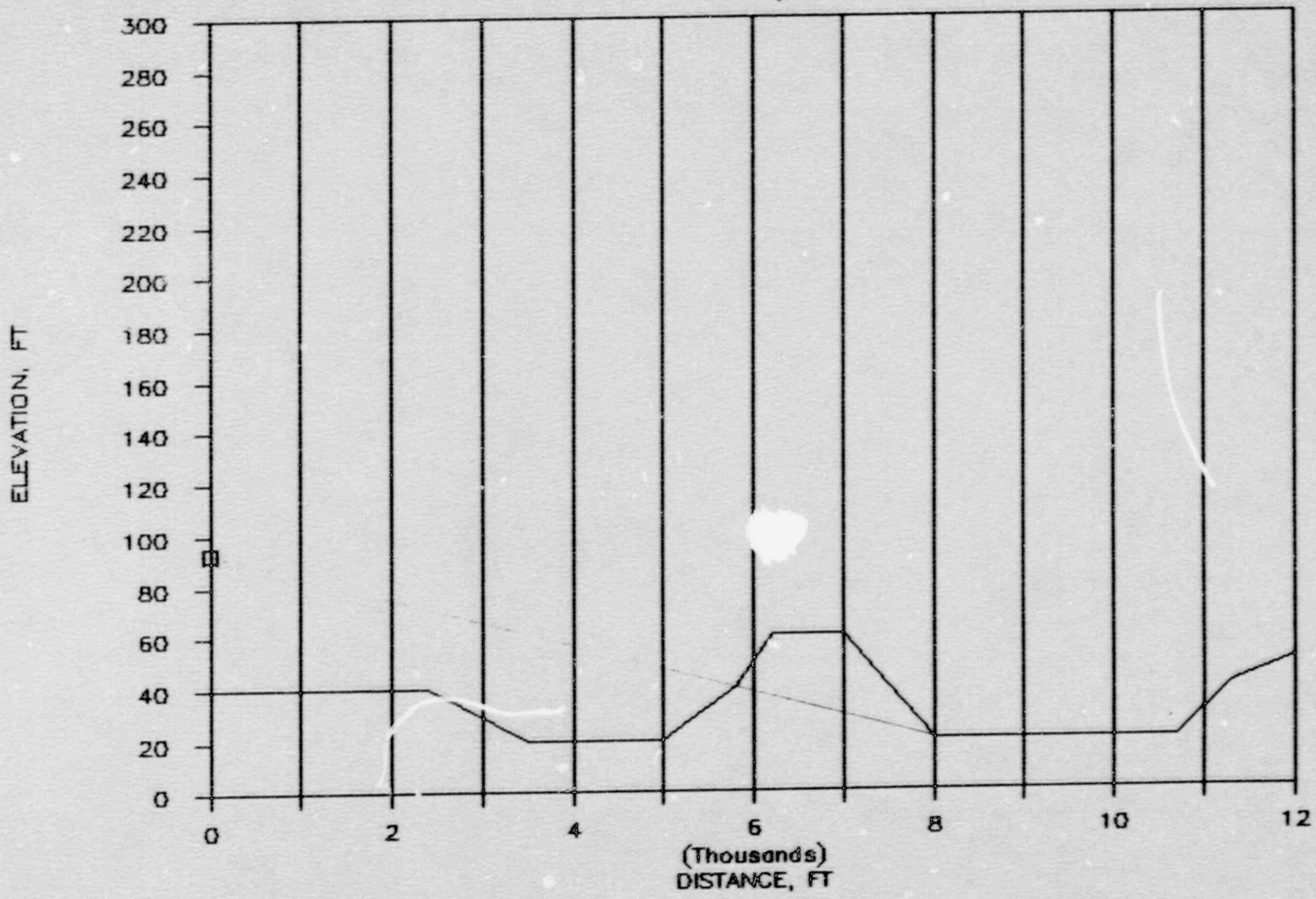
SEABROOK EX-05

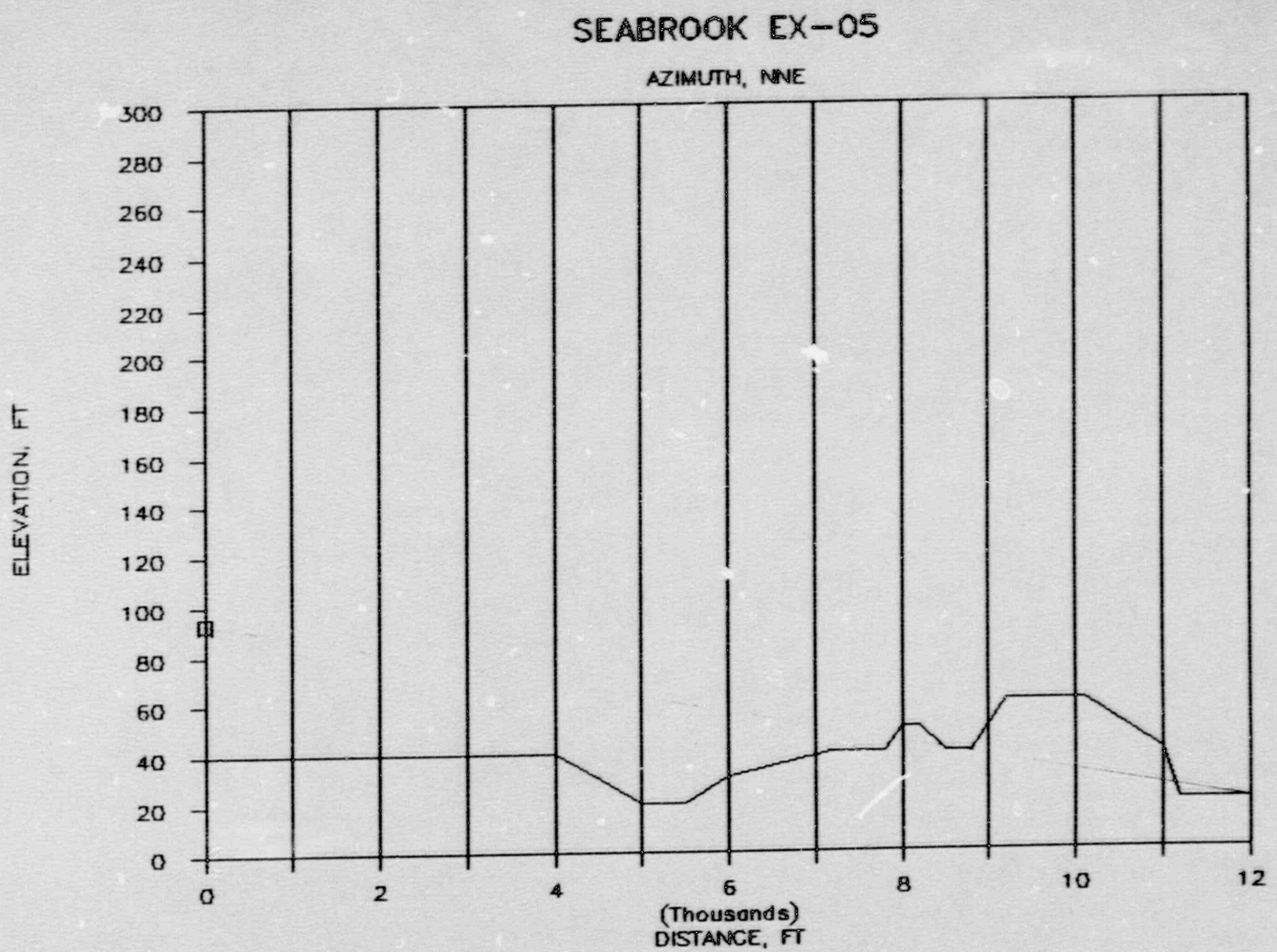
AZIMUTH, ENE

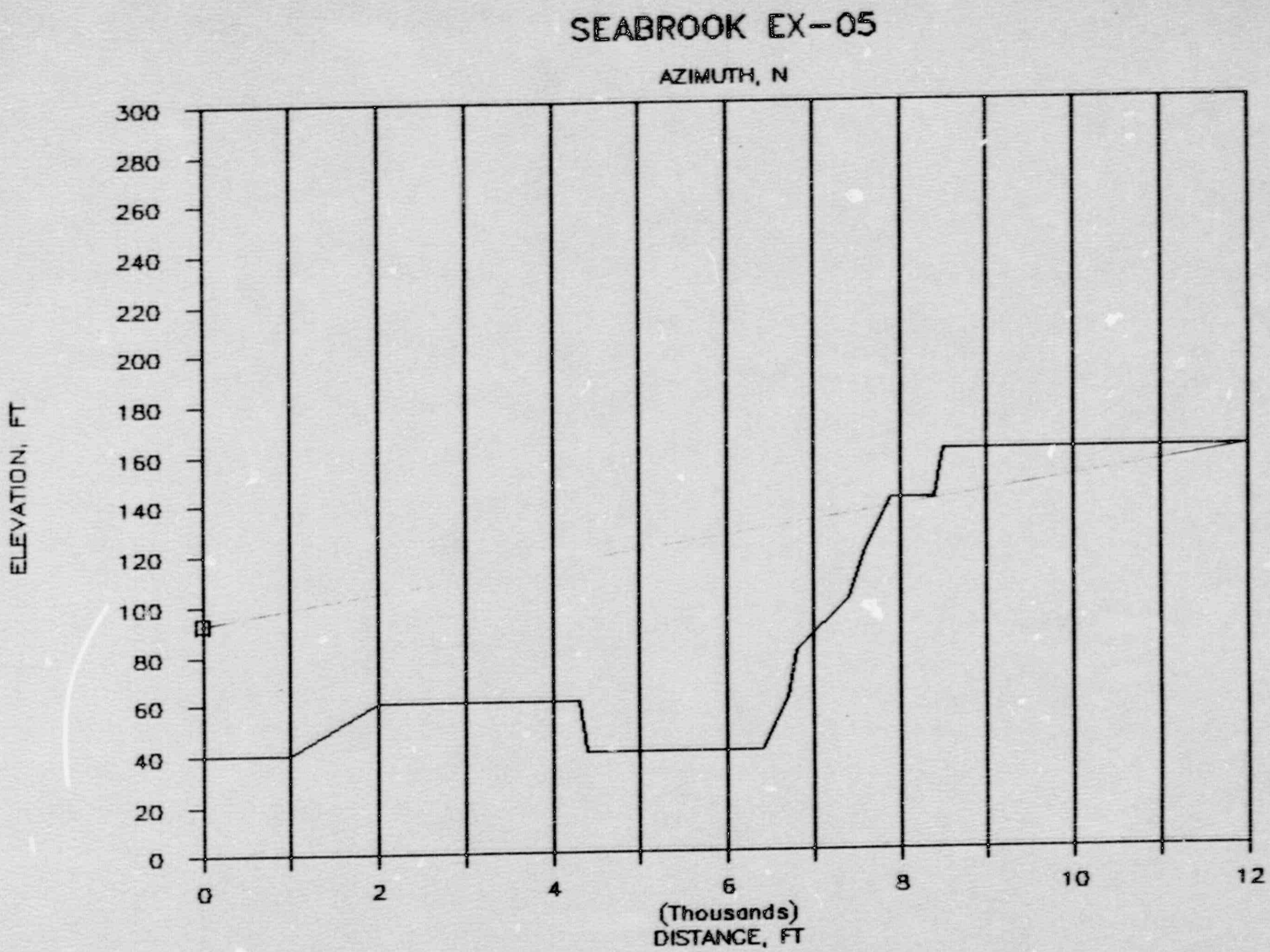


SEABROOK EX-05

AZIMUTH, NE



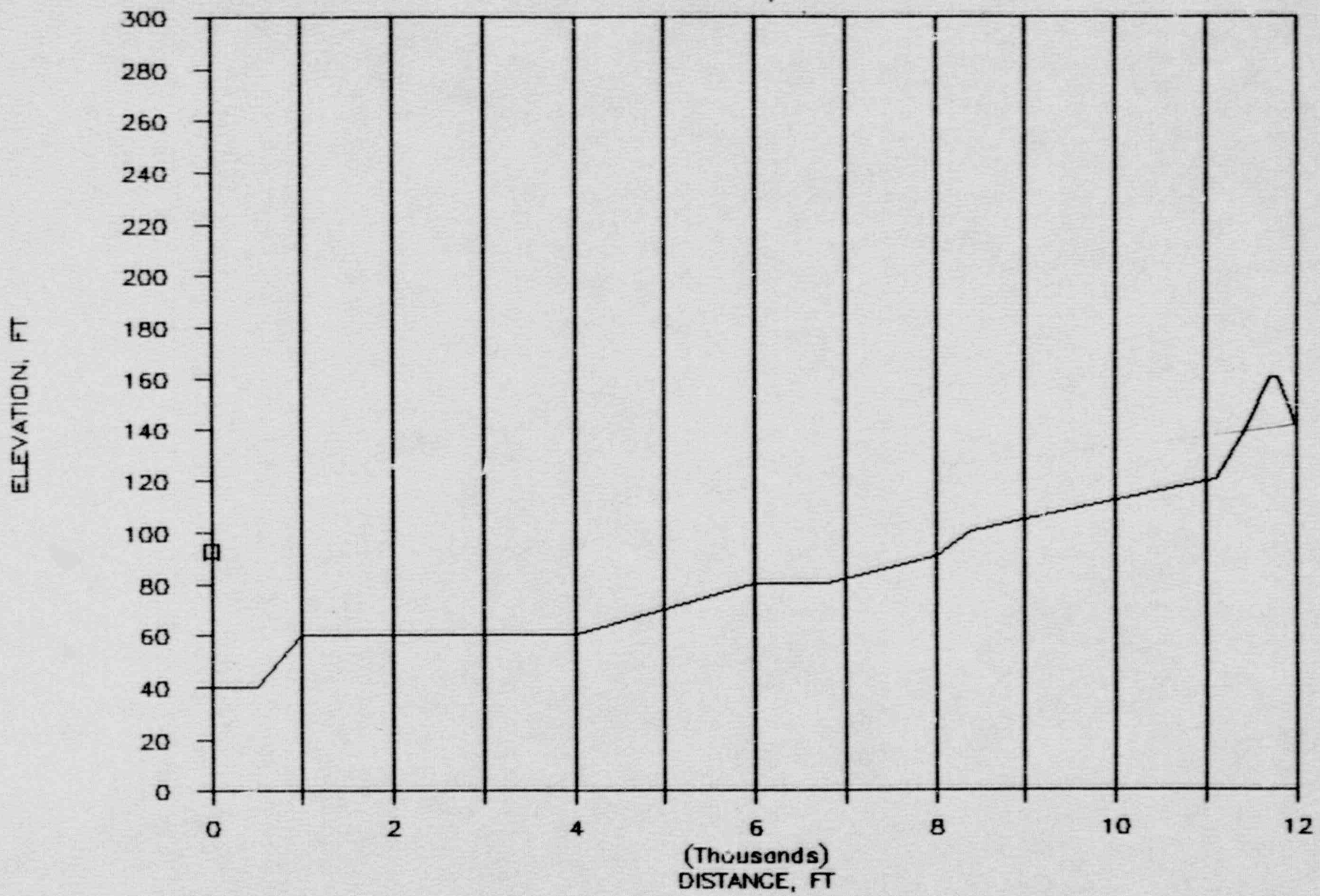

SEABROOK EX-05
AZIMUTH, NNE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

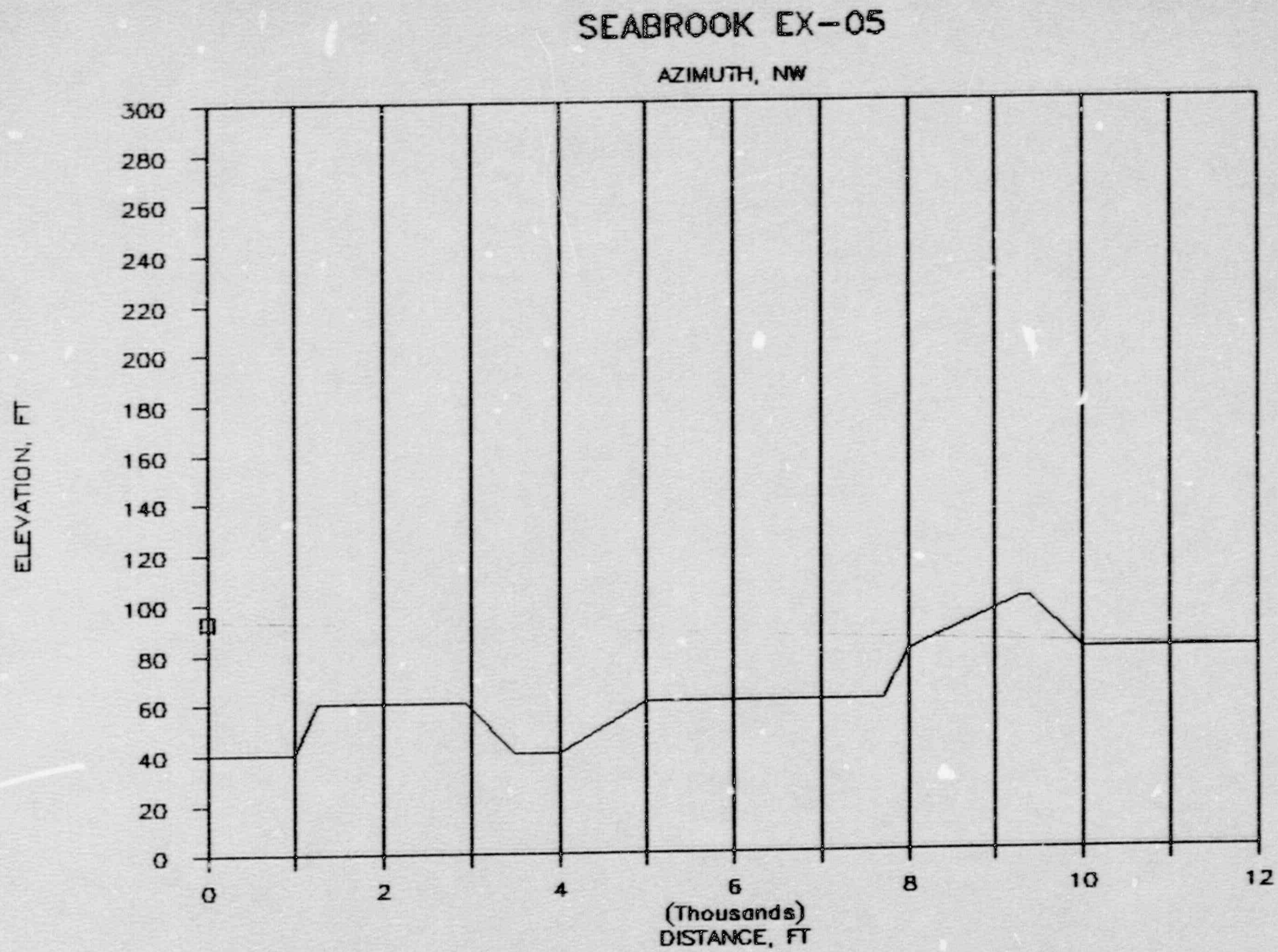


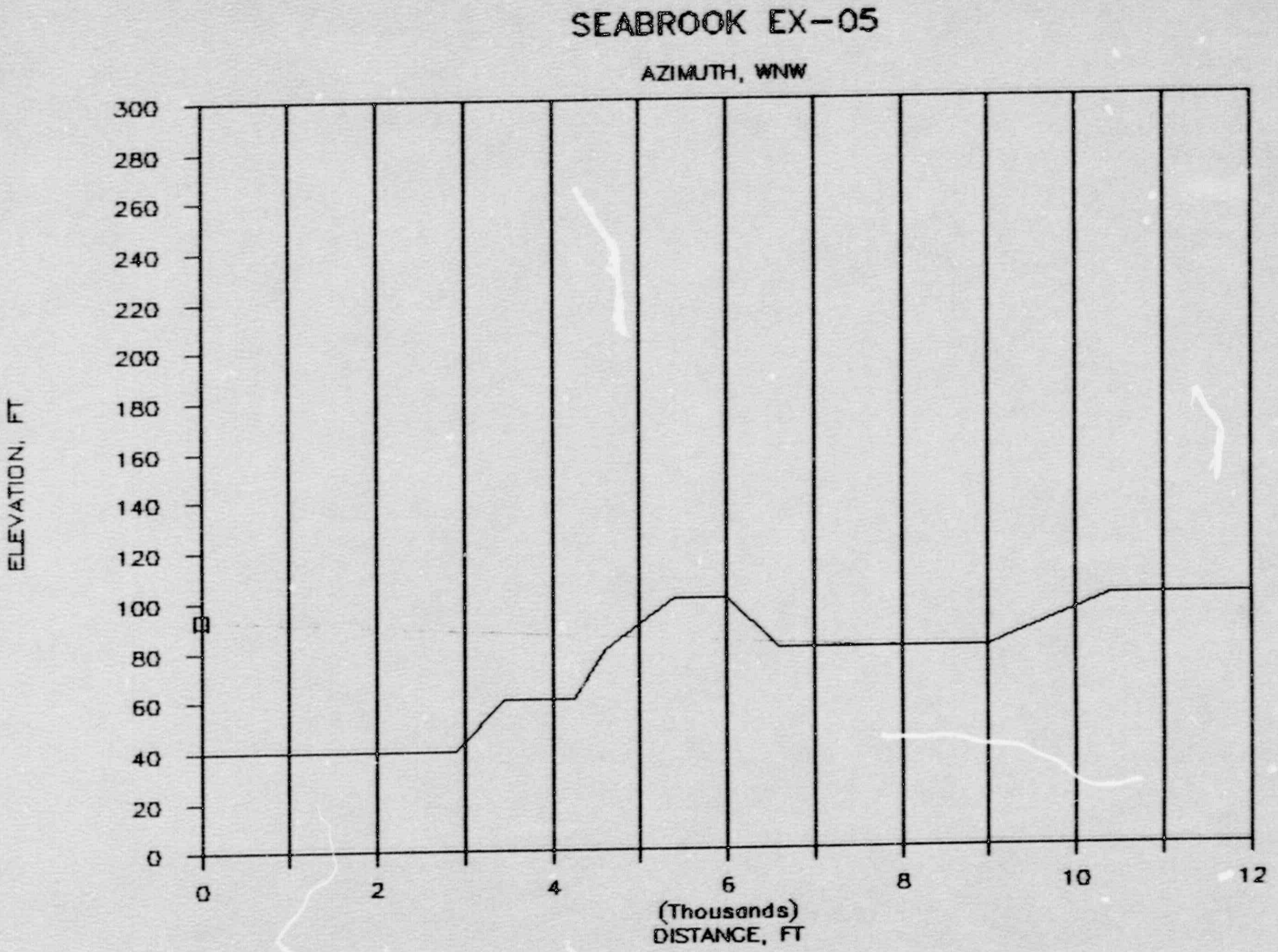
SEABROOK EX-05
AZIMUTH, N
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

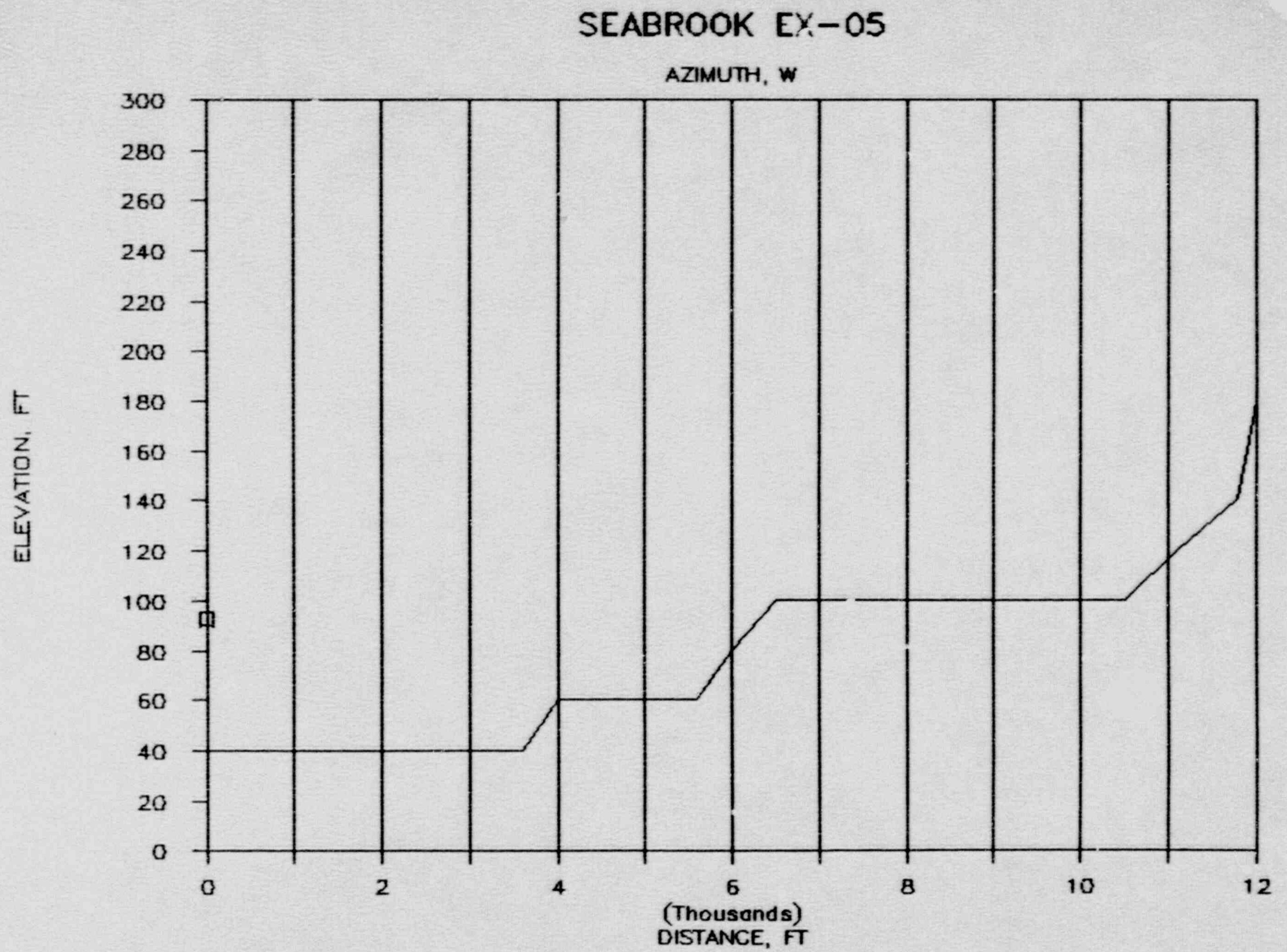
SEABROOK EX-05

AZIMUTH, NNW



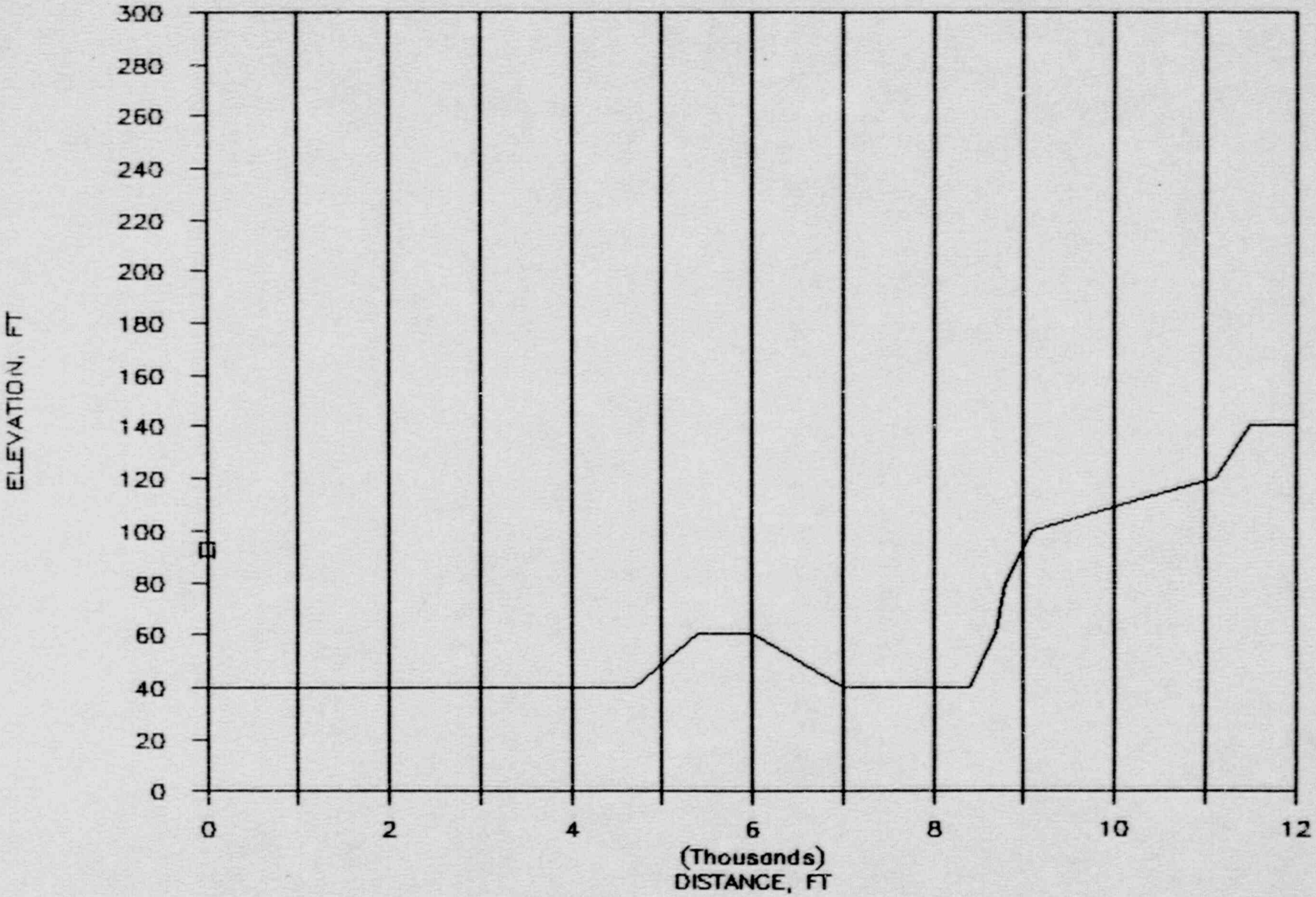

SEABROOK EX-05
AZIMUTH, NW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

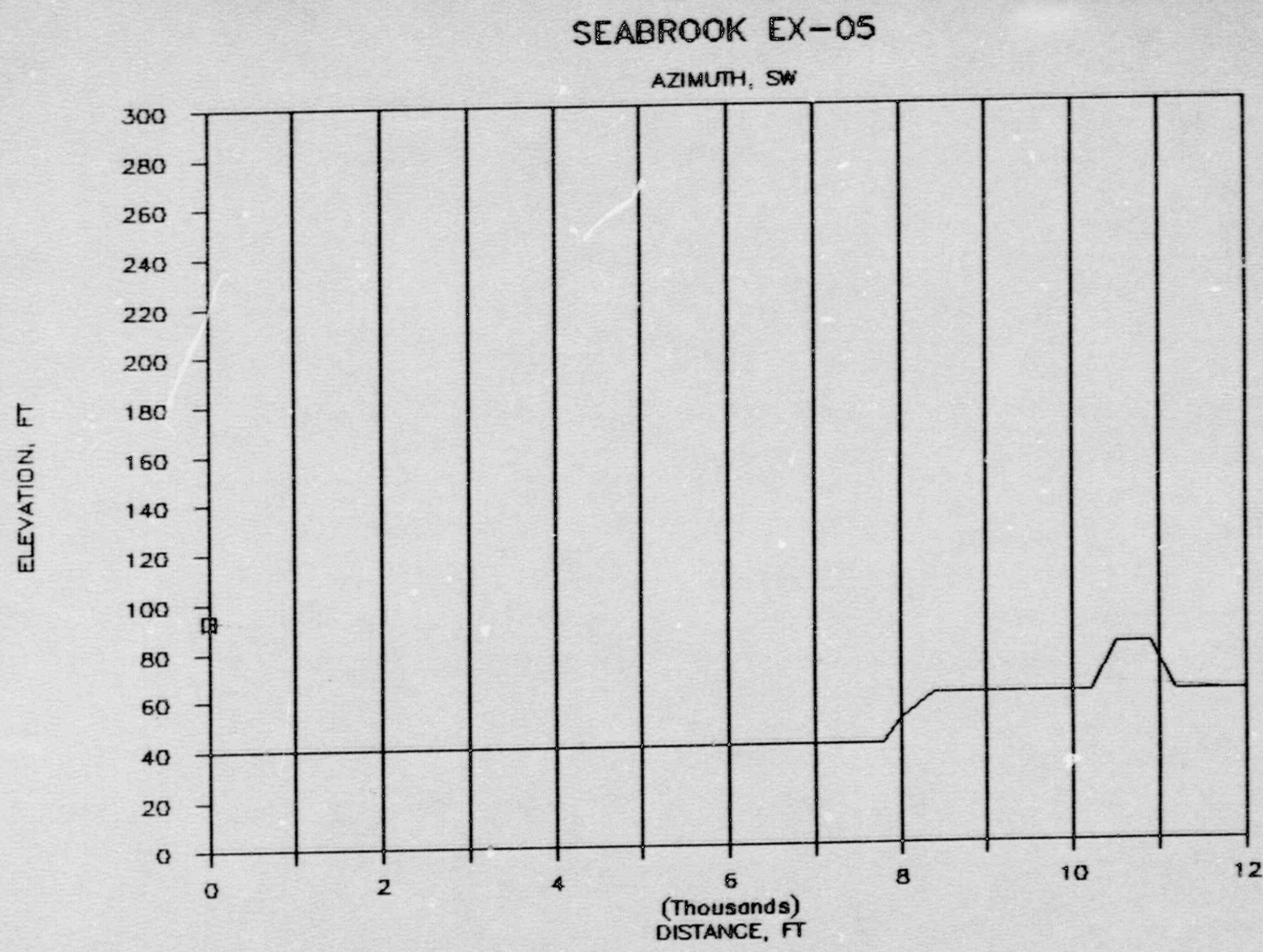

SEABROOK EX-05
AZIMUTH, WNW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

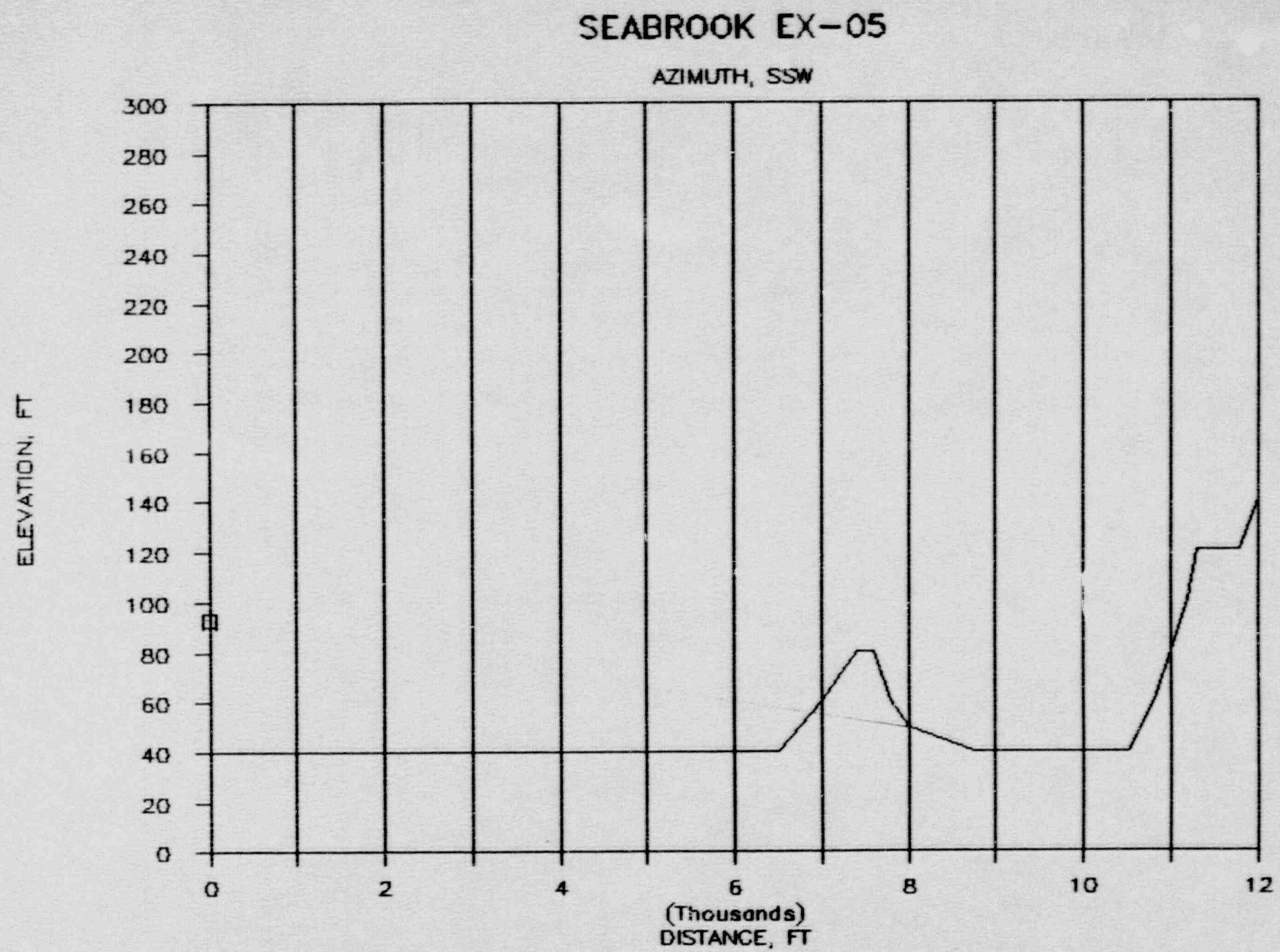

SEABROOK EX-05
AZIMUTH, W
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

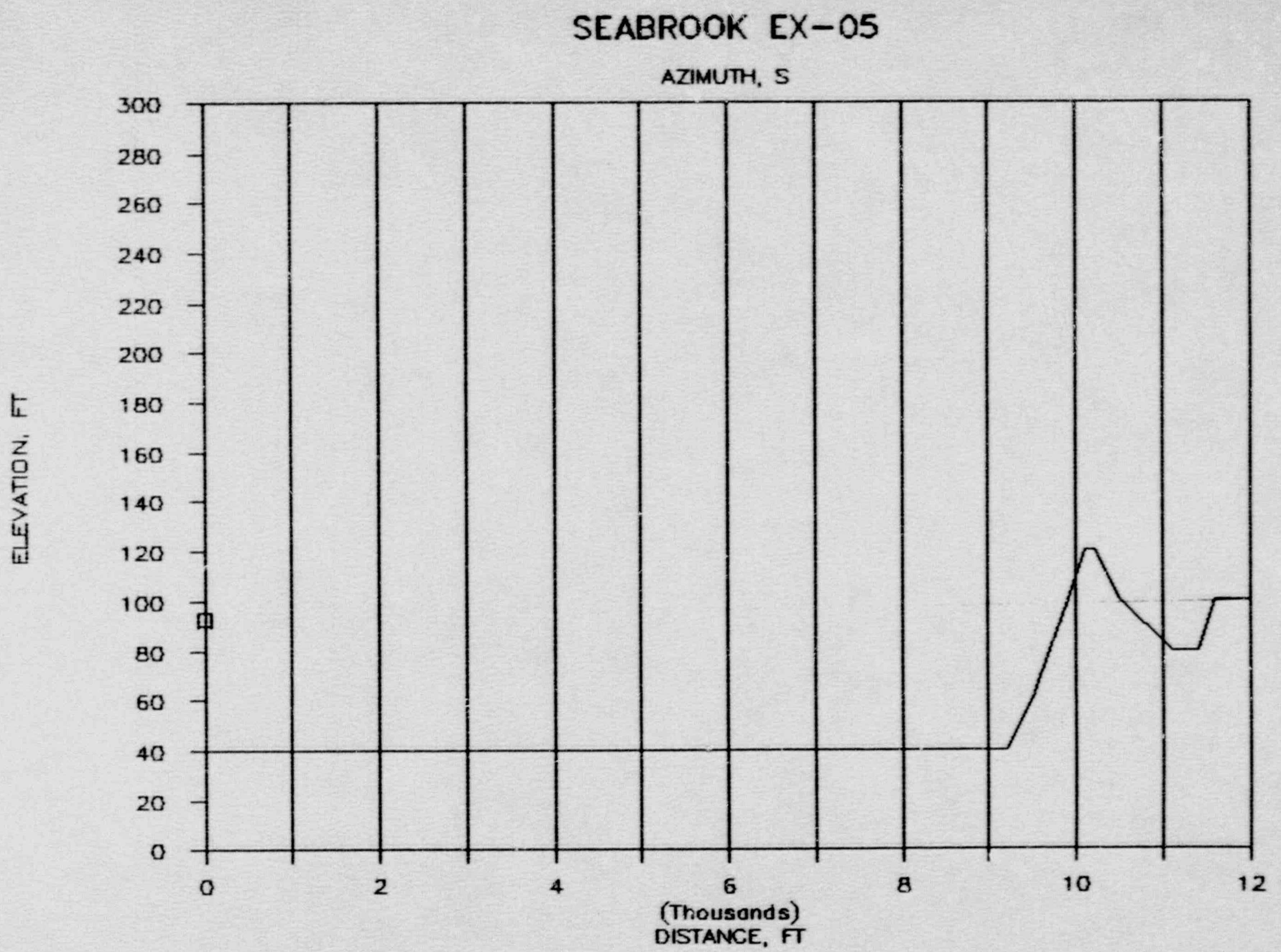
SEABROOK EX-05

AZIMUTH, WSW



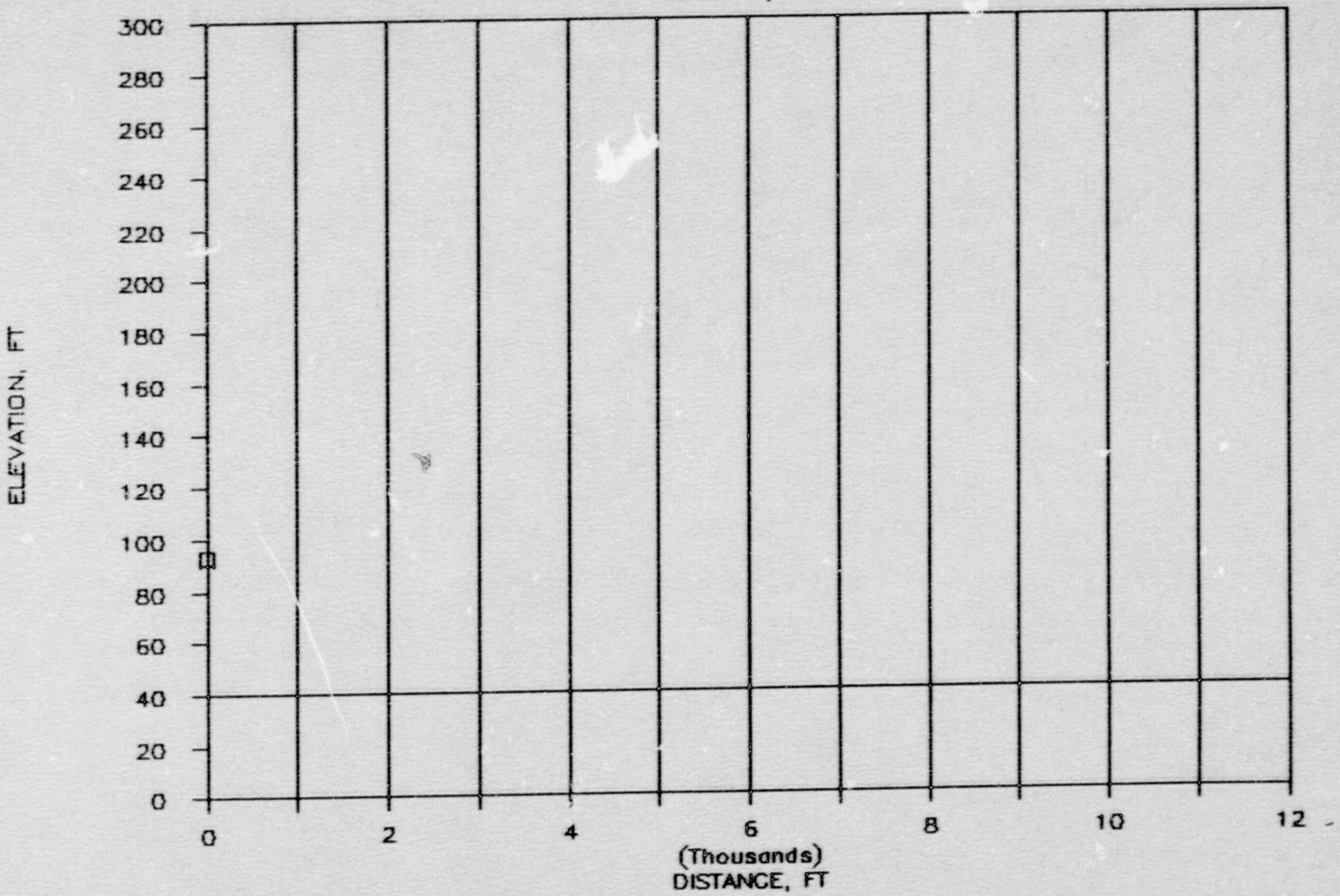

SEABROOK EX-05
AZIMUTH, SW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK EX-05
AZIMUTH, SSW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

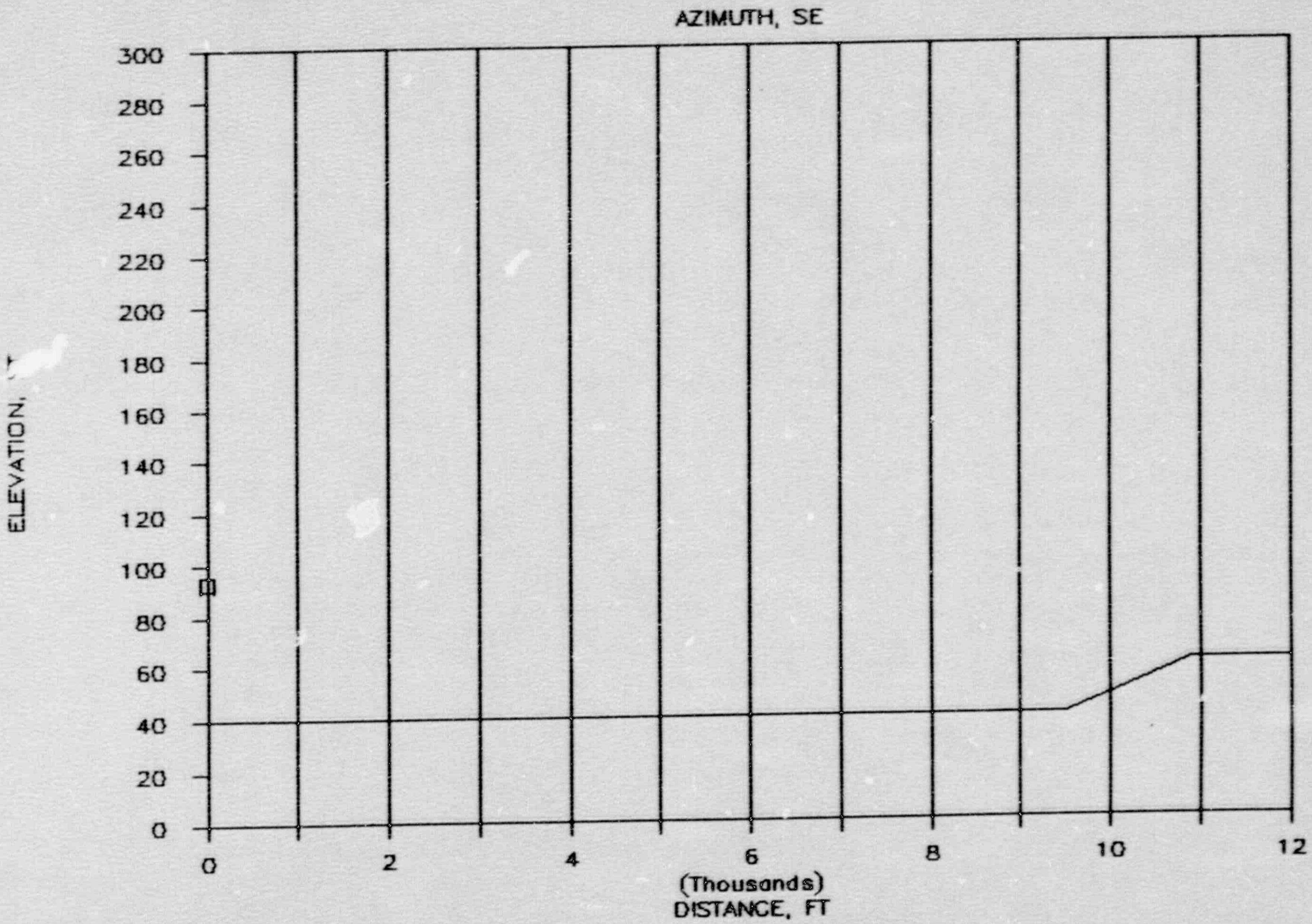

SEABROOK EX-05
AZIMUTH, S
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

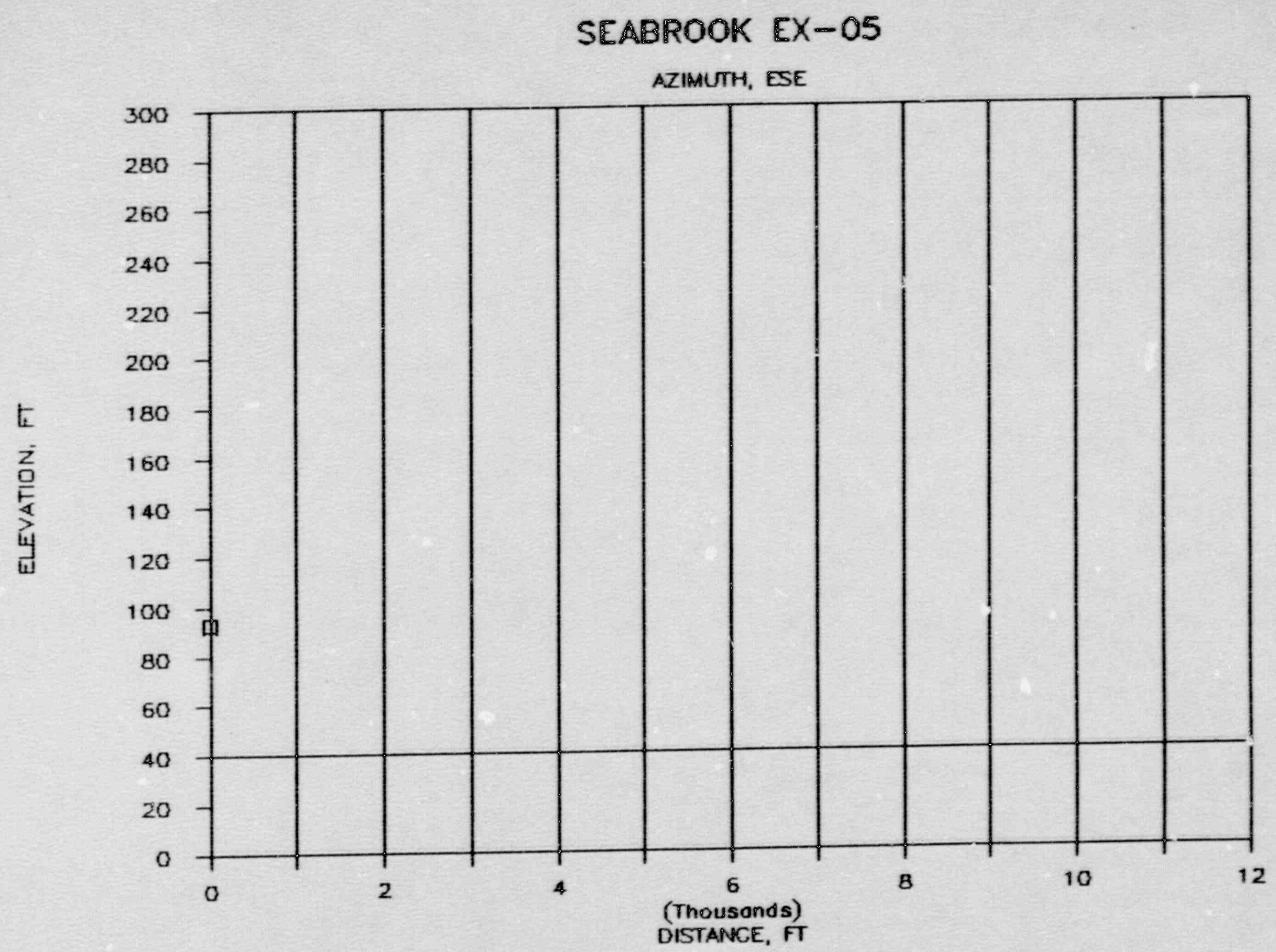
SEABROOK EX-05

AZIMUTH, SSE



SEABROOK EX-05




SEABROOK EX-05
AZIMUTH, ESE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

NEW HAMPHSIRE YANKEE

EX-05

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	40.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	40.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	40.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	40.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	40.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	50.00	SOFT	0.	NO	0.	0.
7	12000.	90.00	80.00	SOFT	0.	NO	0.	0.
8	500.	67.50	40.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	40.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	40.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	40.00	SOFT	0.	NO	0.	0.
12	6000.	67.50	60.00	SOFT	0.	NO	0.	0.
13	8000.	67.50	40.00	SOFT	0.	YES	6900.	80.
14	12000.	67.50	90.00	SOFT	0.	NO	0.	0.
15	500.	45.00	40.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	40.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	40.00	SOFT	0.	NO	0.	0.
18	4000.	45.00	20.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	50.00	SOFT	0.	NO	0.	0.
20	8000.	45.00	20.00	SOFT	0.	YES	7000.	60.
21	12000.	45.00	50.00	SOFT	0.	NO	0.	0.
22	500.	22.50	40.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	40.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	40.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	40.00	SOFT	0.	NO	0.	0.
26	6000.	22.50	30.00	SOFT	0.	NO	0.	0.
27	8000.	22.50	50.00	SOFT	0.	NO	0.	0.
28	12000.	22.50	20.00	SOFT	0.	YES	10100.	60.
29	500.	.00	40.00	SOFT	0.	NO	0.	0.
30	1000.	.00	40.00	SOFT	0.	NO	0.	0.
31	2000.	.00	60.00	SOFT	0.	NO	0.	0.
32	4000.	.00	60.00	SOFT	0.	NO	0.	0.
33	6000.	[illegible]	40.00	SOFT	0.	NO	0.	0.
34	8000.	[illegible]	140.00	SOFT	0.	NO	0.	0.
35	12000.	.00	160.00	SOFT	0.	YES	9000.	160.
36	500.	337.50	40.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	60.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	60.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	60.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	80.00	SOFT	0.	NO	0.	0.
41	8000.	337.50	90.00	SOFT	0.	NO	0.	0.

42	12000.	337.50	140.00	SOFT	0.	YES	11800.	160.
43	500.	315.00	40.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	40.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	60.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	40.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	60.00	SOFT	0.	NO	0.	0.
48	8000.	315.00	80.00	SOFT	0.	NO	0.	0.
49	12000.	315.00	80.00	SOFT	0.	YES	9400.	100.
50	500.	292.50	40.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	40.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	40.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	60.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	100.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	80.00	SOFT	0.	YES	6000.	100.
56	12000.	292.50	100.00	SOFT	0.	NO	0.	0.
57	500.	270.00	40.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	40.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	40.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	60.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	80.00	SOFT	0.	NO	0.	0.
62	8000.	270.00	100.00	SOFT	0.	NO	0.	0.
63	12000.	270.00	180.00	SOFT	0.	NO	0.	0.
64	500.	247.50	40.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	40.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	40.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	40.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	60.00	SOFT	0.	NO	0.	0.
69	8000.	247.50	40.00	SOFT	0.	NO	0.	0.
70	12000.	247.50	140.00	SOFT	0.	NO	0.	0.
71	500.	225.00	40.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	40.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	40.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	40.00	SOFT	0.	NO	0.	0.
75	6000.	225.00	40.00	SOFT	0.	NO	0.	0.
76	8000.	225.00	50.00	SOFT	0.	NO	0.	0.
77	12000.	225.00	60.00	SOFT	0.	YES	10900.	80.
78	500.	202.50	40.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	40.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	40.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	40.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	40.00	SOFT	0.	NO	0.	0.
83	8000.	202.50	50.00	SOFT	0.	YES	7600.	80.
84	12000.	202.50	140.00	SOFT	0.	NO	0.	0.
85	500.	180.00	40.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	40.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	40.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	40.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	40.00	SOFT	0.	NO	0.	0.
90	8000.	180.00	40.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	100.00	SOFT	0.	YES	10200.	120.
92	500.	157.50	40.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	40.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	40.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	40.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	40.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	40.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	40.00	SOFT	0.	NO	0.	0.
99	500.	135.00	40.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	40.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	40.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	40.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	40.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	40.00	SOFT	0.	NO	0.	0.
105	12000.	135.00	60.00	SOFT	0.	NO	0.	0.
106	500.	112.50	40.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	40.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	40.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	40.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	40.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	40.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	40.00	SOFT	0.	NO	0.	0.

1

NEW HAMPHSIRE YANKEE

0

EX-05

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
1	WS-3000	119.3	121.3	.0	.0	.0	.0	120.0	115.0	105.0	100.0	9.4

XO= .00 YO= .00 ZO= 93.00 HEIGHT ABOVE GROUND= 53.00

1

NEW HAMPHSIRE YANKEE

EX-05

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

1

NEW HAMPHSIRE YANKEE

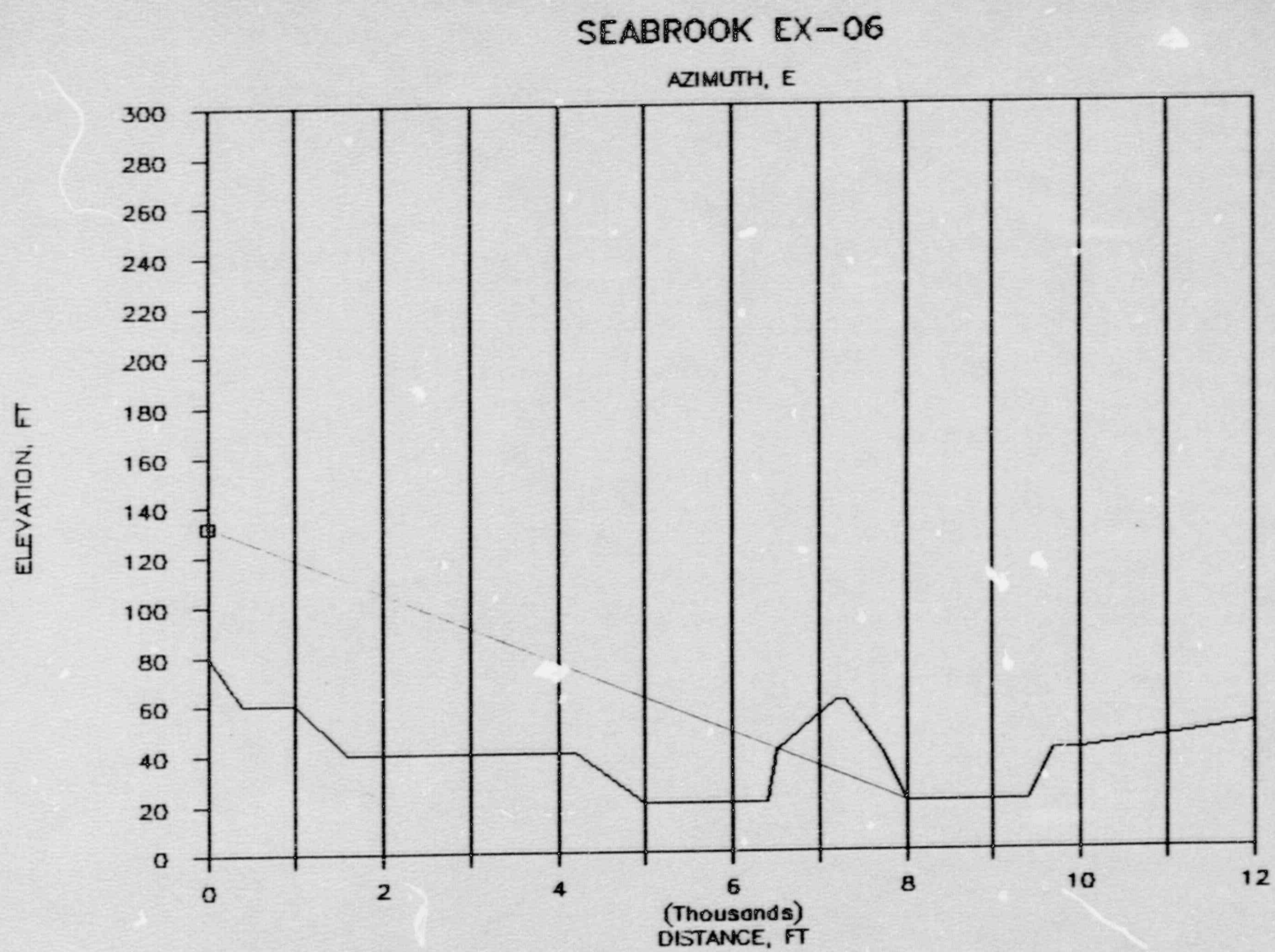
EX-05

SOUND PRESSURE LEVELS IN DBC

UNDER MET CONDITION 1

DISTANCE IN FEET

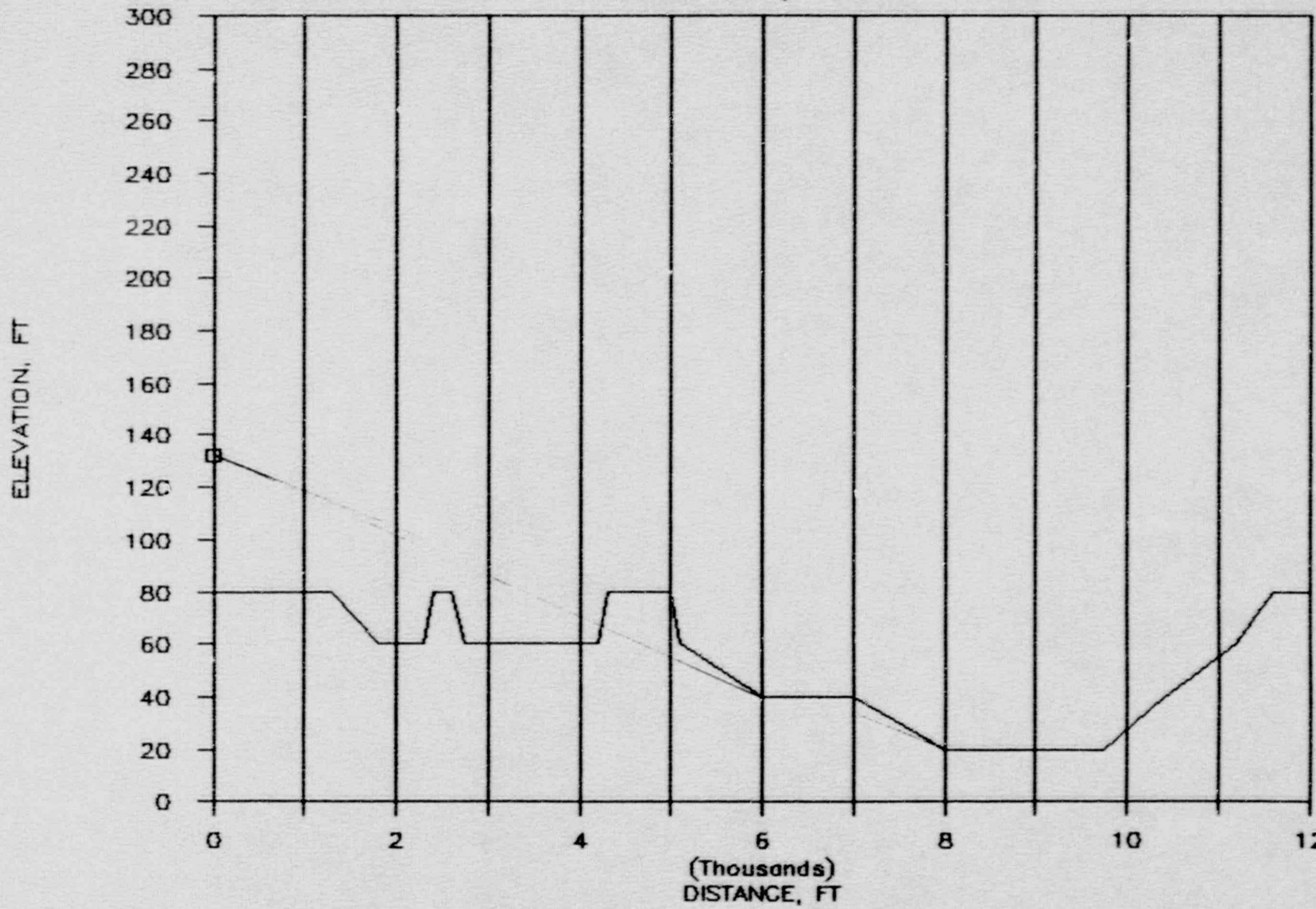
AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	105.6	93.7	84.2	76.3	70.0	62.6	48.7
ENE	105.6	93.7	84.2	76.3	70.5	54.2	49.7
NE	105.6	93.7	84.2	76.3	70.5	56.5	53.1
NNE	105.6	93.7	84.2	76.3	70.5	65.5	49.2
N	105.6	93.7	84.2	76.3	70.5	65.5	50.9
NNW	105.6	93.7	84.2	76.3	70.5	65.5	45.3
NW	105.6	93.7	84.2	76.3	70.5	65.5	50.8
WNW	105.6	93.7	84.2	76.3	70.5	59.7	56.4
W	105.6	93.7	84.2	76.3	70.5	65.5	56.4
WSW	105.6	93.7	84.2	76.3	70.5	65.5	56.4
SW	105.6	93.7	84.2	76.3	70.5	65.5	50.1
SSW	105.6	93.7	84.2	76.3	70.5	54.7	56.4
S	105.6	93.7	84.2	76.3	70.5	65.5	50.1
SSE	105.6	93.7	84.2	76.3	70.5	65.5	56.4
SE	105.6	93.7	84.2	76.3	70.5	65.5	53.1
ESE	105.6	93.7	84.2	76.3	70.5	63.2	49.7

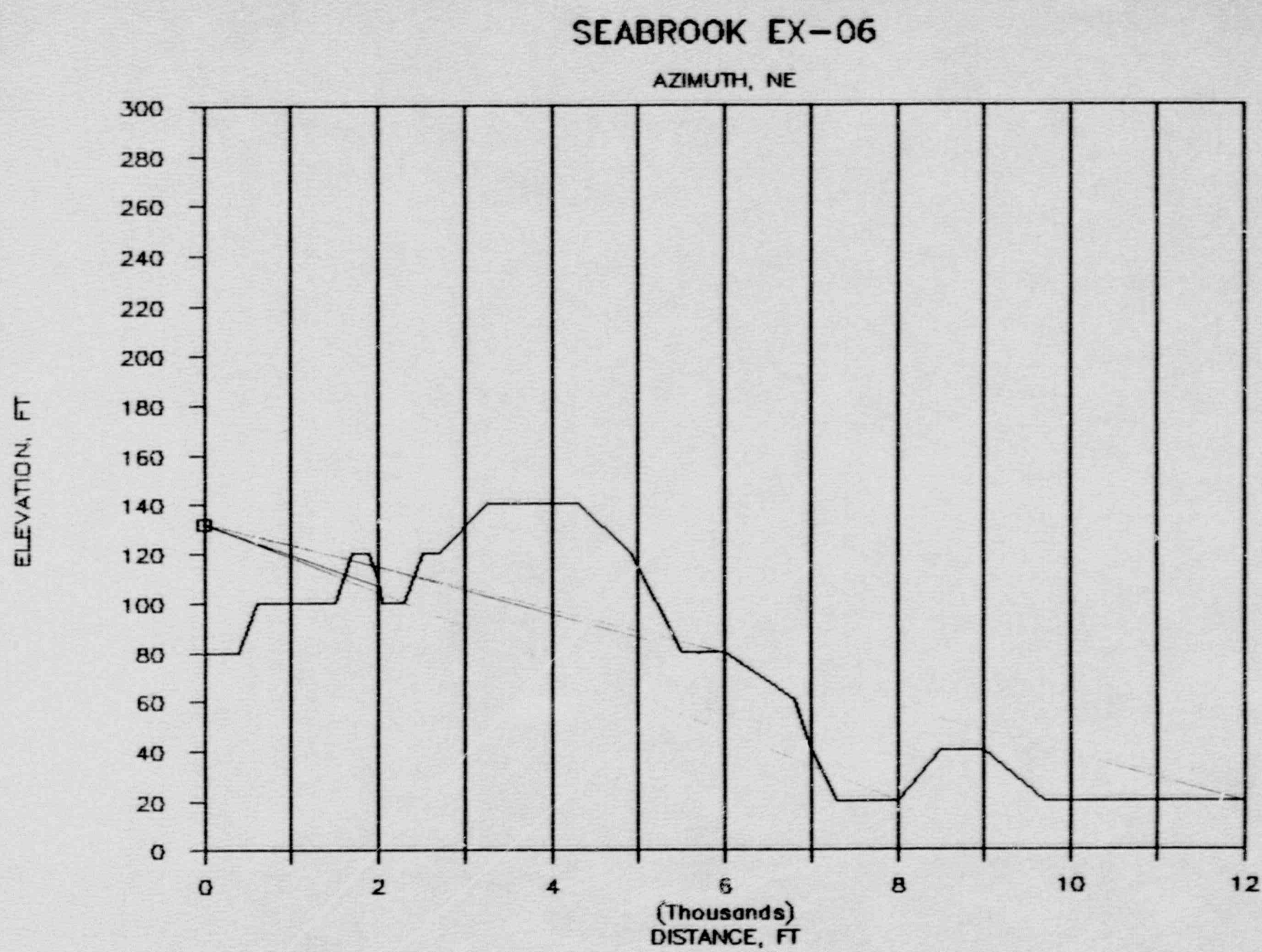


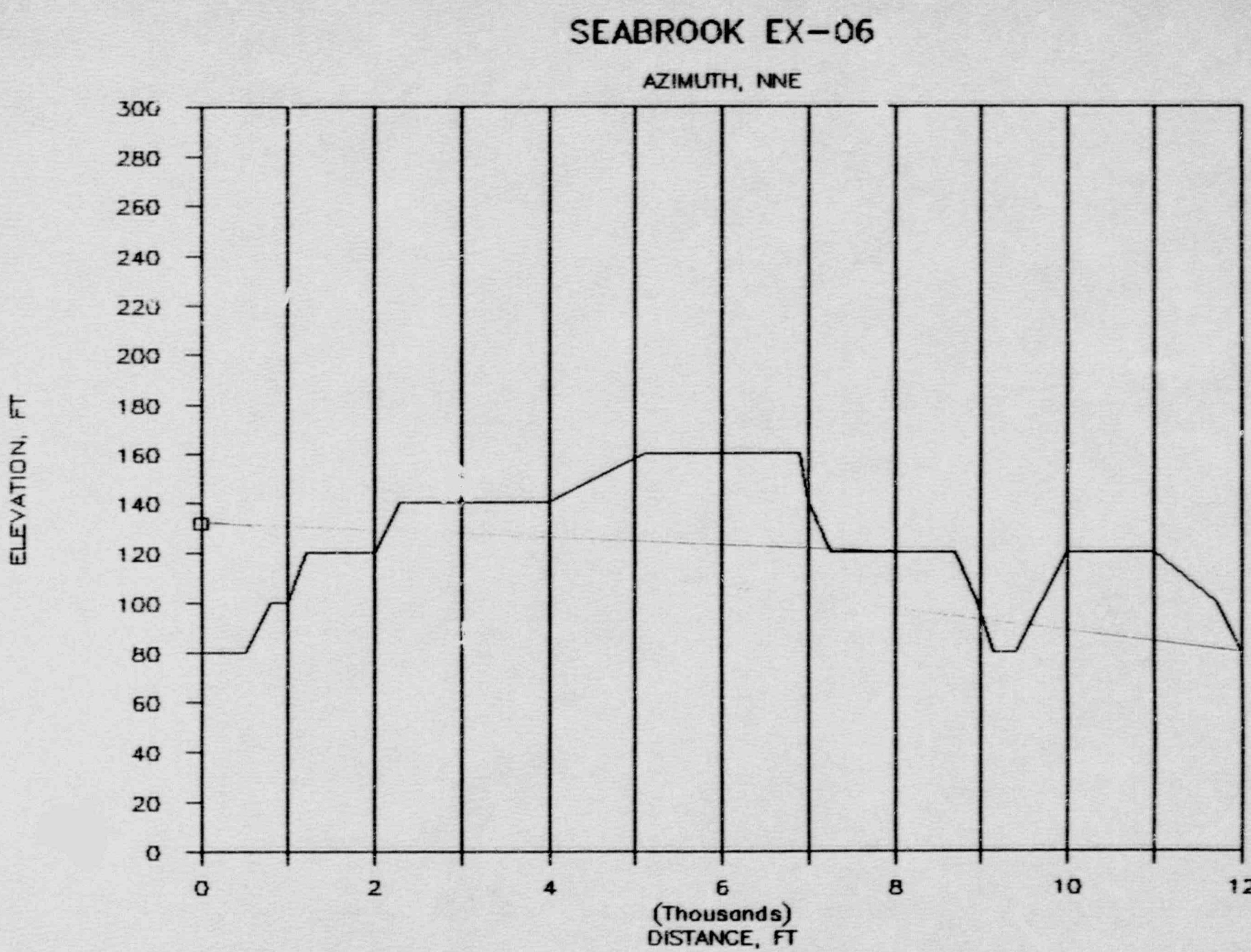
SEABROOK EX-06
AZIMUTH, E
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

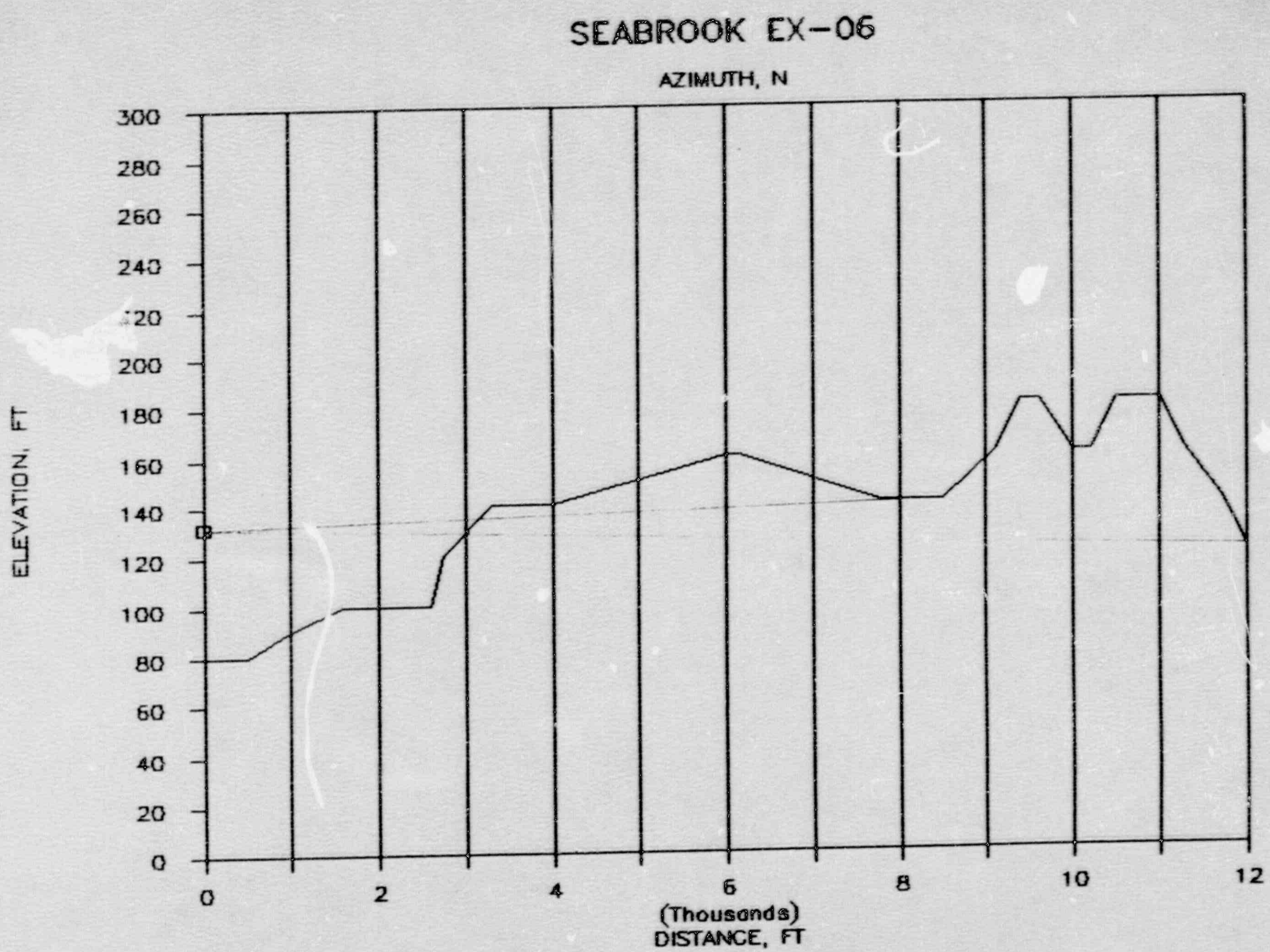
SEABROOK EX-06

AZIMUTH, ENE

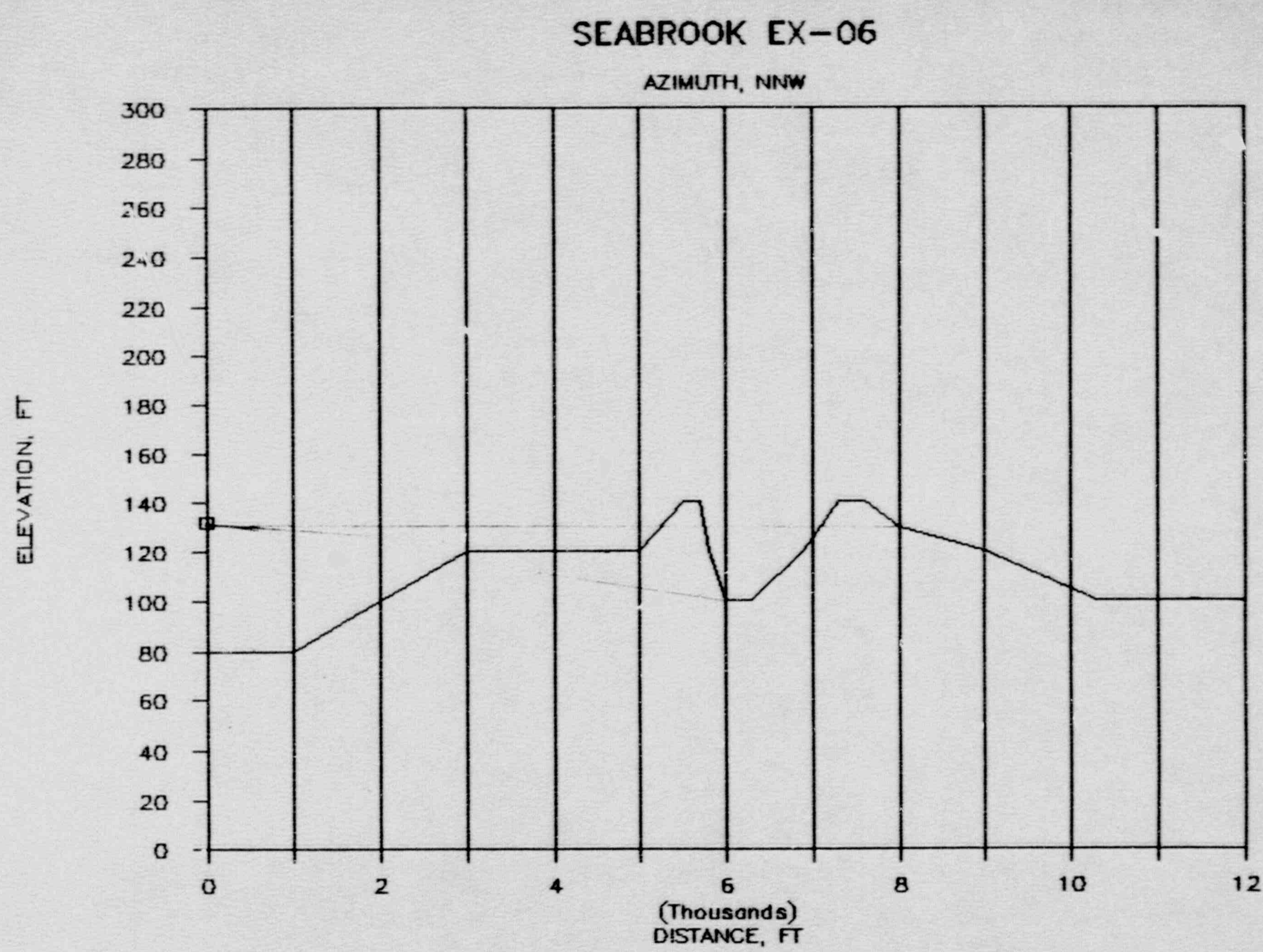


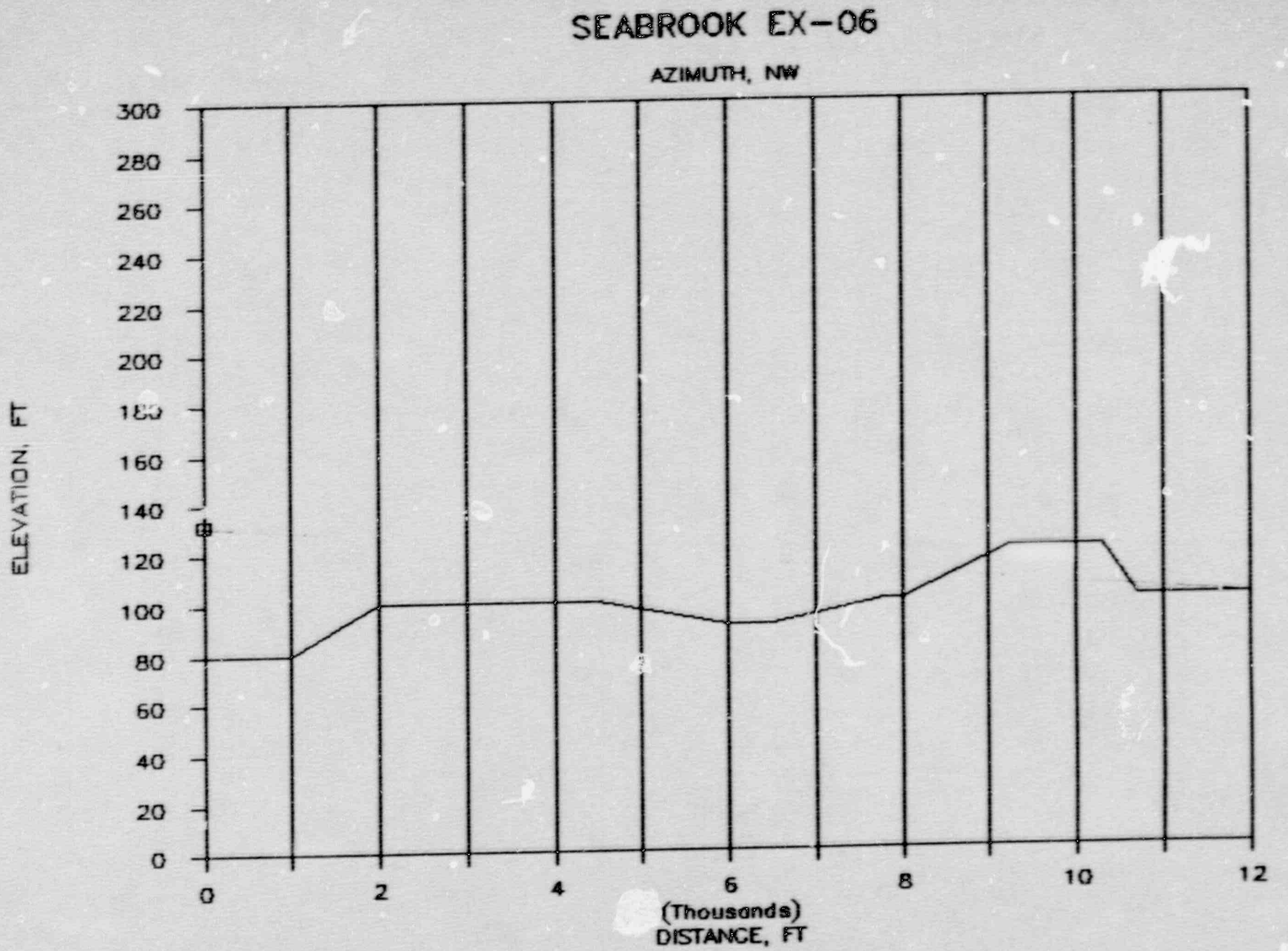

SEABROOK EX-06
AZIMUTH, NE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

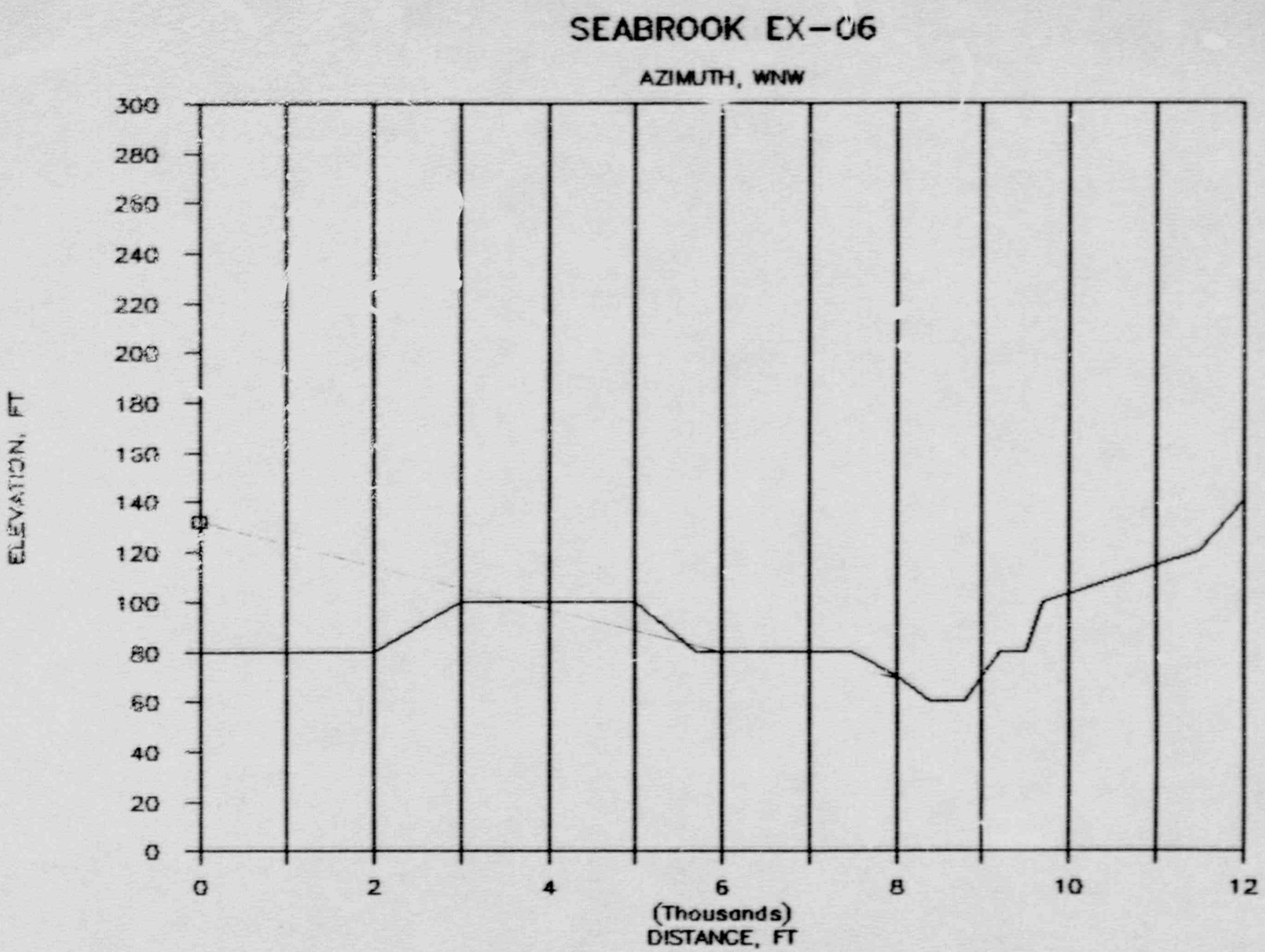

SEABROOK EX-06
AZIMUTH, NNE
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
ELEVATION, FT
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT



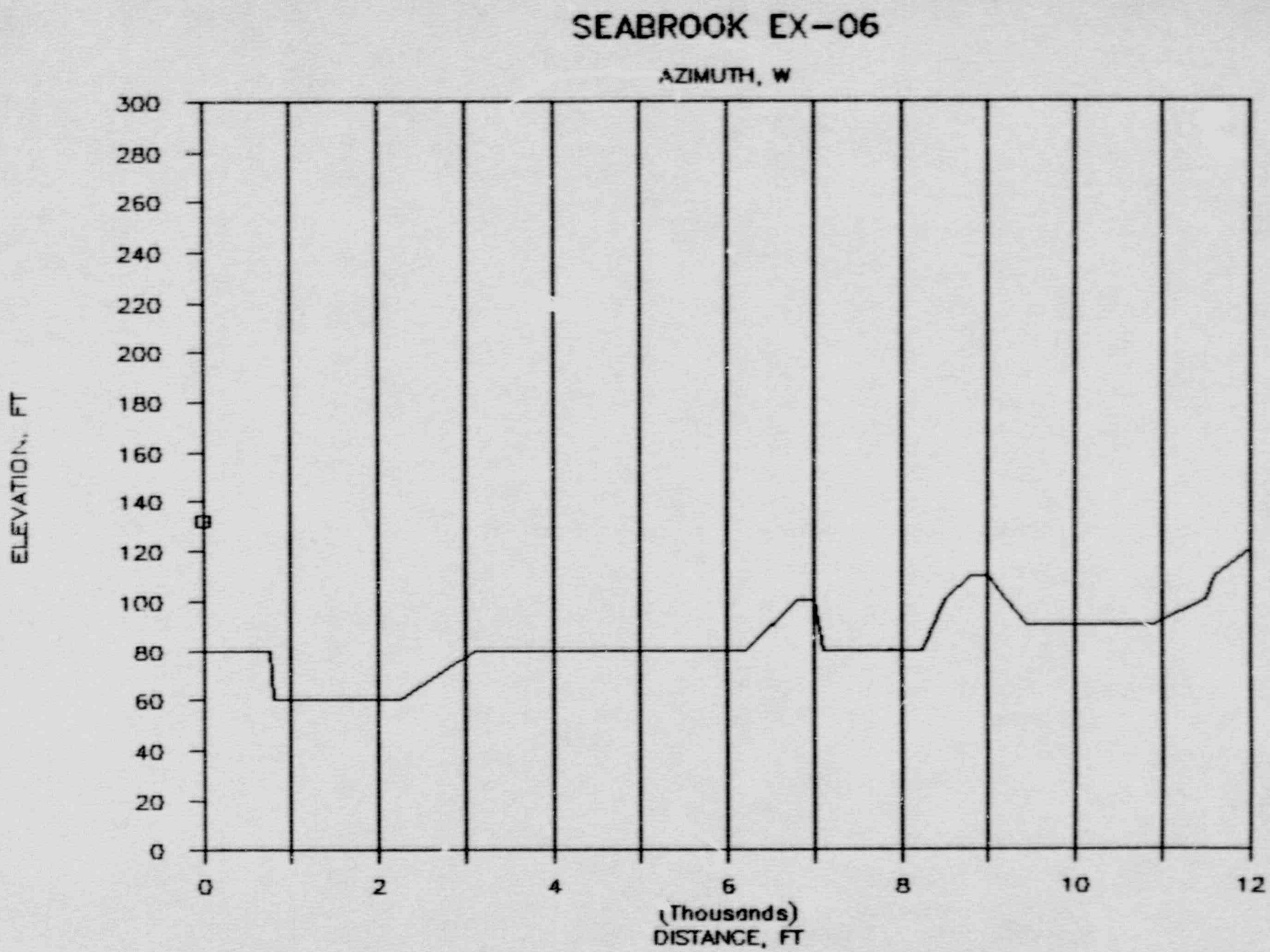
SEABROOK EX-06
AZIMUTH, N
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK EX-06
AZIMUTH, NNW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK EX-06
AZIMUTH, NW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

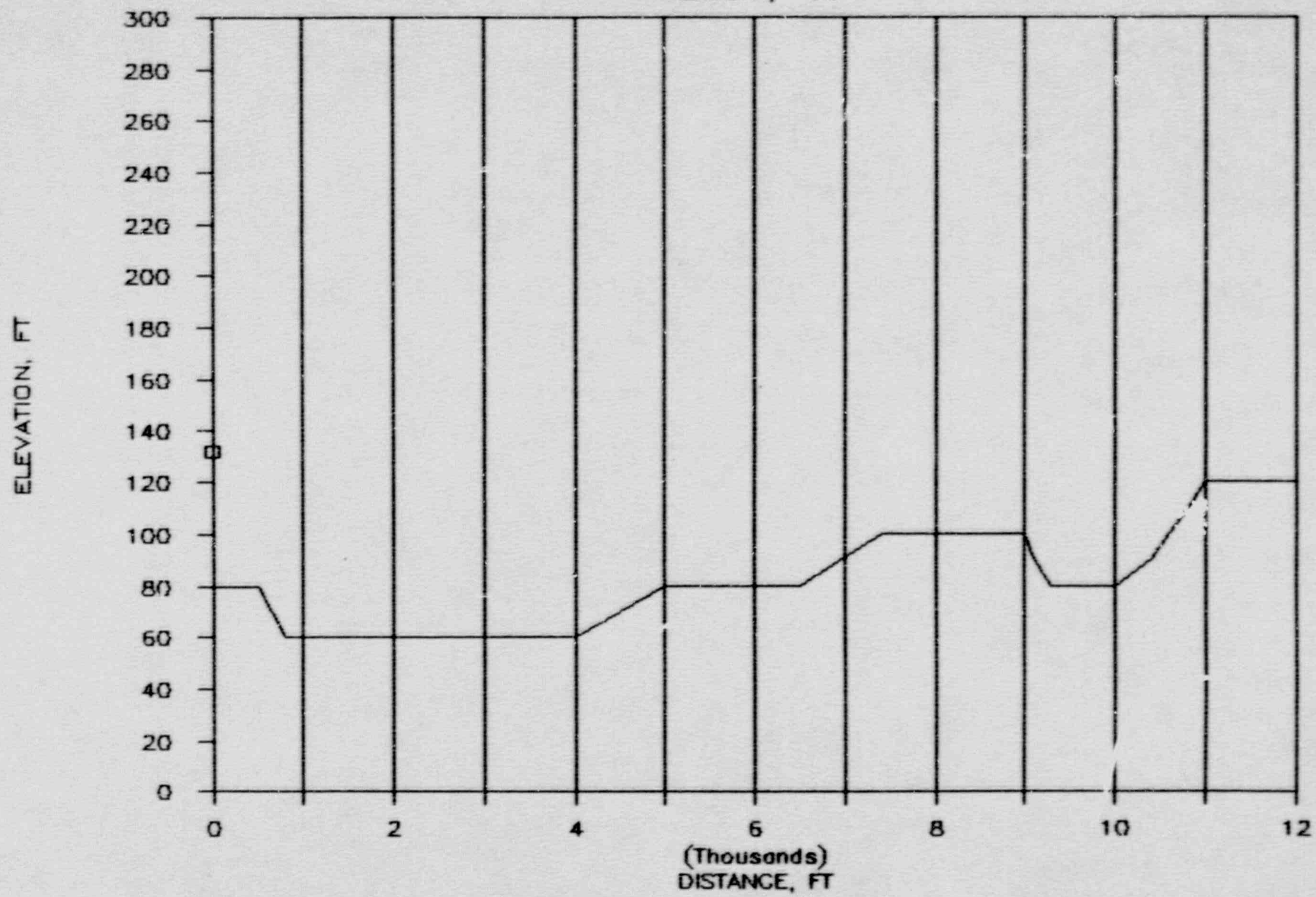


SEABROOK EX-06
AZIMUTH, WNW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK EX-06
AZIMUTH, W
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

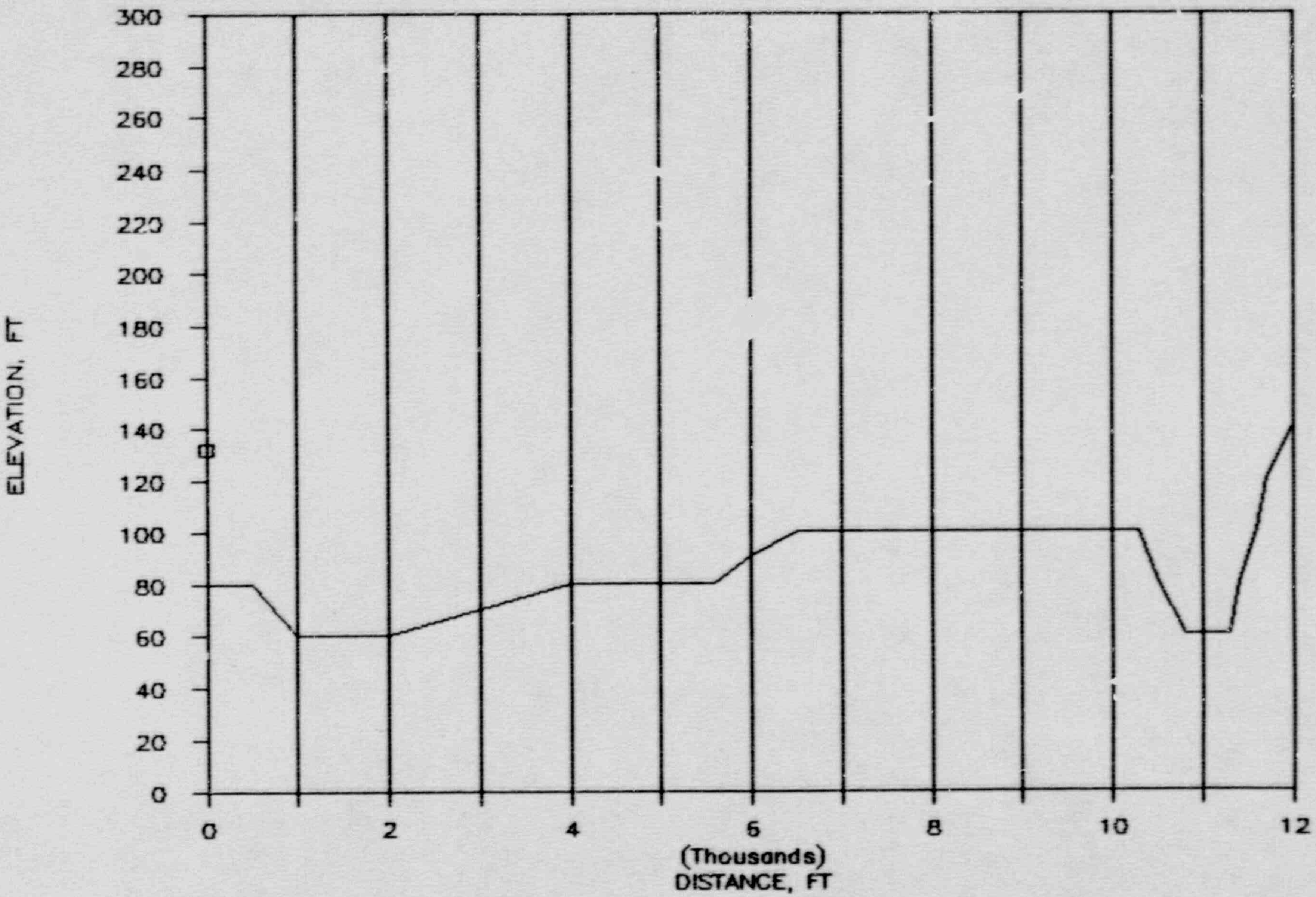
SEABROOK EX-06

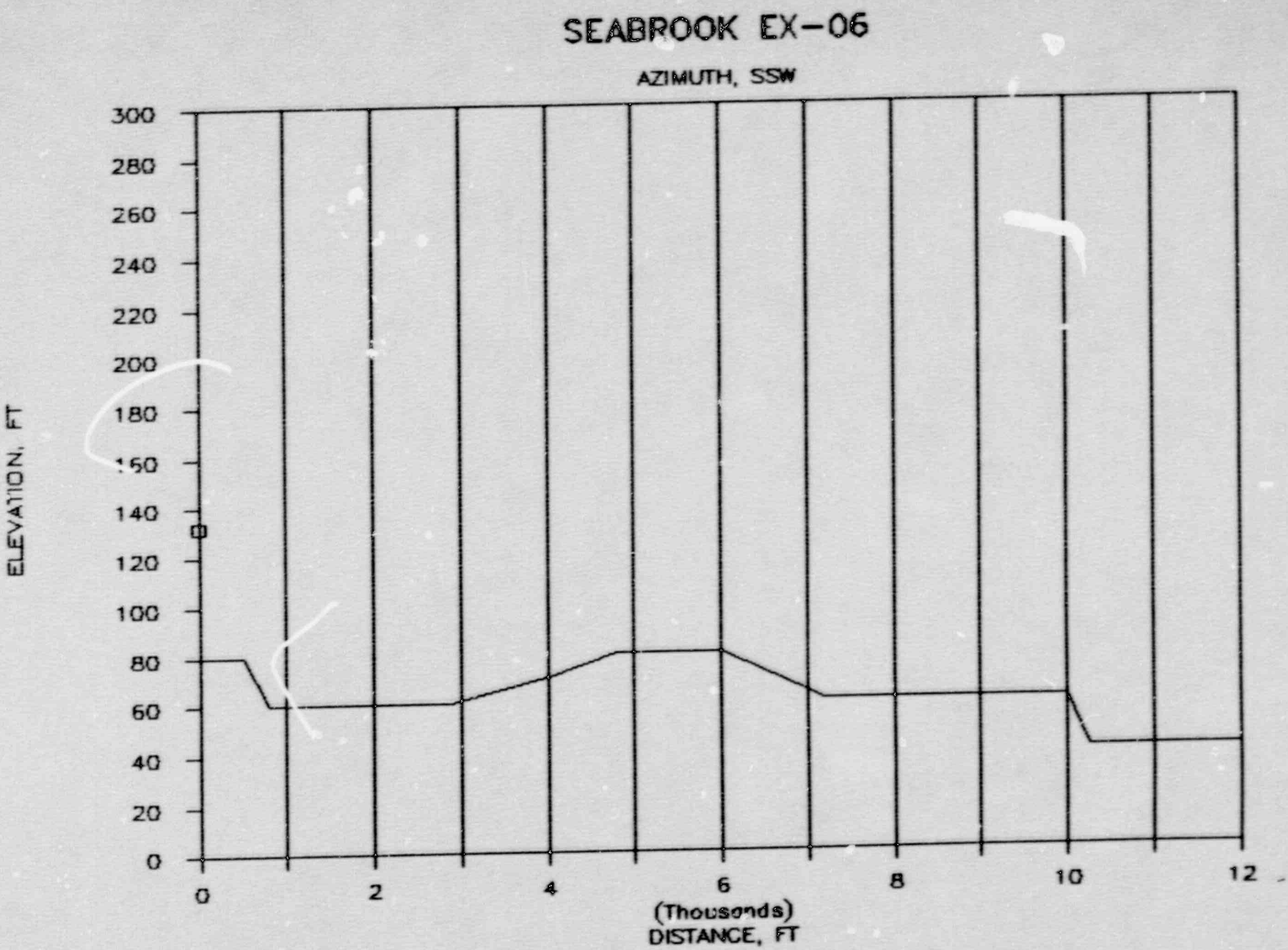
AZIMUTH, W[illegible]



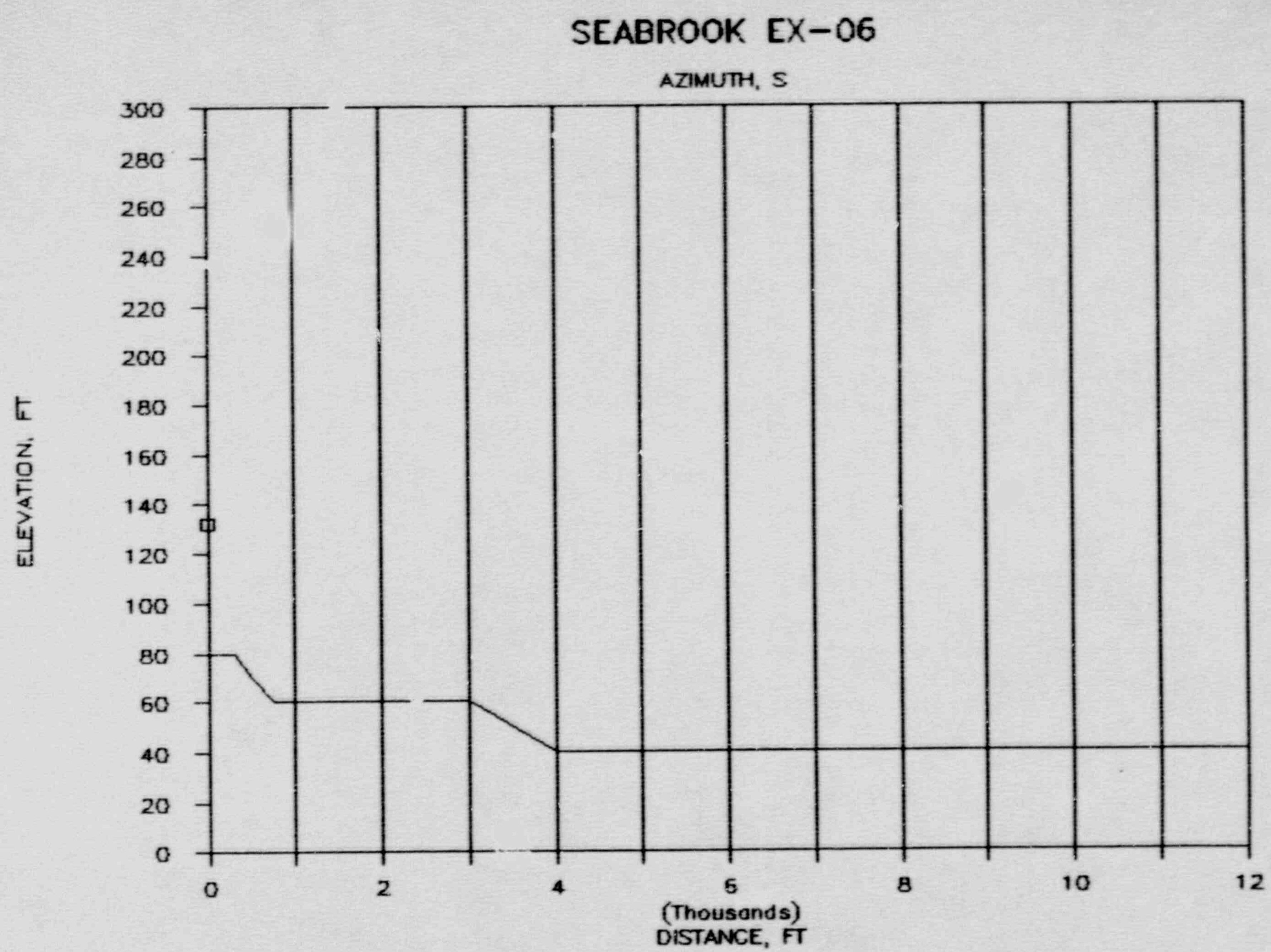
SEABROOK EX-06

AZIMUTH, SW

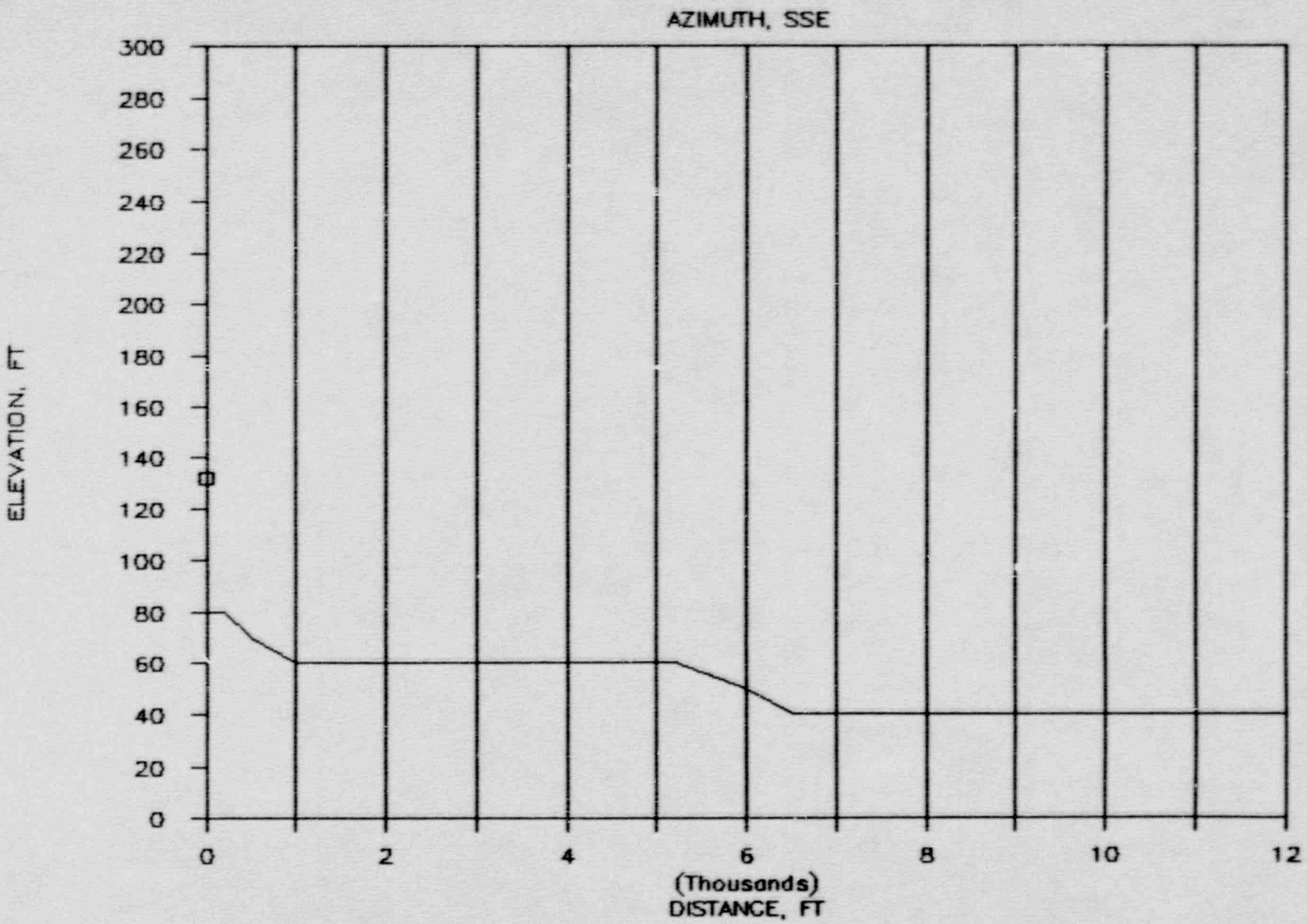


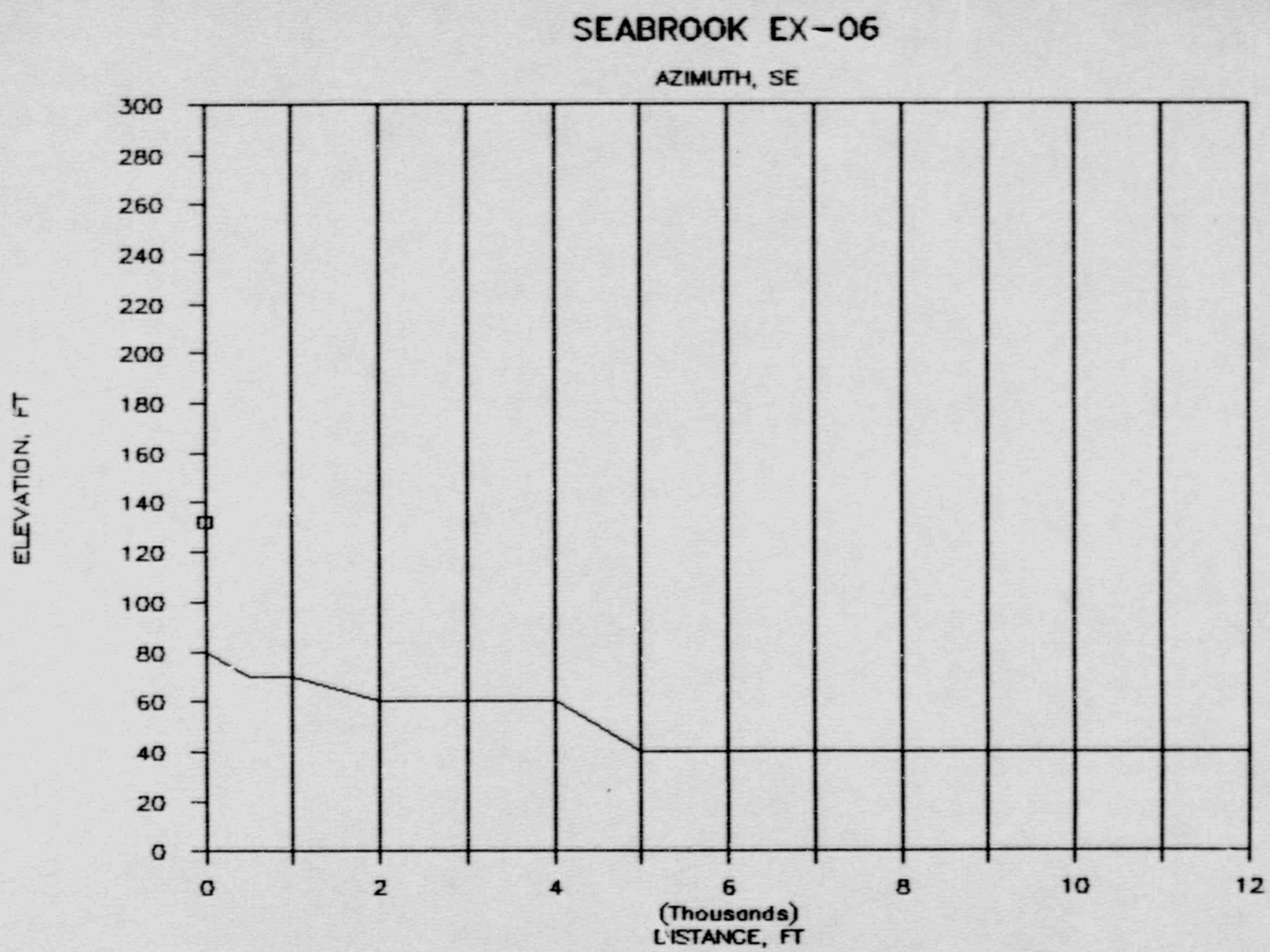


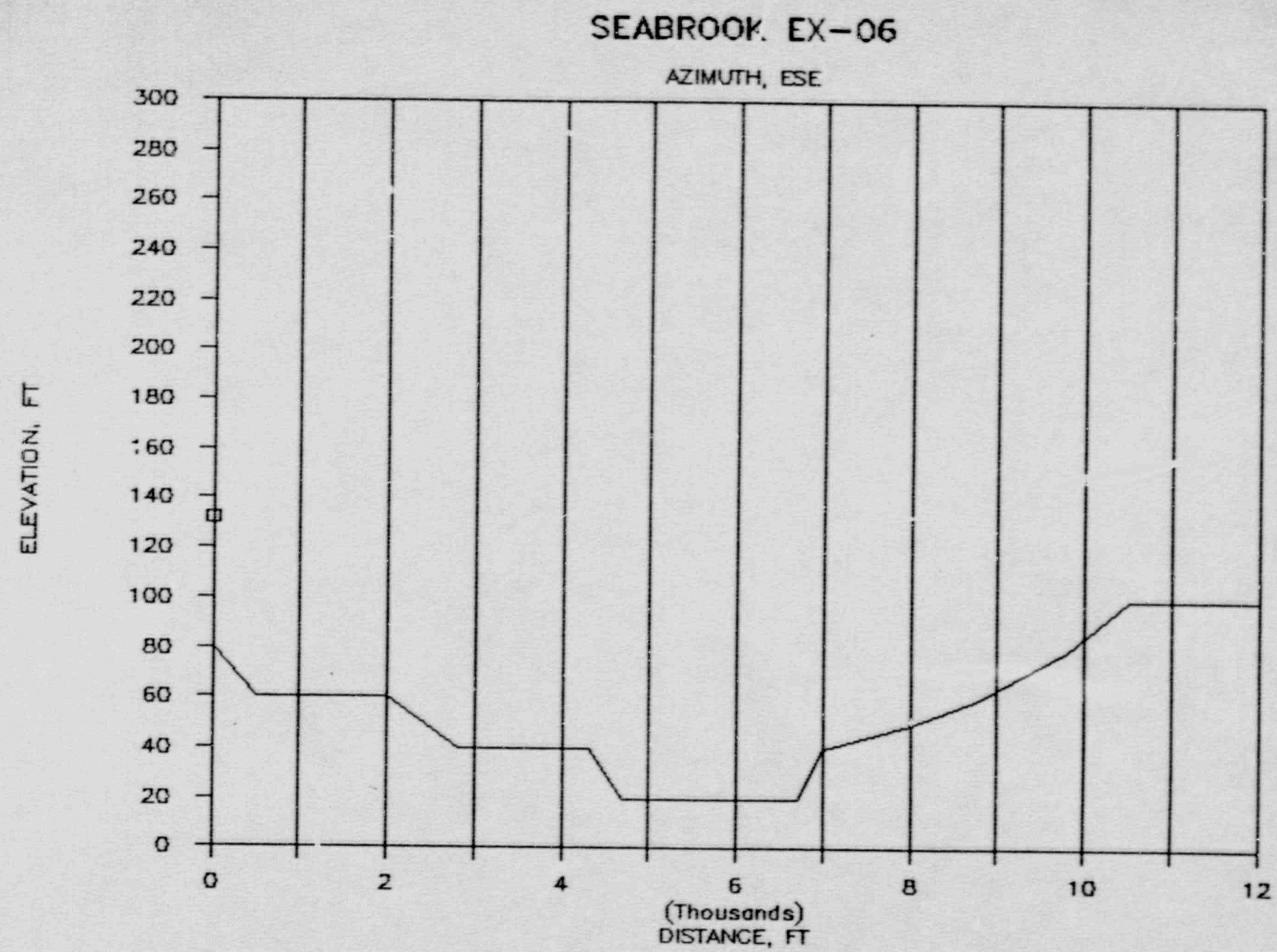
SEABROOK EX-06
AZIMUTH, SSW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK EX-06
AZIMUTH, S
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
ELEVATION, FT
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK EX-06




SEABROOK EX-06
AZIMUTH, SE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT



SEABROOK EX-06
AZIMUTH, ESE
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

NEW HAMPHSIRE YANKEE

EX-06

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	60.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	60.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	40.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	40.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	20.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	20.00	SOFT	0.	YES	7300.	60.
7	12000.	90.00	50.00	SOFT	0.	NO	0.	0.
8	500.	67.50	80.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	80.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	60.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	60.00	SOFT	0.	NO	0.	0.
12	6000.	67.50	40.00	SOFT	0.	YES	5000.	80.
13	8000.	67.50	20.00	SOFT	0.	YES	5000.	80.
14	12000.	67.50	[illegible].00	SOFT	0.	NO	0.	0.
15	500.	45.00	90.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	100.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	110.00	SOFT	0.	YES	1900.	120.
18	4000.	45.00	140.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	80.00	SOFT	0.	YES	4300.	140.
20	8000.	45.00	20.00	SOFT	0.	YES	4300.	140.
21	12000.	45.00	20.00	SOFT	0.	YES	4300.	140.
22	500.	22.50	80.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	100.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	120.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	140.00	SOFT	0.	NO	0.	0.
26	6000.	22.50	160.00	SOFT	0.	NO	0.	0.
27	8000.	22.50	120.00	SOFT	0.	YES	6900.	160.
28	12000.	22.50	80.00	SOFT	0.	YES	6900.	160.
29	500.	.00	80.00	SOFT	0.	NO	0.	0.
30	1000.	.00	90.00	SOFT	0.	NO	0.	0.
31	2000.	.00	100.00	SOFT	0.	NO	0.	0.
32	4000.	.00	140.00	SOFT	0.	NO	0.	0.
33	6000.	.00	160.00	SOFT	0.	NO	0.	0.
34	8000.	.00	140.00	SOFT	0.	YES	6000.	160.
35	12000.	.00	120.00	SOFT	0.	YES	9400.	180.
36	500.	337.50	80.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	80.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	100.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	120.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	100.00	SOFT	0.	YES	5700.	140.
41	8000.	337.50	130.00	SOFT	0.	YES	5700.	140.

42	12000.	337.50	100.00	SOFT	0.	YES	5700.	140.
43	500.	315.00	80.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	80.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	100.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	100.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	90.00	SOFT	0.	NO	0.	0.
48	8000.	315.00	100.00	SOFT	0.	NO	0.	0.
49	12000.	315.00	100.00	SOFT	0.	YES	10300.	120.
50	500.	292.50	80.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	80.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	80.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	100.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	80.00	SOFT	0.	YES	5000.	100.
55	8000.	292.50	70.00	SOFT	0.	YES	5000.	100.
56	12000.	292.50	140.00	SOFT	0.	NO	0.	0.
57	500.	270.00	80.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	60.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	60.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	80.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	80.00	SOFT	0.	NO	0.	0.
62	8000.	270.00	80.00	SOFT	0.	YES	7000.	100.
63	12000.	270.00	120.00	SOFT	0.	NO	0.	0.
64	500.	247.50	80.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	60.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	60.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	60.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	70.00	SOFT	0.	NO	0.	0.
69	8000.	247.50	100.00	SOFT	0.	NO	0.	0.
70	12000.	247.50	120.00	SOFT	0.	NO	0.	0.
71	500.	225.00	80.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	60.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	60.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	80.00	SOFT	0.	NO	0.	0.
75	6000.	225.00	90.00	SOFT	0.	NO	0.	0.
76	8000.	225.00	100.00	SOFT	0.	NO	0.	0.
77	12000.	225.00	140.00	SOFT	0.	NO	0.	0.
78	500.	202.50	80.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	60.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	60.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	70.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	80.00	SOFT	0.	NO	0.	0.
83	8000.	202.50	60.00	SOFT	0.	NO	0.	0.
84	12000.	202.50	40.00	SOFT	0.	NO	0.	0.
85	500.	180.00	70.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	60.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	60.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	60.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	40.00	SOFT	0.	NO	0.	0.
90	8000.	180.00	40.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	40.00	SOFT	0.	NO	0.	0.
92	500.	157.50	70.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	60.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	60.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	60.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	50.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	40.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	40.00	SOFT	0.	NO	0.	0.
99	500.	135.00	70.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	70.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	60.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	60.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	40.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	40.00	SOFT	0.	NO	0.	0.
105	12000.	135.00	40.00	SOFT	0.	NO	0.	0.
106	500.	112.50	60.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	60.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	60.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	40.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	20.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	50.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	100.00	SOFT	0.	NO	0.	0.

1

NEW HAMPHSIRE YANKEE

0

EX-06

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
0 1	[illegible]-3000	119.3	121.3	.0	.0	.0	.0	120.0	115.0	105.0	100.0	9.4

0 XO= .00 YO= .00 ZO= 132.00 HEIGHT ABOVE GROUND= 52.00

1

NEW HAMPHSIRE YANKEE

EX-06

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF [illegible]G)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

1

NEW HAMPHSIRE YANKEE

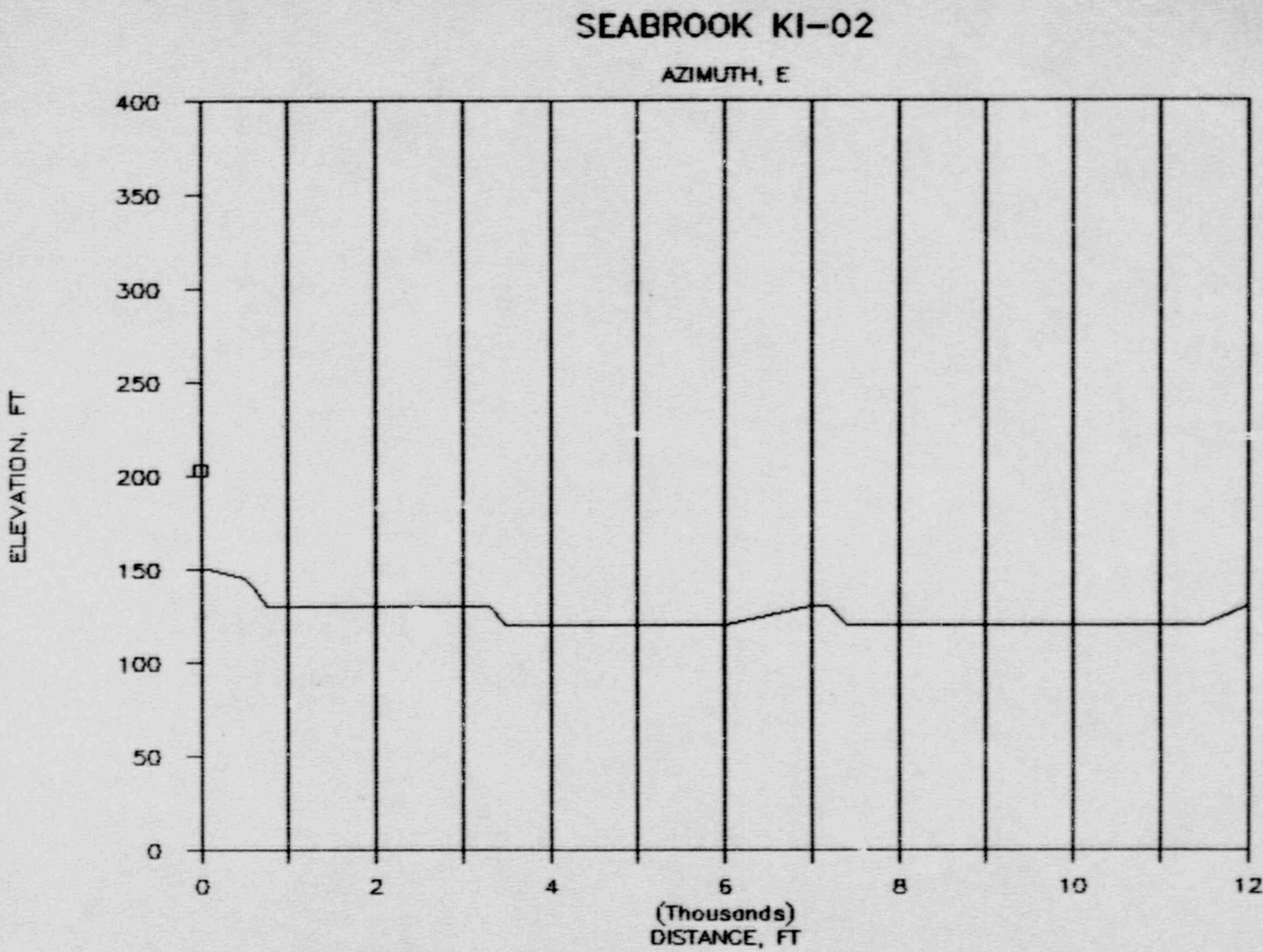
EX-06

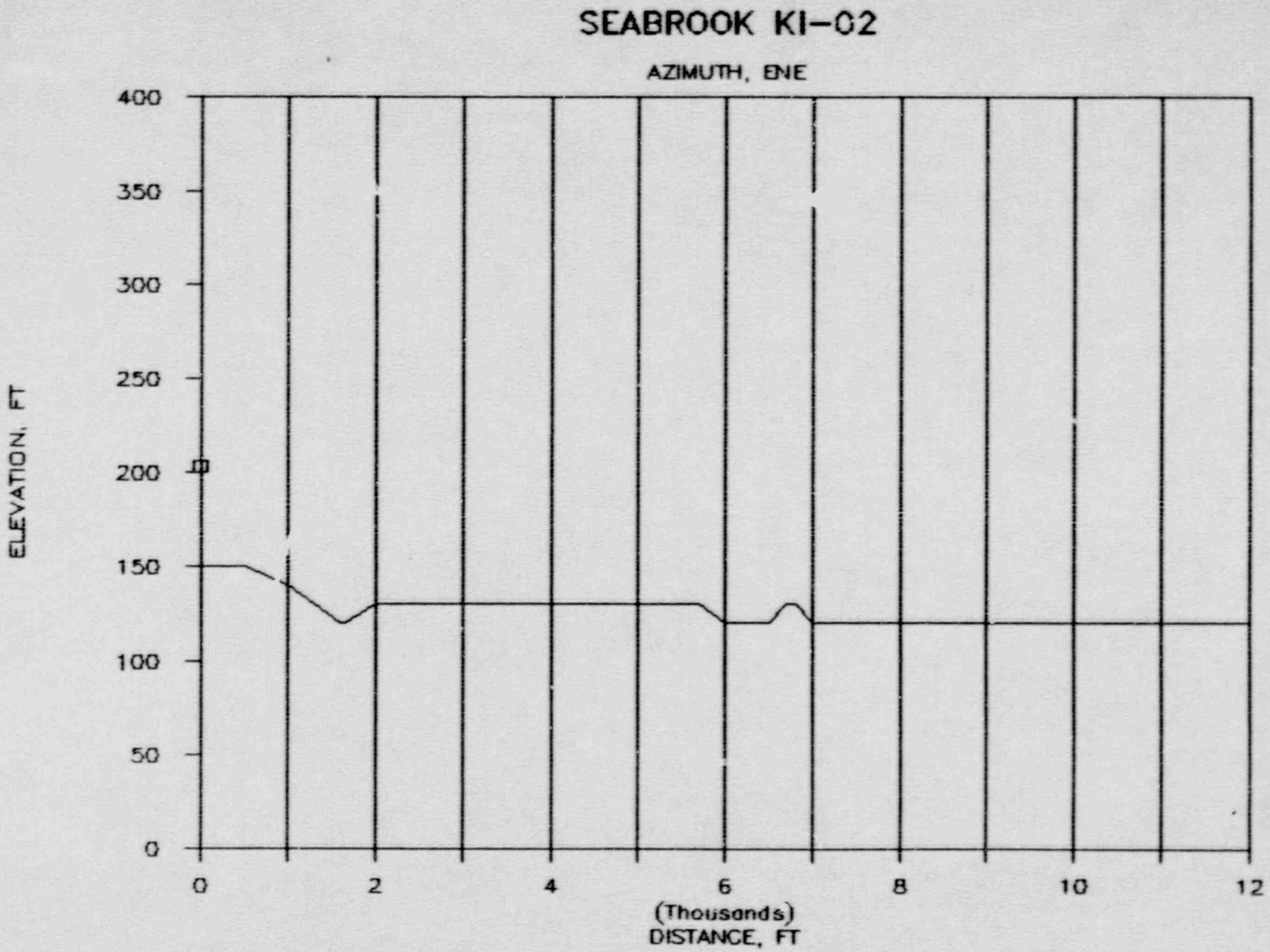
SOUND PRESSURE LEVELS IN DBC

UNDER MET CONDITION 1

DISTANCE IN FEET

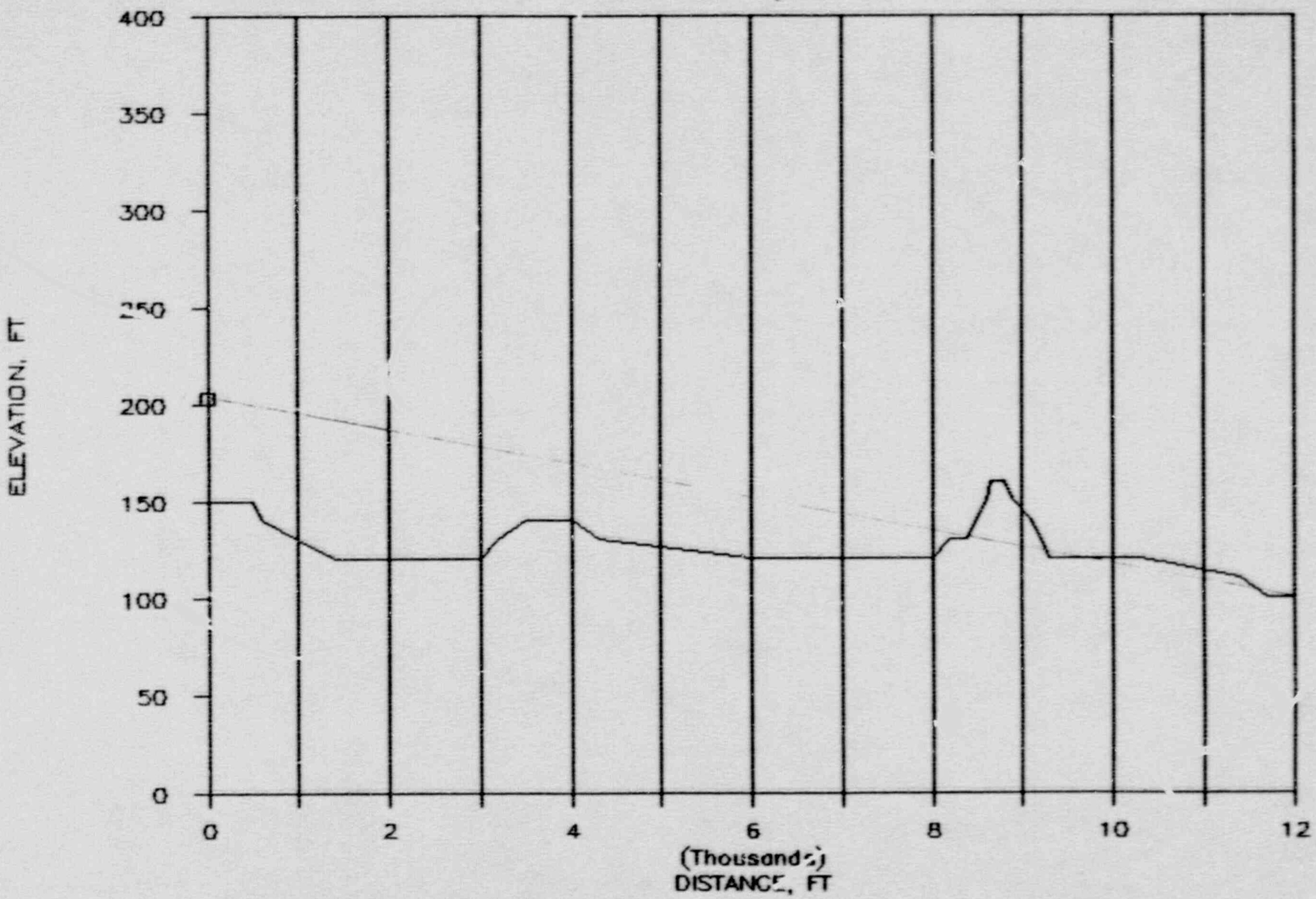
AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	105.4	93.4	83.8	76.1	69.7	52.5	48.3
ENE	105.5	93.4	83.8	76.1	62.3	57.2	49.3
NE	105.5	93.4	75.5	76.1	60.2	54.0	44.5
NNE	105.5	93.4	83.8	76.1	70.3	55.4	47.2
N	105.5	93.4	83.8	76.1	70.3	58.9	46.2
NNW	105.5	93.4	83.8	76.1	56.2	60.2	50.5
NW	105.5	93.4	83.8	76.1	70.3	65.3	50.5
WNW	105.5	93.4	83.8	76.1	64.7	60.4	56.2
W	105.5	93.4	83.8	76.1	70.3	59.4	56.2
WSW	105.5	93.4	83.8	76.1	70.3	65.3	56.2
SW	105.5	93.4	83.8	76.1	70.3	65.3	56.2
SSW	105.5	93.4	83.8	76.1	70.3	65.3	56.2
S	105.5	93.4	83.8	76.1	70.3	65.3	56.2
SSE	105.5	93.4	83.8	76.1	70.3	65.3	56.2
SE	105.5	93.4	83.8	76.1	70.3	65.2	52.8
ESE	105.4	93.4	83.8	76.1	70.2	62.9	49.3


SEABROOK KI-02
AZIMUTH, E
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-02
AZIMUTH, ENE
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

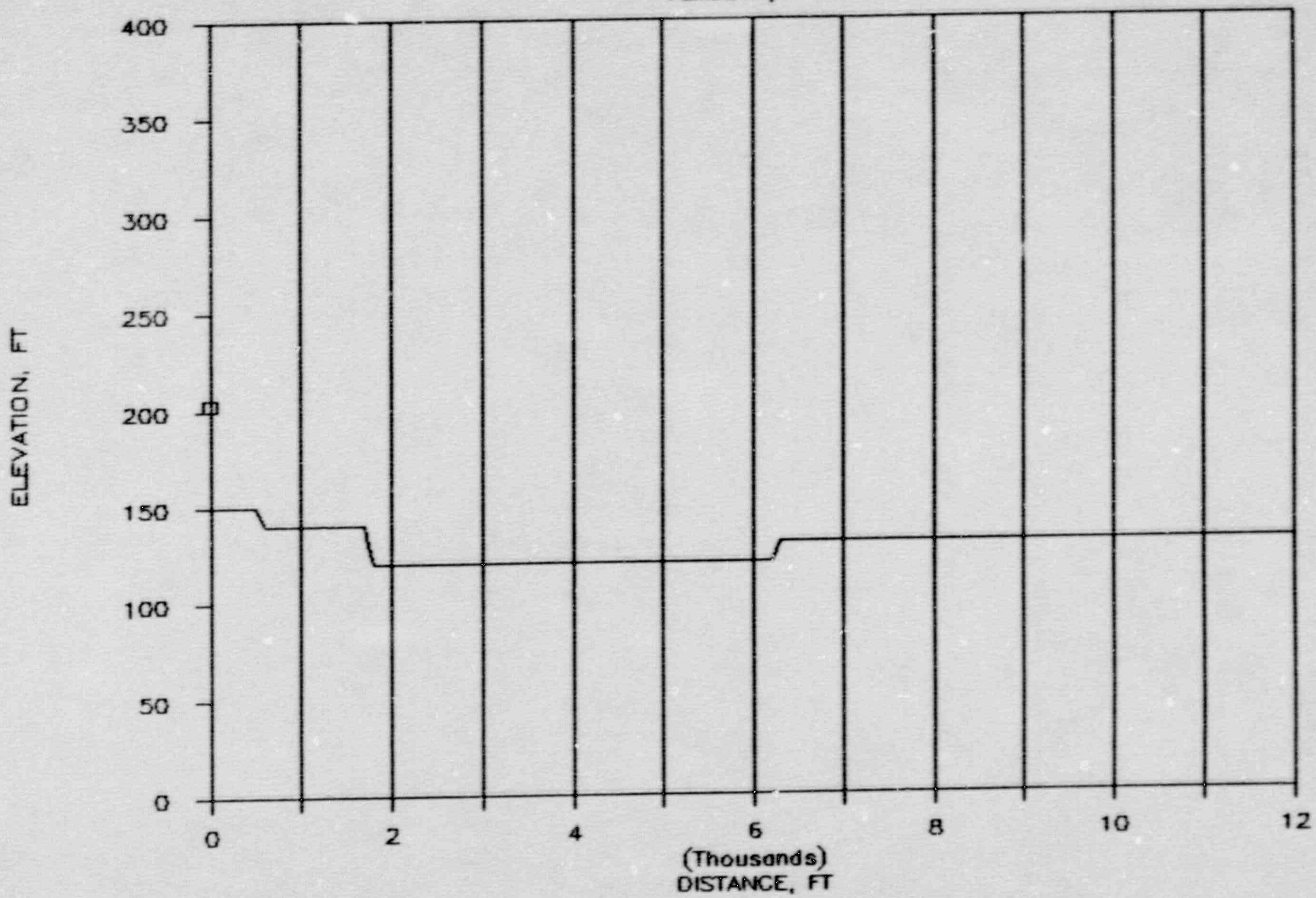
SEABROOK KI-02

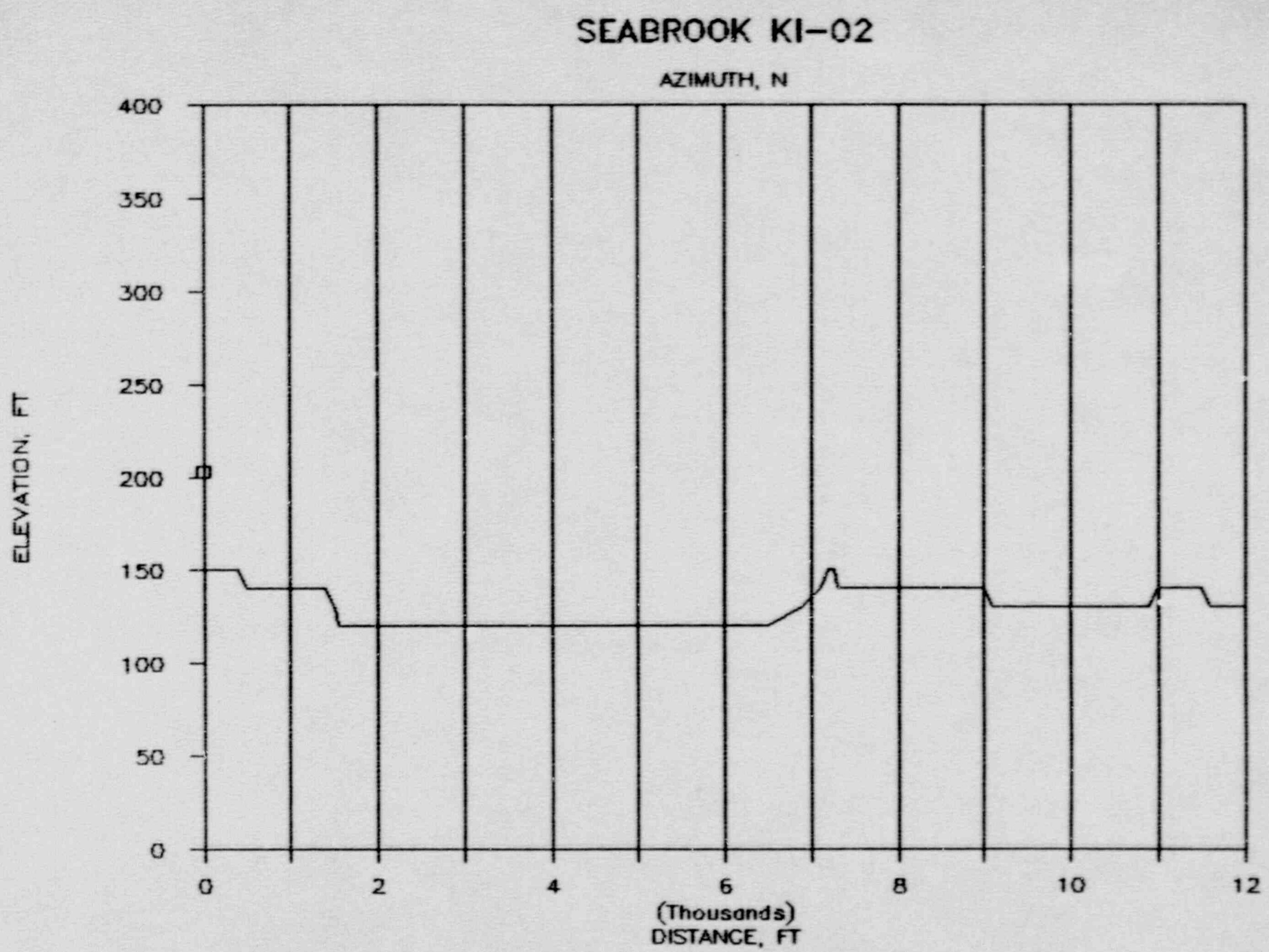
AZIMUTH, NE



SEABROOK KI-02

AZIMUTH, NNE




SEABROOK KI-02
AZIMUTH, N
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
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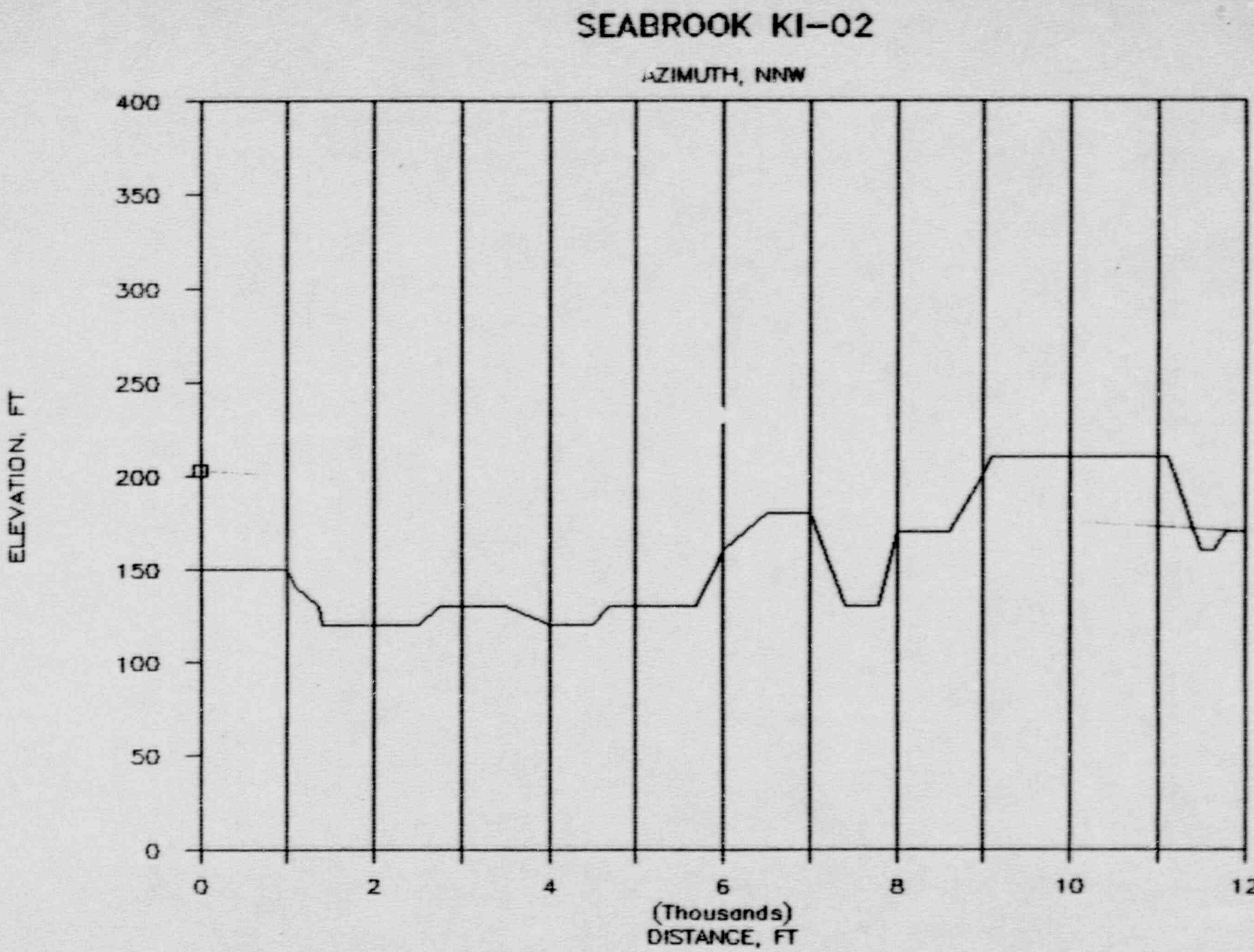
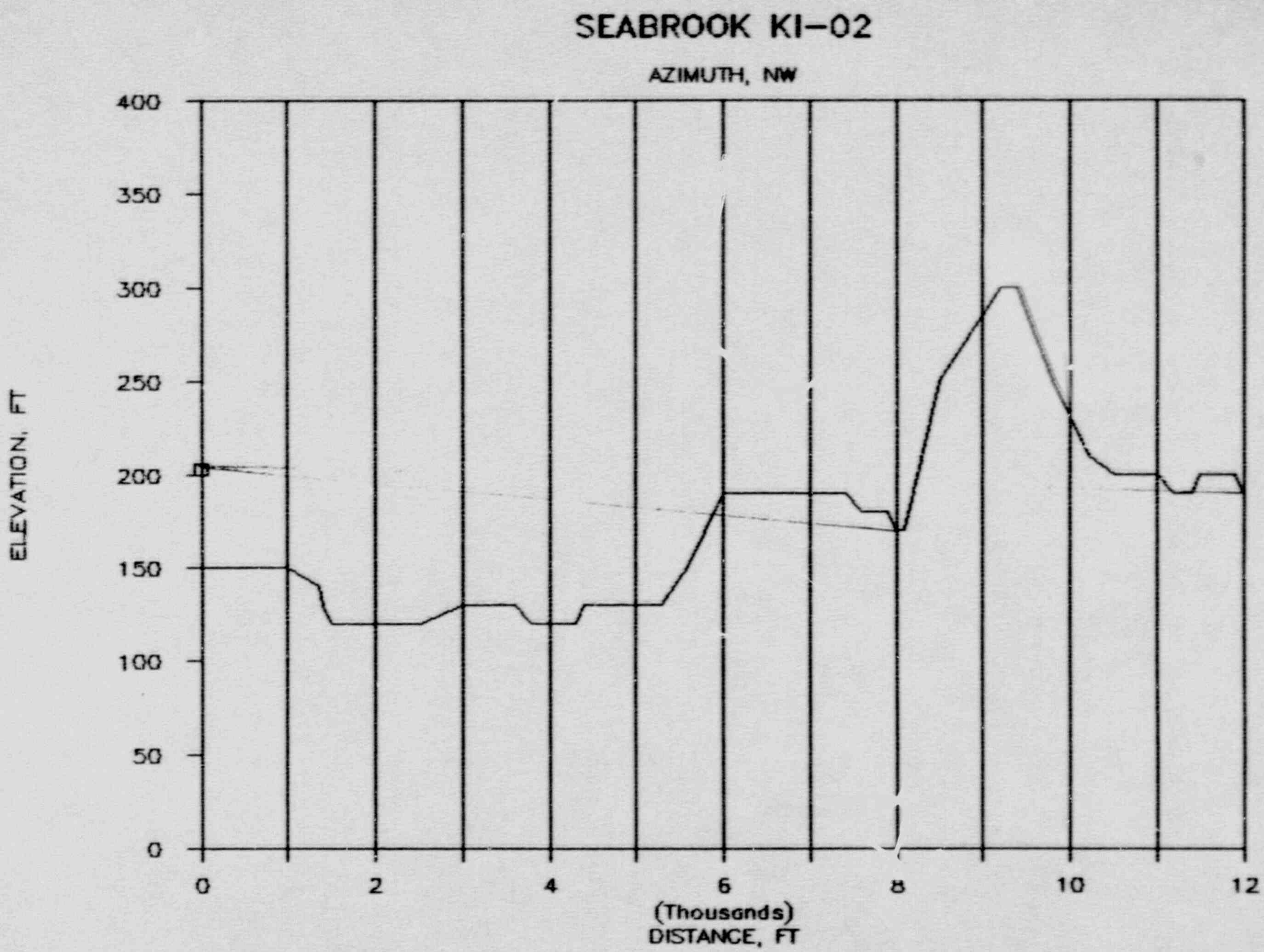
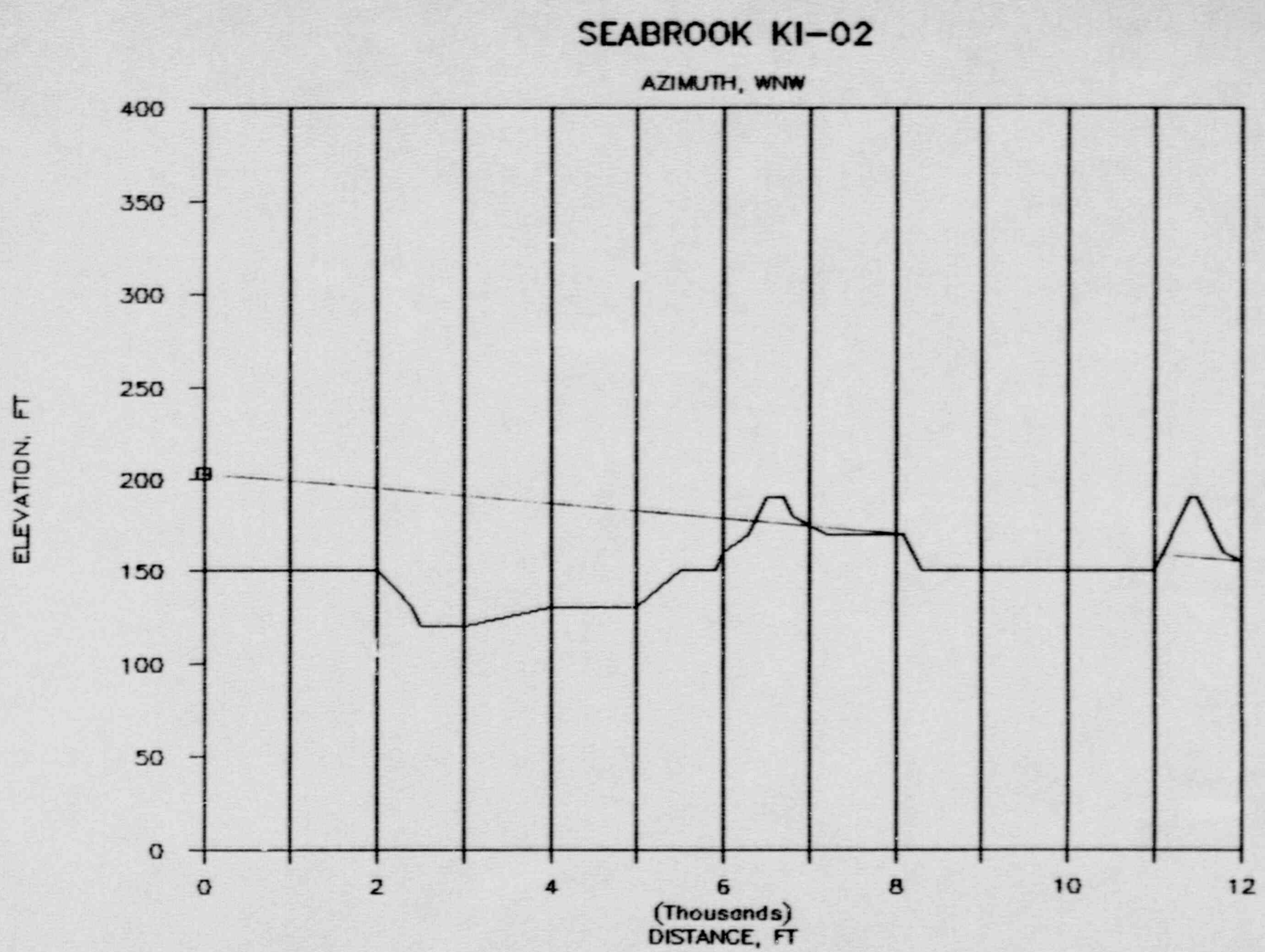
6
8
10
12
(Thousands)
DISTANCE, FT

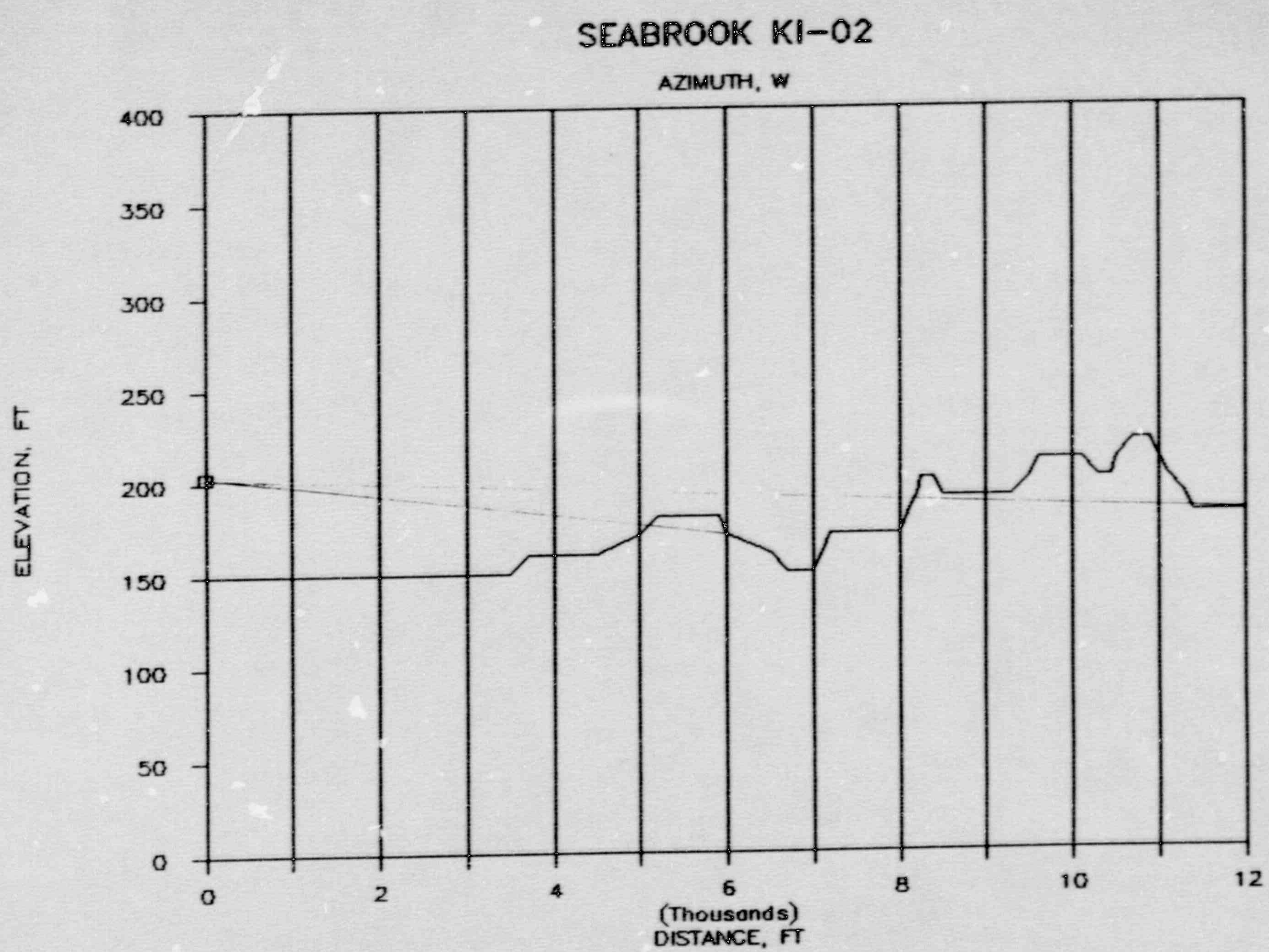


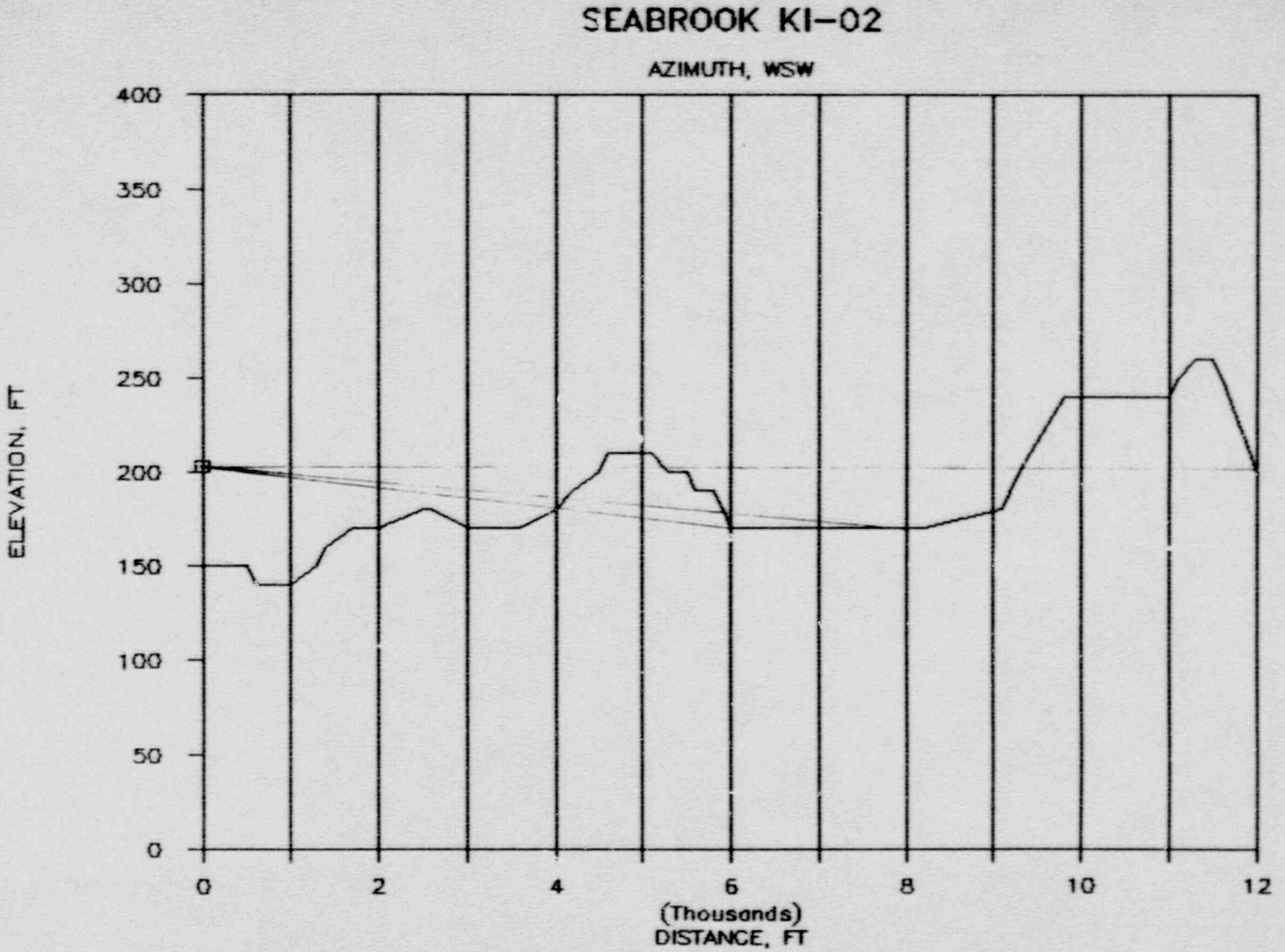
SEABROOK KI-02
AZIMUTH, NNW
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

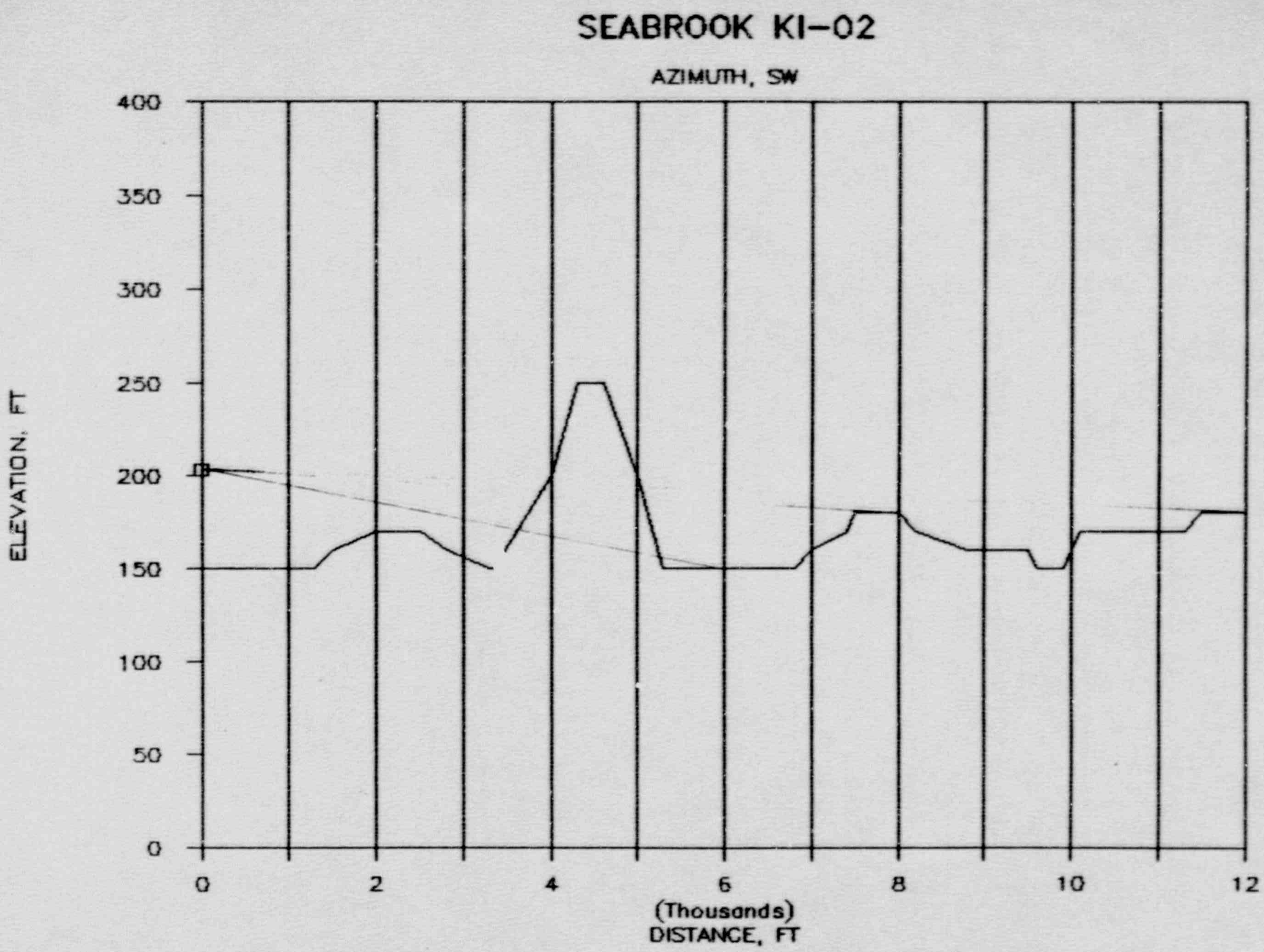

SEABROOK KI-02
AZIMUTH, NW
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

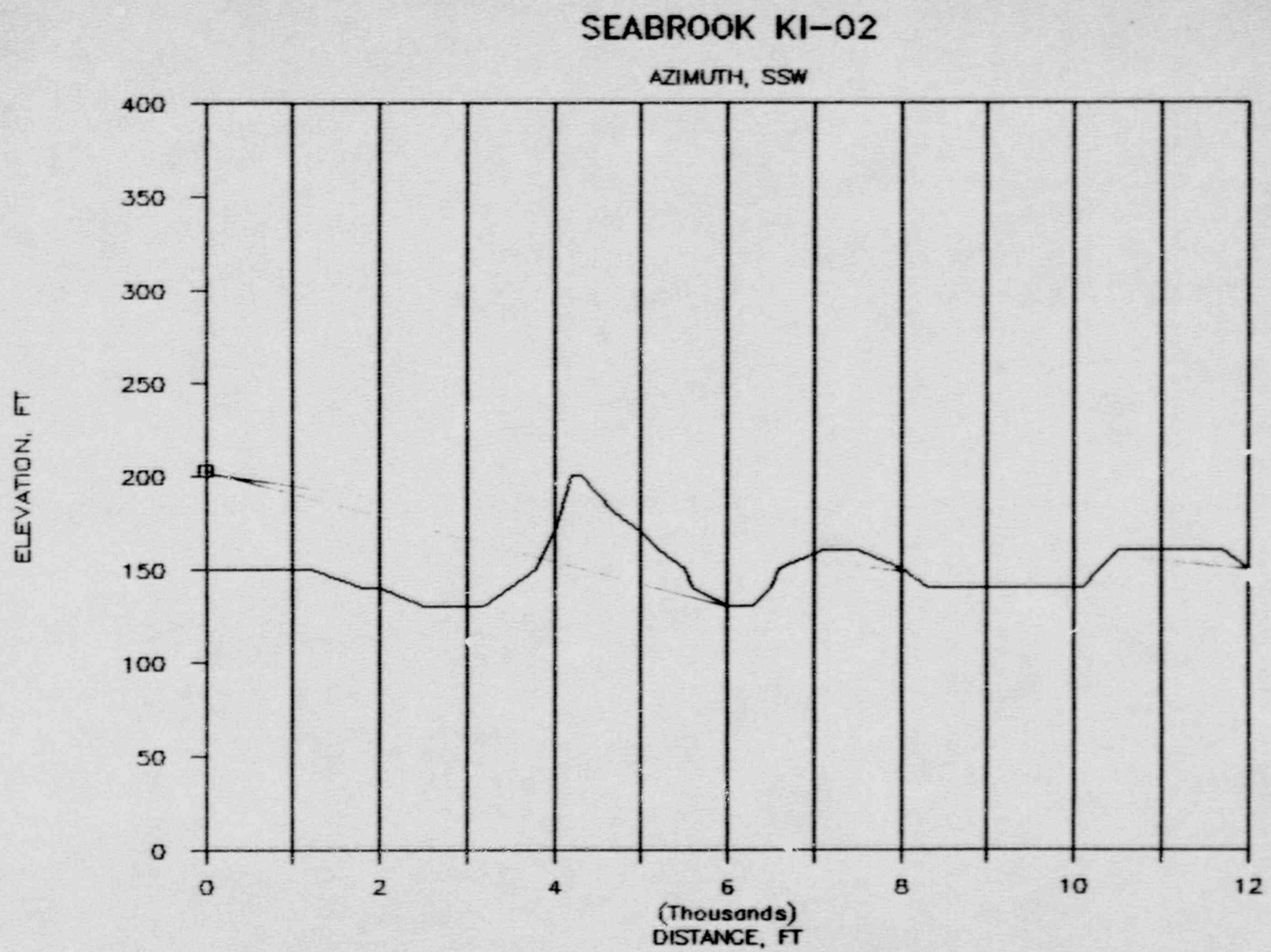


SEABROOK KI-02
AZIMUTH, WNW
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-02
AZIMUTH, W
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

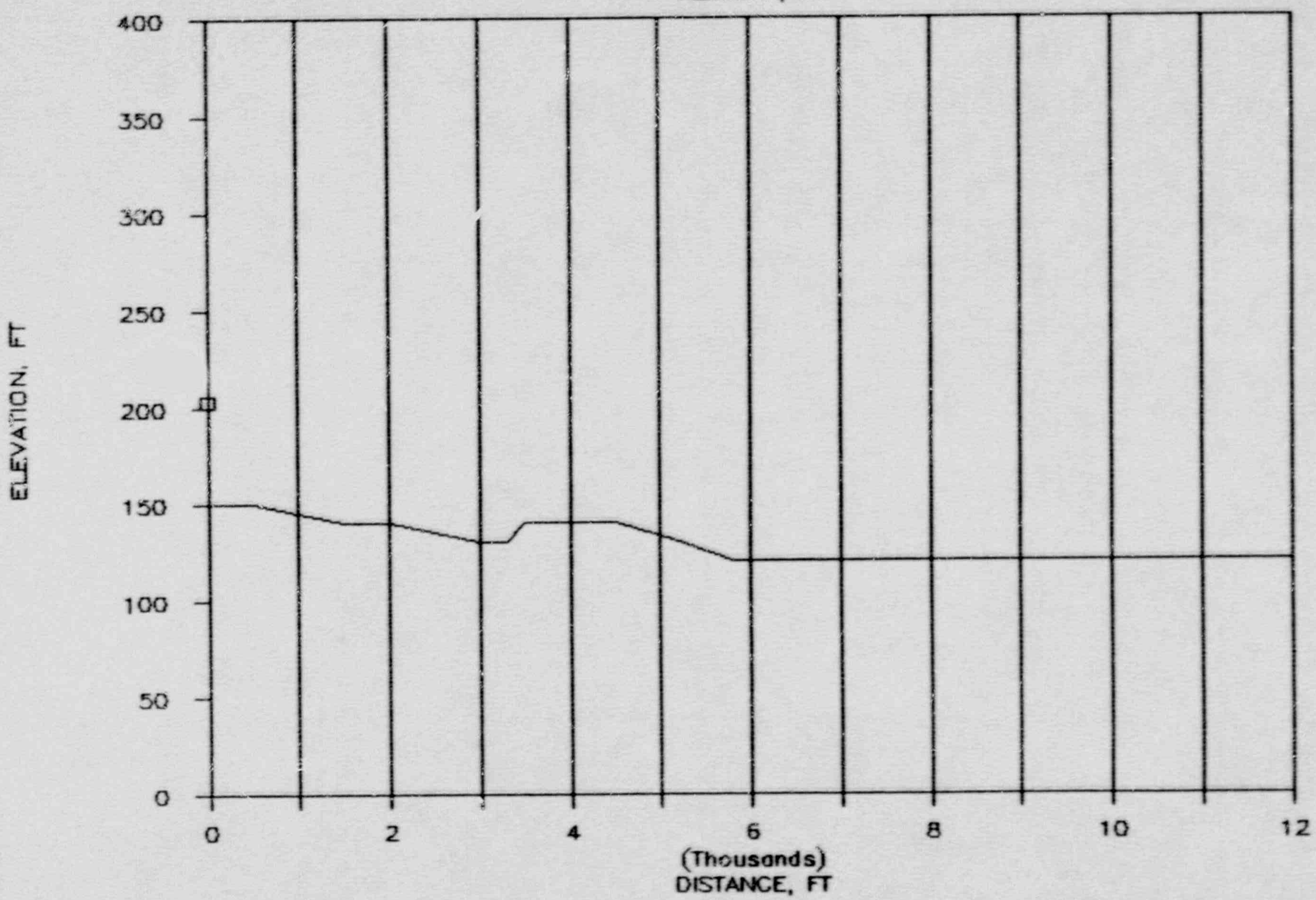

SEABROOK KI-02
AZIMUTH, WSW
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-02
AZIMUTH, SW
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-02
AZIMUTH, SSW
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

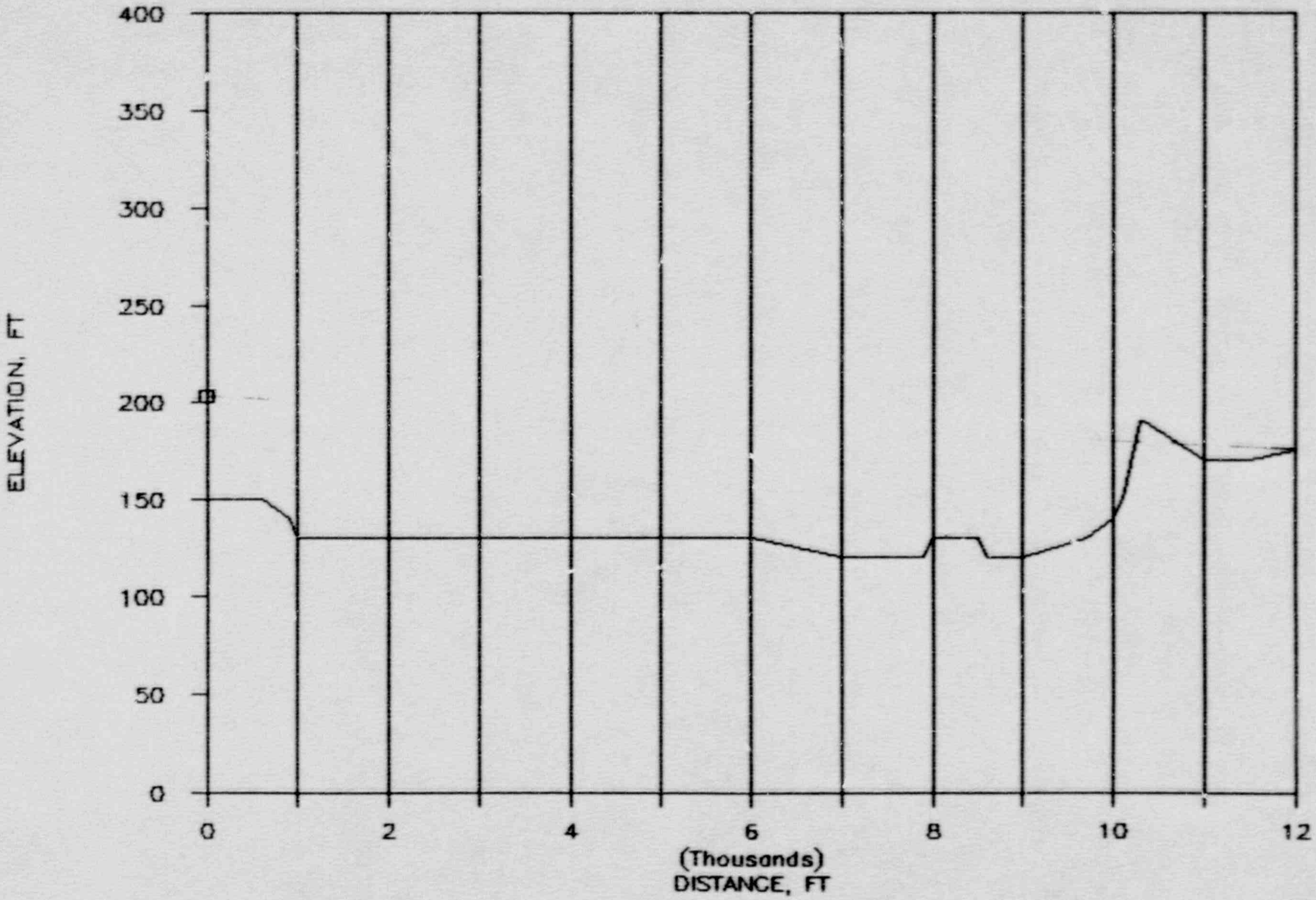
SEABROOK KI-02

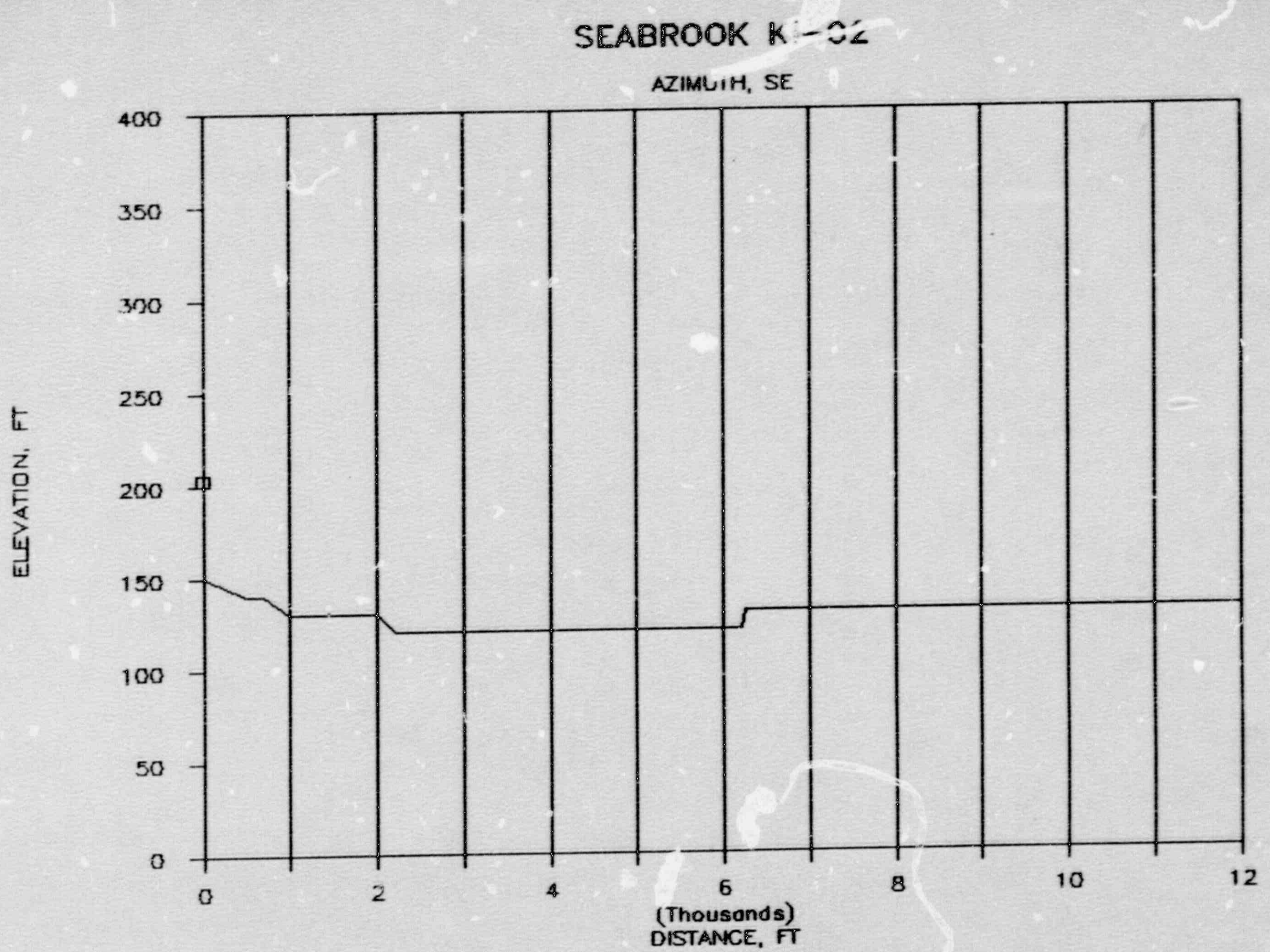
AZIMUTH, S



SEABROOK KI-02

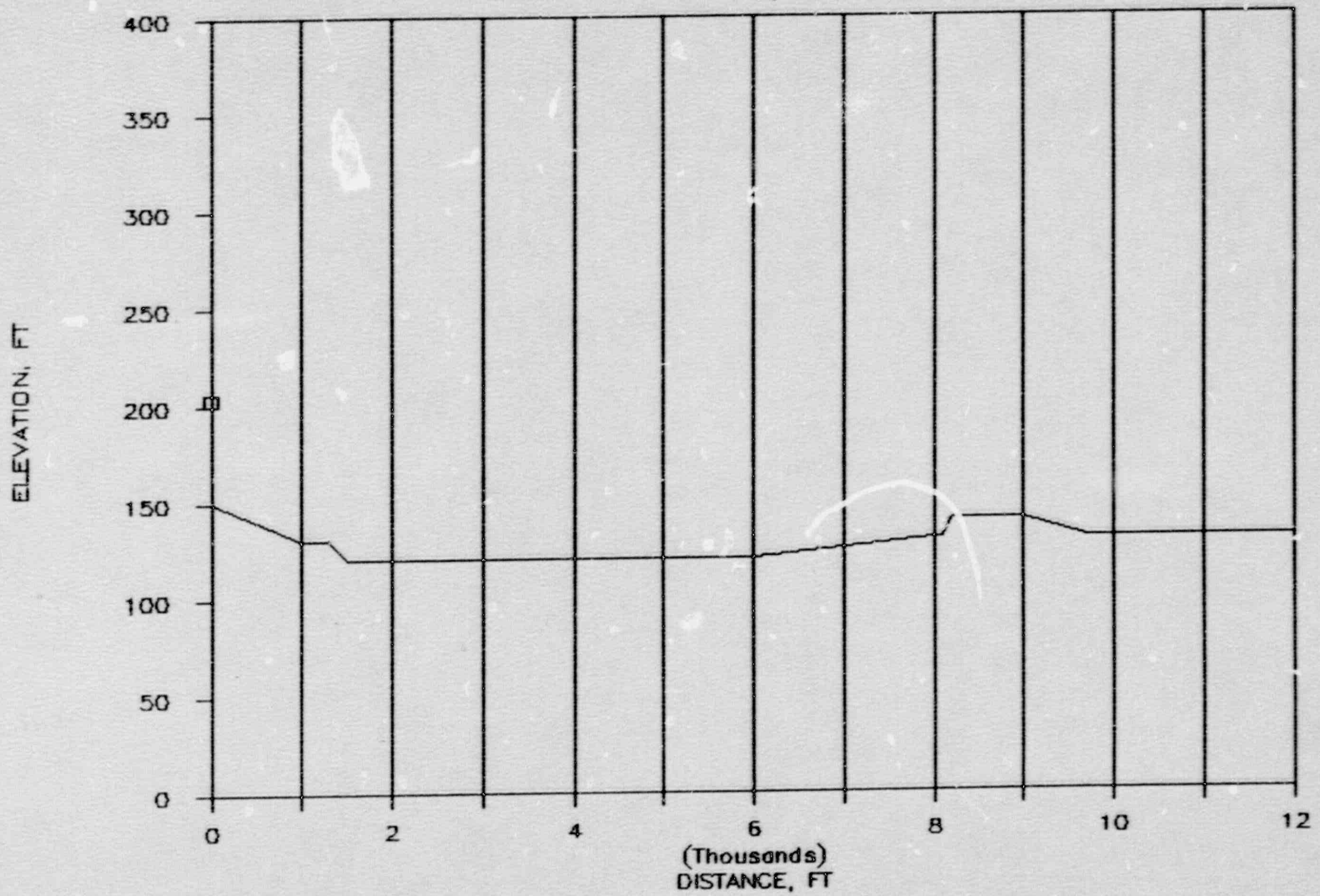
AZIMUTH, SSE




SEABROOK K
AZIMUTH, SE
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK KI-02

AZIMUTH, ESE



NEW HAMPHSIRE YANKEE

KI-02

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	145.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	130.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	130.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	120.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	120.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	120.00	SOFT	0.	NO	0.	0.
7	12000.	90.00	130.00	SOFT	0.	NO	0.	0.
8	500.	67.50	150.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	140.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	130.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	130.00	SOFT	0.	NO	0.	0.
12	6000.	67.50	120.00	SOFT	0.	NO	0.	0.
13	8000.	67.50	120.00	SOFT	0.	NO	0.	0.
14	12000.	67.50	120.00	SOFT	0.	NO	0.	0.
15	500.	45.00	150.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	130.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	120.00	SOFT	0.	NO	0.	0.
18	4000.	45.00	140.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	120.00	SOFT	0.	NO	0.	0.
20	8000.	45.00	120.00	SOFT	0.	NO	0.	0.
21	12000.	45.00	100.00	SOFT	0.	YES	8650.	160.
22	500.	22.50	150.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	140.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	120.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	120.00	SOFT	0.	NO	0.	0.
26	6000.	22.50	120.00	SOFT	0.	NO	0.	0.
27	8000.	22.50	130.00	SOFT	0.	NO	0.	0.
28	12000.	22.50	130.00	SOFT	0.	NO	0.	0.
29	500.	.00	140.00	SOFT	0.	NO	0.	0.
30	1000.	.00	140.00	SOFT	0.	NO	0.	0.
31	2000.	.00	120.00	SOFT	0.	NO	0.	0.
32	4000.	.00	120.00	SOFT	0.	NO	0.	0.
33	6000.	.00	120.00	SOFT	0.	NO	0.	0.
34	8000.	.00	140.00	SOFT	0.	NO	0.	0.
35	12000.	.00	130.00	SOFT	0.	NO	0.	0.
36	500.	337.50	150.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	150.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	120.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	120.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	160.00	SOFT	0.	NO	0.	0.
41	8000.	337.50	170.00	SOFT	0.	NO	0.	0.

42	12000.	337.50	170.00	SOFT	0.	YES	9100.	210.
43	500.	315.00	150.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	150.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	120.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	120.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	190.00	SOFT	0.	NO	0.	0.
48	8000.	315.00	170.00	SOFT	0.	YES	6000.	190.
49	12000.	315.00	190.00	SOFT	0.	YES	9200.	300.
50	500.	292.50	150.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	150.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	150.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	130.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	160.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	170.00	SOFT	0.	YES	6500.	190.
56	12000.	292.50	155.00	SOFT	0.	YES	11400.	190.
57	500.	270.00	150.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	150.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	150.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	160.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	170.00	SOFT	0.	YES	5900.	180.
62	8000.	270.00	170.00	SOFT	0.	NO	0.	0.
63	12000.	270.00	180.00	SOFT	0.	YES	10700.	220.
64	500.	247.50	150.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	140.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	170.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	180.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	170.00	SOFT	0.	YES	4600.	210.
69	8000.	247.50	170.00	SOFT	0.	YES	4600.	210.
70	12000.	247.50	200.00	SOFT	0.	YES	11300.	260.
71	500.	225.00	150.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	150.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	170.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	200.00	SOFT	0.	NO	0.	0.
75	6000.	225.00	150.00	SOFT	0.	YES	4300.	250.
76	8000.	225.00	180.00	SOFT	0.	YES	4300.	250.
77	12000.	225.00	180.00	SOFT	0.	YES	4300.	250.
78	500.	202.50	150.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	150.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	140.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	170.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	130.00	SOFT	0.	YES	4200.	200.
83	8000.	202.50	150.00	SOFT	0.	YES	4200.	200.
84	12000.	202.50	150.00	SOFT	0.	YES	4200.	200.
85	500.	180.00	150.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	145.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	140.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	140.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	120.00	SOFT	0.	NO	0.	0.
90	8000.	180.00	120.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	120.00	SOFT	0.	NO	0.	0.
92	500.	157.50	150.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	130.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	130.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	130.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	130.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	130.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	175.00	SOFT	0.	YES	10300.	190.
99	500.	135.00	140.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	130.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	130.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	120.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	120.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	130.00	SOFT	0.	NO	0.	0.
105	12000.	135.00	130.00	SOFT	0.	NO	0.	0.
106	500.	112.50	140.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	130.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	120.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	120.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	120.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	130.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	130.00	SOFT	0.	NO	0.	0.

1

0 NEW HAMPHSIRE YANKEE

KI-02

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
1	WS-4000	125.3	127.3	.0	.0	.0	.0	126.0	121.0	111.0	106.0	1.0

0 XO= .00 YO= .00 ZO= 203.00 HEIGHT ABOVE GROUND= 53.00

/

1

NEW HAMPHSIRE YANKEE

KI-02

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

1

NEW HAMPHSIRE YANKEE

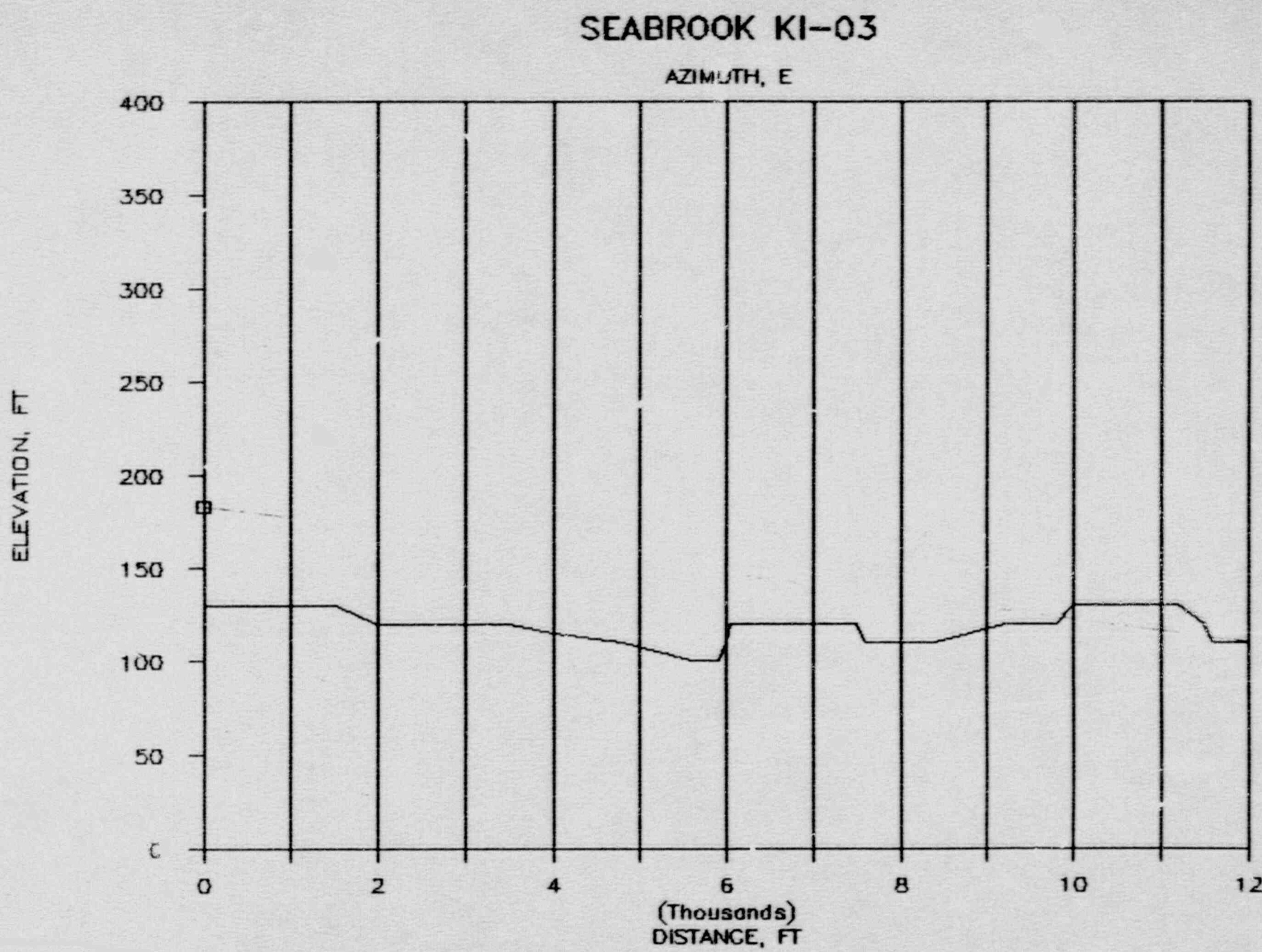
KI-02

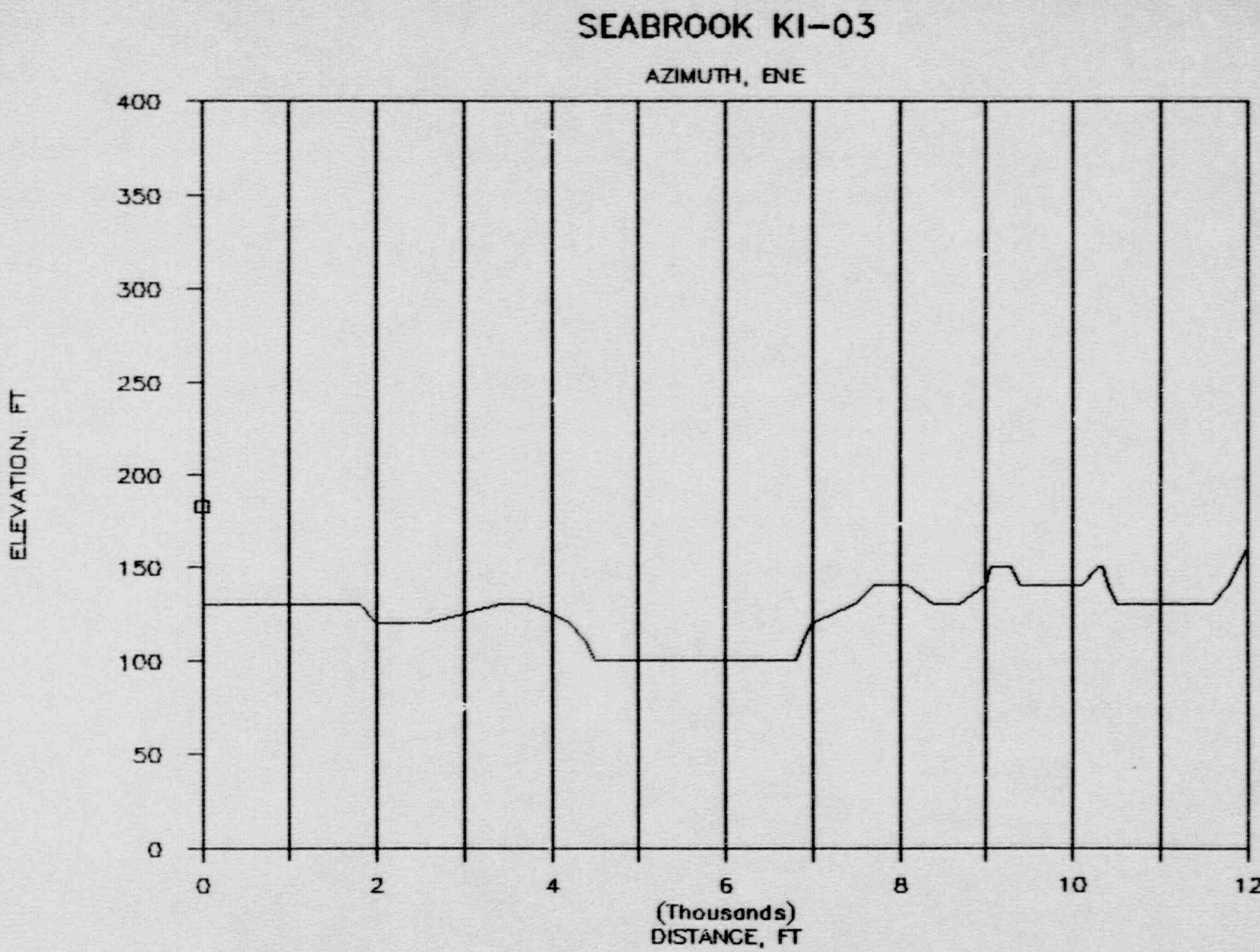
SOUND PRESSURE LEVELS IN DBC

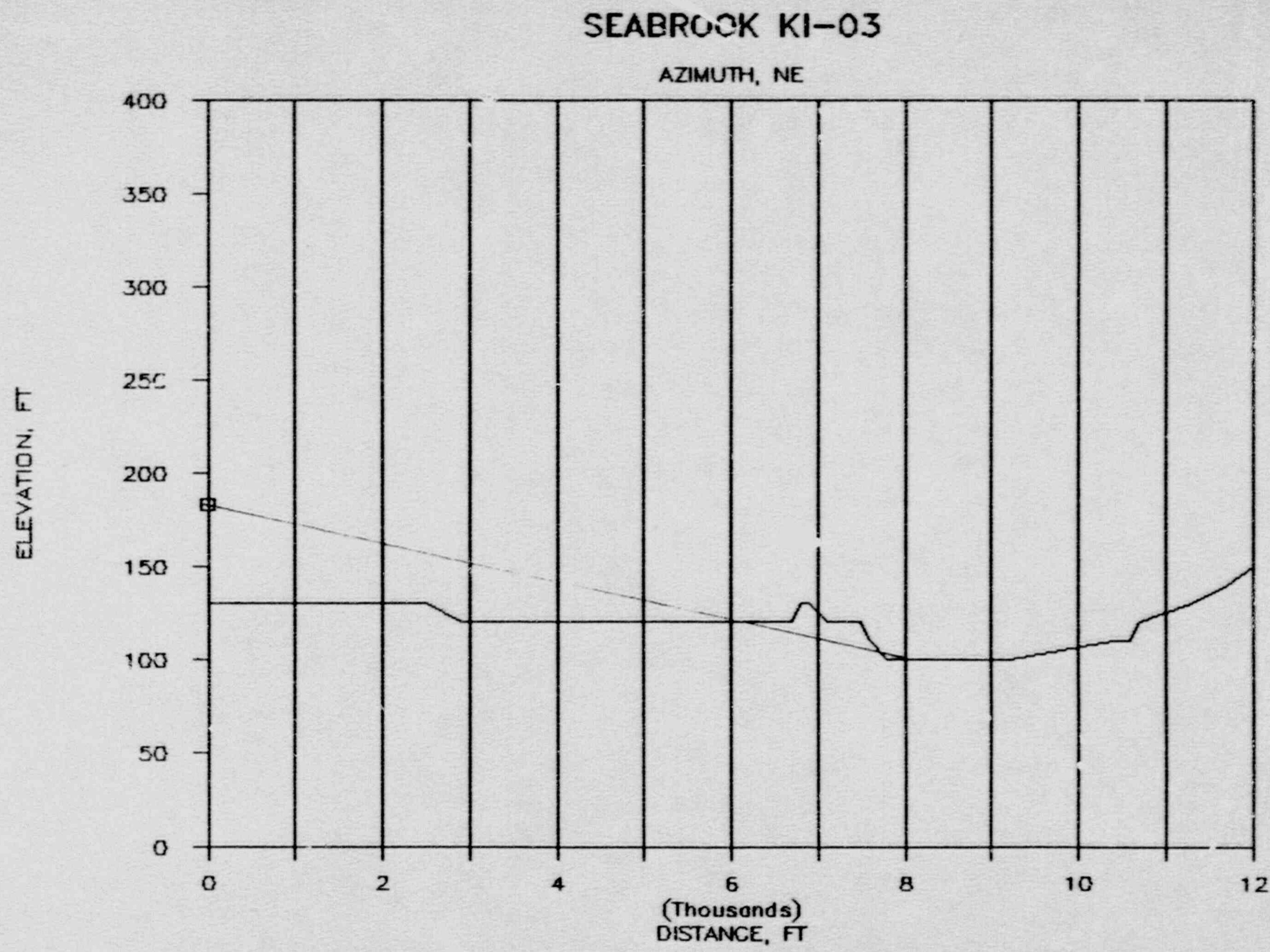
UNDER MET CONDITION 1

DISTANCE IN FEET

AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
[illegible]	111.6	99.7	90.2	82.3	76.0	68.6	54.7
[illegible]	111.6	99.7	90.2	82.3	76.5	69.2	55.7
[illegible]	111.6	99.7	90.2	82.3	76.5	71.5	52.3
NNE	111.6	99.7	90.2	82.3	76.5	71.5	62.4
N	111.6	99.7	90.2	82.3	76.5	71.5	62.4
NNW	111.6	99.7	90.2	82.3	76.5	71.5	55.3
NW	111.6	99.7	90.2	82.3	76.5	66.2	48.1
WNW	111.6	99.7	90.2	82.3	76.5	65.8	51.9
W	111.6	99.7	90.2	82.3	68.1	71.5	53.1
WSW	111.6	99.7	90.2	82.3	67.9	64.9	48.1
SW	111.6	99.7	90.2	82.3	61.9	61.1	53.4
SSW	111.6	99.7	90.2	82.3	66.1	65.1	57.1
S	111.6	99.7	90.2	82.3	76.5	71.5	62.4
SSE	111.6	99.7	90.2	82.3	76.5	71.5	57.1
SE	111.6	99.7	90.2	82.3	76.5	71.5	59.1
ESE	111.6	99.7	90.2	82.3	76.5	69.2	55.7


SEABROOK KI-03
AZIMUTH, E
400
350
300
250
200
150
100
50
0
ELEVATION, FT
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-03
AZIMUTH, ENE
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-03
AZIMUTH, NE
ELEVATION, FT
400
350
300
250
200
150
100
50
0
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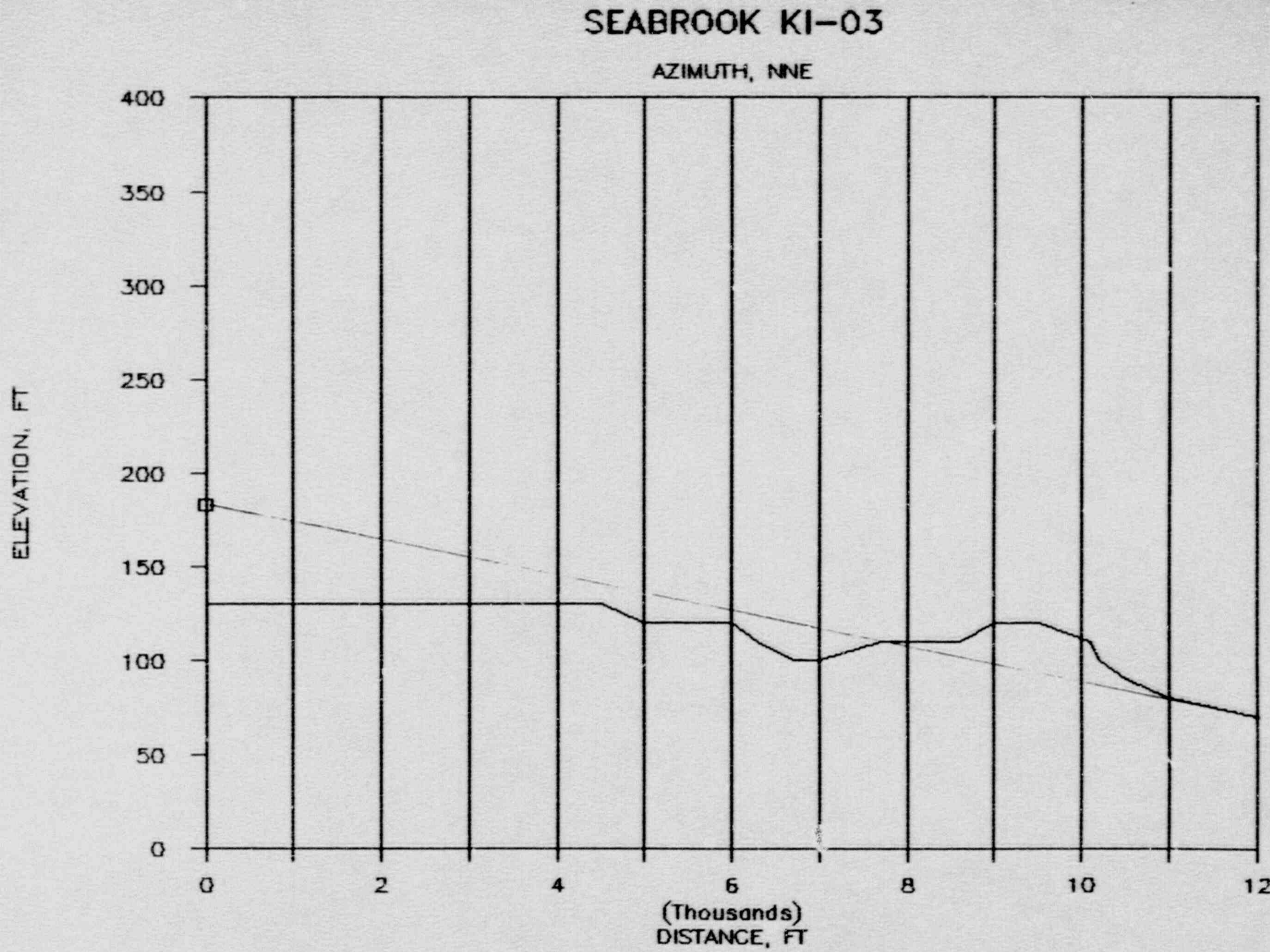
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-03
AZIMUTH, NNE
ELEVATION, FT
400
350
300
250
200
150
100
50
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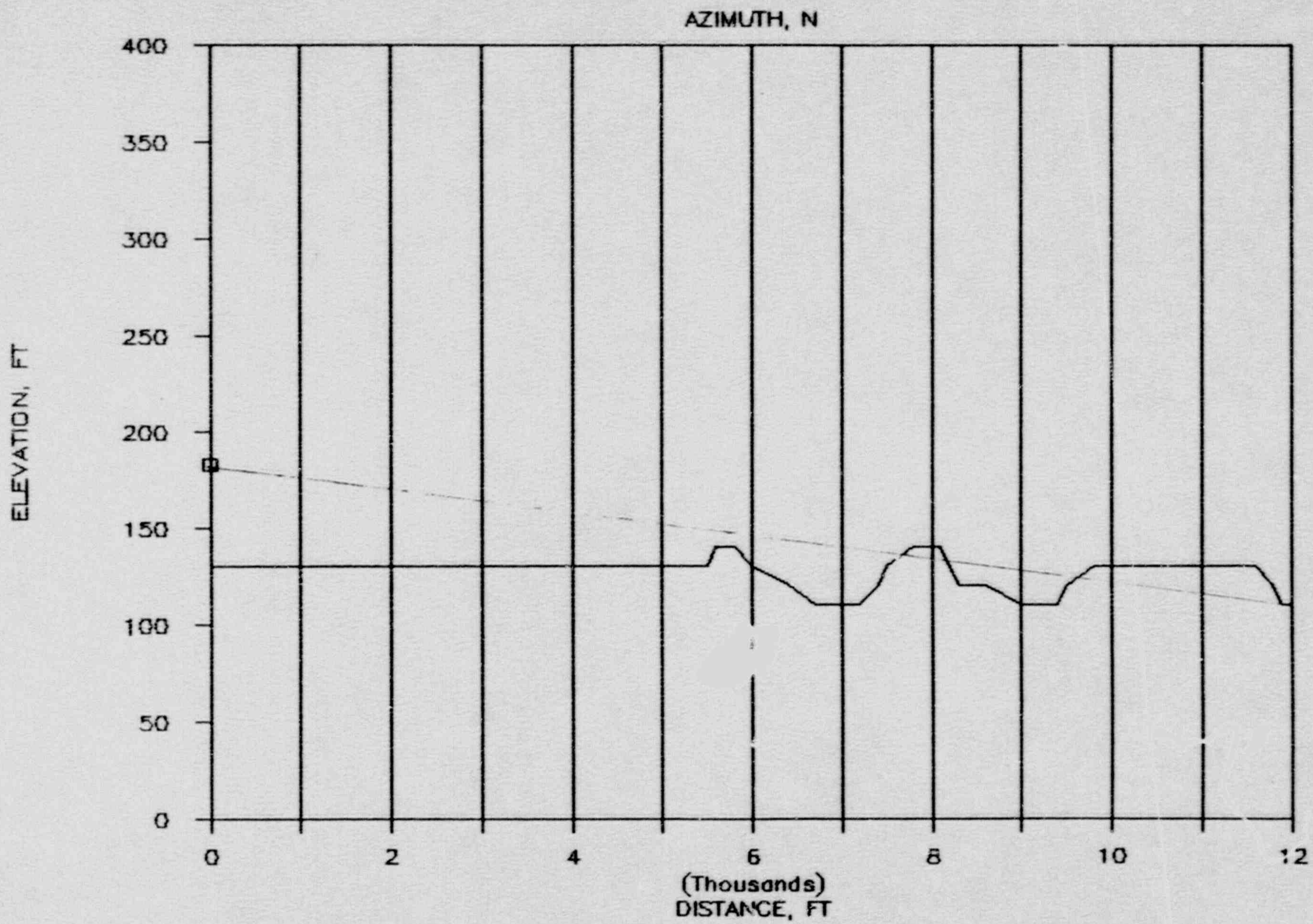
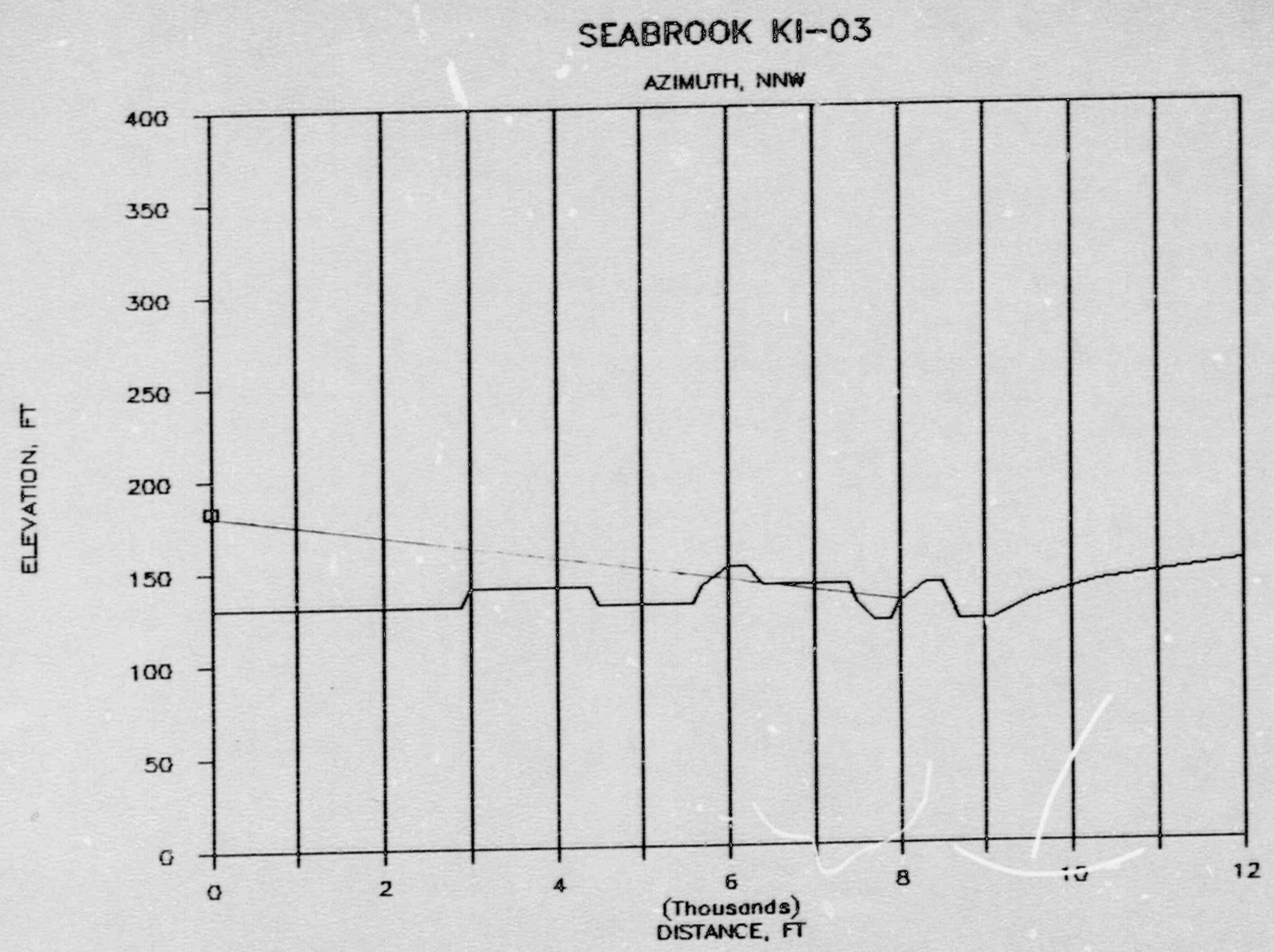
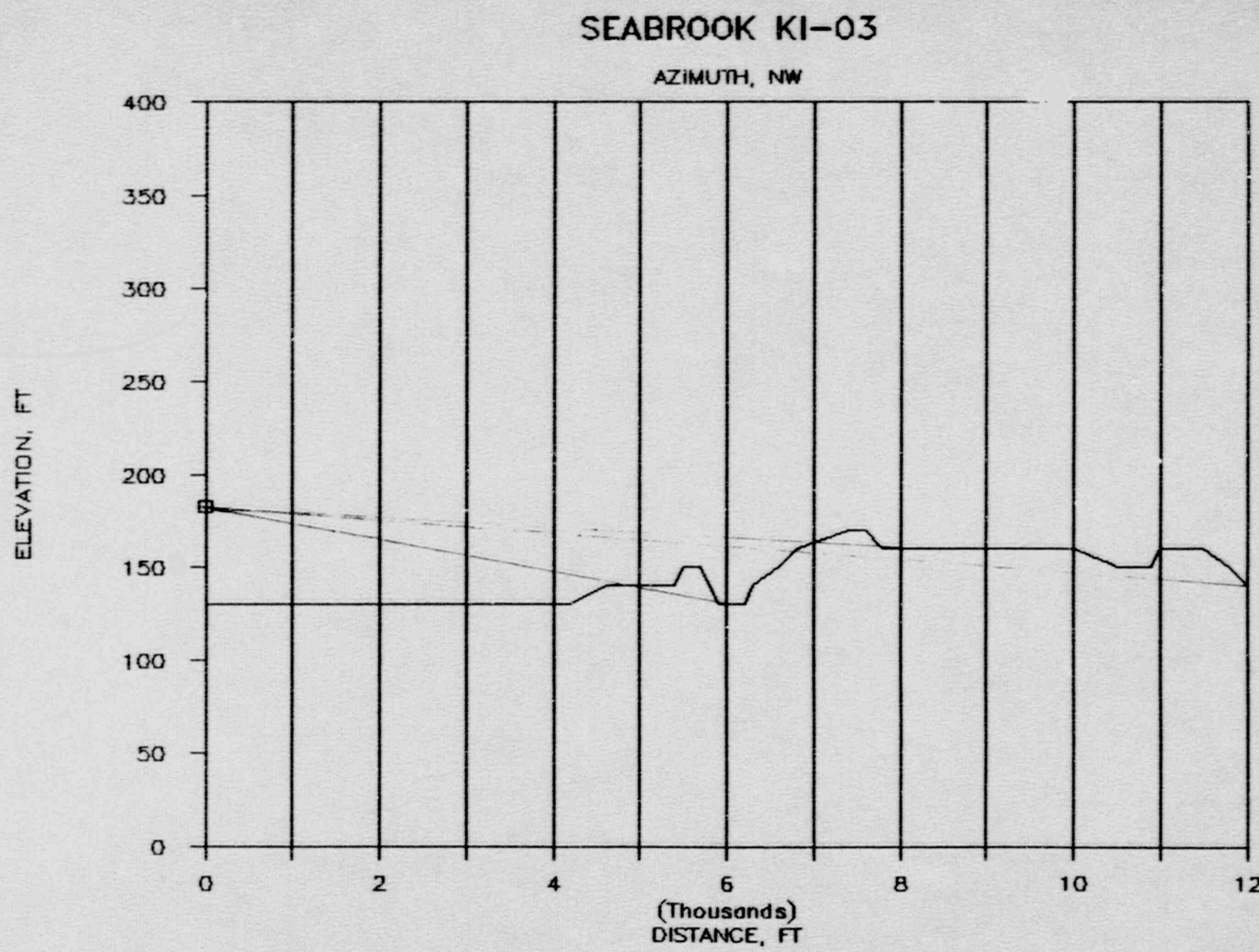
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK KI-03




SEABROOK KI-03
AZIMUTH, NNW
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT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AZIMUTH, NW
ELEVATION, FT
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200
150
100
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2
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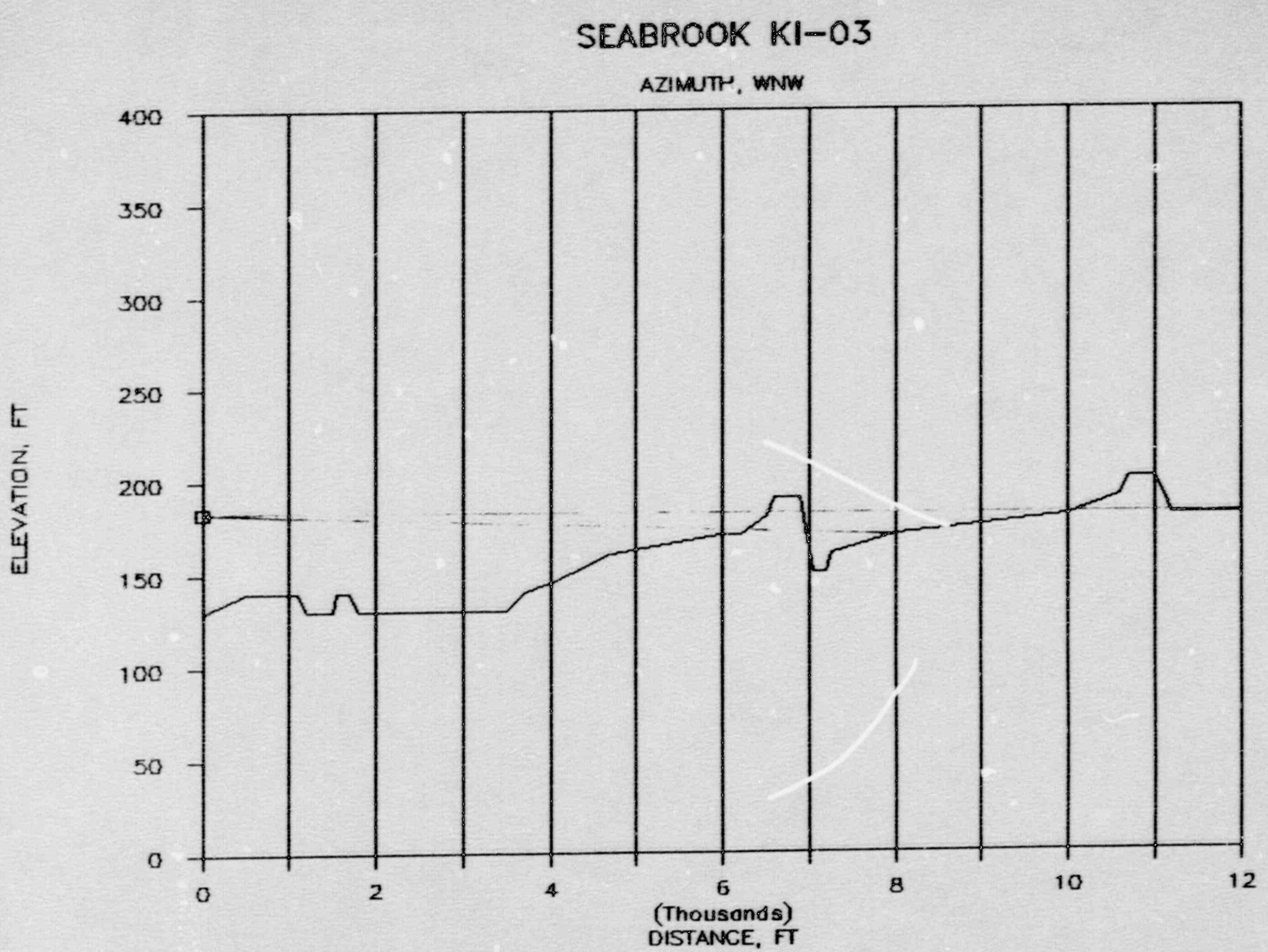
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-03
AZIMUTH, WNW
ELEVATION, FT
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200
150
100
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2
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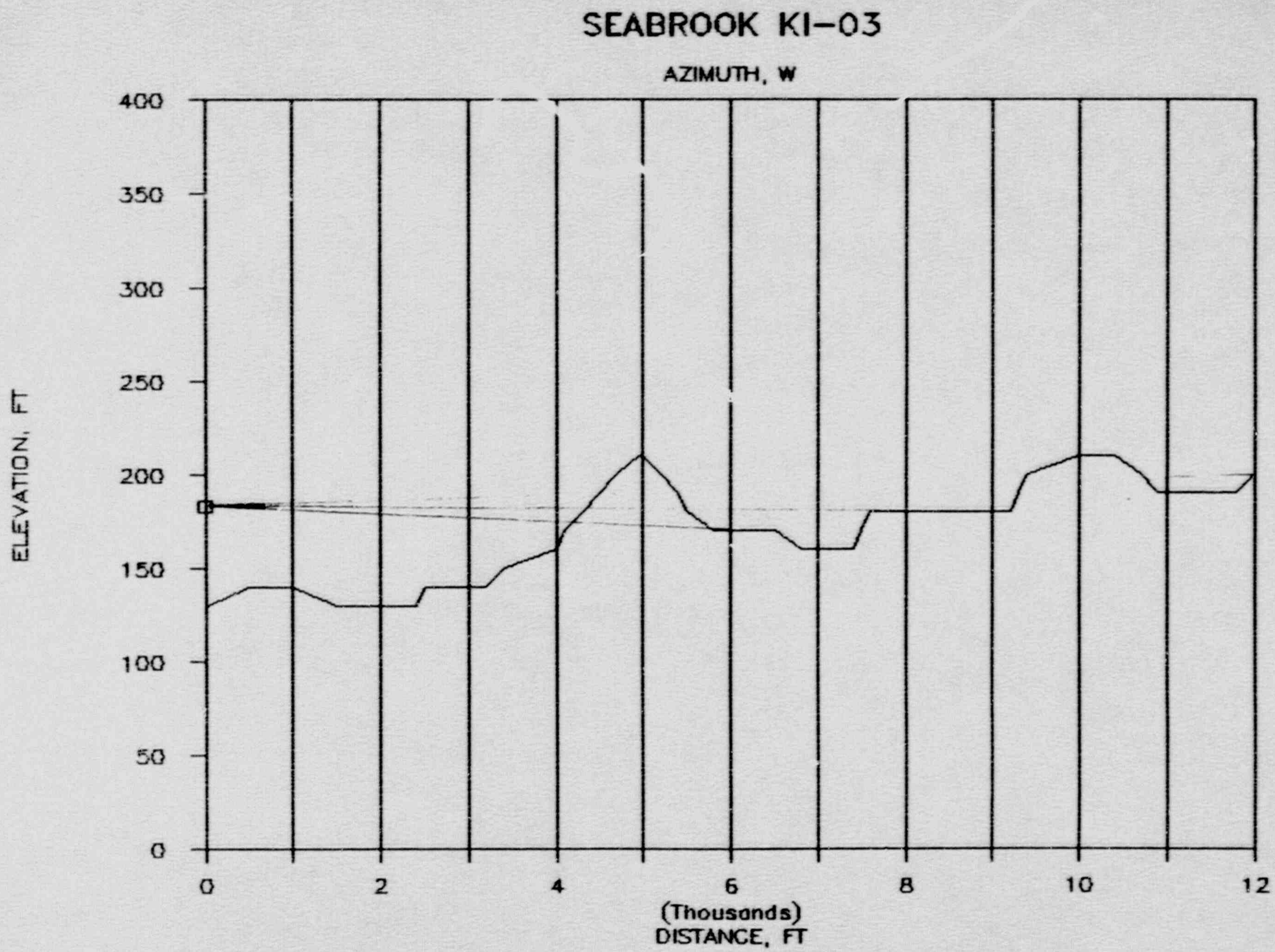
6
8
10
12
(Thousands)
DISTANCE, FT



SEABROOK KI-03
AZIMUTH, W
ELEVATION, FT
400
350
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250
200
150
100
50
0
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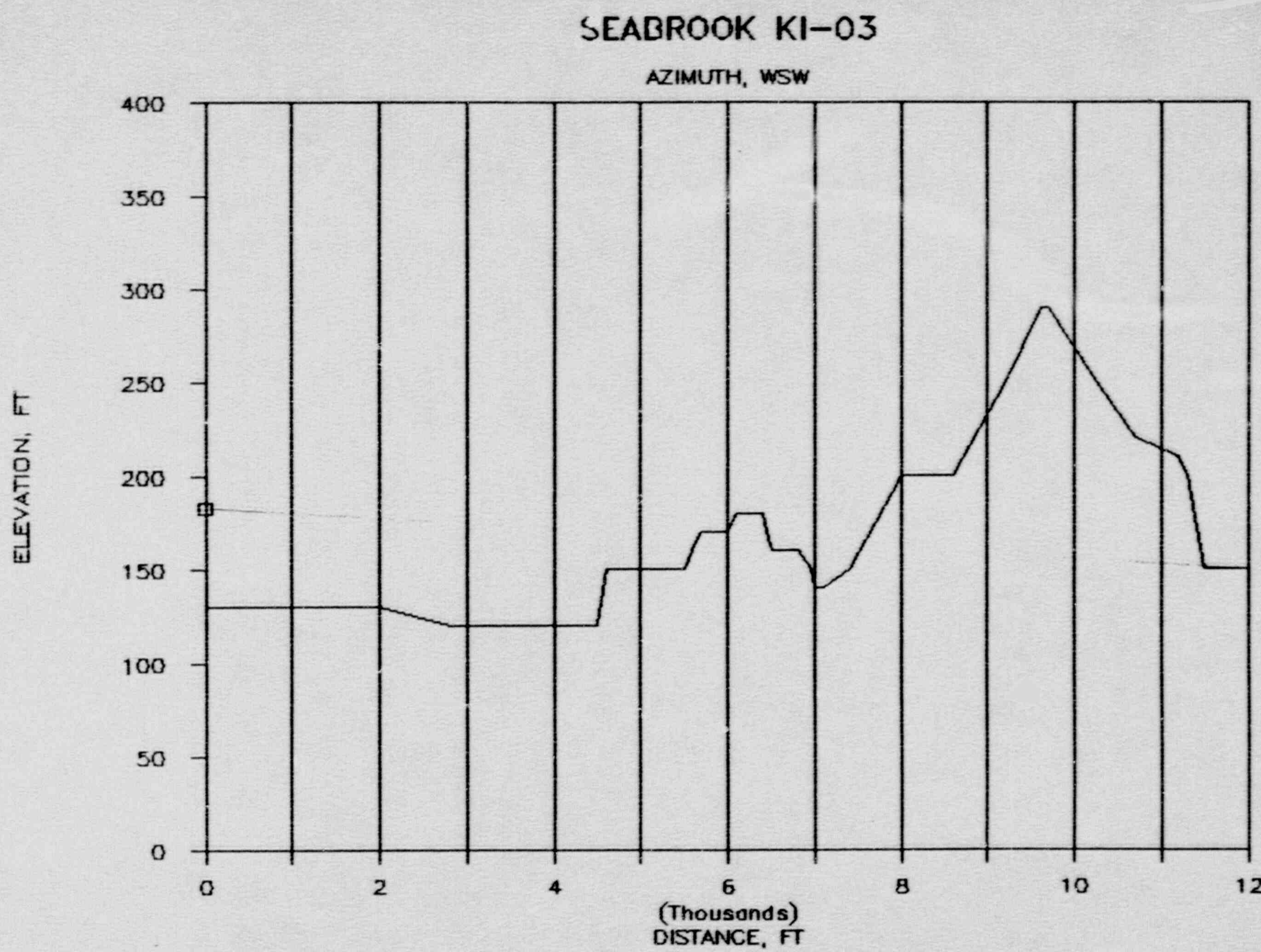
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK KI-03
AZIMUTH, WSW
ELEVATION, FT
400
350
300
250
200
150
100
50
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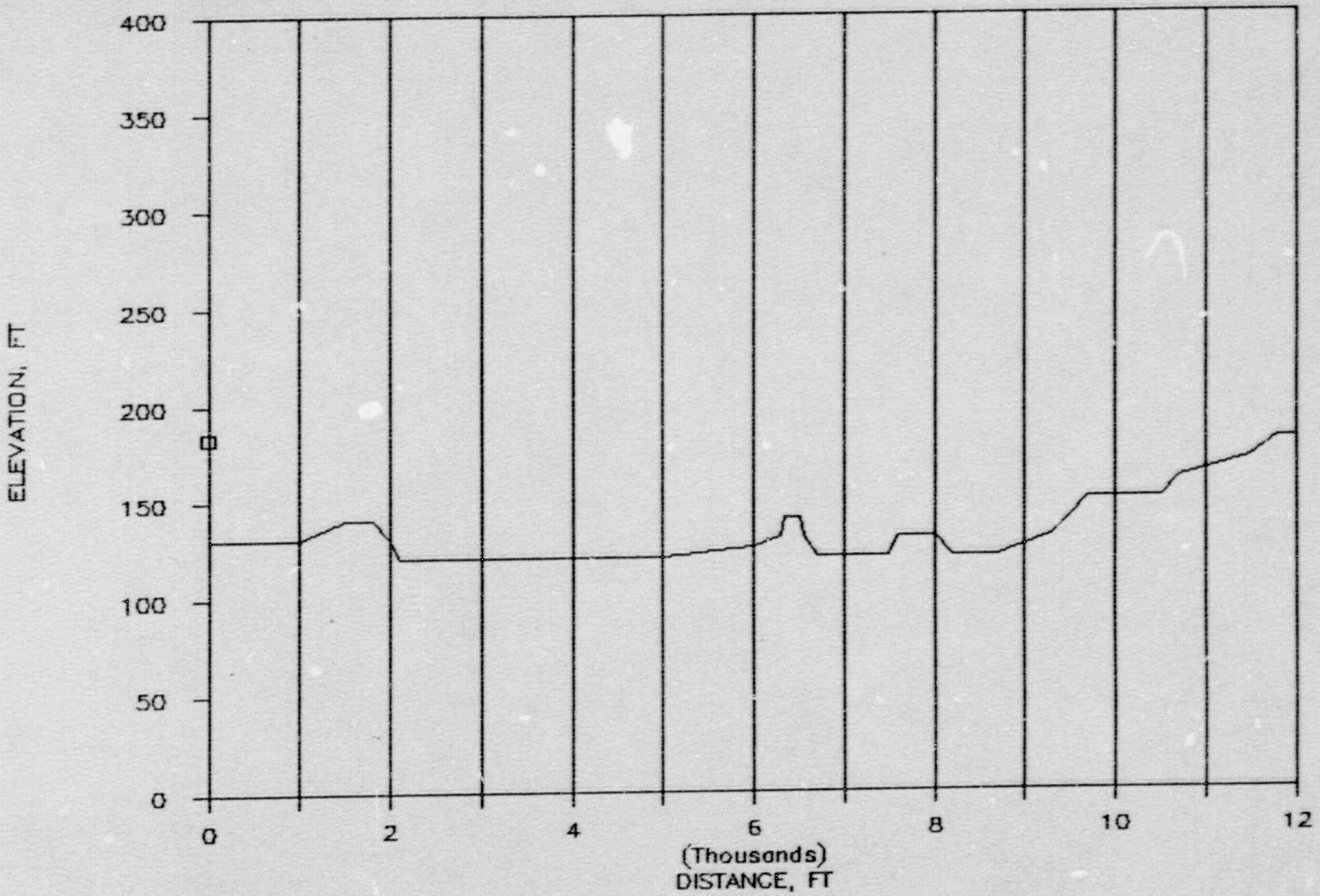
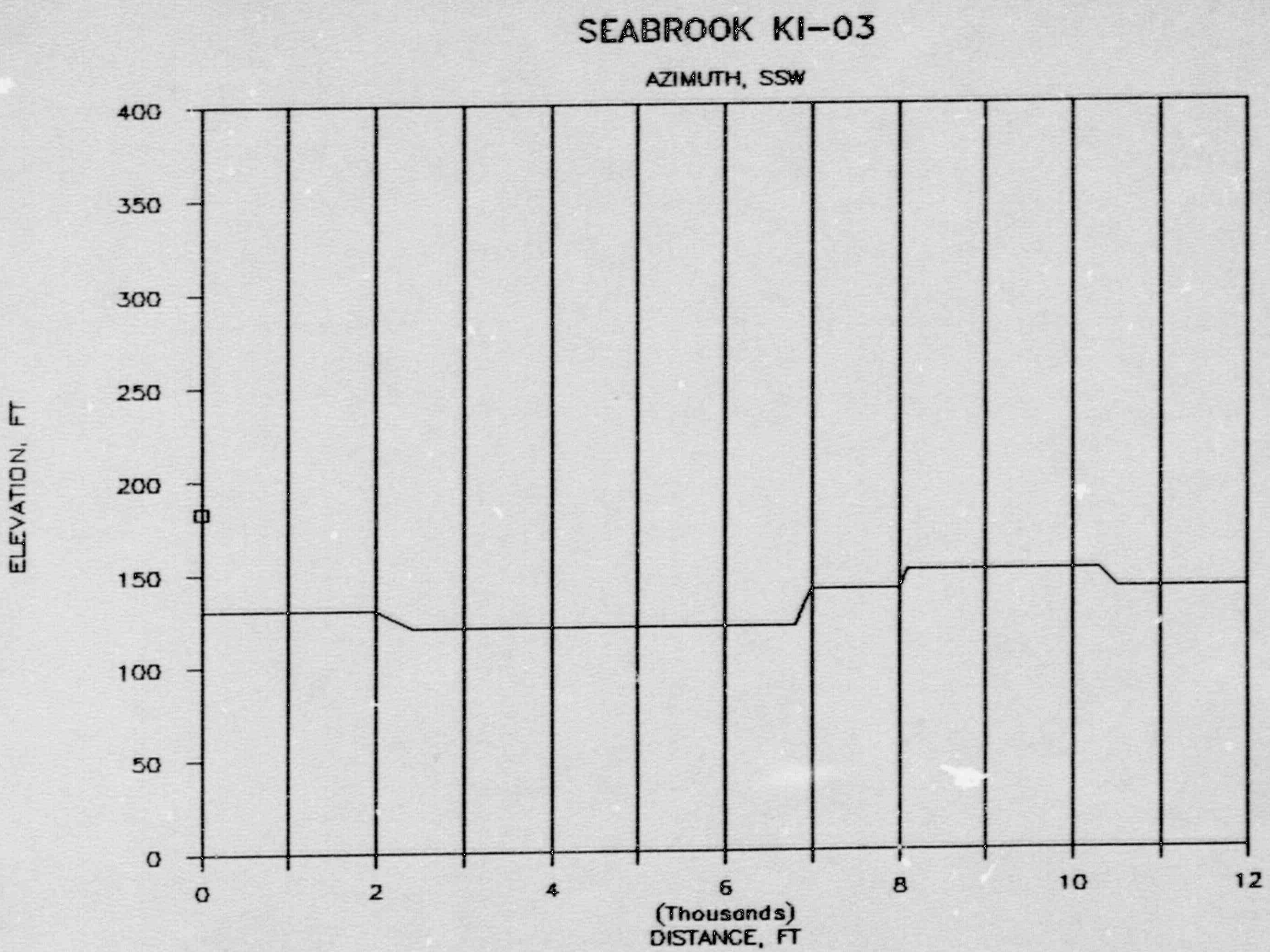
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK KI-03

AZIMUTH, SW




SEABROOK KI-03
AZIMUTH, SSW
ELEVATION, FT
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350
300
250
200
150
100
50
0
0
2
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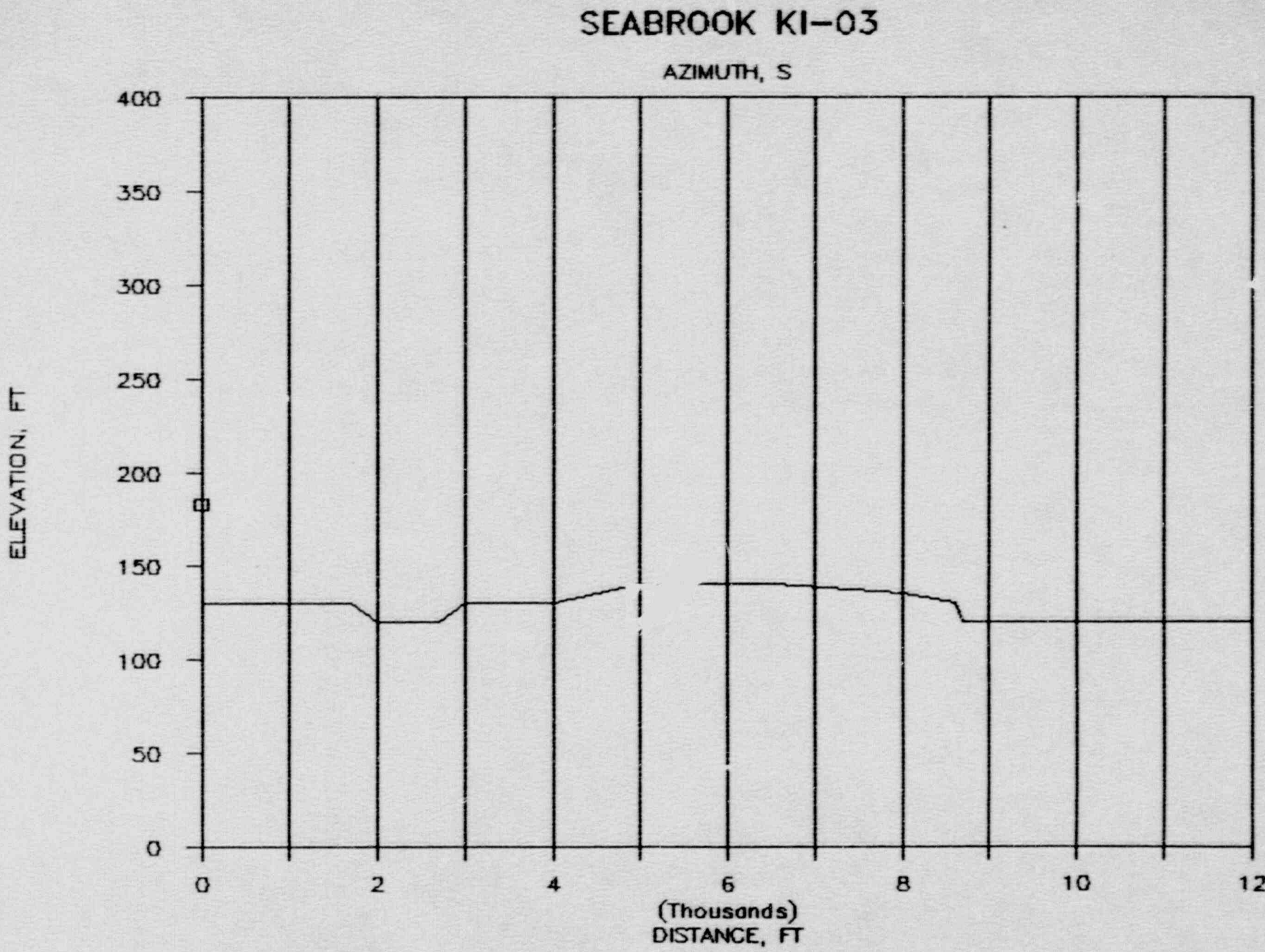
12
(Thousands)
DISTANCE, FT


SEABROOK KI-03
AZIMUTH, S
ELEVATION, FT
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300
250
200
150
100
50
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0
2
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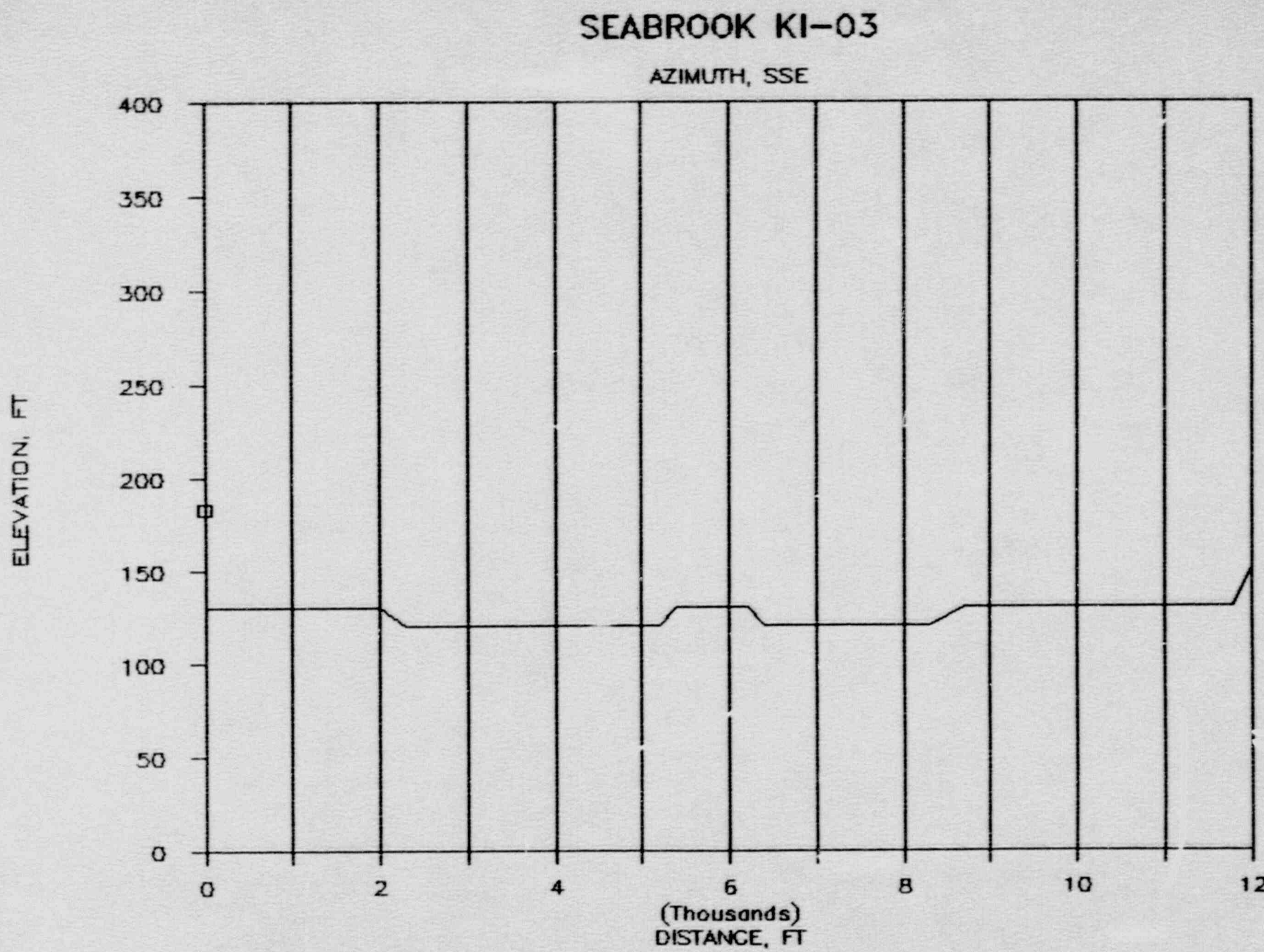
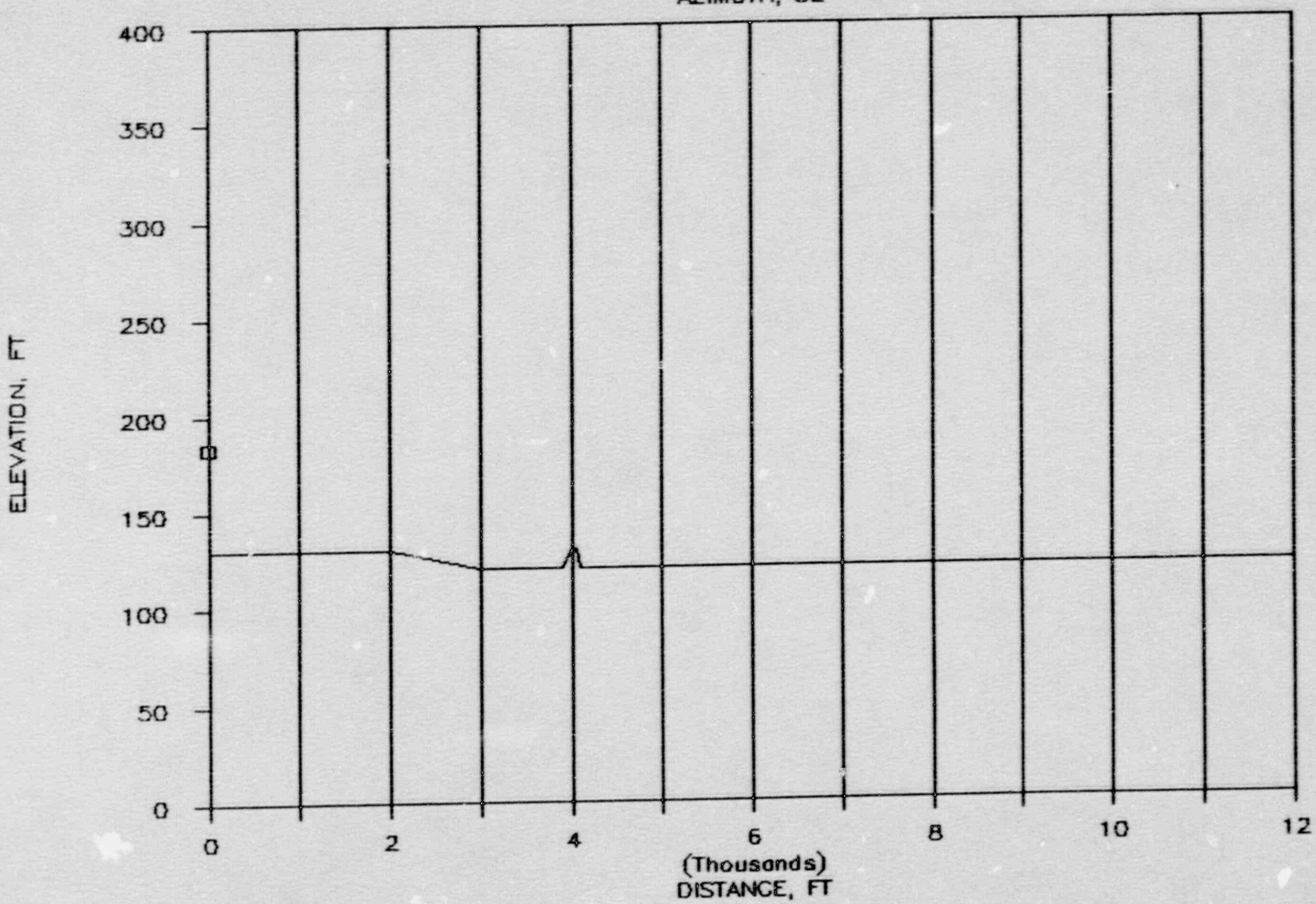
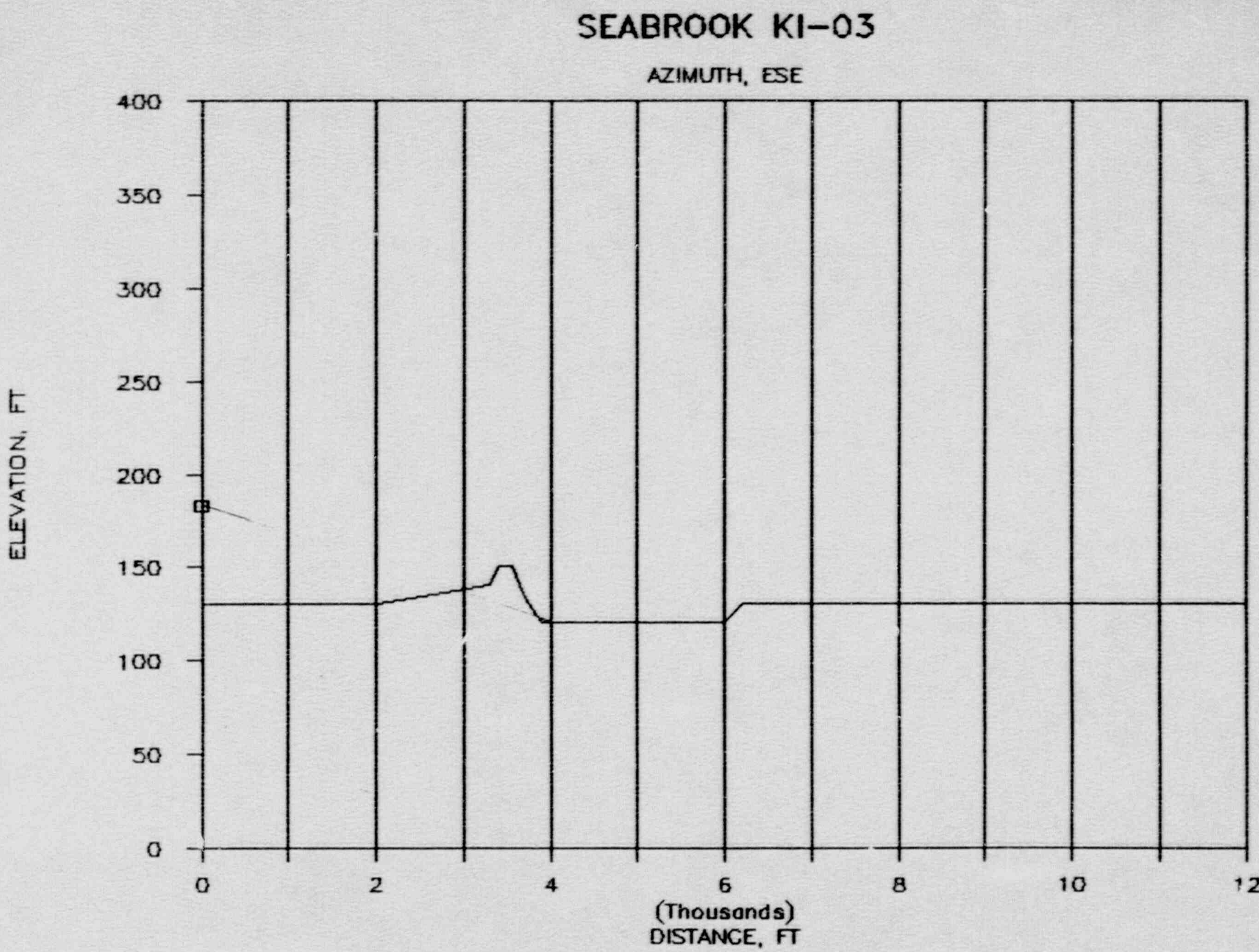
12
(Thousands)
DISTANCE, FT


SEABROOK KI-03
AZIMUTH, SSE
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK KI-03

AZIMUTH, SE




SEABROOK KI-03
AZIMUTH, ESE
ELEVATION, FT
400
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

NEW HAMPHSIRE YANKEE

KI-03

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	130.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	130.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	120.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	115.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	110.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	110.00	SOFT	0.	NO	0.	0.
7	12000.	90.00	110.00	SOFT	0.	YES	11200.	130.
8	500.	67.50	130.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	130.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	120.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	125.00	SOFT	0.	NO	0.	0.
12	6000.	67.50	100.00	SOFT	0.	NO	0.	0.
13	8000.	67.50	140.00	SOFT	0.	NO	0.	0.
14	12000.	67.50	160.00	SOFT	0.	NO	0.	0.
15	500.	45.00	130.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	130.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	130.00	SOFT	0.	NO	0.	0.
18	4000.	45.00	120.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	120.00	SOFT	0.	NO	0.	0.
20	8000.	45.00	100.00	SOFT	0.	YES	6800.	130.
21	12000.	45.00	150.00	SOFT	0.	NO	0.	0.
22	500.	22.50	130.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	130.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	130.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	130.00	SOFT	0.	NO	0.	0.
26	6000.	22.50	12[illegible].00	SOFT	0.	NO	0.	0.
27	8000.	22.50	110.00	SOFT	0.	NO	0.	0.
28	12000.	22.50	70.00	SOFT	0.	YES	9500.	120.
29	500.	.00	130.00	SOFT	0.	NO	0.	0.
30	1000.	.00	130.00	SOFT	0.	NO	0.	0.
31	2000.	.00	130.00	SOFT	0.	NO	0.	0.
32	4000.	.00	130.00	SOFT	0.	NO	0.	0.
33	6000.	.00	130.00	SOFT	0.	NO	0.	0.
34	8000.	.00	140.00	SOFT	0.	NO	0.	0.
35	12000.	.00	110.00	SOFT	0.	YES	11600.	130.
36	500.	337.50	130.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	130.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	130.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	140.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	150.00	SOFT	0.	NO	0.	0.
41	8000.	337.50	130.00	SOFT	0.	YES	6000.	150.

42	12000.	337.50	150.00	SOFT	0.	NO	0.	0.
43	500.	315.00	130.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	130.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	130.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	130.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	130.00	SOFT	0.	YES	5700.	150.
48	8000.	315.00	160.00	SOFT	0.	YES	7600.	170.
49	12000.	315.00	140.00	SOFT	0.	YES	7600.	170.
50	500.	292.50	140.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	140.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	130.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	145.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	170.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	170.00	SOFT	0.	YES	6900.	190.
56	12000.	292.50	180.00	SOFT	0.	YES	11000.	200.
57	500.	270.00	140.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	140.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	130.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	160.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	170.00	SOFT	0.	YES	5000.	210.
62	8000.	270.00	180.00	SOFT	0.	YES	5000.	210.
63	12000.	270.00	200.00	SOFT	0.	YES	5000.	210.
64	500.	247.50	130.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	130.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	130.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	120.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	170.00	SOFT	0.	NO	0.	0.
69	8000.	247.50	200.00	SOFT	0.	NO	0.	0.
70	12000.	247.50	150.00	SOFT	0.	YES	9600.	290.
71	500.	225.00	130.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	130.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	130.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	120.00	SOFT	0.	NO	0.	0.
75	6000.	225.00	125.00	SOFT	0.	NO	0.	0.
76	8000.	225.00	130.00	SOFT	0.	NO	0.	0.
77	12000.	225.00	180.00	SOFT	0.	NO	0.	0.
78	500.	202.50	130.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	130.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	130.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	120.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	120.00	SOFT	0.	NO	0.	0.
83	8000.	202.50	140.00	SOFT	0.	NO	0.	0.
84	12000.	202.50	140.00	SOFT	0.	NO	0.	0.
85	500.	180.00	130.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	130.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	120.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	130.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	140.00	SOFT	0.	NO	0.	0.
90	8000.	180.00	135.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	120.00	SOFT	0.	NO	0.	0.
92	500.	157.50	130.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	130.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	130.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	120.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	130.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	120.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	150.00	SOFT	0.	NO	0.	0.
99	500.	135.00	130.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	130.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	130.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	130.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	120.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	120.00	SOFT	0.	NO	0.	0.
105	12000.	135.00	120.00	SOFT	0.	NO	0.	0.
106	500.	112.50	130.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	130.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	130.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	120.00	SOFT	0.	YES	3550.	150.
110	6000.	112.50	120.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	130.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	130.00	SOFT	0.	NO	0.	0.

NEW HAMPHSIRE YANKEE

KI-03

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
1	WS-4000	125.3	127.3	.0	.0	.0	.0	126.0	121.0	111.0	106.0	100.0

0 XO= .00 YO= .00 ZO= 283.00 HEIGHT ABOVE GROUND= 53.00

NEW HAMPHSIRE YANKEE

KI-03

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

NEW HAMPHSIRE YANKEE

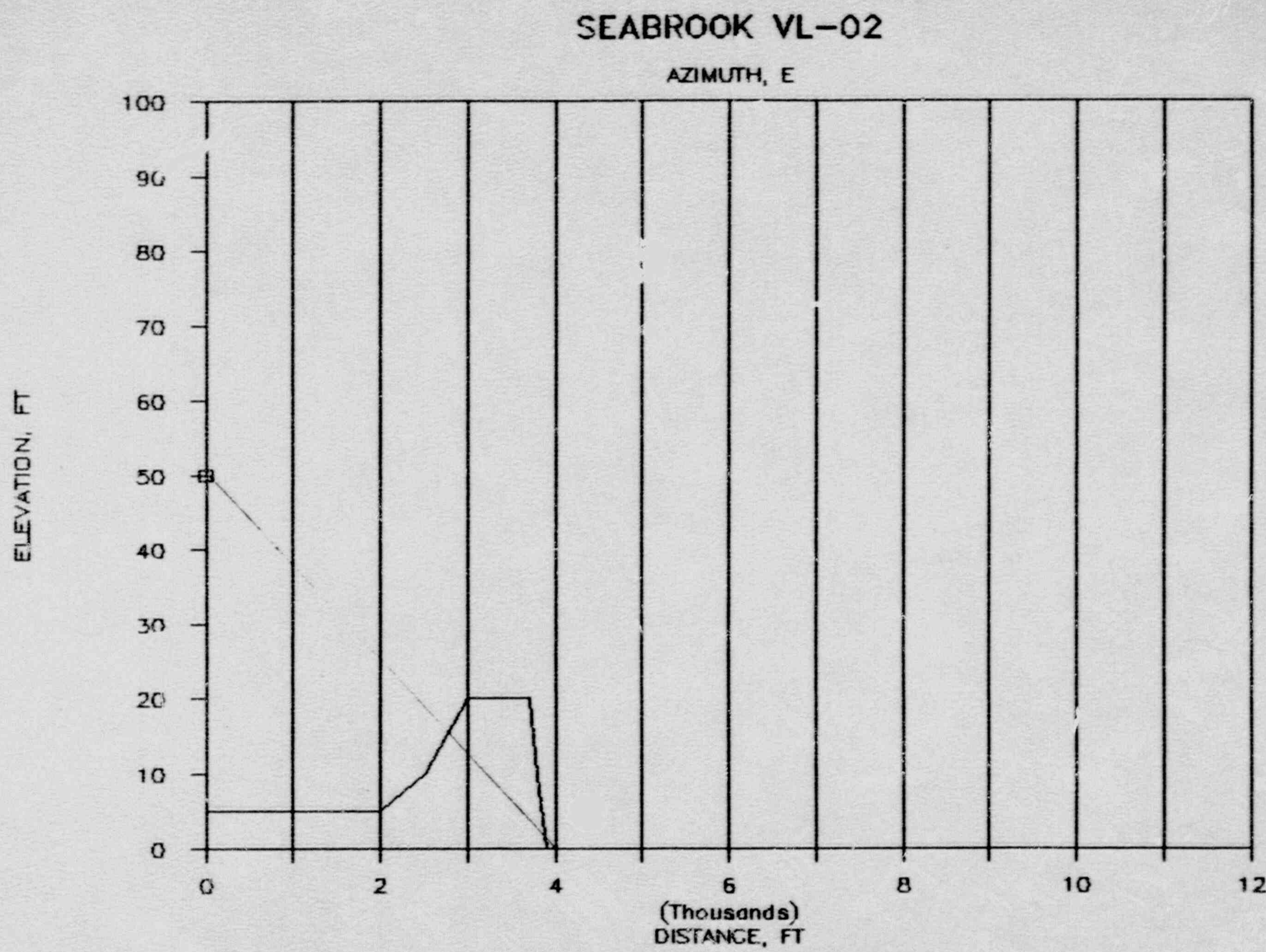
KI-03

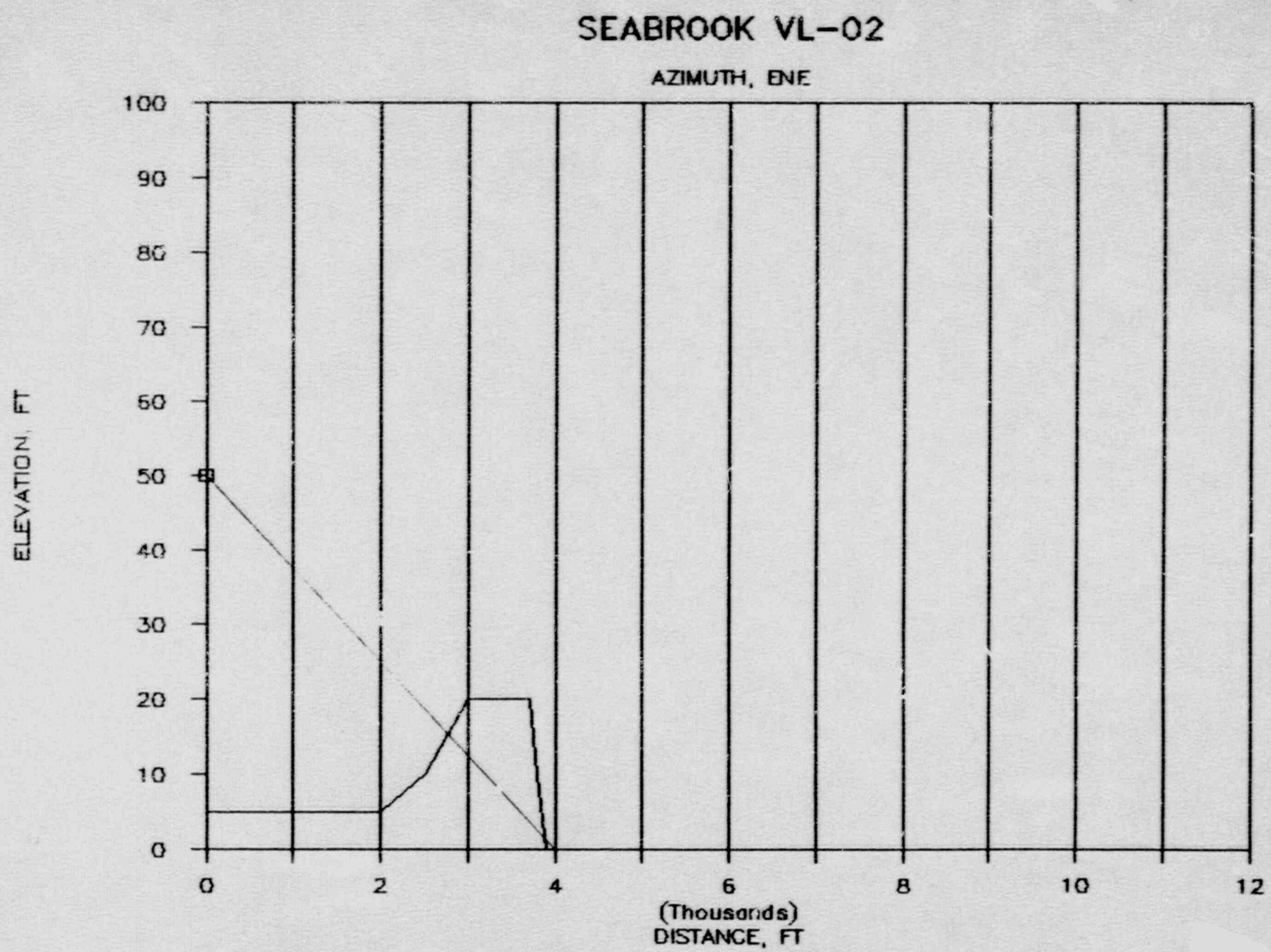
SOUND PRESSURE LEVELS IN DBC

UNDER MET CONDITION 1

DISTANCE IN FEET

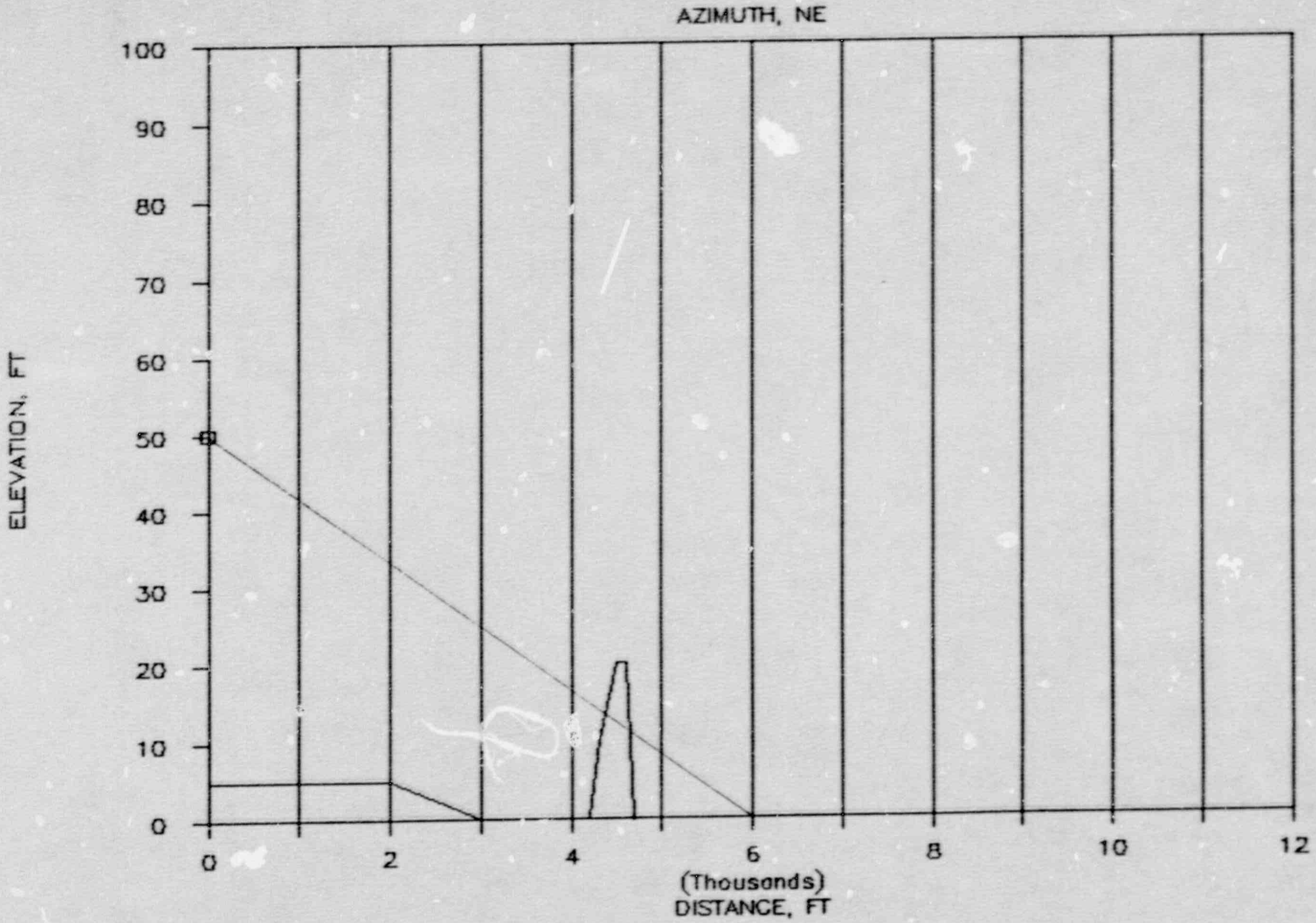
AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	111.0	99.5	90.1	82.3	76.0	68.6	49.3
ENE	111.0	99.5	90.1	82.3	76.5	69.2	55.7
NE	111.0	99.5	90.1	82.3	76.5	66.7	59.1
NNE	111.0	99.5	90.1	82.3	76.5	71.5	57.5
N	111.0	99.5	90.1	82.3	76.5	71.5	55.1
NNW	111.0	99.5	90.1	82.3	76.5	65.5	62.4
NW	111.0	99.5	90.1	82.3	69.2	66.5	56.6
WNW	111.1	99.5	90.1	82.3	76.5	66.6	56.8
W	111.1	99.5	90.1	82.3	69.2	66.5	55.2
WSW	111.0	99.5	90.1	82.3	76.5	71.5	47.2
SW	111.0	99.5	90.1	82.3	76.5	71.5	62.4
SSW	111.0	99.5	90.1	82.3	76.5	71.5	62.4
S	111.0	99.5	90.1	82.3	76.5	71.5	62.4
SSE	111.0	99.5	90.1	82.3	76.5	71.5	62.4
SE	111.0	99.5	90.1	82.3	76.5	71.5	59.1
ESE	111.0	99.5	90.1	75.8	76.5	69.2	55.7

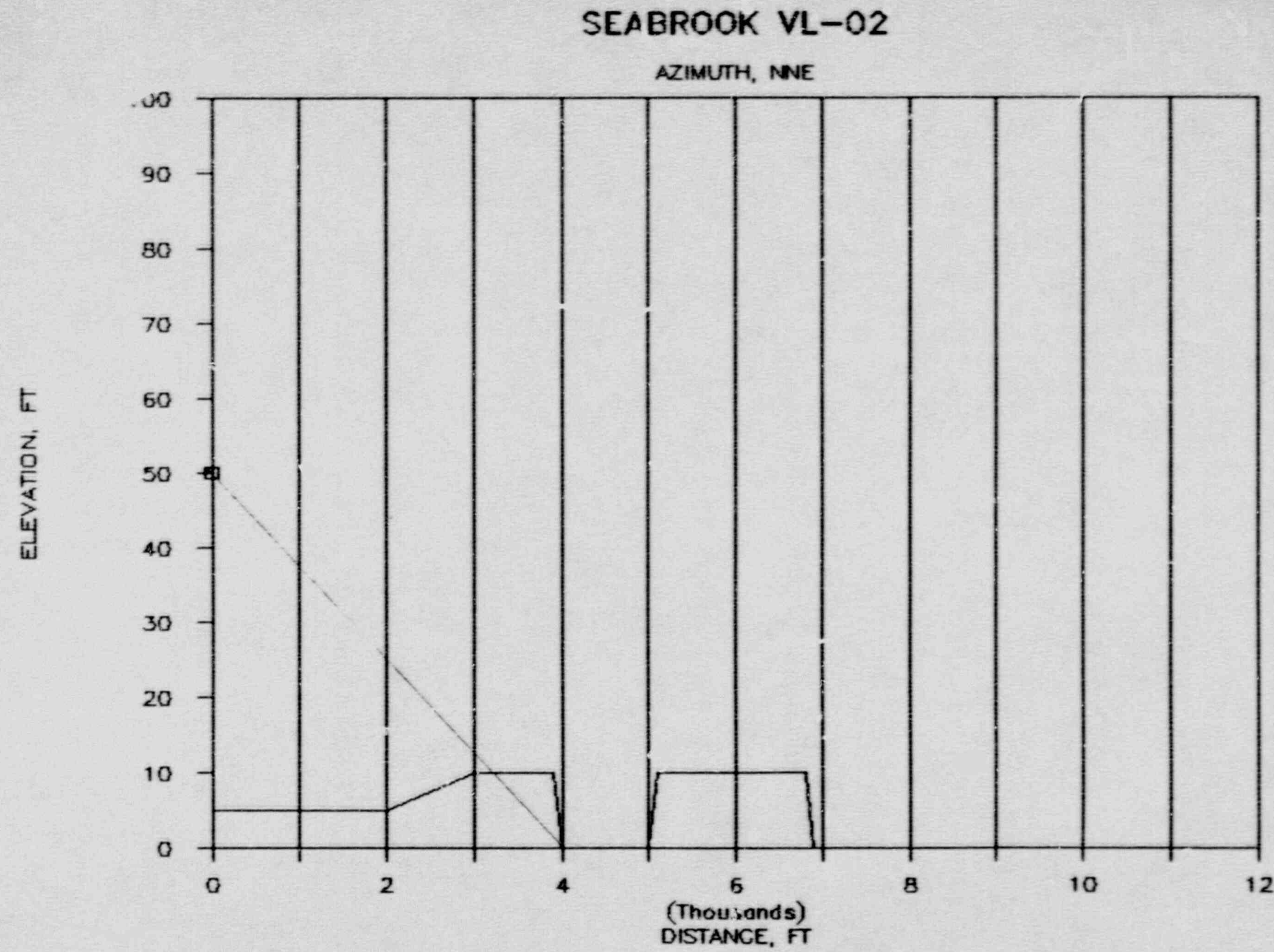

SEABROOK VL-02
AZIMUTH, E
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

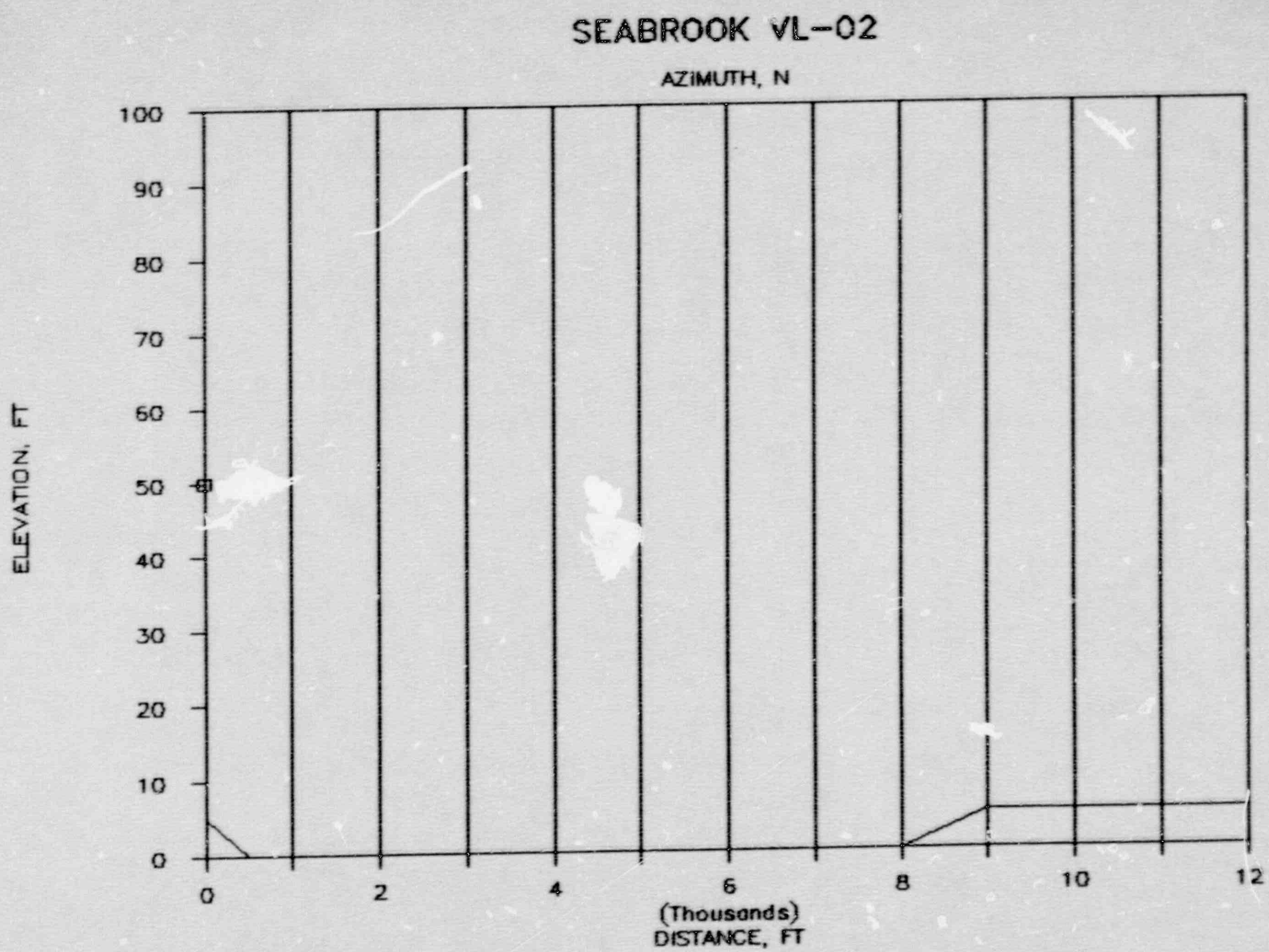


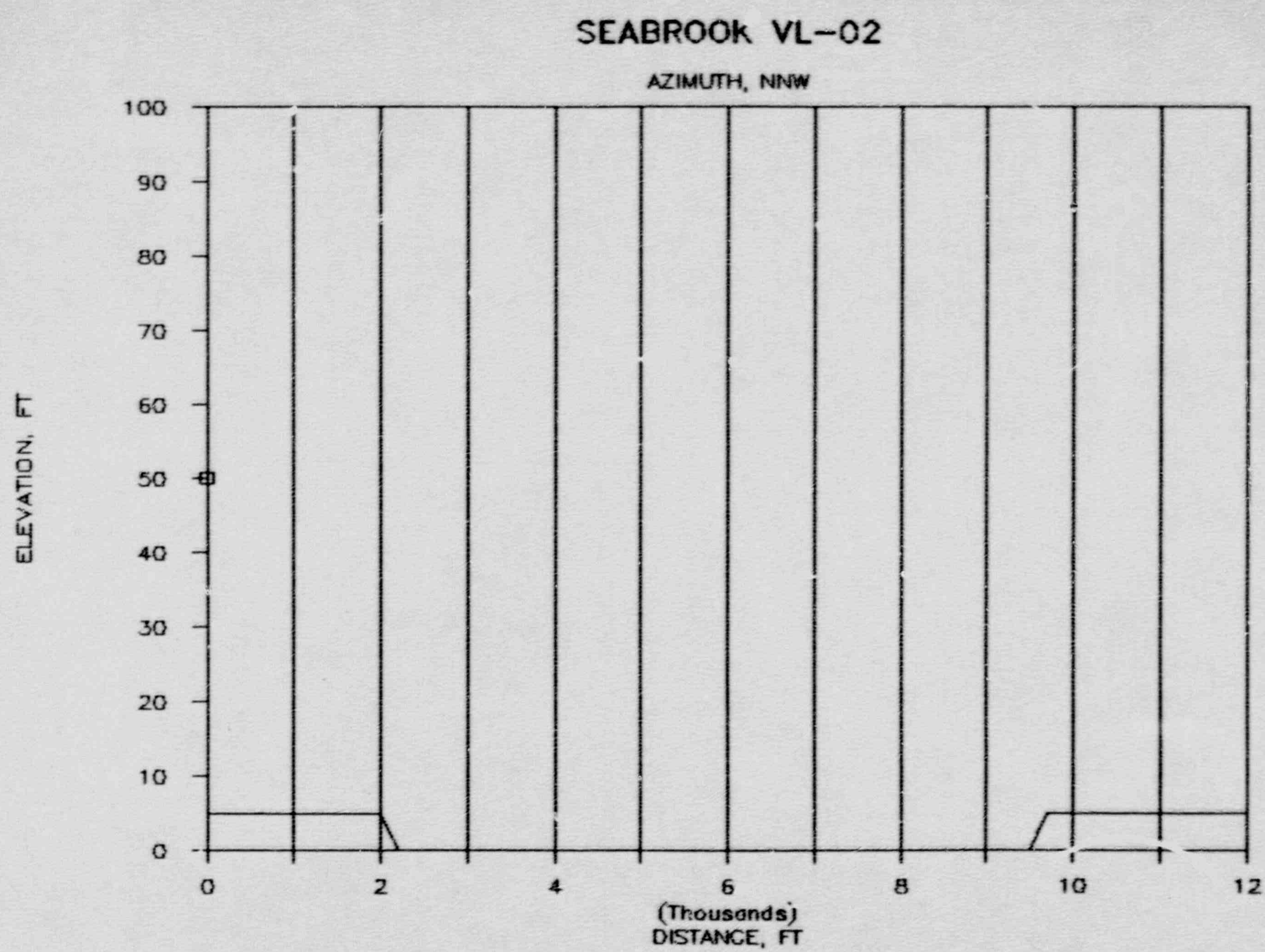
SEABROOK VL-02
AZIMUTH, ENE
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

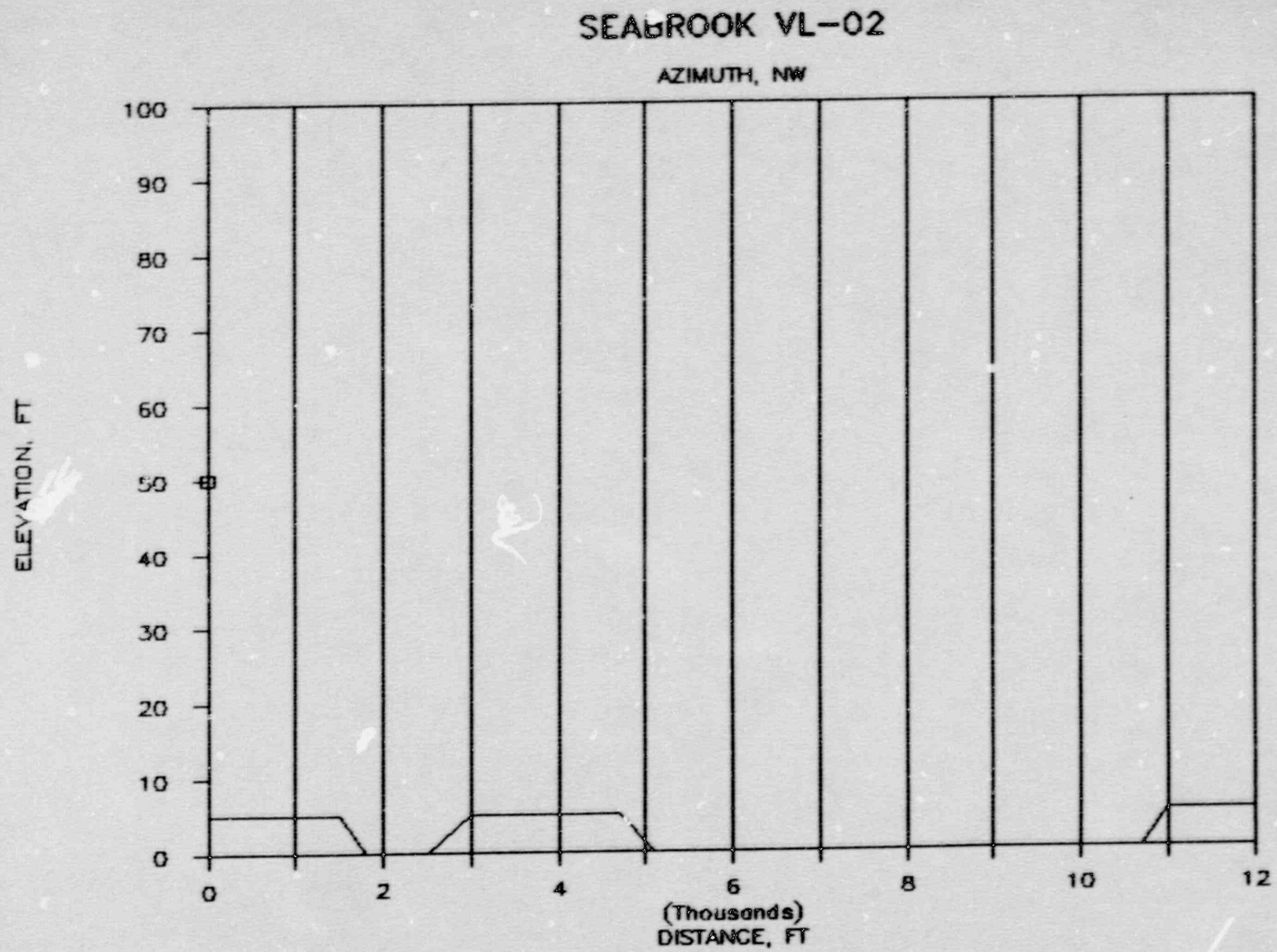
SEABROOK VL-02




SEABROOK VL-02
AZIMUTH, NNE
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

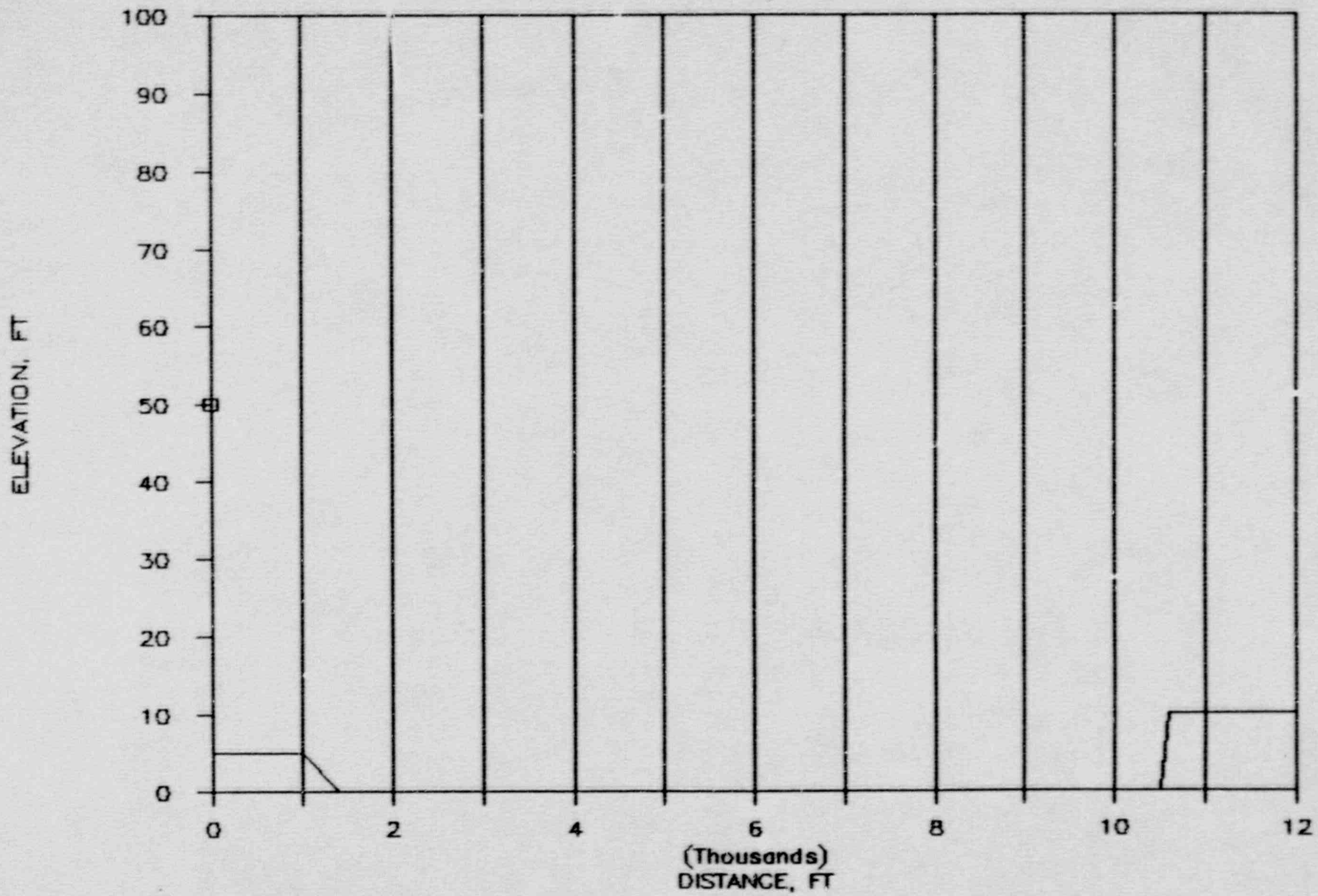

SEABROOK VL-02
AZIMUTH, N
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

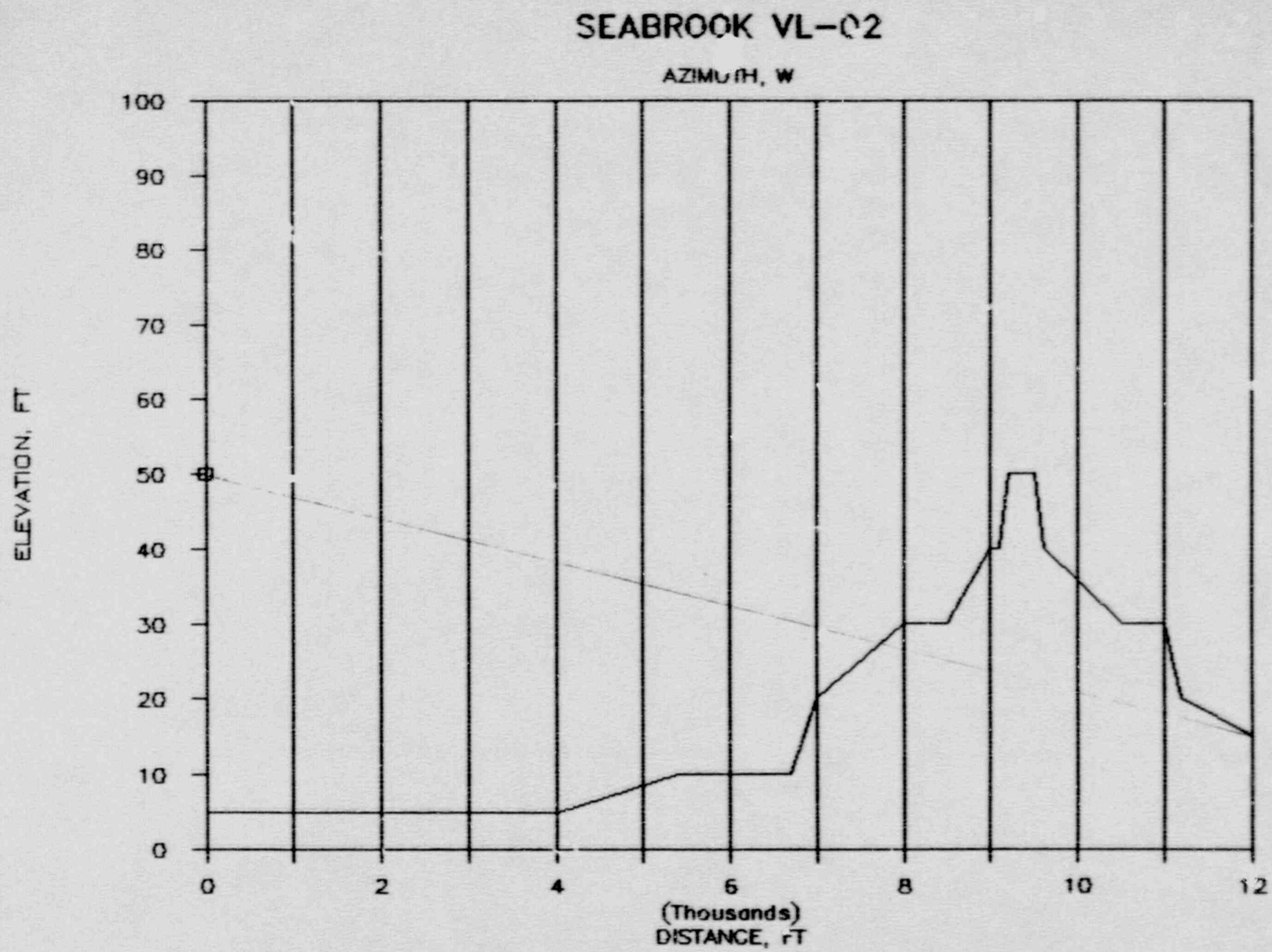

SEABROOK VL-02
AZIMUTH, NNW
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK VL-02
AZIMUTH, NW
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

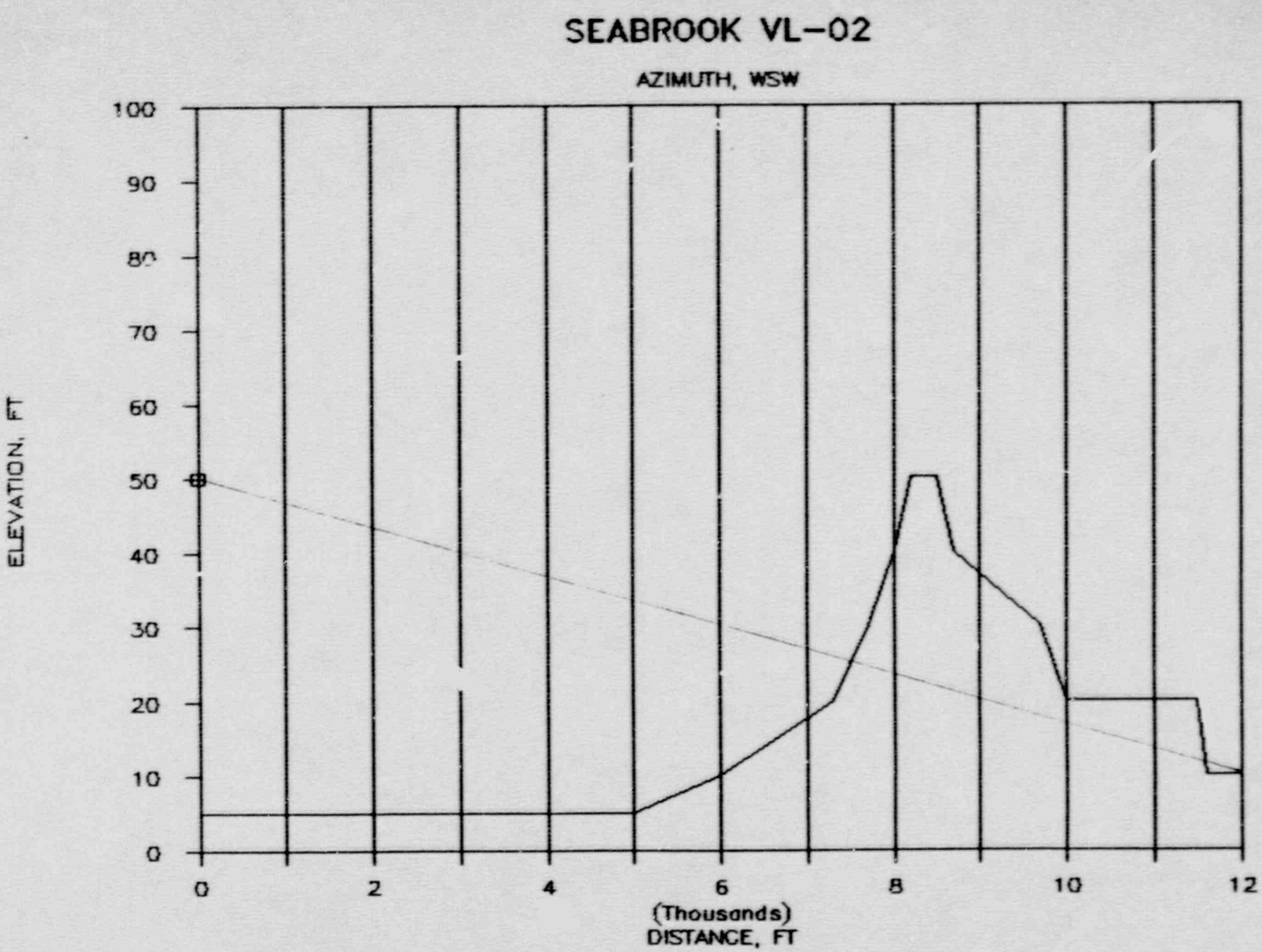
SEABROOK VL-02

AZIMUTH, WNW

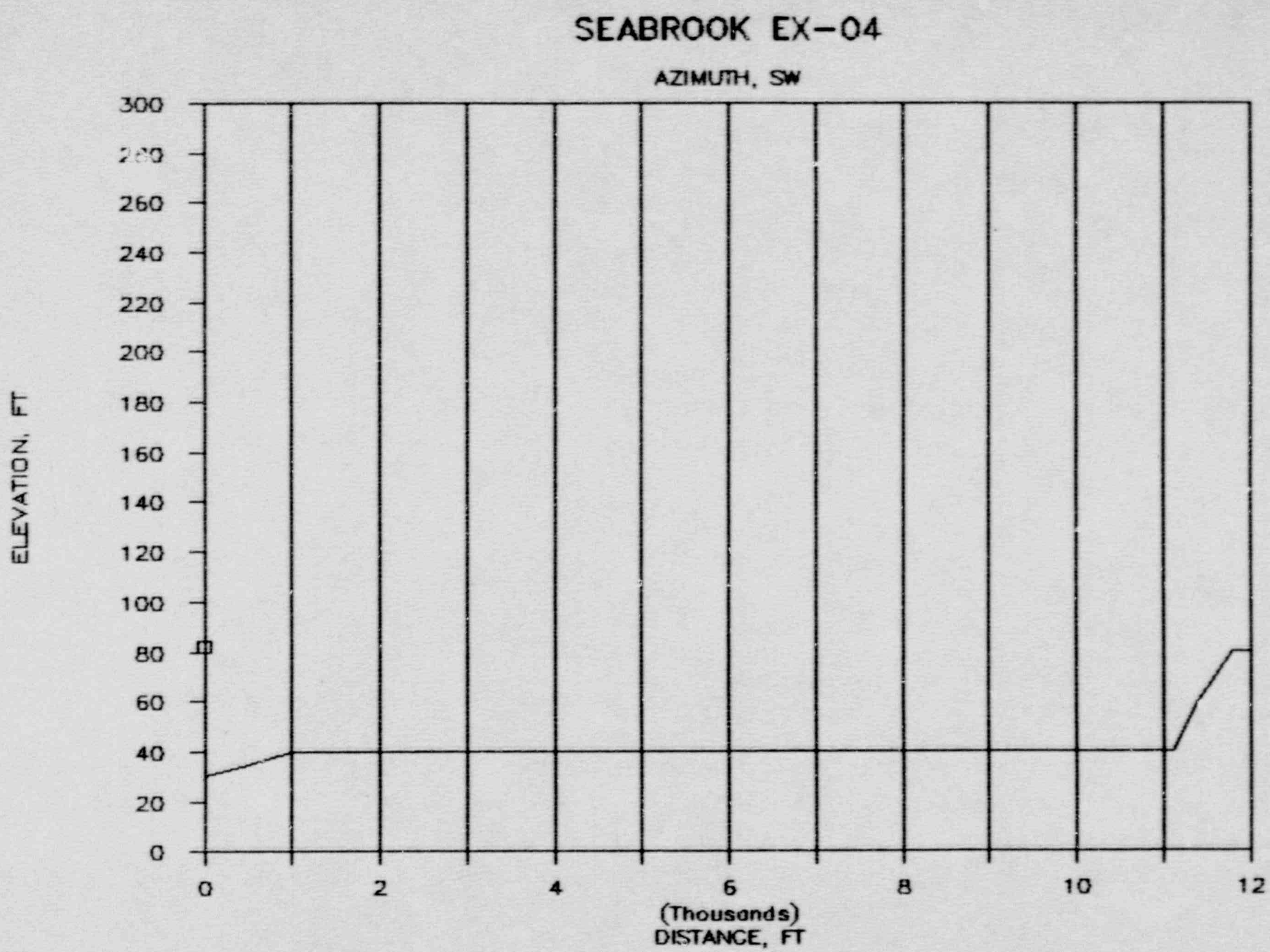


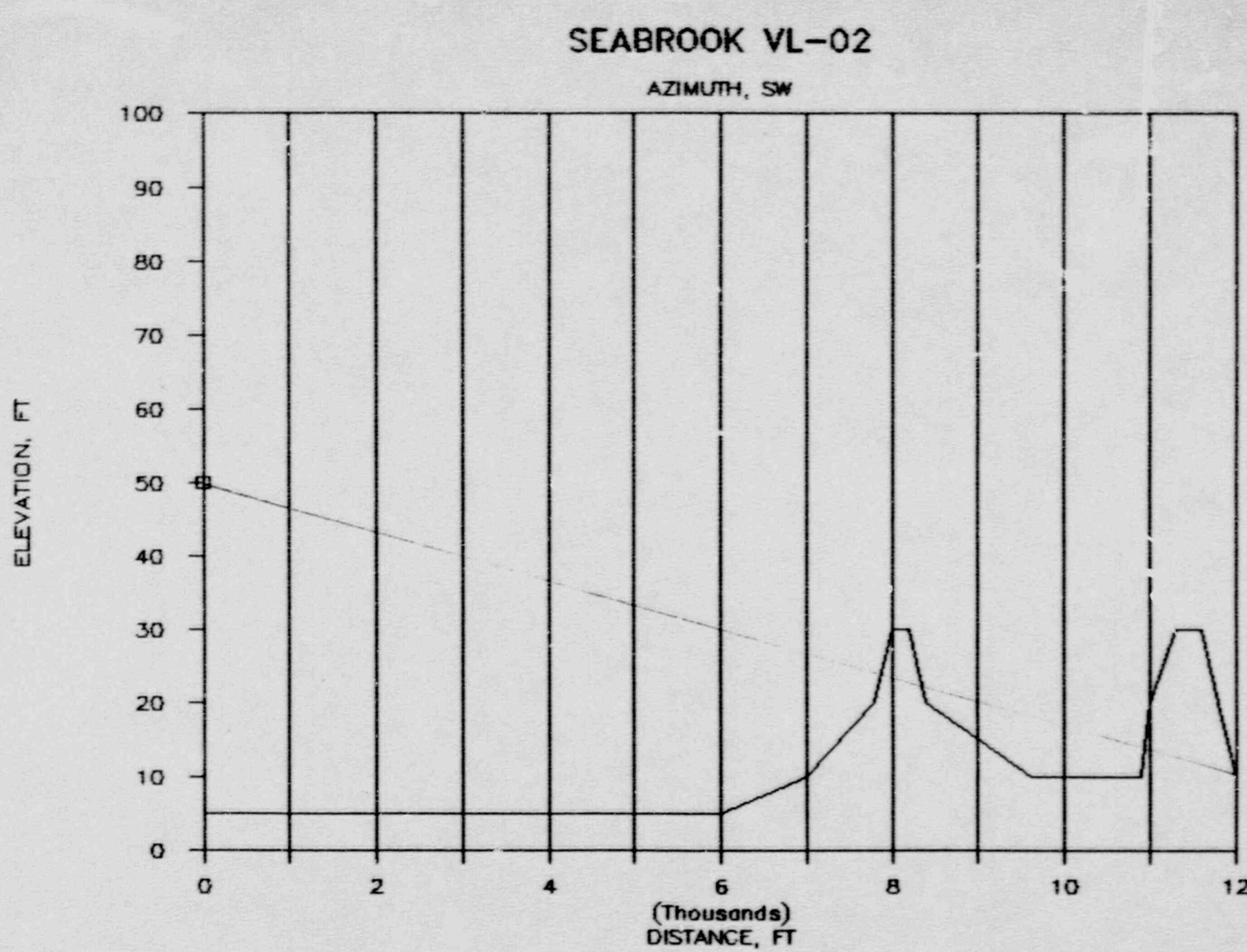


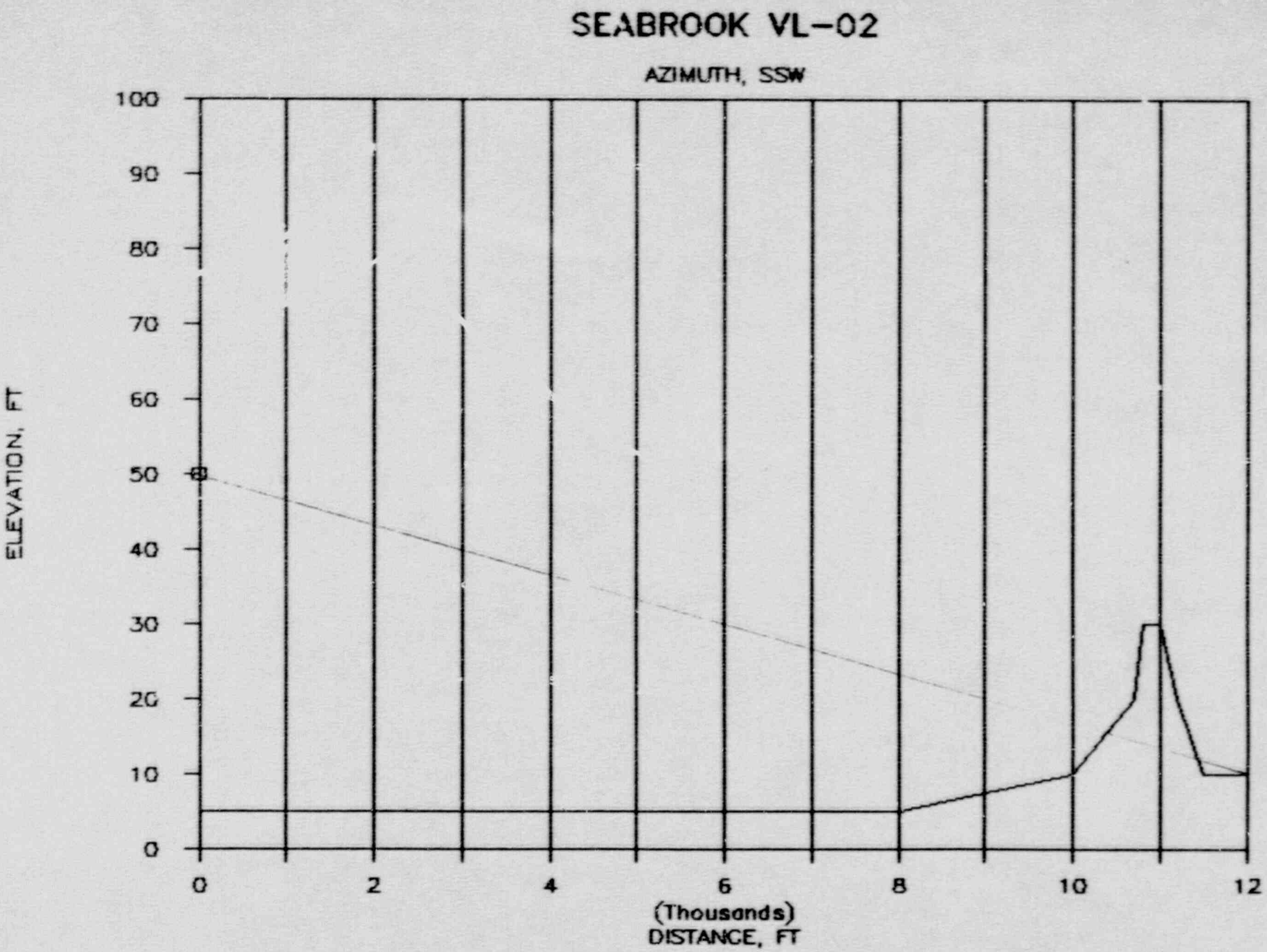
SEABROOK VL-02
AZIMUTH, W
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT



SEABROOK VL-02
AZIMUTH, WSW
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

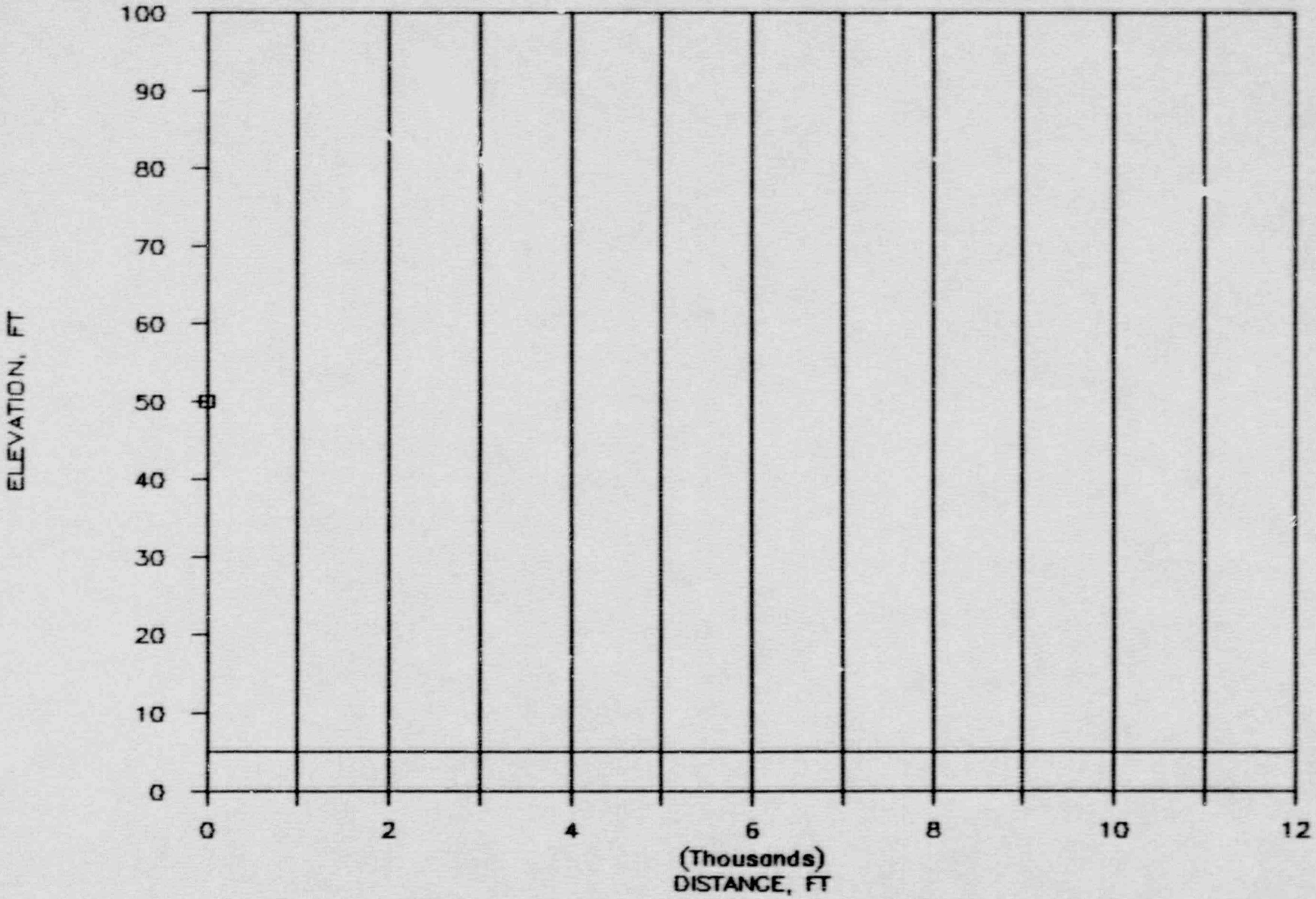

SEABROOK EX-04
AZIMUTH, SW
ELEVATION, FT
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK VL-02
AZIMUTH, SW
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK VL-02
AZIMUTH, SSW
100
90
80
70
60
50
40
30
20
10
0
ELEVATION, FT
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

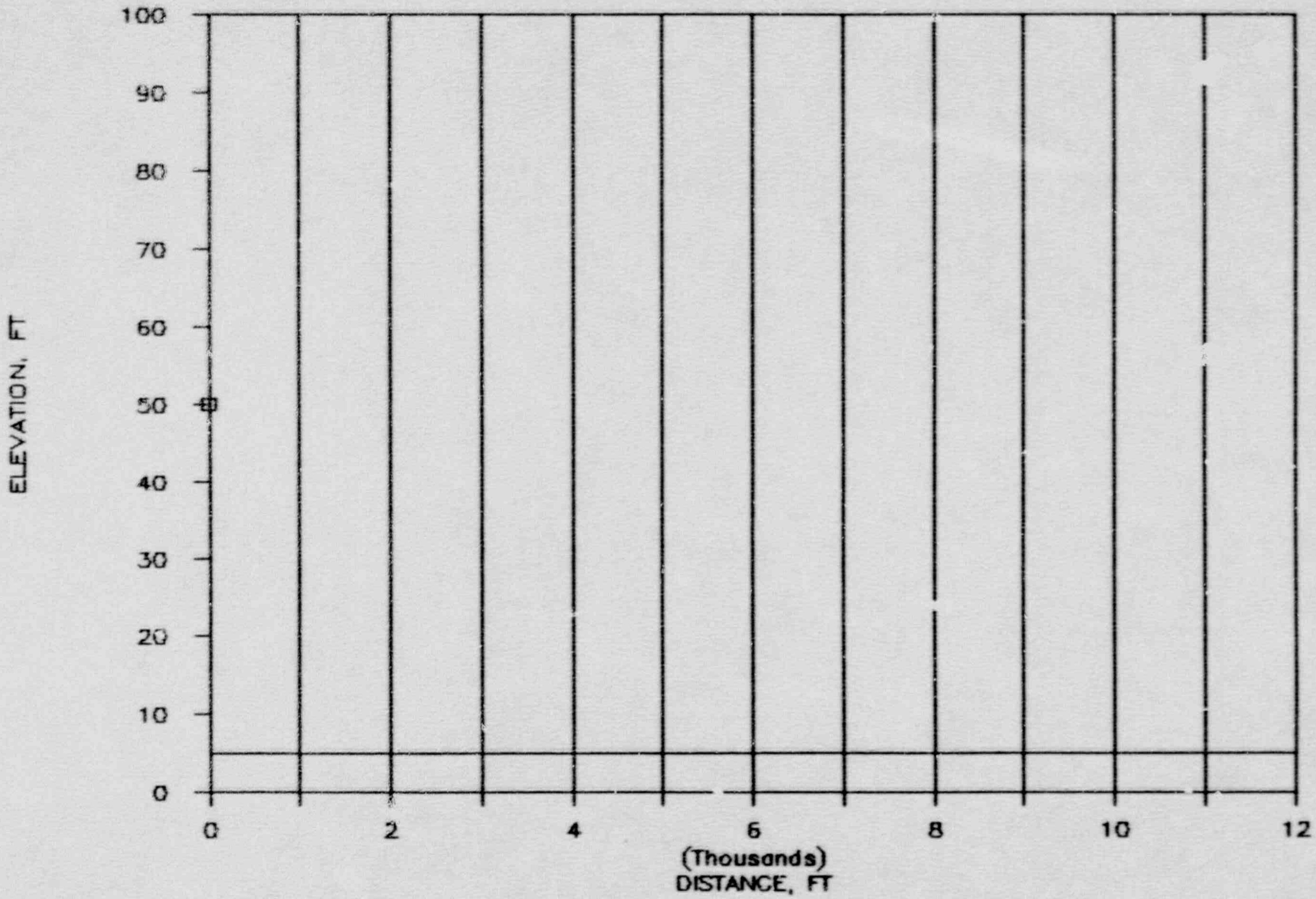
SEABROOK VL-02

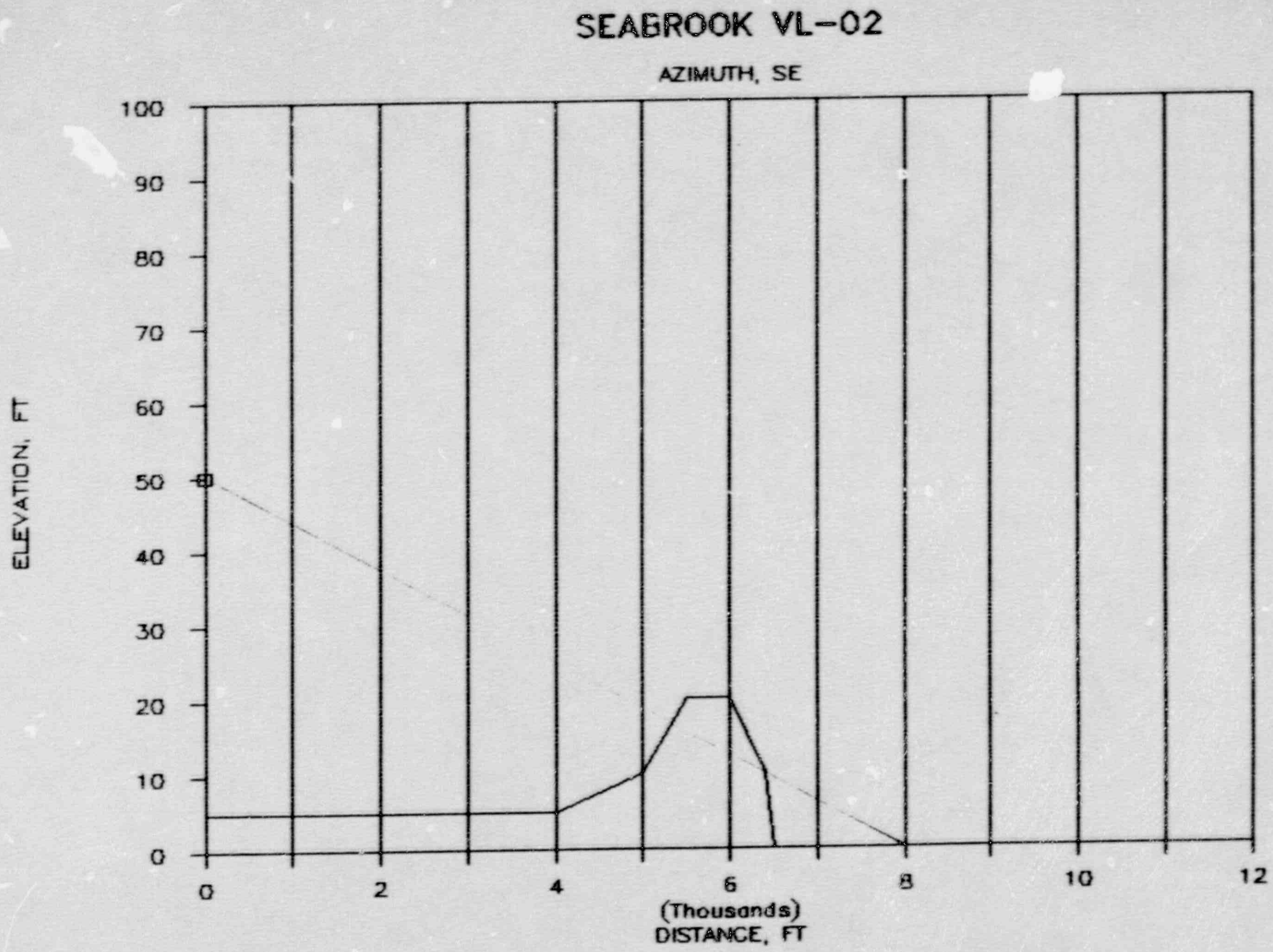
AZIMUTH, S



SEABROCK VL-02

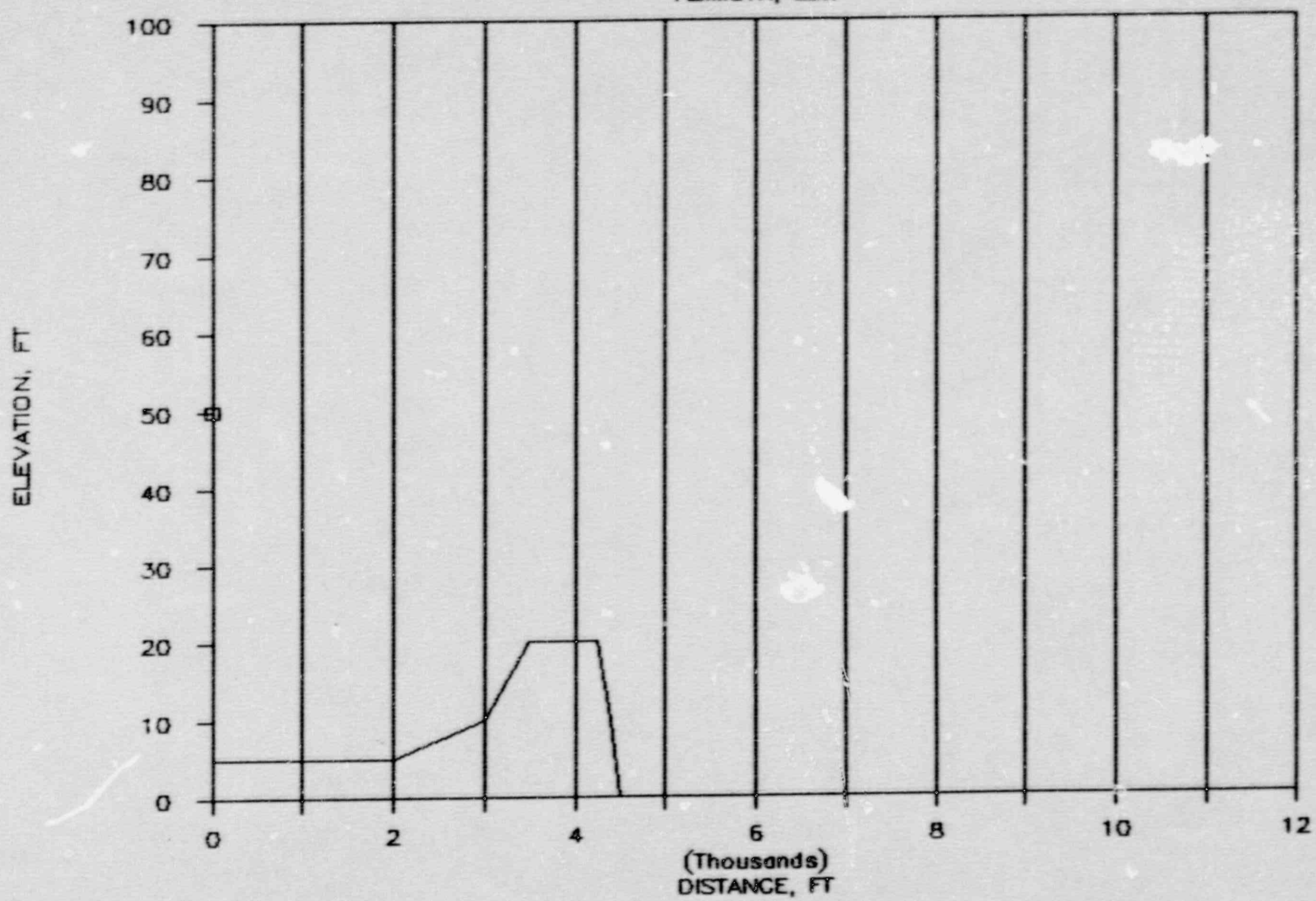
AZIMUTH, SSE




SEABROOK VL-02
AZIMUTH, SE
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK VL-02

AZIMUTH, ESE



NEW HAMPHSIRE YANKEE

VL-02

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	5.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	5.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	5.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	5.00	SOFT	0.	YES	3700.	20.
5	6000.	90.00	5.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	5.00	SOFT	0.	NO	0.	0.
7	12000.	90.00	5.00	SOFT	0.	NO	0.	0.
8	500.	67.50	5.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	5.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	5.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	5.00	SOFT	0.	YES	3700.	20.
12	6000.	67.50	5.00	SOFT	0.	NO	0.	0.
13	8000.	67.50	5.00	SOFT	0.	NO	0.	0.
14	12000.	67.50	5.00	SOFT	0.	NO	0.	0.
15	500.	45.00	5.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	5.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	5.00	SOFT	0.	NO	0.	0.
18	4000.	45.00	5.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	5.00	SOFT	0.	YES	4500.	20.
20	8[illegible]	45.00	5.00	SOFT	0.	NO	0.	0.
21	12000.	45.00	5.00	SOFT	0.	NO	0.	0.
22	500.	22.50	5.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	5.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	5.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	5.00	SOFT	0.	YES	3900.	10.
26	6000.	22.50	10.00	SOFT	0.	NO	0.	0.
27	8000.	22.50	5.00	SOFT	0.	NO	0.	0.
28	12000.	22.50	5.00	SOFT	0.	NO	0.	0.
29	500.	.00	.00	SOFT	0.	NO	0.	0.
30	1000	.00	5.00	SOFT	0.	NO	0.	0.
31	2000.	.00	5.00	SOFT	0.	NO	0.	0.
32	4000.	.00	5.00	SOFT	0.	NO	0.	0.
33	6000.	.00	5.00	SOFT	0.	NO	0.	0.
34	8000.	.00	5.00	SOFT	0.	NO	0.	0.
35	12000.	.00	5.00	SOFT	0.	NO	0.	0.
36	500.	337.50	5.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	5.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	5.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	5.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	5.00	SOFT	0.	NO	0.	0.
41	8000.	337.50	5.00	SOFT	0.	NO	0.	0.

42	12000.	337.50	5.00	SOFT	0.	NO	0.	0.
43	500.	315.00	5.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	5.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	5.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	5.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	5.00	SOFT	0.	NO	0.	0.
48	8000.	315.00	5.00	SOFT	0.	NO	0.	0.
49	12000.	315.00	5.00	SOFT	0.	NO	0.	0.
50	500.	292.50	5.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	5.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	5.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	5.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	5.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	5.00	SOFT	0.	NO	0.	0.
56	12000.	292.50	10.00	SOFT	0.	NO	0.	0.
57	500.	270.00	5.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	5.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	5.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	5.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	10.00	SOFT	0.	NO	0.	0.
62	8000.	270.00	30.00	SOFT	0.	NO	0.	0.
63	12000.	270.00	15.00	SOFT	0.	YES	9200.	50.
64	500.	2[illegible].50	5.00	SOFT	0.	NO	0.	0.
65	1000.	24[illegible].50	5.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	5.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	5.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	10.00	SOFT	0.	NO	0.	0.
69	8000.	247.50	40.00	SOFT	0.	NO	0.	0.
70	12000.	247.50	10.00	SOFT	0.	YES	8200.	50.
71	500.	225.00	5.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	5.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	5.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	5.00	SOFT	0.	NO	0.	0.
75	6000.	225.00	5.00	SOFT	0.	NO	0.	0.
76	8000.	225.00	30.00	SOFT	0.	NO	0.	0.
77	12000.	225.00	10.00	SOFT	0.	YES	8000.	30.
78	500.	202.50	5.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	5.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	5.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	5.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	5.00	SOFT	0.	NO	0.	0.
83	8000.	202.50	5.00	SOFT	0.	NO	0.	0.
84	12000.	202.50	10.00	SOFT	0.	YES	11000.	30.
85	500.	180.00	5.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	5.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	5.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	5.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	5.00	SOFT	0.	NO	0.	0.
90	8000.	180.00	5.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	5.00	SOFT	0.	NO	0.	0.
92	500.	157.50	5.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	5.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	5.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	5.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	5.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	5.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	5.00	SOFT	0.	NO	0.	0.
99	500.	135.00	5.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	5.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	5.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	5.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	20.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	5.00	SOFT	0.	YES	6000.	20.
105	12000.	135.00	5.00	SOFT	0.	NO	0.	0.
106	500.	112.50	5.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	5.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	5.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	20.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	5.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	5.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	5.00	SOFT	0.	NO	0.	0.

NEW HAMPHSIRE YANKEE

VL-02

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	25	500	1000	2000	4000	8000 (HZ)
1	VANS	128.3	130.3	.0	.0	.0	.0	129.0	124.[illegible]	114.0	109.0	103.0

XO= .00 YO= .00 ZO= 50.00 HEIGHT ABOVE GROUND= 45.00

NEW HAMPHSIRE YANKEE

VL-02

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

NEW HAMPHSIRE YANKEE

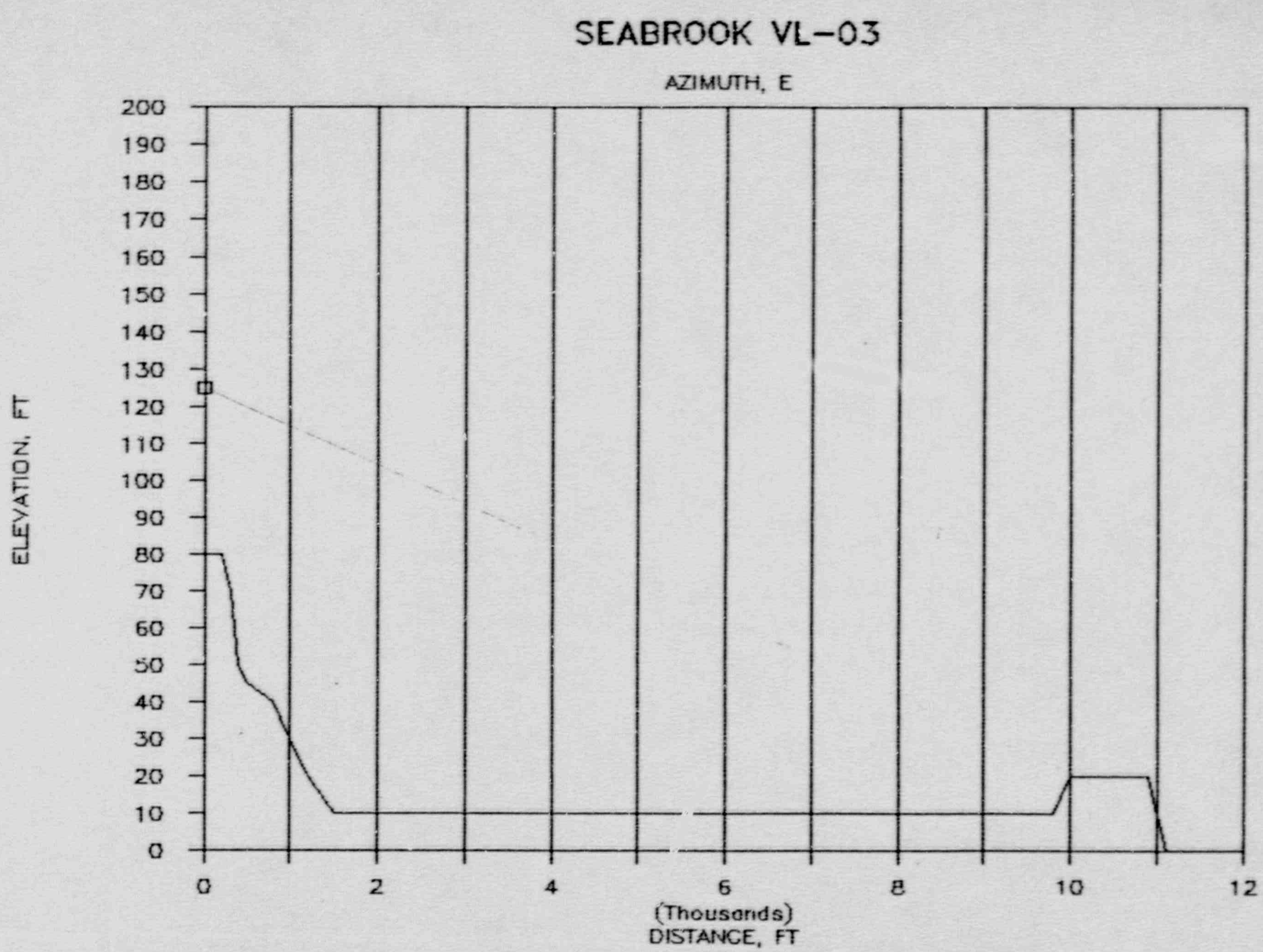
VL-02

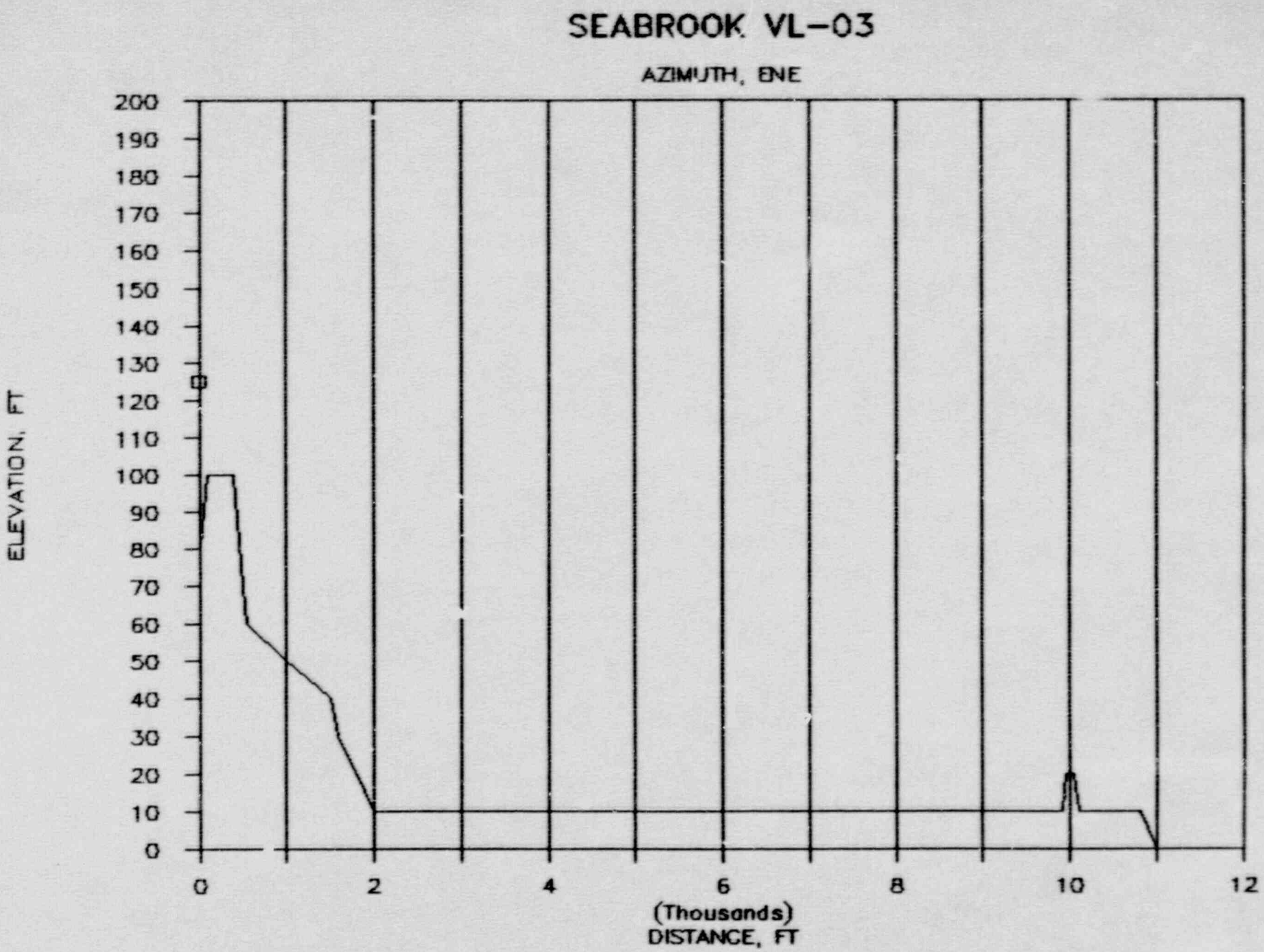
SOUND PRESSURE LEVELS IN DBC

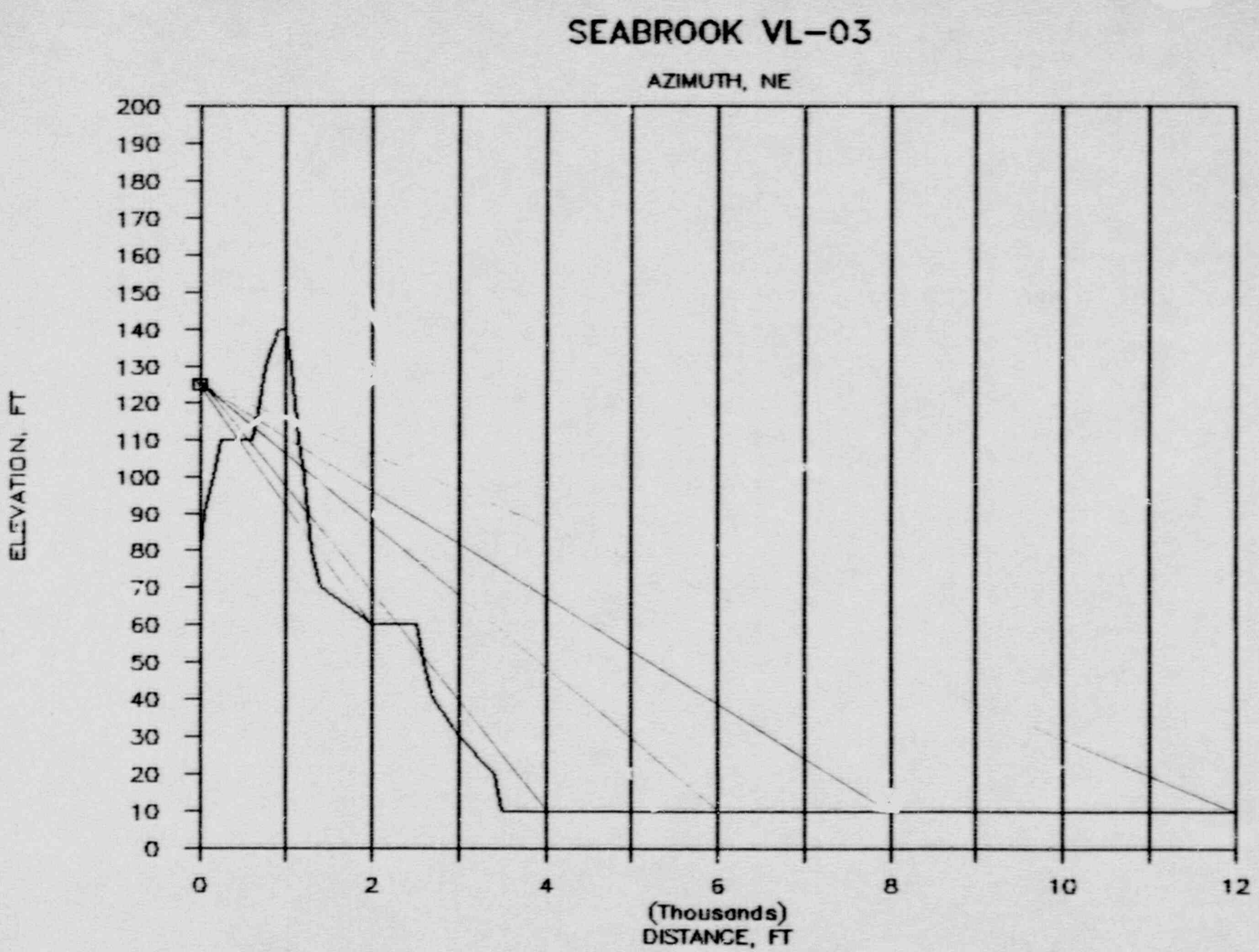
UNDER MET CONDITION 1

DISTANCE IN FEET

AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	113.5	100.5	90.1	76.0	76.0	68.4	54.1
ENE	113.5	100.5	90.1	76.0	76.6	69.2	55.2
NE	113.5	100.5	90.1	83.1	72.9	71.9	59.2
NNE	113.5	100.5	90.1	77.4	77.8	73.1	64.3
N	113.5	100.5	90.1	83.1	77.8	73.1	64.3
NNW	113.5	100.5	90.1	83.1	77.8	73.1	64.3
NW	113.5	100.5	90.1	83.1	77.8	73.1	64.3
WNW	113.5	100.5	90.1	83.1	77.8	73.1	64.3
W	113.5	100.5	90.1	83.1	77.8	7[illegible].1	57.8
WSW	113.5	100.5	90.1	83.1	77.8	73.1	58.0
SW	113.5	100.5	90.1	83.1	77.8	73.1	59.4
SSW	113.5	100.5	90.1	83.1	77.8	73.1	57.9
S	113.5	100.5	90.1	83.1	77.8	73.1	64.3
SSE	113.5	100.5	90.1	83.1	77.8	73.1	64.3
SE	113.5	100.5	90.1	83.1	77.8	67.1	59.2
ESE	113.5	100.5	90.1	83.1	76.6	69.2	55.2


SEABROOK VL-03
AZIMUTH, E
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

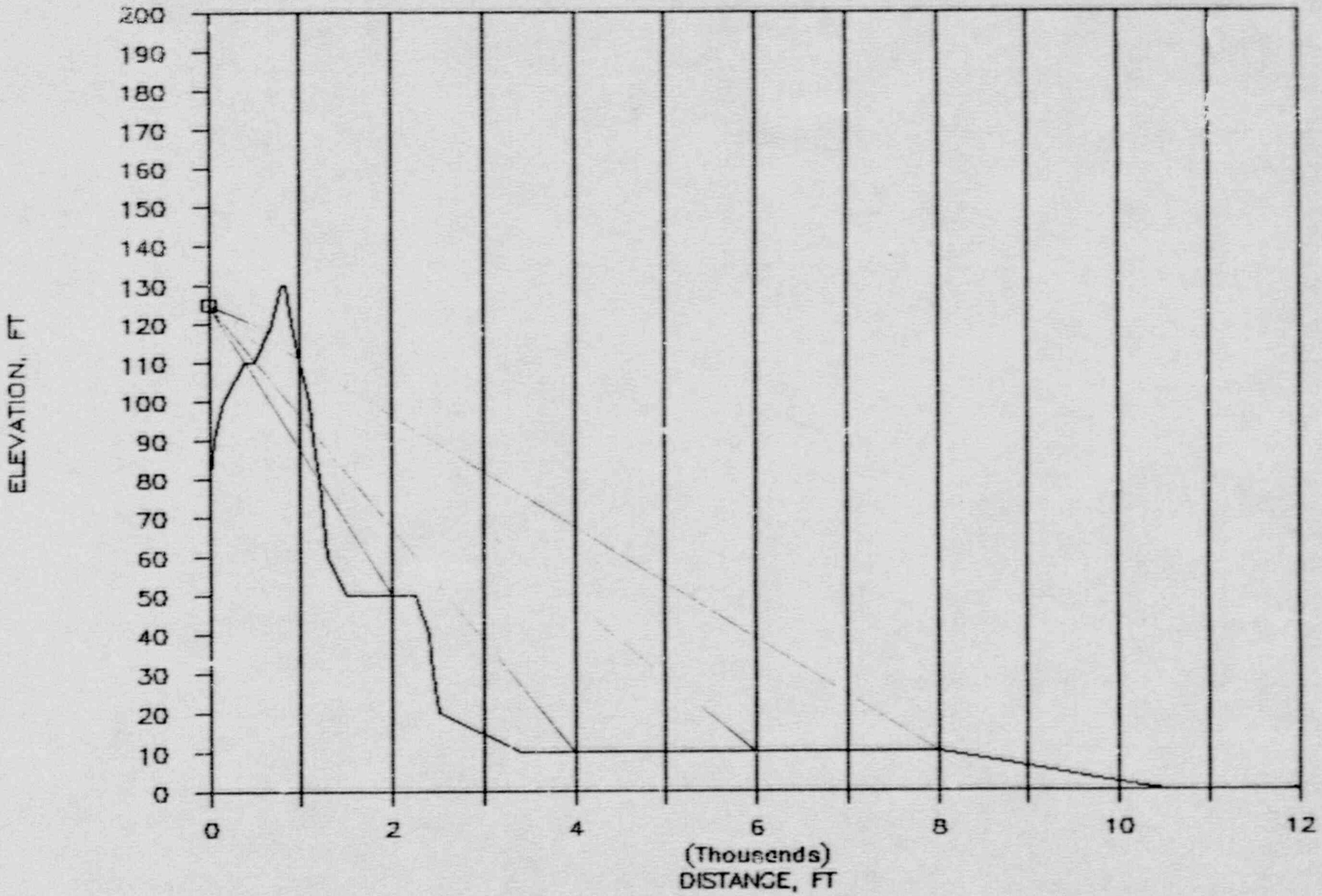

SEABROOK VL-03
AZIMUTH, ENE
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

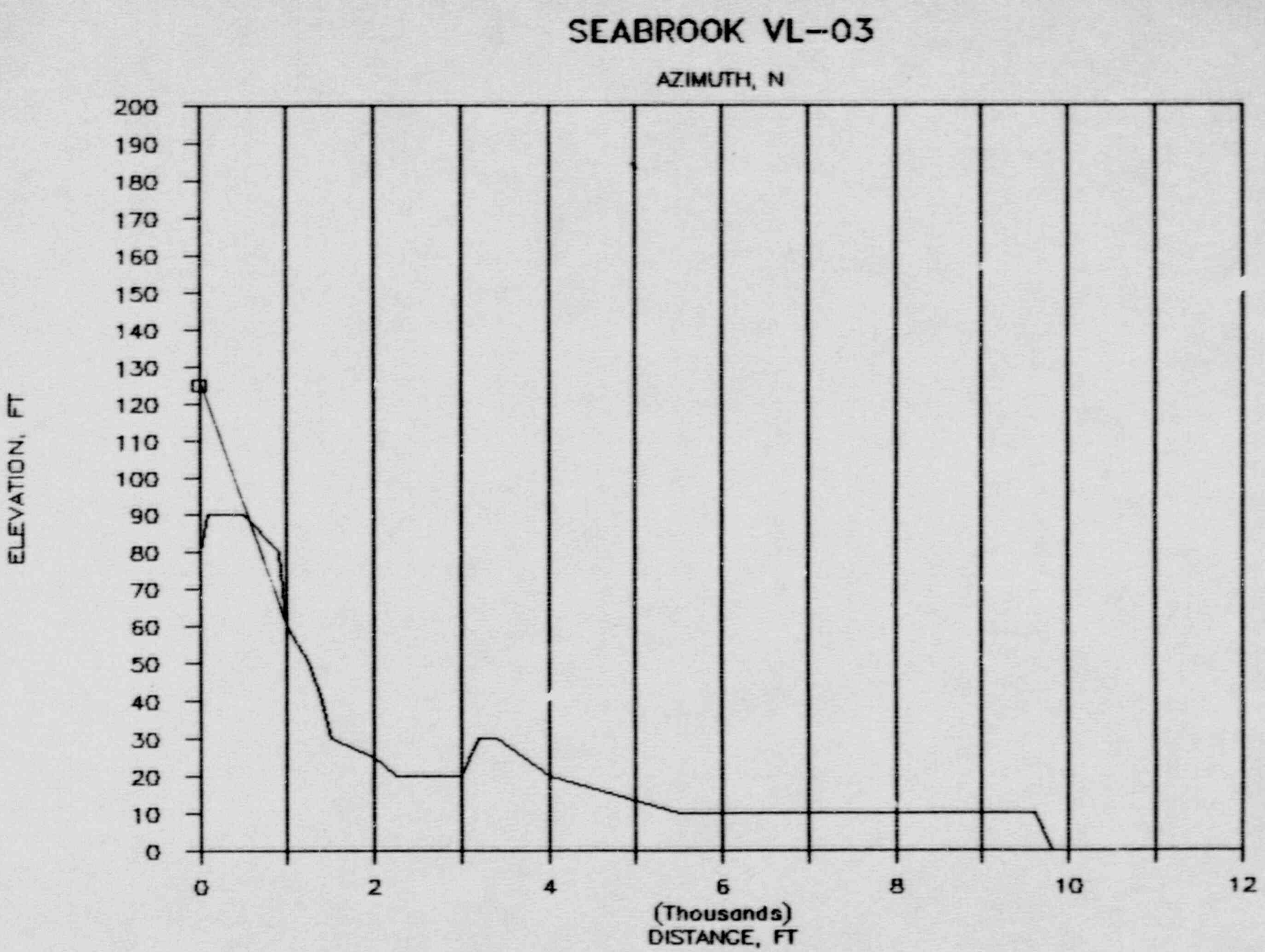


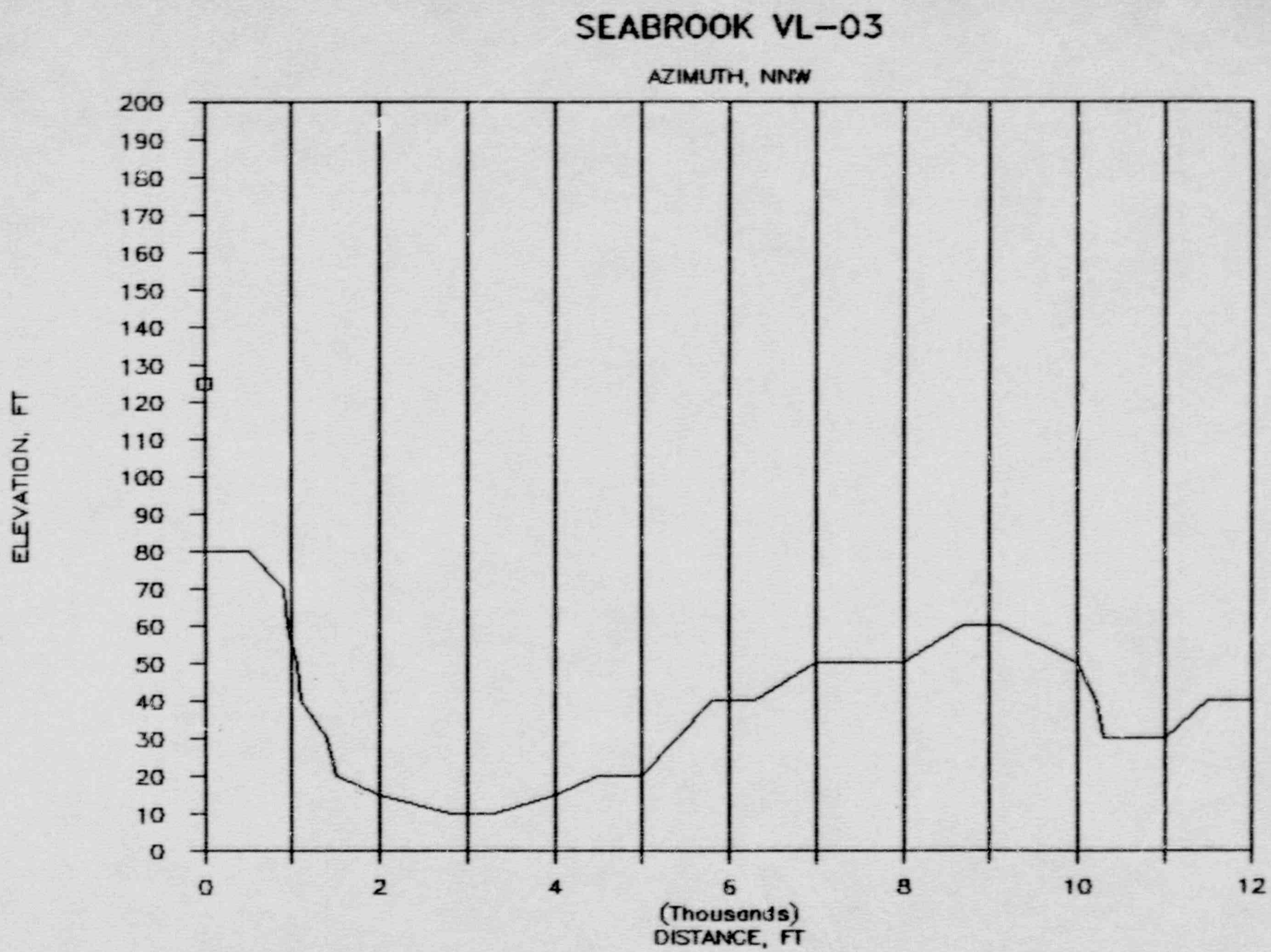
SEABROOK VL-03
AZIMUTH, NE
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK VL-03

AZIMUTH, NNE

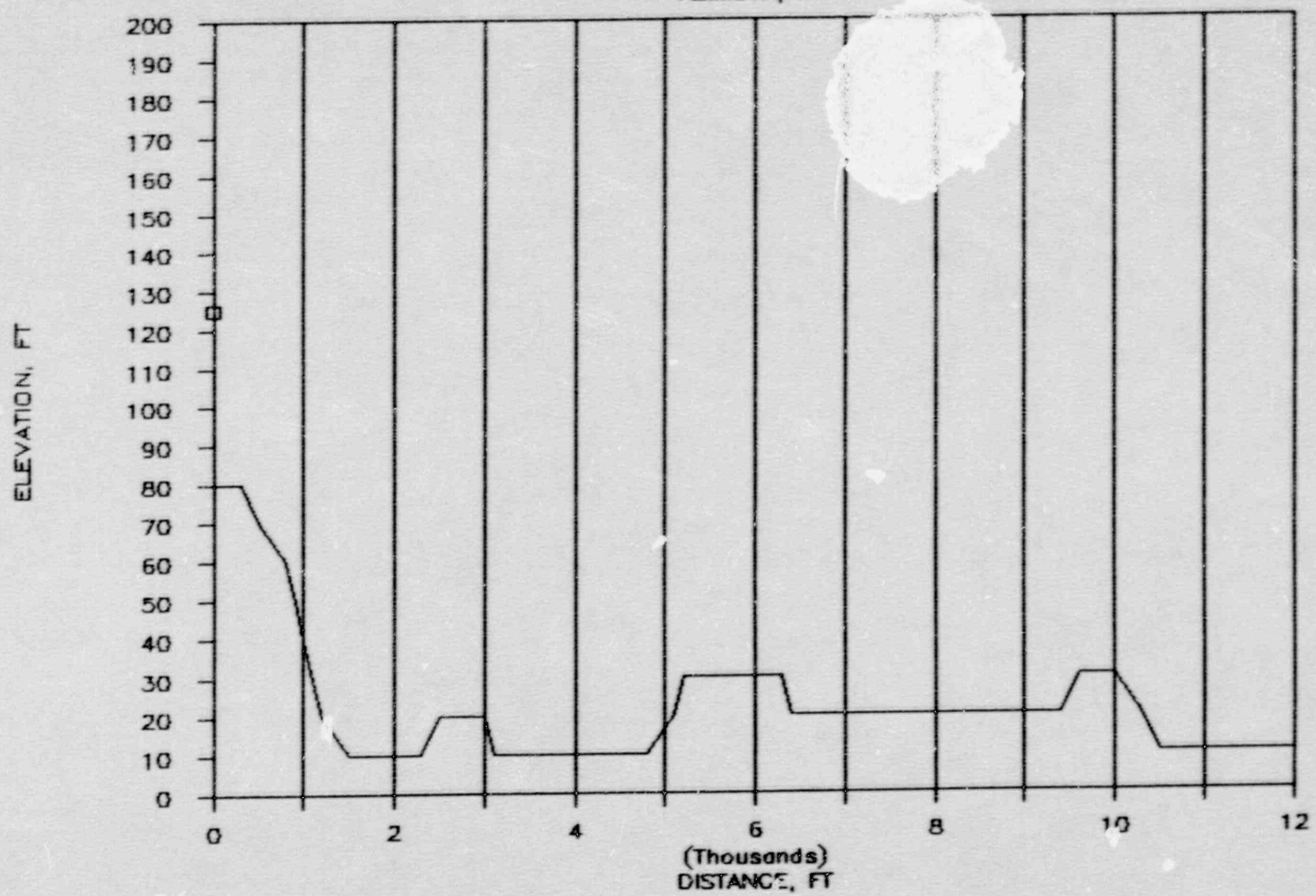


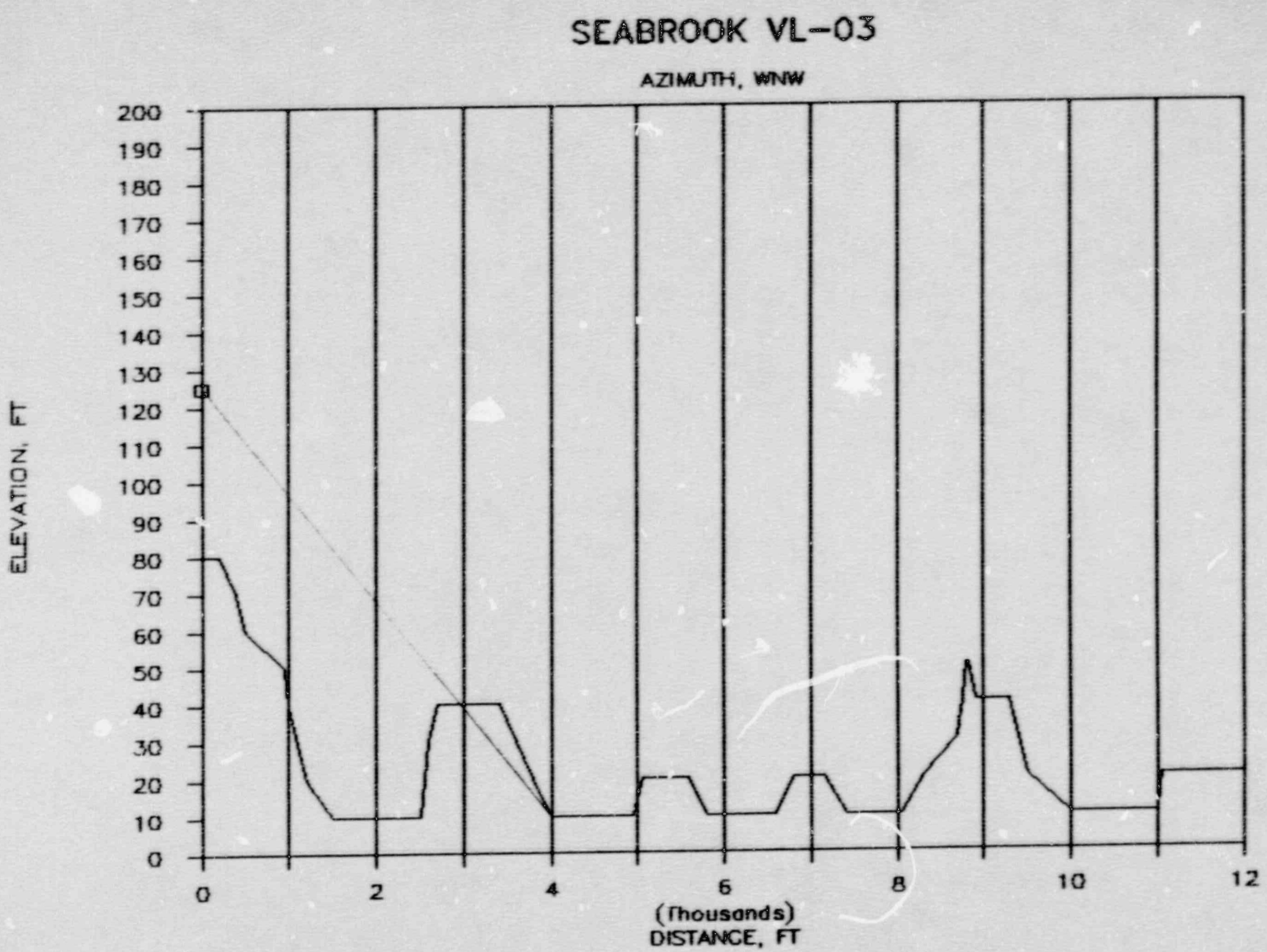

SEABROOK VL-03
AZIMUTH, N
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK VL-03
AZIMUTH, NNW
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

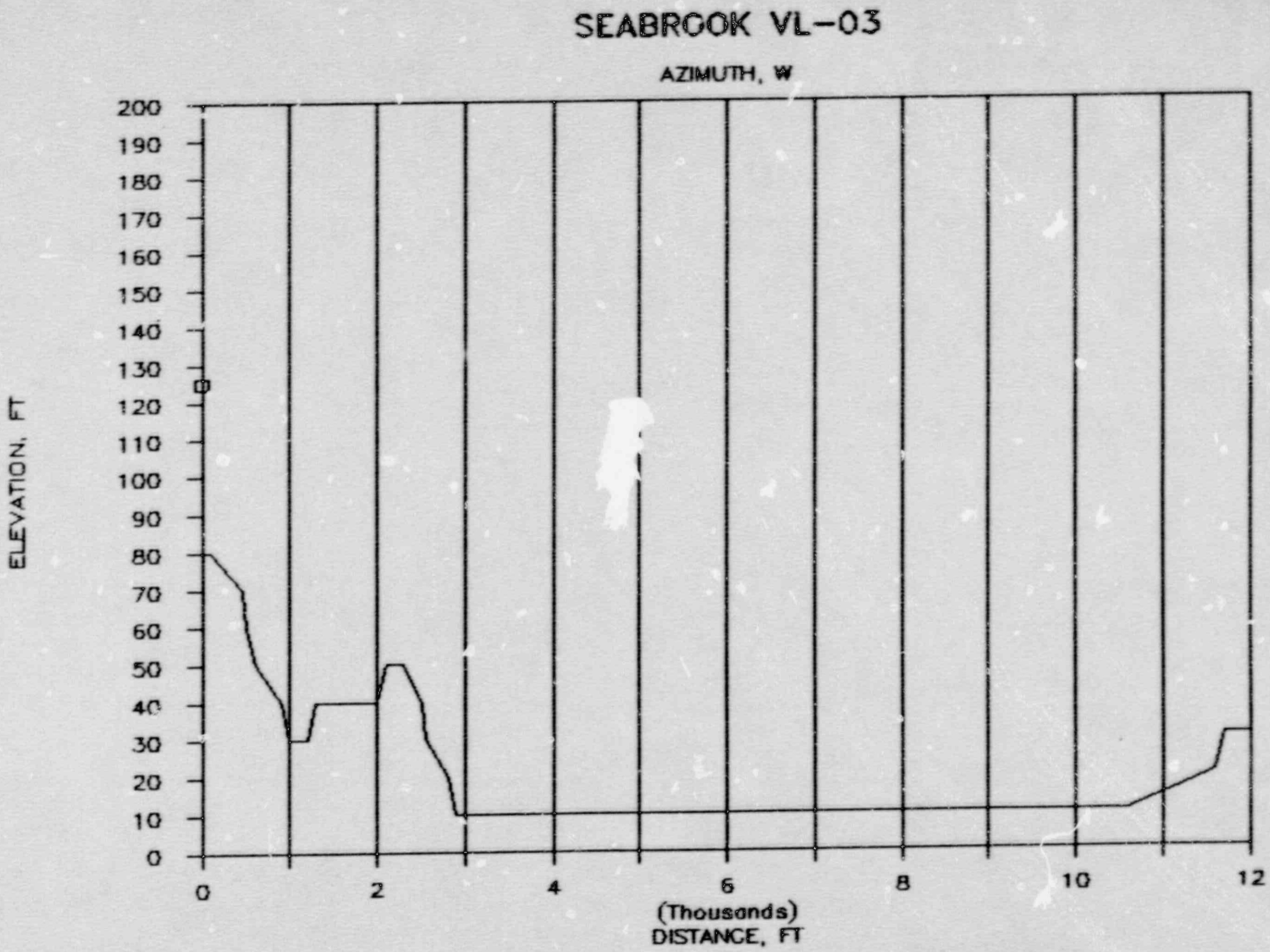
SEABROOK VL-03

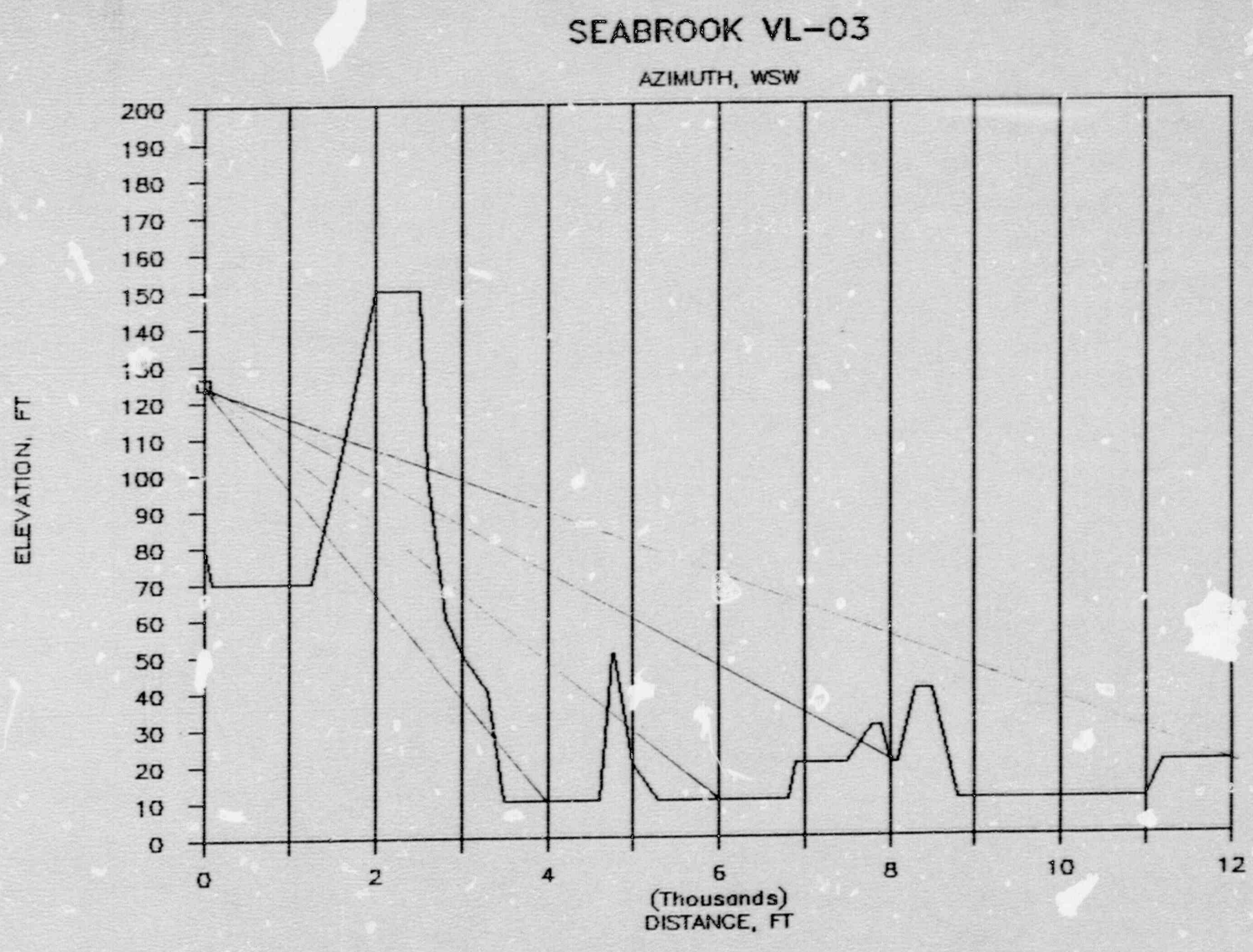
AZIMUTH, NW

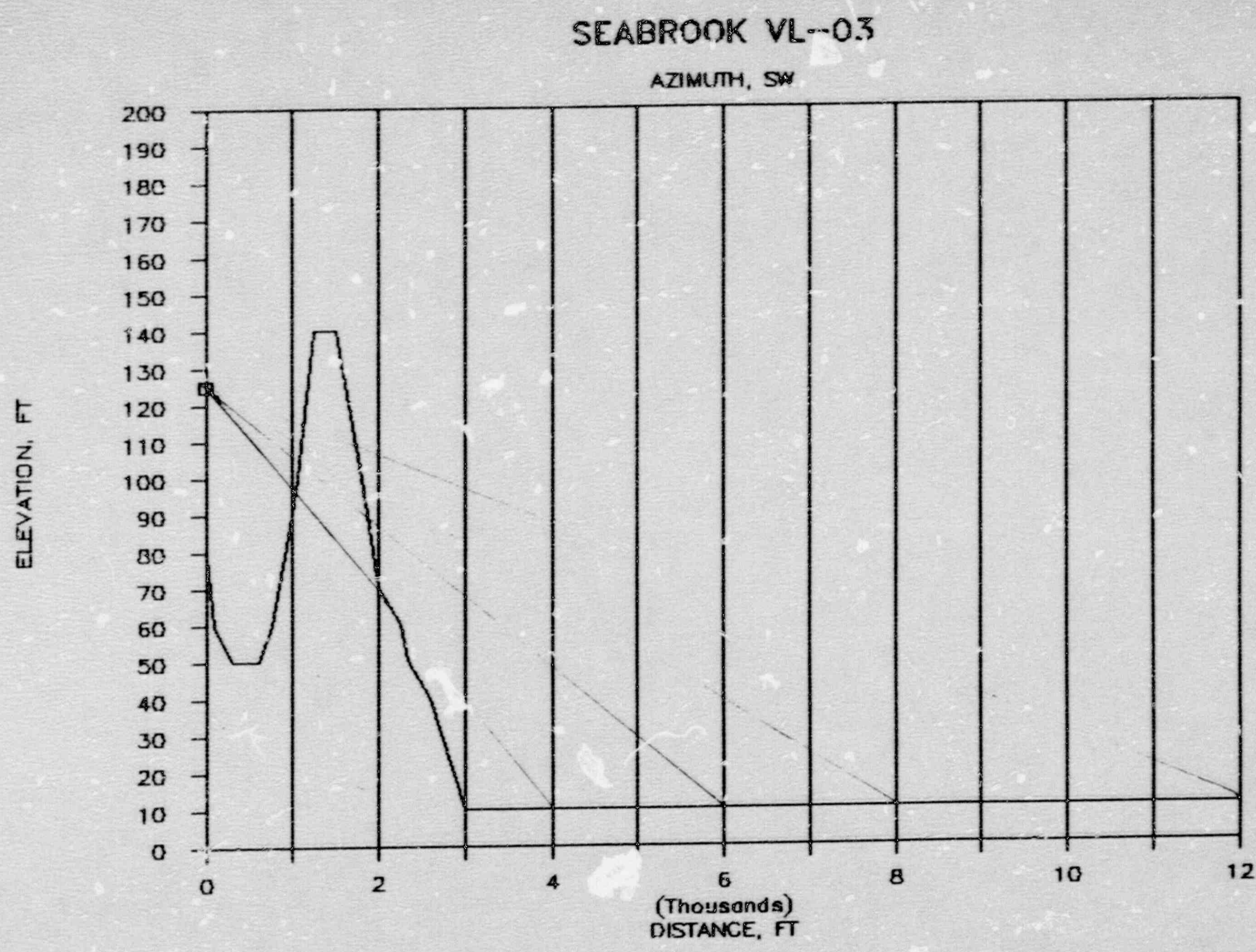




SEABROOK VL-03
AZIMUTH, WNW
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK VL-03
AZIMUTH, W
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

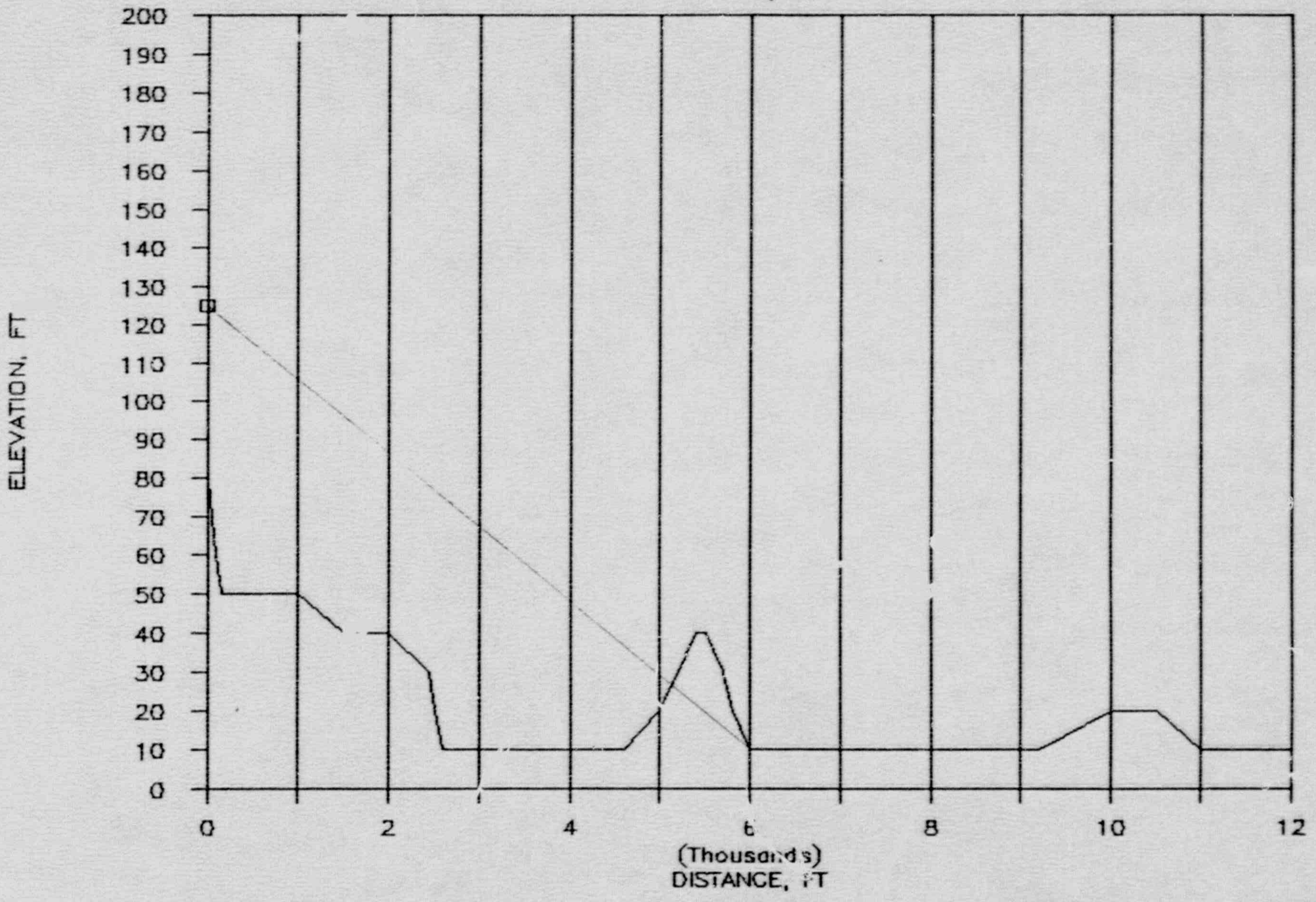

SEABROOK VL-03
AZIMUTH, WSW
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT



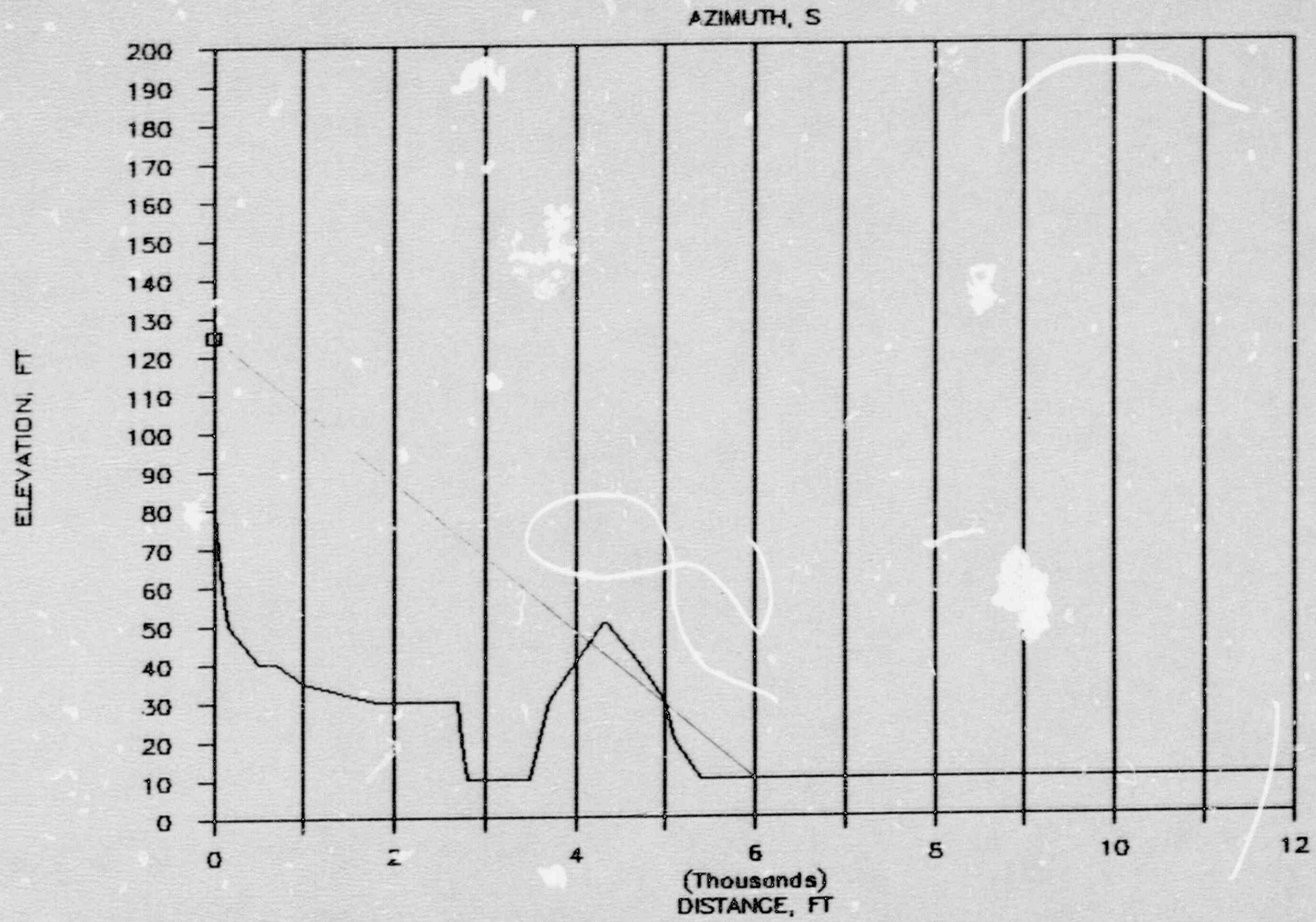
SEABROOK VL--03
AZIMUTH, SW
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

SEABROOK VL-03

AZIMUTH, SSW

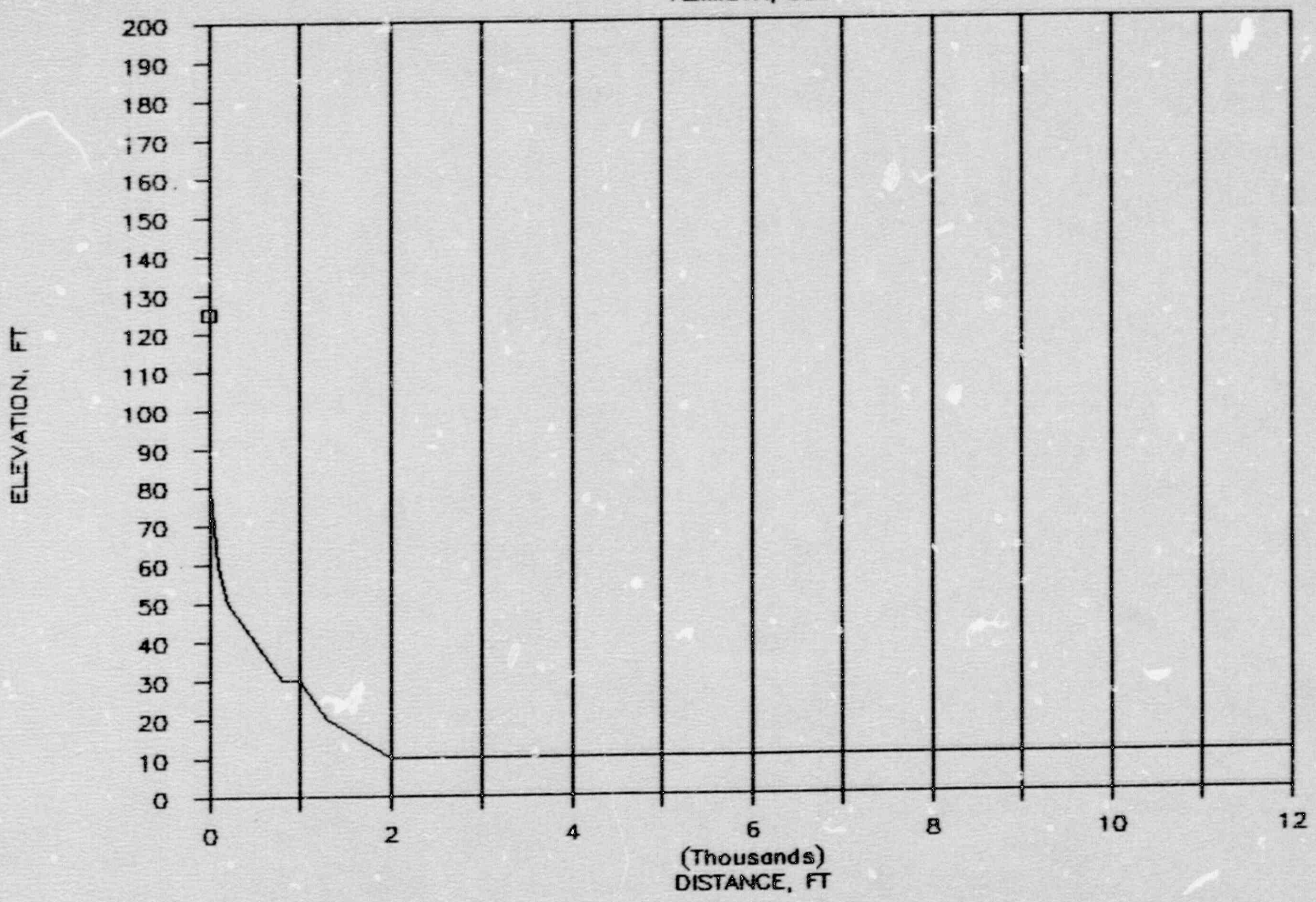


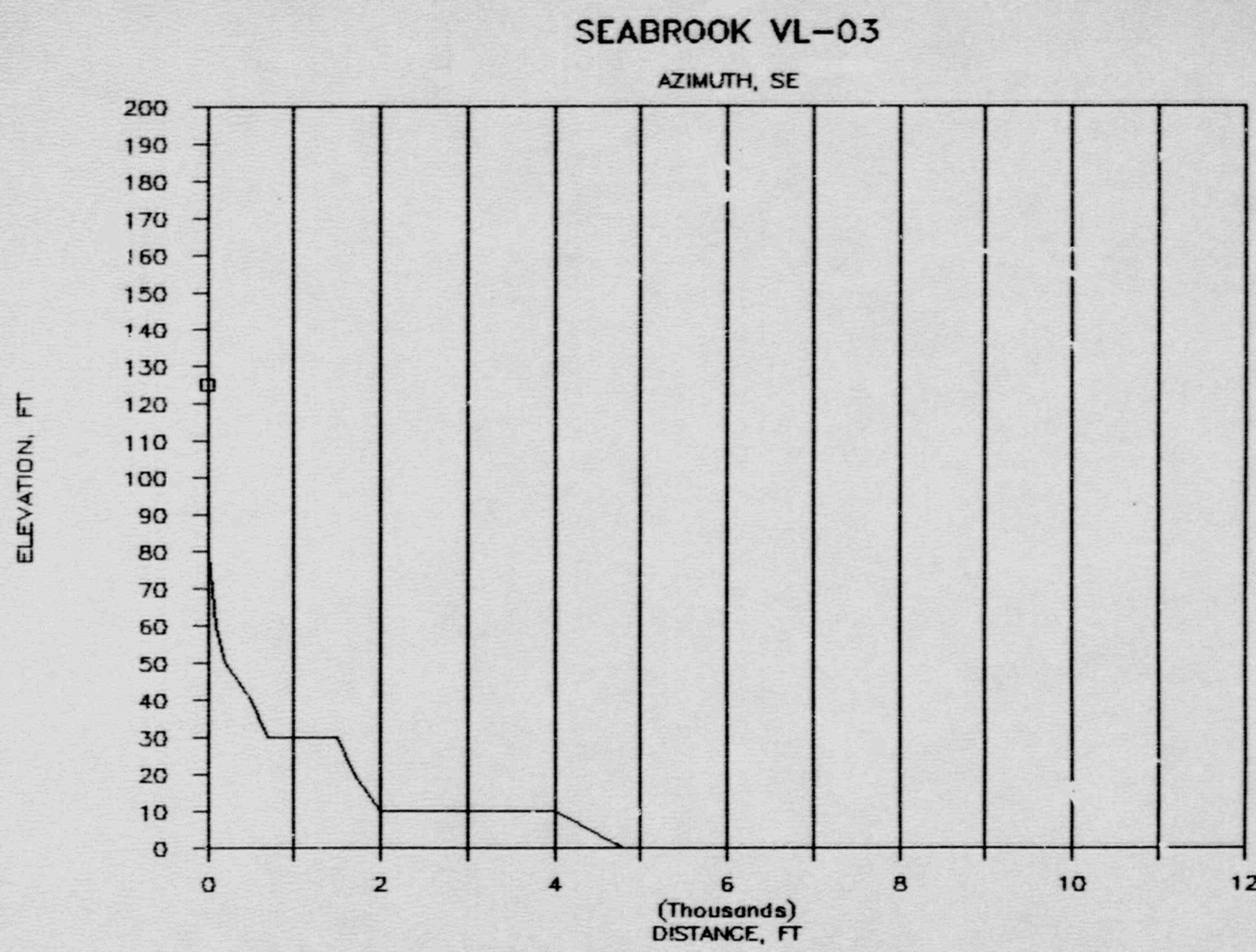
SEABROOK VL-03

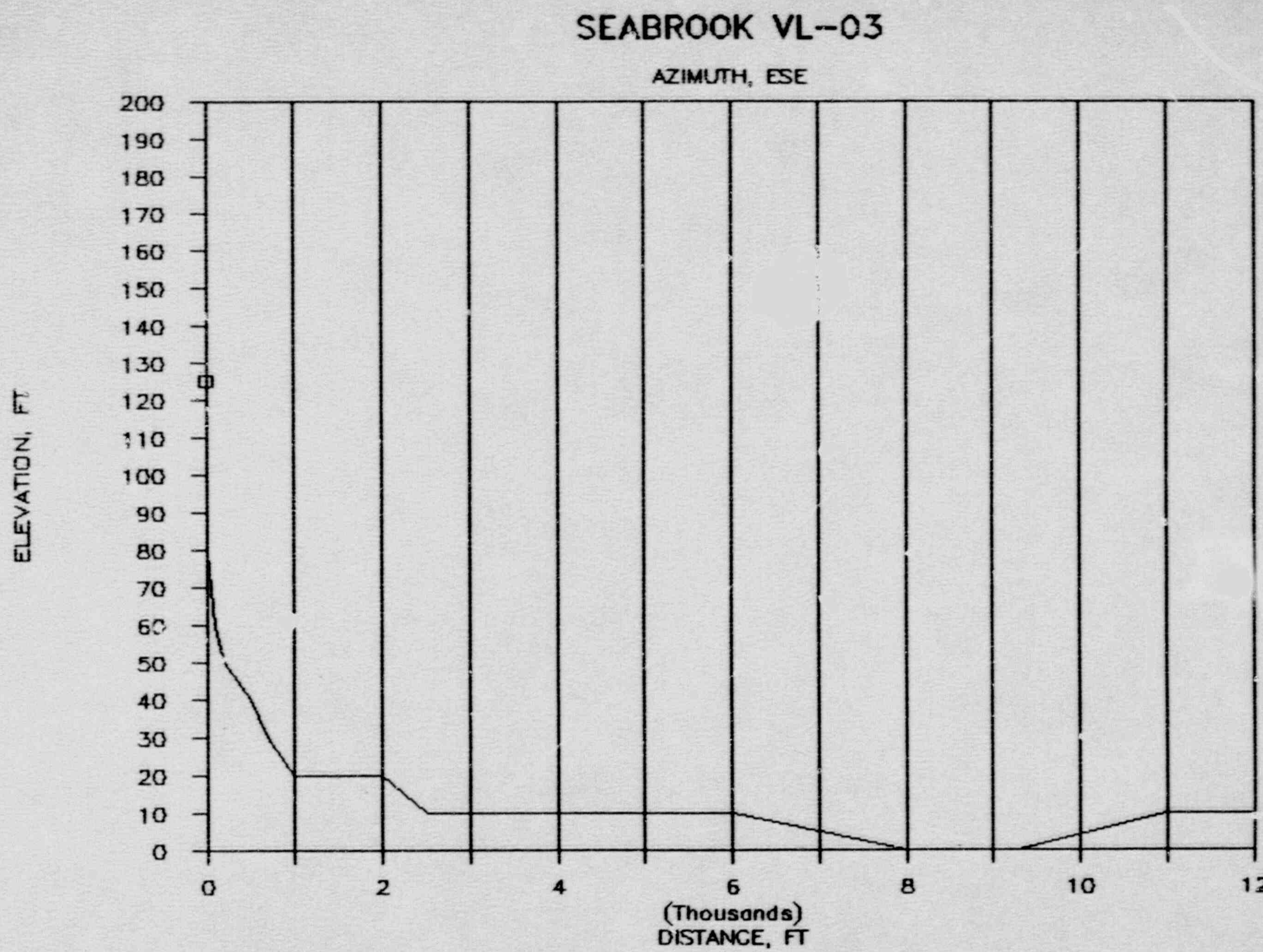


SEABROOK V[illegible]-03

AZIMUTH, SSE




SEABROOK VL-03
AZIMUTH, SE
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK VL-03
AZIMUTH, ESE
ELEVATION, FT
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

NEW HAMPHSIRE YANKEE

VL-03

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	45.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	30.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	10.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	10.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	10.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	10.00	SOFT	0.	NO	0.	0.
7	12000.	90.00	5.00	SOFT	0.	YES	10900.	20.
8	500.	67.50	70.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	50.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	10.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	10.00	SOFT	0.	NO	0.	0.
12	6000.	67.50	10.00	SOFT	0.	NO	0.	0.
13	8000.	67.50	10.00	SOFT	0.	NO	0.	0.
14	12000.	67.50	5.00	SOFT	0.	NO	0.	0.
15	500.	45.00	110.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	140.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	60.00	SOFT	0.	YES	1000.	140.
18	4000.	45.00	10.00	SOFT	0.	YES	1000.	140.
19	6000.	45.00	10.00	SOFT	0.	YES	1000.	140.
20	8000.	45.00	10.00	SOFT	0.	YES	1000.	140.
21	12000.	45.00	10.00	SOFT	0.	YES	1000.	140.
22	500.	22.50	110.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	110.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	50.00	SOFT	0.	YES	800.	130.
25	4000.	22.50	10.00	SOFT	0.	YES	800.	130.
26	6000.	22.50	10.00	SOFT	0.	YES	800.	130.
27	8000.	22.50	10.00	SOFT	0.	YES	800.	130.
28	12000.	22.50	5.00	SOFT	0.	YES	800.	130.
29	500.	.00	90.00	SOFT	0.	NO	0.	0.
30	1000.	.00	60.00	SOFT	0.	YES	500.	90.
31	2000.	.00	25.00	SOFT	0.	NO	0.	0.
32	4000.	.00	20.00	SOFT	0.	NO	0.	0.
33	6000.	.00	10.00	SOFT	0.	NO	0.	0.
34	8000.	.00	10.00	SOFT	0.	NO	0.	0.
35	12000.	.00	5.00	SOFT	0.	NO	0.	0.
36	500.	337.50	80.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	[illegible]	SOFT	0.	NO	0.	0.
38	2000.	337.50	15.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	15.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	40.00	SOFT	0.	NO	0.	0.
41	8000.	337.50	50.00	SOFT	0.	NO	0.	0.

42	12000.	337.50	40.00	SOFT	0.	NO	0.	0.
43	500.	315.00	70.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	40.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	10.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	10.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	30.00	SOFT	0.	NO	0.	0.
48	8000.	315.00	20.00	SOFT	0.	NO	0.	0.
49	12000.	315.00	10.00	SOFT	0.	NO	0.	0.
50	500.	292.50	60.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	40.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	10.00	SOFT	0.	NO	0.	0.
[illegible]	4000.	292.50	10.00	SOFT	0.	YES	3400.	40.
54	6000.	292.50	10.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	10.00	SOFT	0.	NO	0.	0.
56	12000.	292.50	20.00	SOFT	0.	NO	0.	0.
57	500.	270.00	60.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	30.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	40.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	10.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	10.00	SOFT	0.	NO	0.	0.
62	8000.	270.00	10.00	SOFT	0.	NO	0.	0.
63	12000.	270.00	30.00	SOFT	0.	NO	0.	0.
64	500.	247.50	70.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	70.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	150.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	10.00	SOFT	0.	YES	2000.	150.
68	6000.	247.50	10.00	SOFT	0.	YES	2000.	150.
69	8000.	247.50	20.00	SOFT	0.	YES	2000.	150.
70	12000.	247.50	20.00	SOFT	0.	YES	2000.	150.
71	500.	225.00	50.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	90.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	70.00	SOFT	0.	YES	1250.	140.
74	4000.	225.00	10.00	SOFT	0.	YES	1250.	140.
75	6000.	225.00	10.00	SOFT	0.	YES	1250.	140.
76	8000.	225.00	10.00	SOFT	0.	YES	1250.	140.
77	12000.	225.00	10.00	SOFT	0.	YES	1250.	140.
78	500.	202.50	50.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	50.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	40.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	10.00	SOFT	0.	NO	0.	0.
82	6000.	202.50	10.00	SOFT	0	YES	5500.	40.
83	8000.	202.50	10.00	SOFT	0.	NO	0.	0.
84	12000.	202.50	10.00	SOFT	0.	NO	0.	0.
85	500.	180.00	40.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	35.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	30.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	40.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	10.00	SOFT	0.	YES	4350.	50.
90	8000.	180.00	10.00	SOFT	0.	NO	0.	0.
91	12000.	180.00	10.00	SOFT	0.	NO	0.	0.
92	500.	157.50	40.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	30.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	10.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	10.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	10.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	10.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	10.00	SOFT	0.	NO	0.	0.
99	500.	135.00	40.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	30.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	10.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	10.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	5.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	5.00	SOFT	0.	NO	0.	0.
105	12000.	135.00	5.00	SOFT	0.	NO	0.	0.
106	500.	112.50	40.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	20.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	20.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	10.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	10.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	5.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	10.00	SOFT	0.	NO	0.	0.

NEW HAMPHSIRE YANKEE

VL-03

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
1	VANS	128.3	130.3	.0	.0	.0	.0	129.0	124.0	114.0	109.0	103.0

XO= .00 YO= .00 ZO= 125.00 HEIGHT ABOVE GROUND= 45.00

NEW HAMPHSIRE YANKEE

VL-03

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

NEW HAMPHSIRE YANKEE

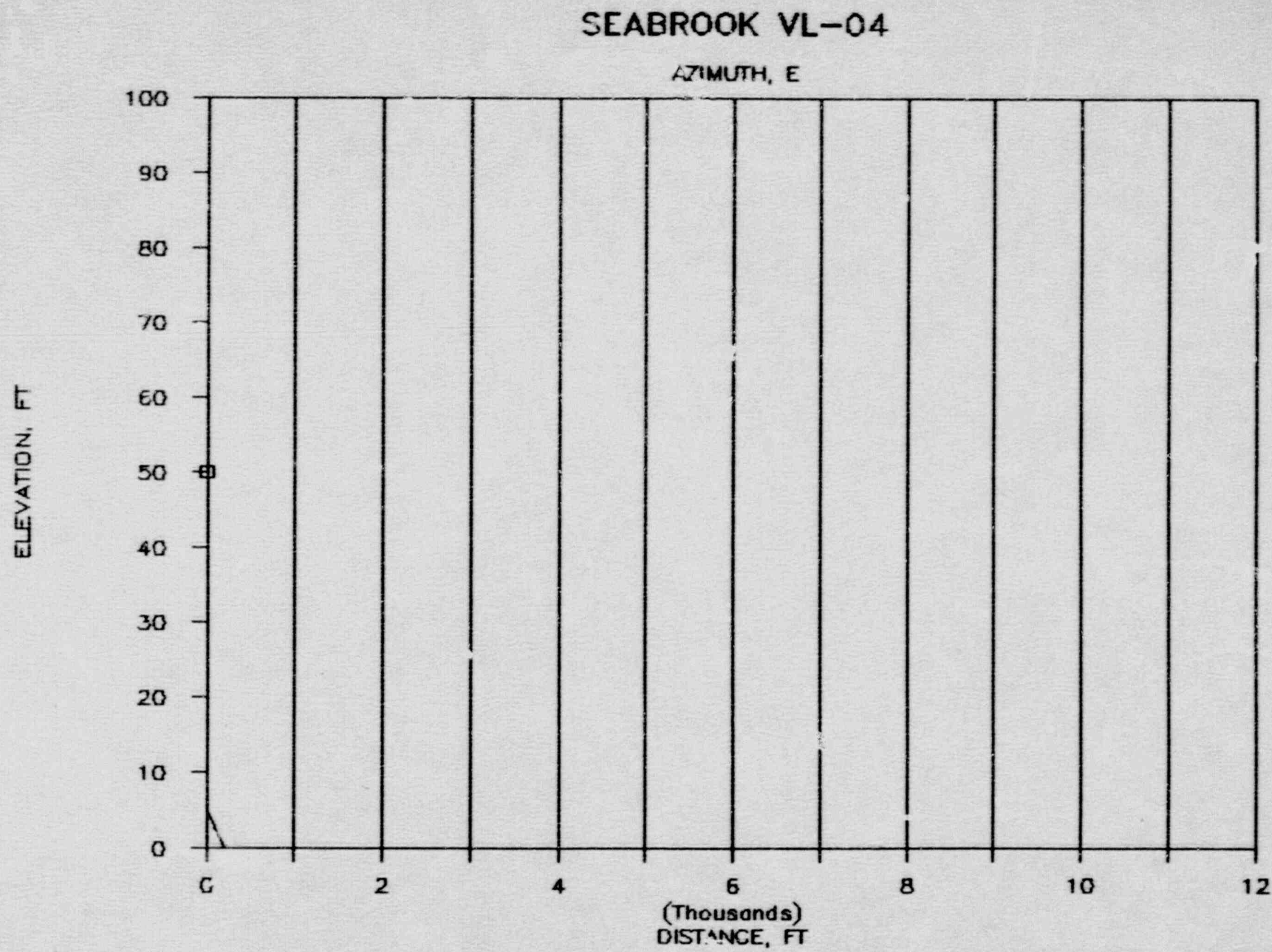
VL-03

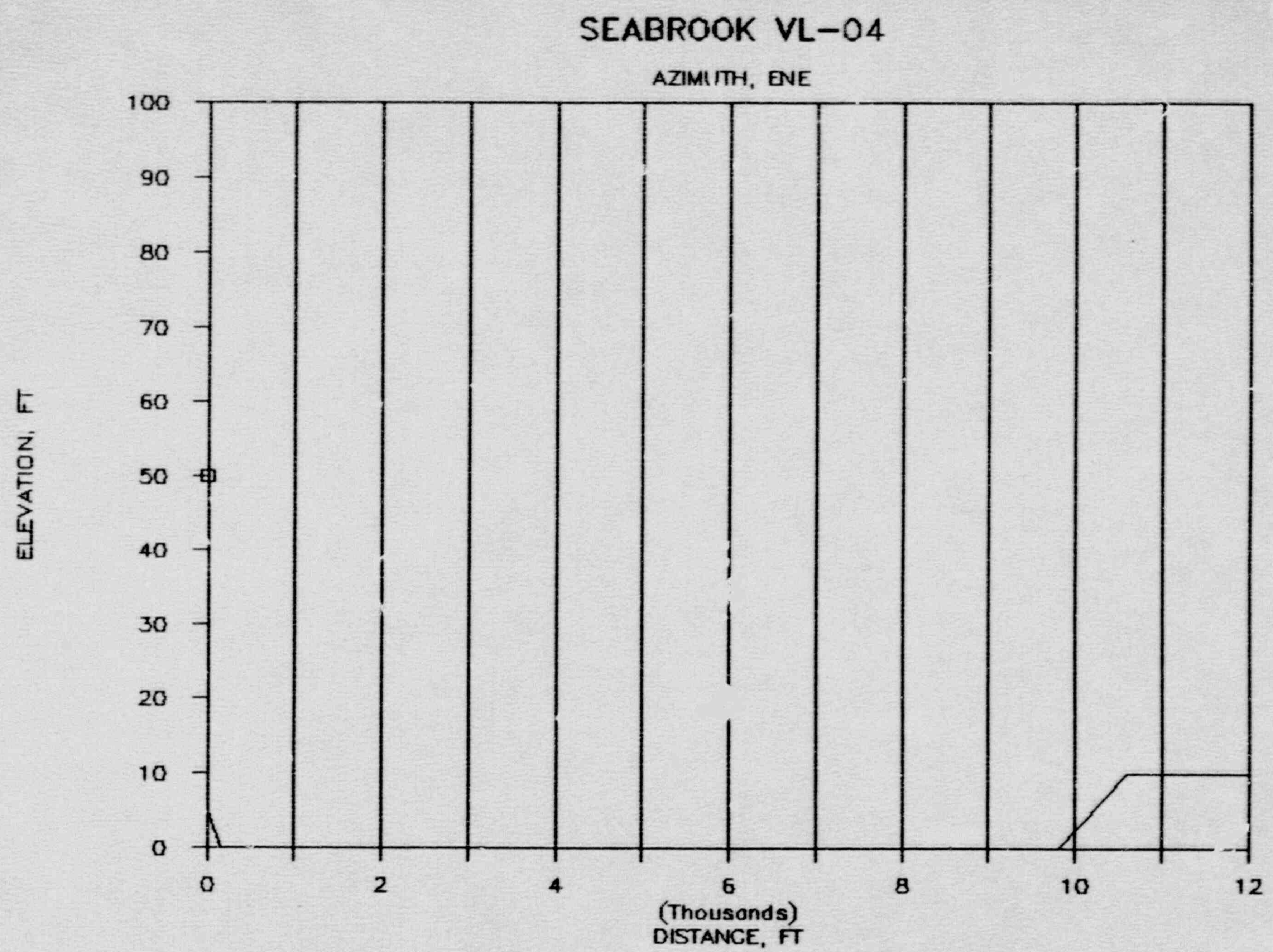
SOUND PRESSURE LEVELS IN DBC

UNDER MET CONDITION 1

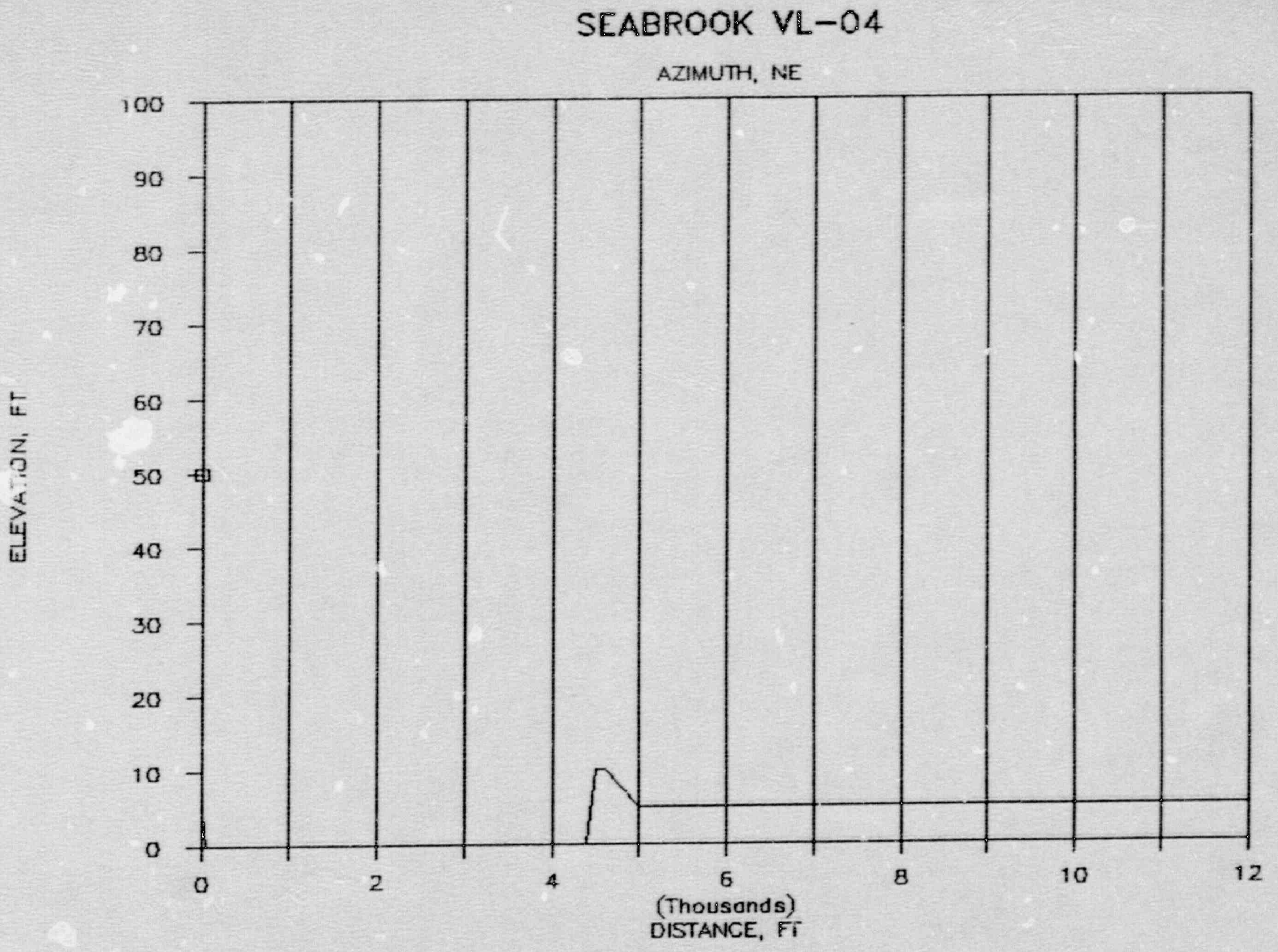
DISTANCE IN FEET

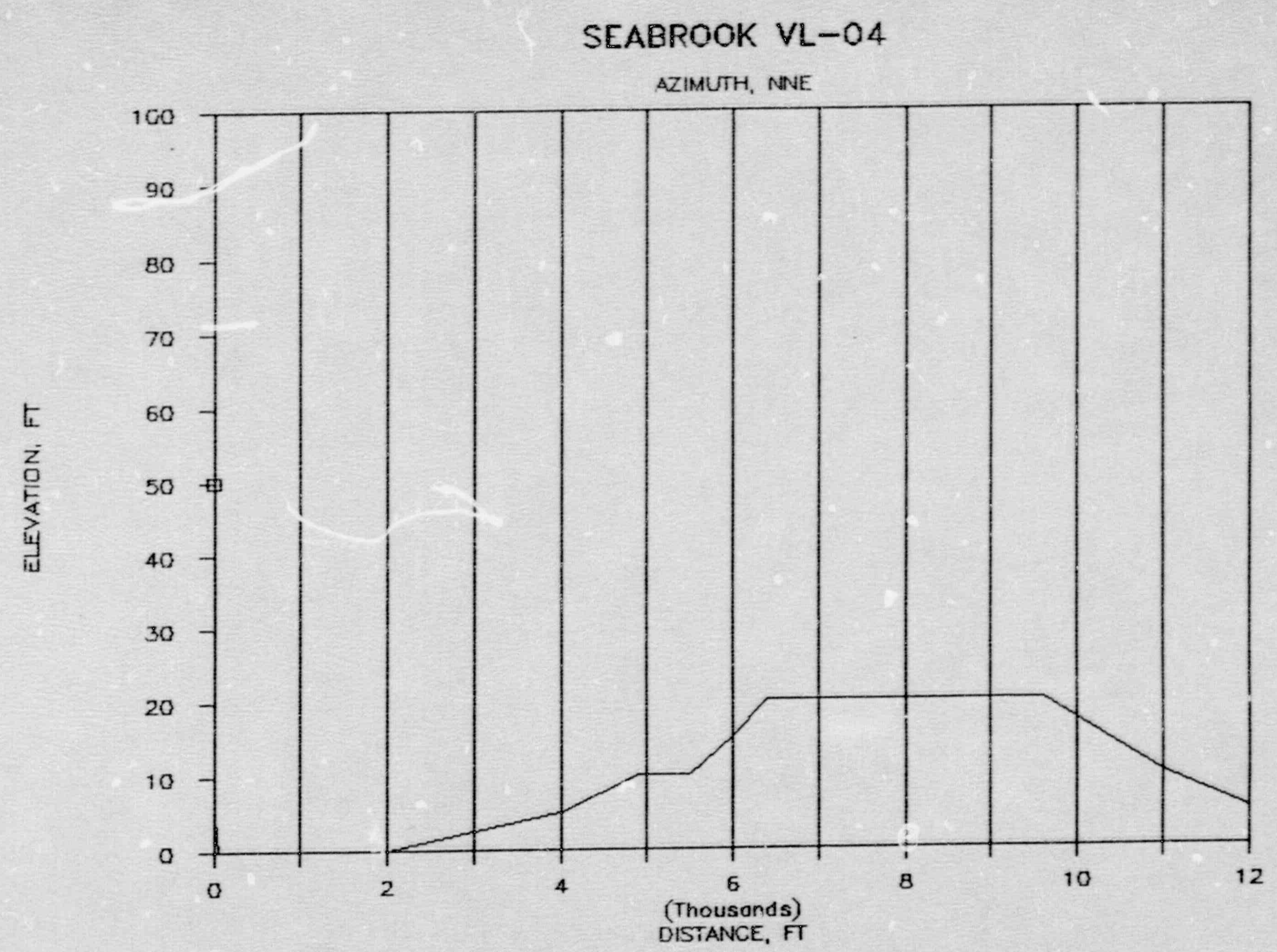
AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	113.4	100.5	90.1	83.1	76.0	68.4	49.2
ENE	113.5	100.5	90.1	83.1	76.6	69.2	55.2
NE	113.6	100.5	76.4	71.5	68.1	63.2	51.5
NNE	113.6	100.5	78.5	73.8	70.3	66.4	58.3
N	113.5	95.5	90.1	83.1	77.8	73.0	64.3
NNW	113.5	100.5	90.1	83.1	77.8	73.1	64.3
NW	113.5	100.5	90.1	83.1	77.8	73.0	64.3
WNW	113.5	100.5	90.1	76.6	77.8	73.0	64.3
W	113.5	100.5	90.1	83.1	77.8	73.0	64.3
WSW	113.5	100.5	90.1	67.9	65.7	62.7	55.4
SW	113.4	100.5	75.9	71.0	67.9	64.3	56.6
SSW	113.4	100.5	90.1	83.1	69.3	73.0	64.3
S	113.4	100.5	90.1	83.1	72.6	73.0	64.3
SSE	113.4	100.5	90.1	83.1	77.8	73.0	64.3
SE	113.4	100.5	90.1	83.1	77.8	71.9	59.2
ESE	113.4	100.5	90.1	83.1	76.6	69.2	55.2


SEABROOK VL-04
AZIMUTH, E
100
90
80
70
60
50
40
30
20
10
0
ELEVATION, FT
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

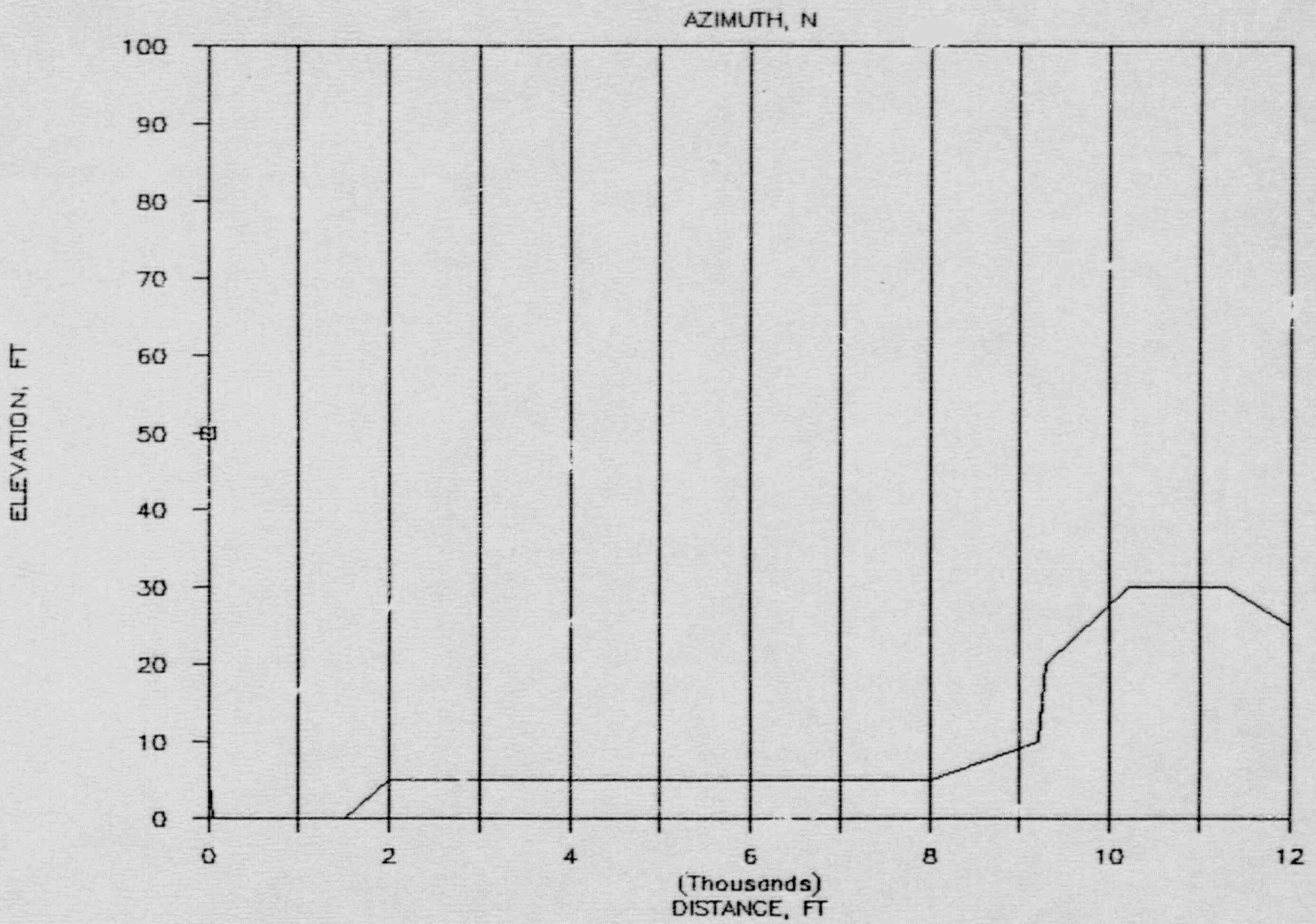


SEABROOK VL-04
AZIMUTH, ENE
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

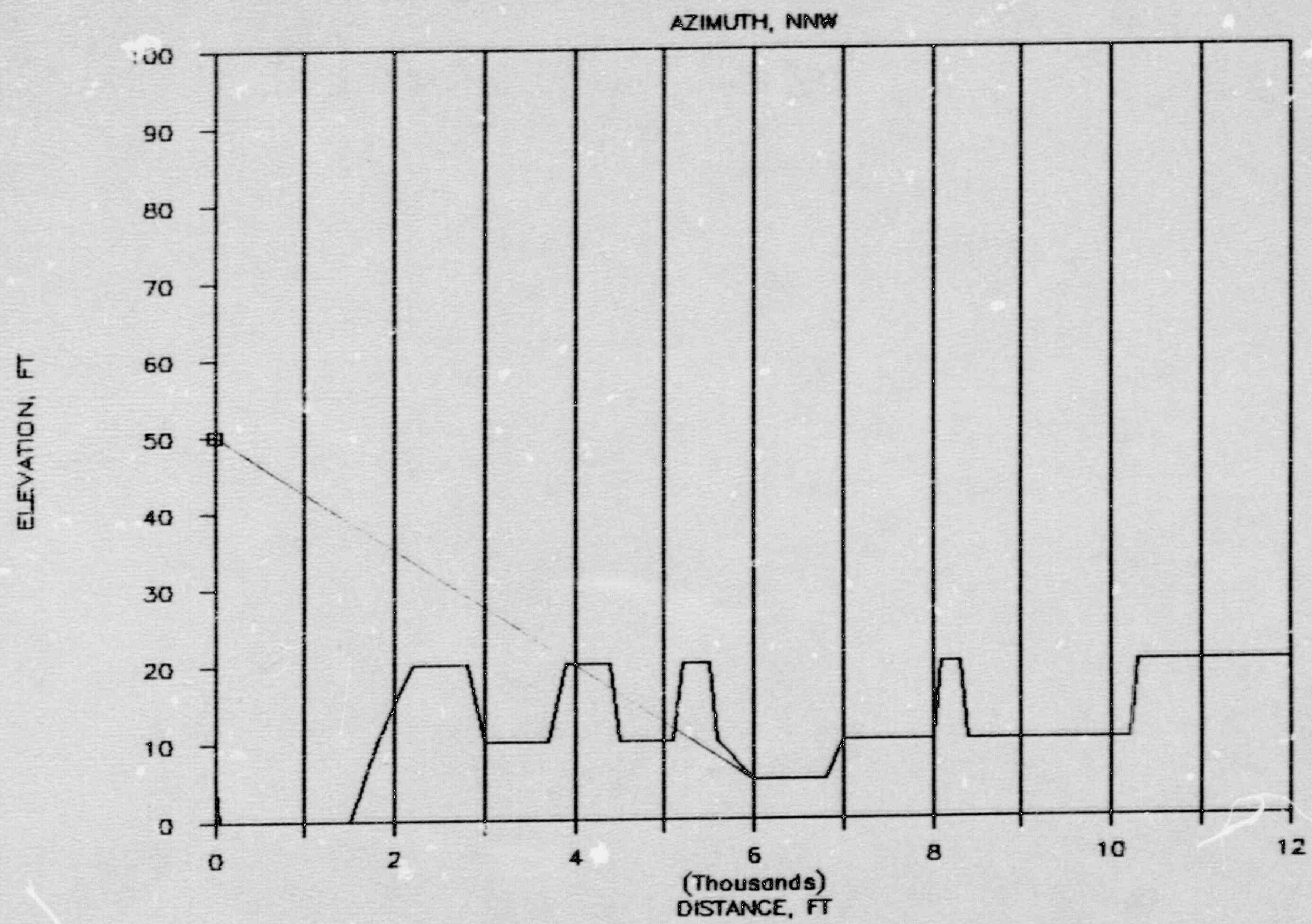

SEABROOK VL-04
AZIMUTH, NE
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK VL-04
AZIMUTH, NNE
100
90
80
70
60
50
40
30
20
10
0
ELEVATION, FT
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

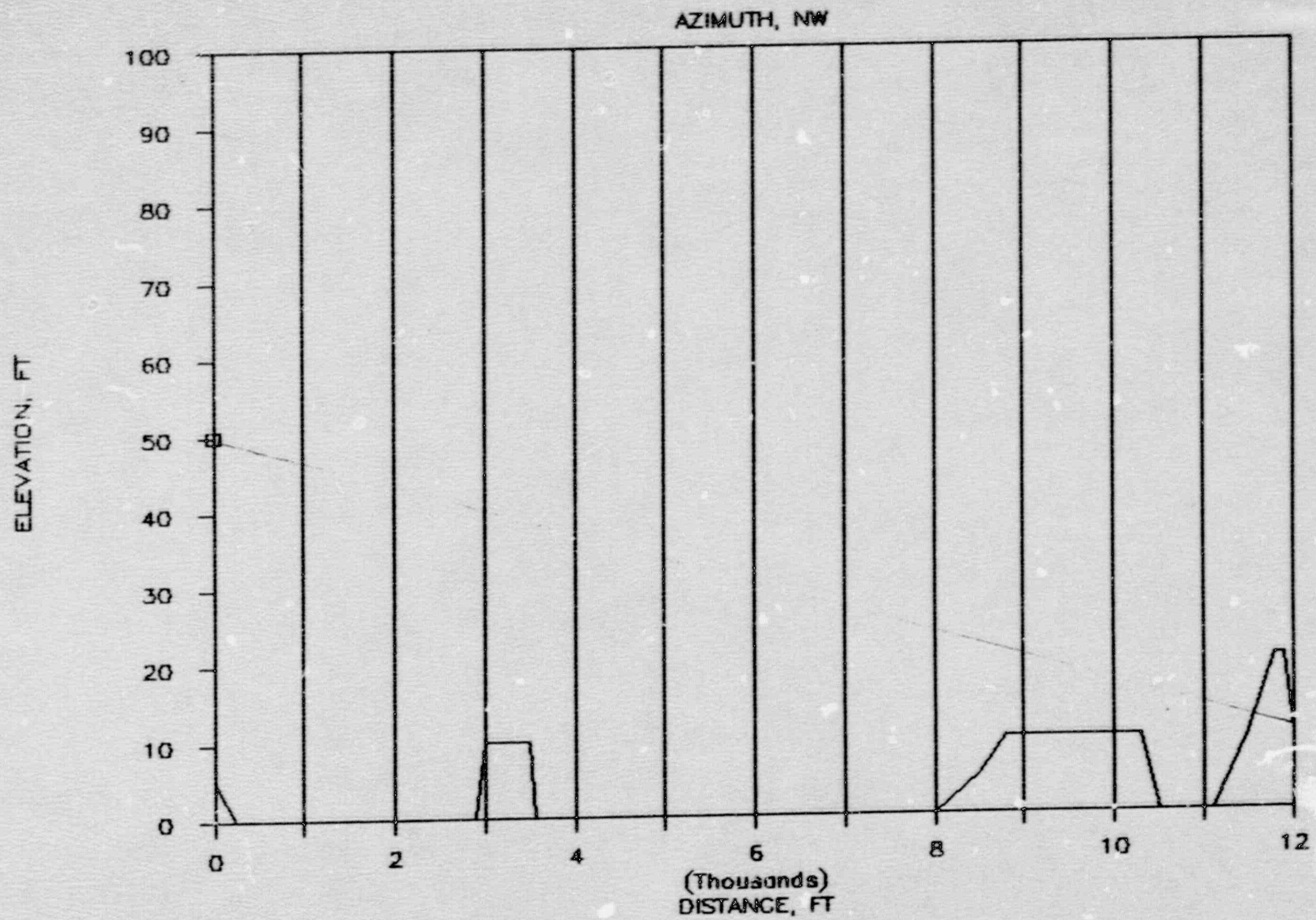
SEABROOK VL-04



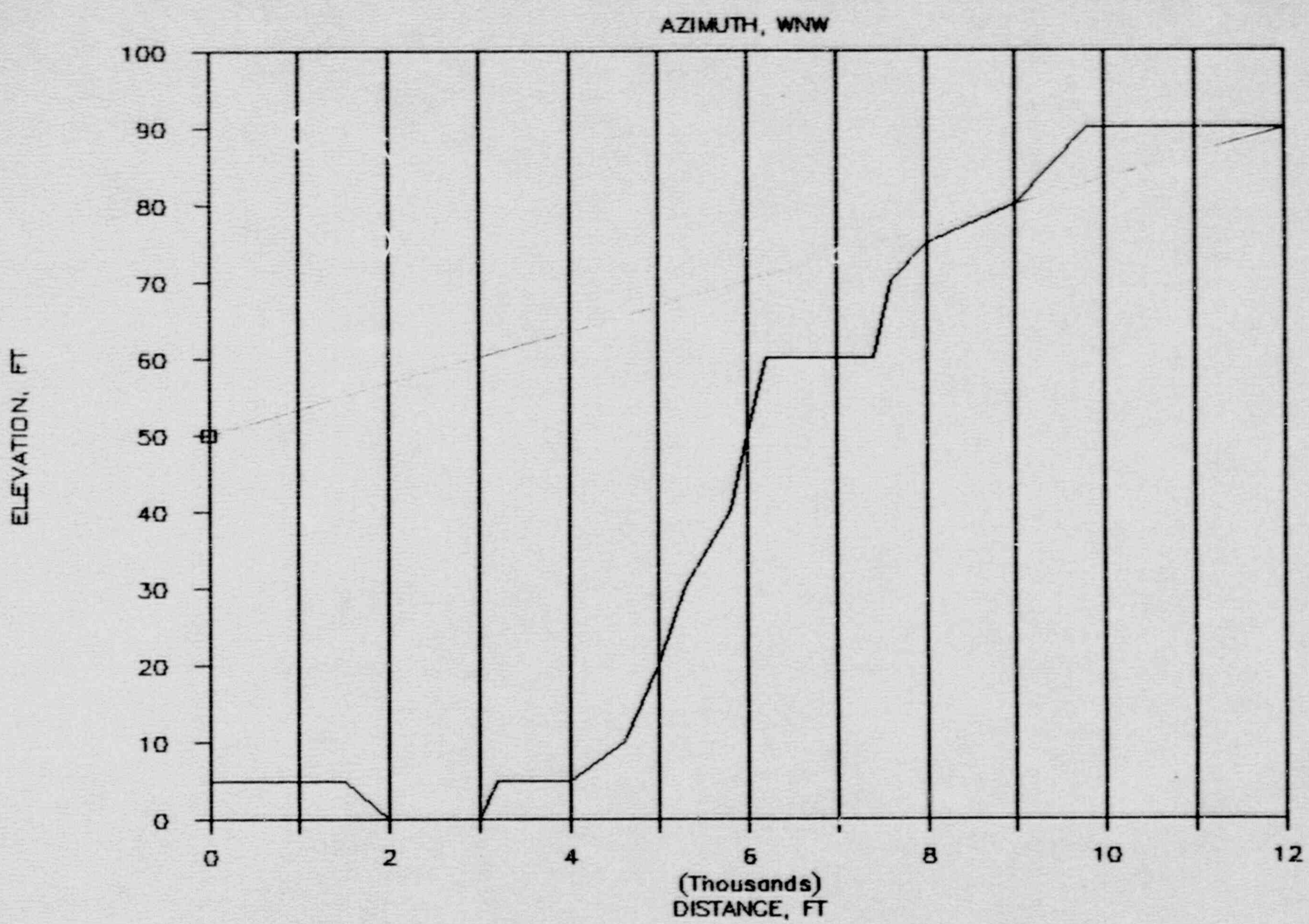
SEABROOK VL-04

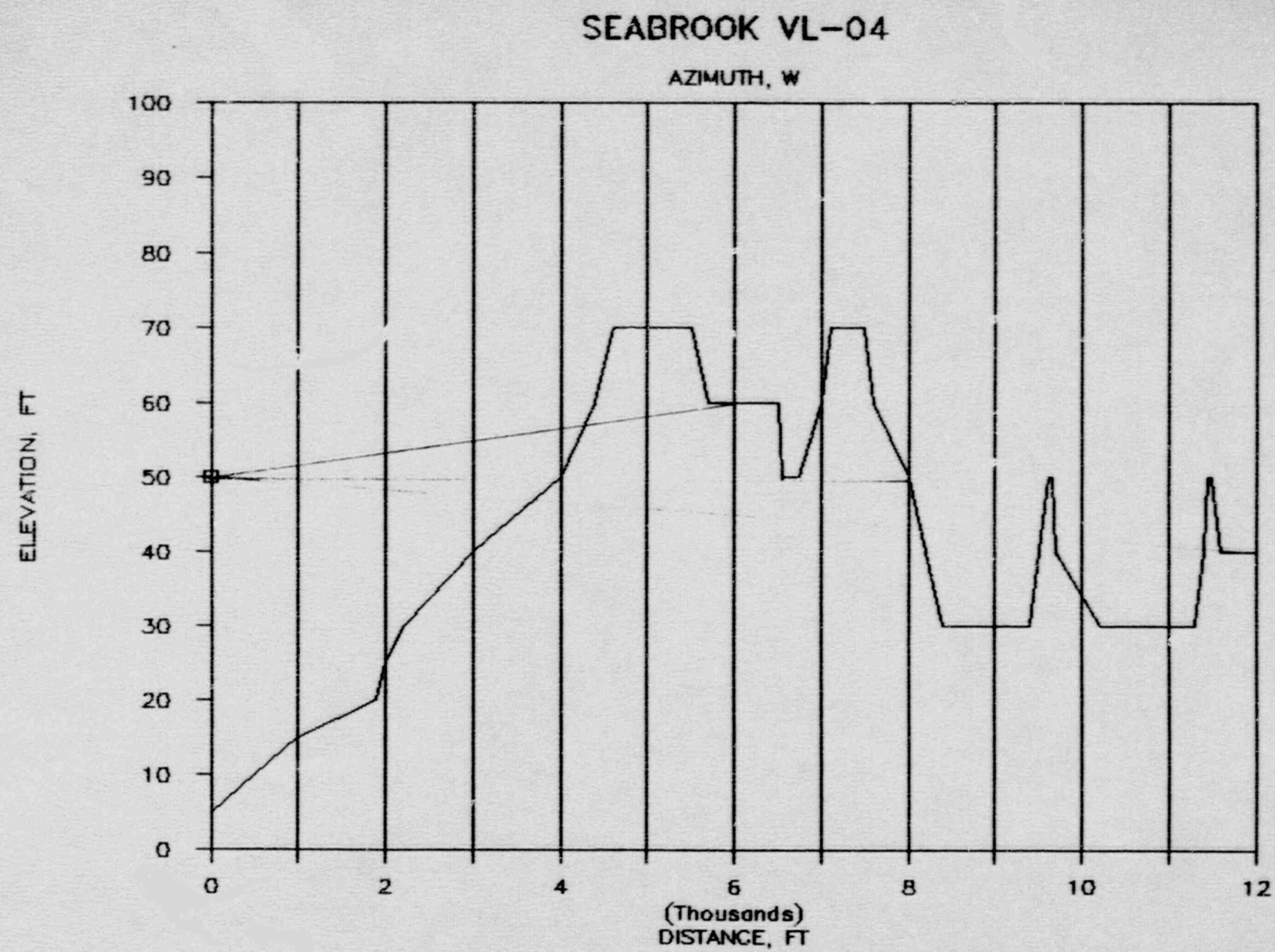


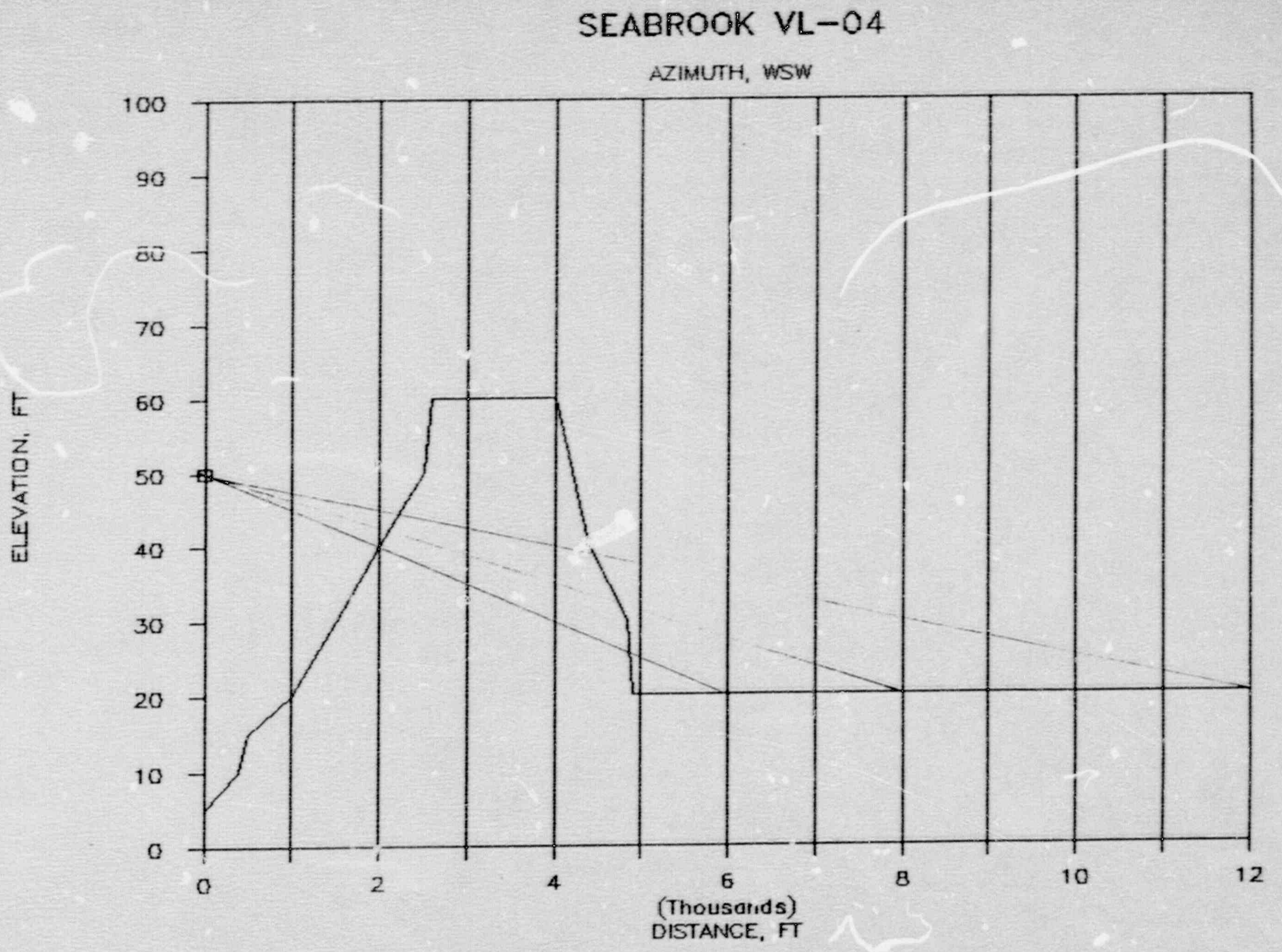
SEABROOK VL-04



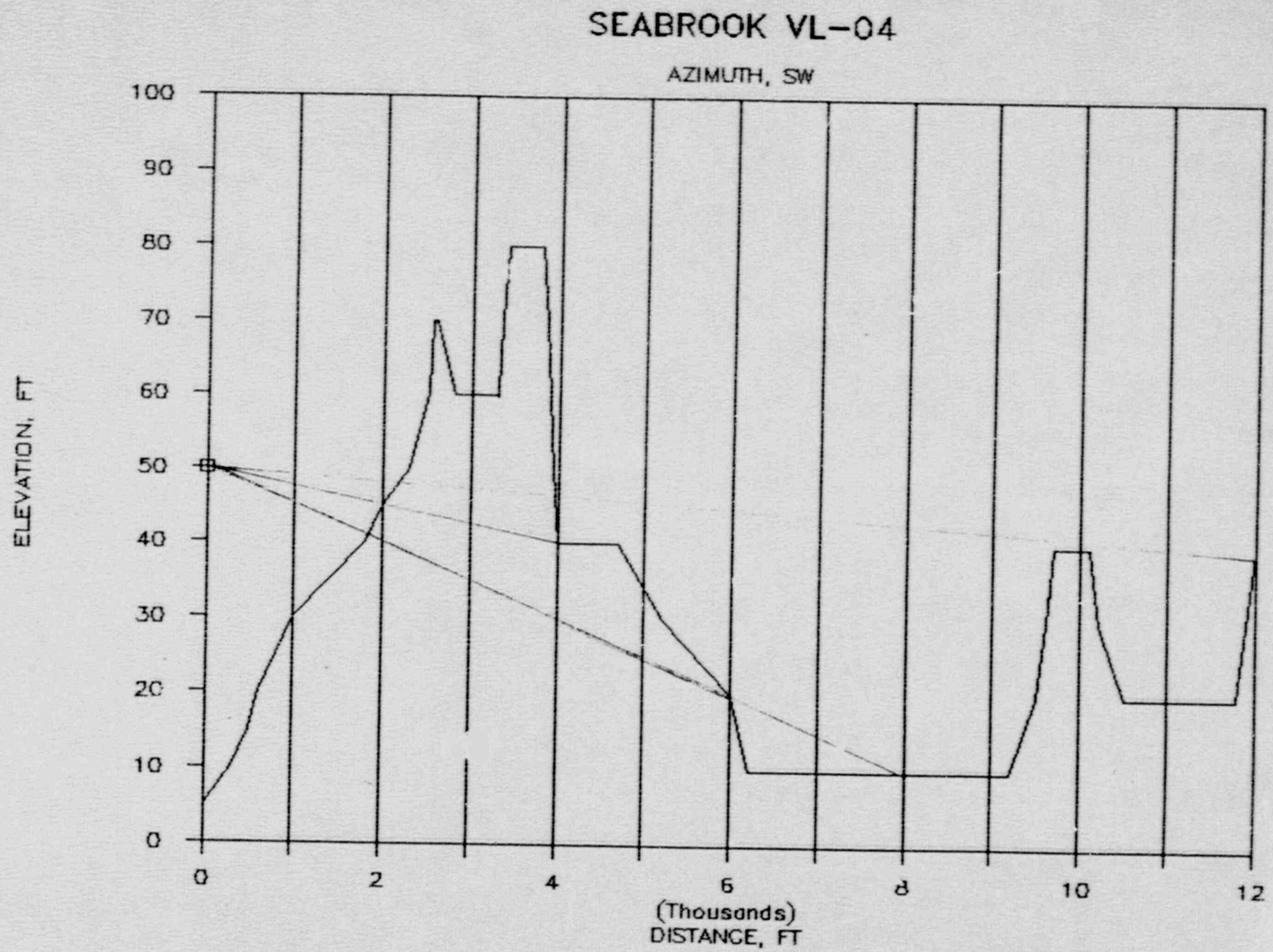
SEABROOK VL-04




SEABROOK VL-04
AZIMUTH, W
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

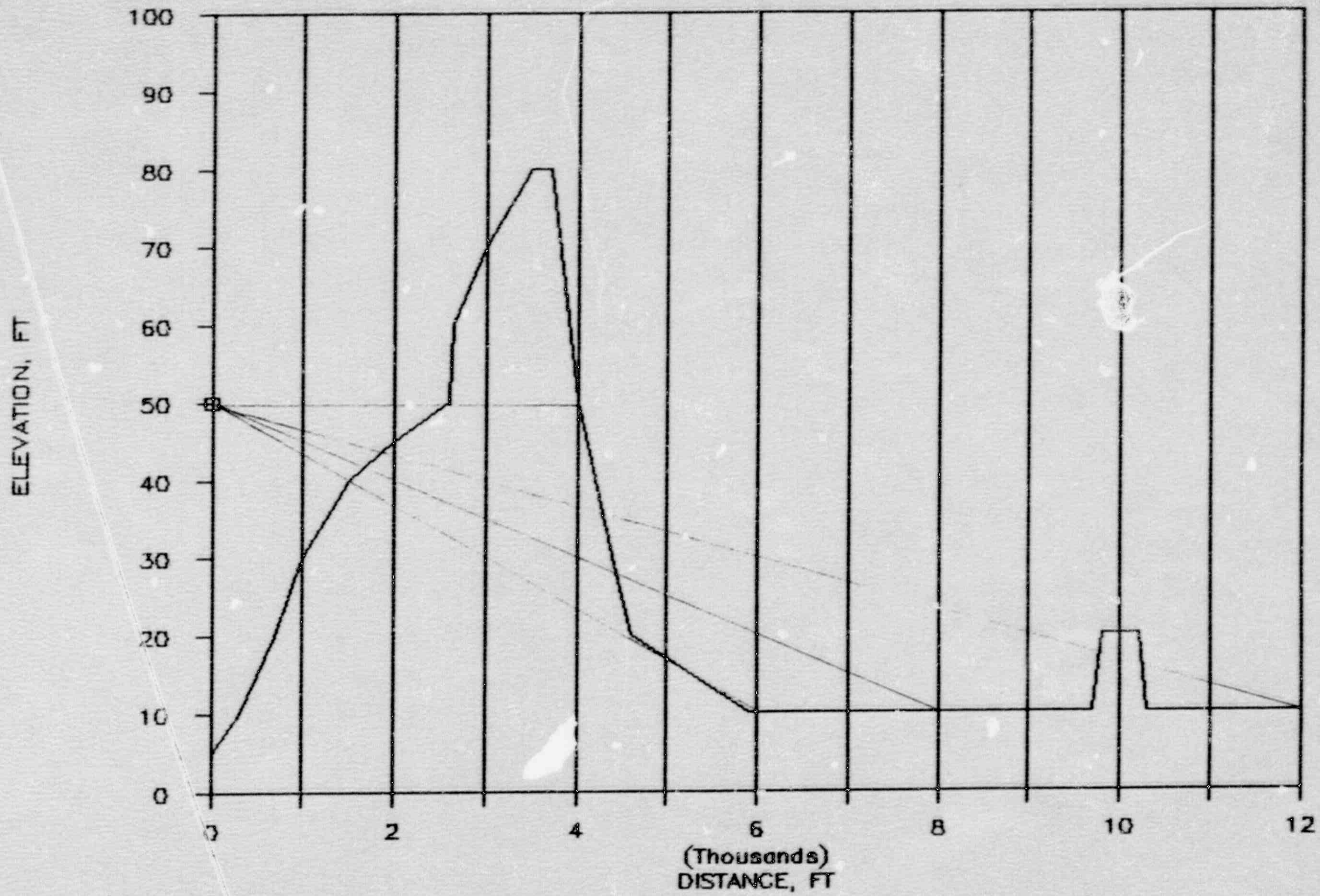


SEABROOK VL-04
AZIMUTH, WSW
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT


SEABROOK VL-04
AZIMUTH, SW
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
DISTANCE, FT

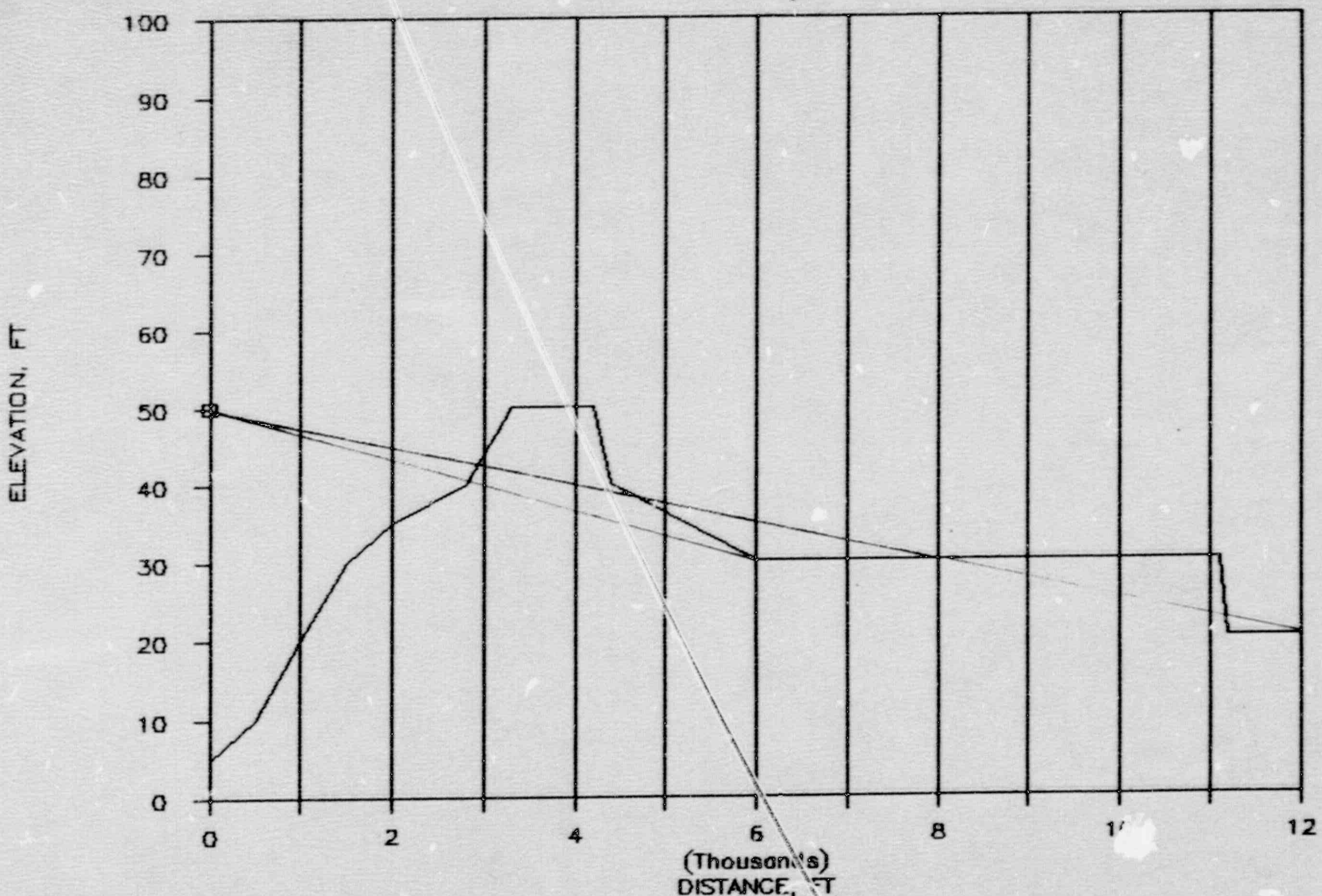
SEABROOK VL-04

AZIMUTH, SSW



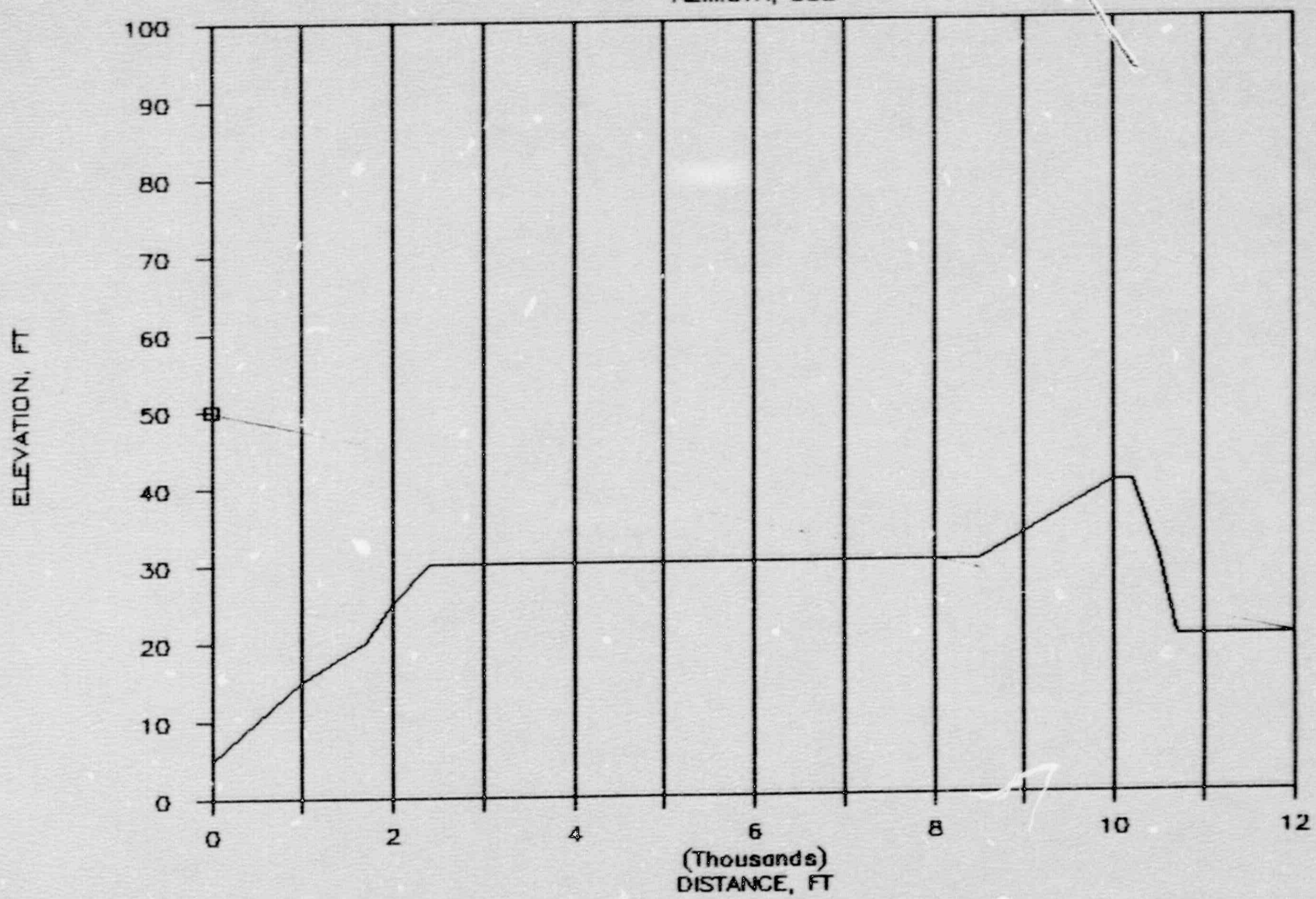
SEABROOK VL-04

AZIMUTH, S



SEABROOK VL-04

AZIMUTH, SSE



1

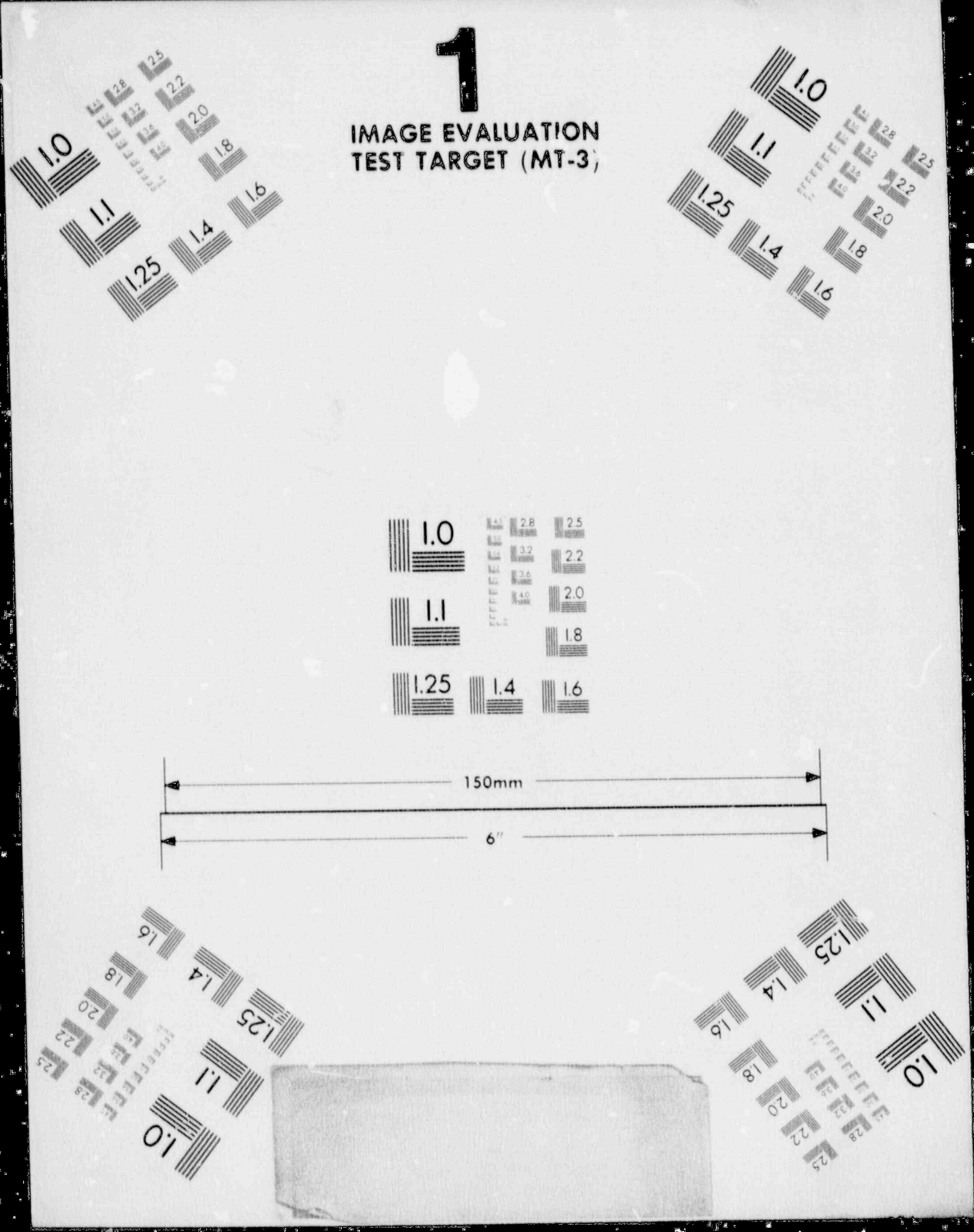
IMAGE EVALUATION TEST TARGET (MT-3)

150mm

6"

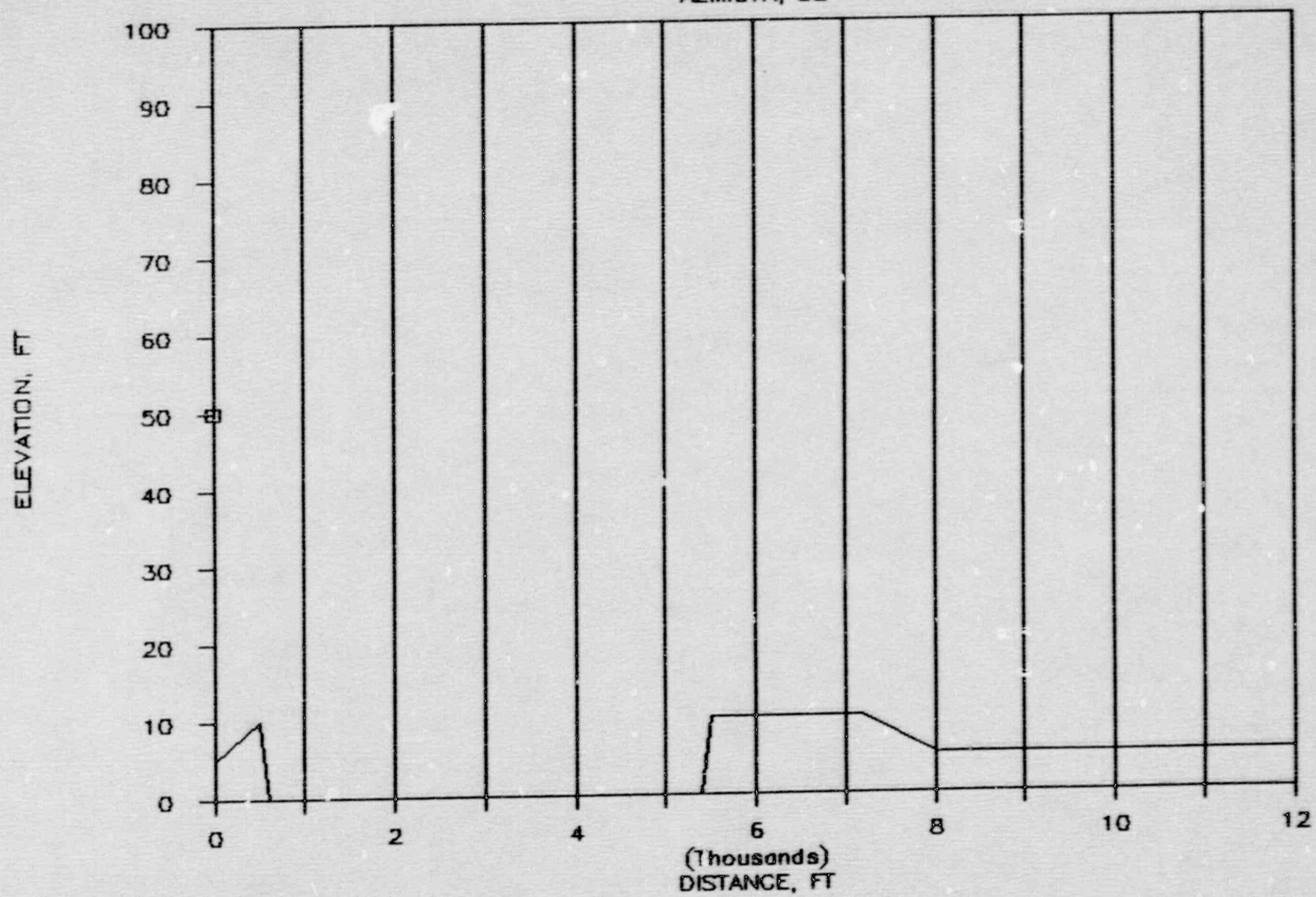
1

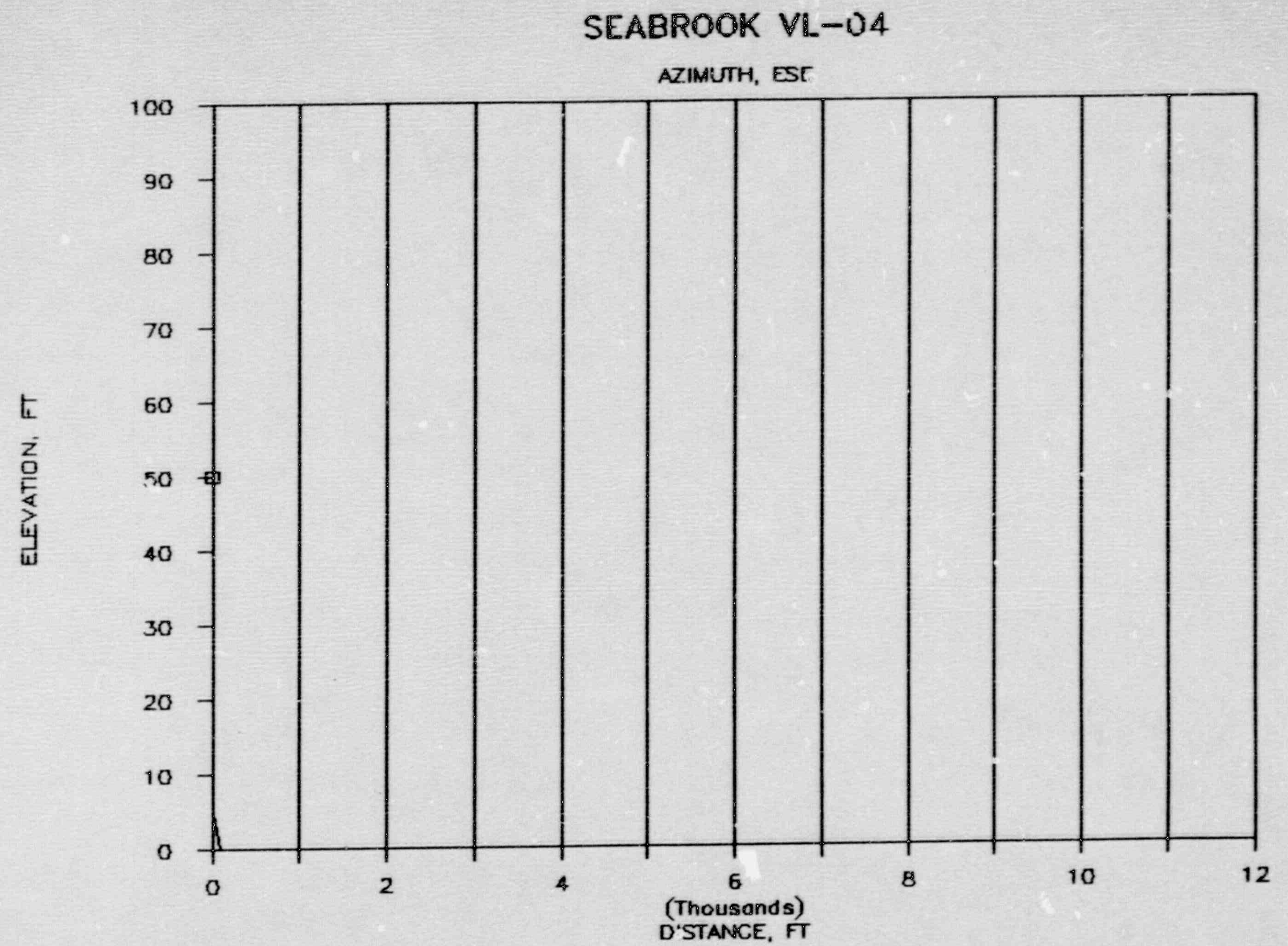
IMAGE EVALUATION TEST TARGET (MT-3)



SEABROOK VL-04

AZIMUTH, SE





SEABROOK VL-04
AZIMUTH, ESE
ELEVATION, FT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
(Thousands)
D'STANCE, FT

NEW HAMPHSIRE YANKEE

VL-04

SOURCE-RECEIVER TOPOGRAPHICAL INPUTS

ALL BEARINGS ARE WITH RESPECT TO NORTH MEASURING CLOCKWISE

GRID POINT	DISTANCE	BEARING	HEIGHT	GROUND TYPE	FOLIAGE PENETRATION	INTERVENING OBSTRUCTIONS	DISTANCE TO HIGHEST OBSTRUCTION FROM SOURCE	HEIGHT OF OBSTRUCTION
1	500.	90.00	5.00	SOFT	0.	NO	0.	0.
2	1000.	90.00	5.00	SOFT	0.	NO	0.	0.
3	2000.	90.00	5.00	SOFT	0.	NO	0.	0.
4	4000.	90.00	5.00	SOFT	0.	NO	0.	0.
5	6000.	90.00	5.00	SOFT	0.	NO	0.	0.
6	8000.	90.00	5.00	SOFT	0.	NO	0.	0.
7	12000.	90.00	5.00	SOFT	0.	NO	0.	0.
8	500.	67.50	5.00	SOFT	0.	NO	0.	0.
9	1000.	67.50	5.00	SOFT	0.	NO	0.	0.
10	2000.	67.50	5.00	SOFT	0.	NO	0.	0.
11	4000.	67.50	5.00	SOFT	0.	NO	0.	0.
12	6000.	67.50	5.00	SOFT	0.	NO	0.	0.
13	8000.	67.50	5.00	SOFT	0.	NO	0.	0.
14	12000.	67.50	10.00	SOFT	0.	NO	0.	0.
15	500.	45.00	5.00	SOFT	0.	NO	0.	0.
16	1000.	45.00	5.00	SOFT	0.	NO	0.	0.
17	2000.	45.00	5.00	SOFT	0.	NO	0.	0.
18	4000.	45.00	5.00	SOFT	0.	NO	0.	0.
19	6000.	45.00	5.00	SOFT	0.	NO	0.	0.
20	8000.	45.00	5.00	SOFT	0.	NO	0.	0.
21	12000.	45.00	5.00	SOFT	0.	NO	0.	0.
22	500.	22.50	5.00	SOFT	0.	NO	0.	0.
23	1000.	22.50	5.00	SOFT	0.	NO	0.	0.
24	2000.	22.50	5.00	SOFT	0.	NO	0.	0.
25	4000.	22.50	5.00	SOFT	0.	NO	0.	0.
26	6000.	22.50	15.00	SOFT	0.	NO	0.	0.
27	8000.	22.50	20.00	SOFT	0.	NO	0.	0.
28	12000.	22.50	5.00	SOFT	0.	NO	0.	0.
29	500.	.00	5.00	SOFT	0.	NO	0.	0.
30	1000.	.00	5.00	SOFT	0.	NO	0.	0.
31	2000	.00	5.00	SOFT	0.	NO	0.	0.
32	4000.	.00	5.00	SOFT	0.	NO	0.	0.
33	6000.	.00	5.00	SOFT	0.	NO	0.	0.
34	8000.	.00	5.00	SOFT	0.	NO	0.	0.
35	12000.	.00	25.00	SOFT	0.	NO	0.	0.
36	500.	337[illegible]	5.00	SOFT	0.	NO	0.	0.
37	1000.	337.50	5.00	SOFT	0.	NO	0.	0.
38	2000.	337.50	15.00	SOFT	0.	NO	0.	0.
39	4000.	337.50	20.00	SOFT	0.	NO	0.	0.
40	6000.	337.50	5.00	SOFT	0.	YES	5500.	20.
41	8000.	337.50	10.00	SOFT	0.	NO	0.	0.

42	12000.	337.50	20.00	SOFT	0.	NO	0.	0.
43	500.	315.00	5.00	SOFT	0.	NO	0.	0.
44	1000.	315.00	5.00	SOFT	0.	NO	0.	0.
45	2000.	315.00	5.00	SOFT	0.	NO	0.	0.
46	4000.	315.00	5.00	SOFT	0.	NO	0.	0.
47	6000.	315.00	5.00	SOFT	0.	NO	0.	0.
48	8000.	315.00	5.00	SOFT	0.	NO	0.	0.
49	12000.	315.00	10.00	SOFT	0.	YES	11900.	20.
50	500.	292.50	5.00	SOFT	0.	NO	0.	0.
51	1000.	292.50	5.00	SOFT	0.	NO	0.	0.
52	2000.	292.50	5.00	SOFT	0.	NO	0.	0.
53	4000.	292.50	5.00	SOFT	0.	NO	0.	0.
54	6000.	292.50	50.00	SOFT	0.	NO	0.	0.
55	8000.	292.50	75.00	SOFT	0.	NO	0.	0.
56	12000.	292.50	90.00	SOFT	0.	YES	9800.	90.
57	500.	270.00	10.00	SOFT	0.	NO	0.	0.
58	1000.	270.00	15.00	SOFT	0.	NO	0.	0.
59	2000.	270.00	25.00	SOFT	0.	NO	0.	0.
60	4000.	270.00	50.00	SOFT	0.	NO	0.	0.
61	6000.	270.00	60.00	SOFT	0.	YES	4600.	70.
62	8000.	270.00	50.00	SOFT	0.	YES	4600.	70.
63	12000.	270.00	40.00	SOFT	0.	YES	4600.	70.
64	500.	247.50	15.00	SOFT	0.	NO	0.	0.
65	1000.	247.50	20.00	SOFT	0.	NO	0.	0.
66	2000.	247.50	40.00	SOFT	0.	NO	0.	0.
67	4000.	247.50	60.00	SOFT	0.	NO	0.	0.
68	6000.	247.50	20.00	SOFT	0.	YES	2600.	60.
69	8000.	247.50	20.00	SOFT	0.	YES	2600.	60.
70	12000.	247.50	20.00	SOFT	0.	YES	2600.	60.
71	500.	225.00	15.00	SOFT	0.	NO	0.	0.
72	1000.	225.00	30.00	SOFT	0.	NO	0.	0.
73	2000.	225.00	45.00	SOFT	0.	NO	0.	0.
74	4000.	225.00	40.00	SOFT	0.	YES	3400.	80.
75	6000.	225.00	20.00	SOFT	0.	YES	3400.	80.
76	8000.	225.00	10.00	SOFT	0.	YES	3400.	80.
77	12000.	225.00	40.00	SOFT	0.	YES	3400.	80.
78	500.	202.50	15.00	SOFT	0.	NO	0.	0.
79	1000.	202.50	30.00	SOFT	0.	NO	0.	0.
80	2000.	202.50	45.00	SOFT	0.	NO	0.	0.
81	4000.	202.50	50.00	SOFT	0.	YES	3500.	80.
82	6000.	202.50	10.00	SOFT	0.	YES	3500.	80.
83	8000.	202.50	10.00	SOFT	0.	YES	3500.	80.
84	12000.	202.50	10.00	SOFT	0.	YES	3500.	80.
85	500.	180.00	10.00	SOFT	0.	NO	0.	0.
86	1000.	180.00	20.00	SOFT	0.	NO	0.	0.
87	2000.	180.00	35.00	SOFT	0.	NO	0.	0.
88	4000.	180.00	50.00	SOFT	0.	NO	0.	0.
89	6000.	180.00	30.00	SOFT	0.	YES	4200.	50.
90	8000.	180.00	30.00	SOFT	0.	YES	4200.	50.
91	12000.	180.00	20.00	SOFT	0.	YES	4200.	50.
92	500.	157.50	10.00	SOFT	0.	NO	0.	0.
93	1000.	157.50	15.00	SOFT	0.	NO	0.	0.
94	2000.	157.50	25.00	SOFT	0.	NO	0.	0.
95	4000.	157.50	30.00	SOFT	0.	NO	0.	0.
96	6000.	157.50	30.00	SOFT	0.	NO	0.	0.

97	8000.	157.50	30.00	SOFT	0.	NO	0.	0.
98	12000.	157.50	20.00	SOFT	0.	YES	10000.	40.
99	500.	135.00	10.00	SOFT	0.	NO	0.	0.
100	1000.	135.00	5.00	SOFT	0.	NO	0.	0.
101	2000.	135.00	5.00	SOFT	0.	NO	0.	0.
102	4000.	135.00	5.00	SOFT	0.	NO	0.	0.
103	6000.	135.00	10.00	SOFT	0.	NO	0.	0.
104	8000.	135.00	5.00	SOFT	0.	NO	0.	0.
105	12000.	135.00	5.00	SOFT	0.	NO	0.	0.
106	500.	112.50	5.00	SOFT	0.	NO	0.	0.
107	1000.	112.50	5.00	SOFT	0.	NO	0.	0.
108	2000.	112.50	5.00	SOFT	0.	NO	0.	0.
109	4000.	112.50	5.00	SOFT	0.	NO	0.	0.
110	6000.	112.50	5.00	SOFT	0.	NO	0.	0.
111	8000.	112.50	5.00	SOFT	0.	NO	0.	0.
112	12000.	112.50	5.00	SOFT	0.	NO	0.	0.

NEW HAMPHSIRE YANKEE

VL-04

SOURCE SOUND PRESSURE LEVEL INPUT AT 100 FT

INDEX	SOURCE	DBA	DBC	31.5	63	125	250	500	1000	2000	4000	8000 (HZ)
1	VANS	128.3	130.3	.0	.0	.0	.0	129.0	124.0	114.0	109.0	103.0

XO= .00 YO= .00 ZO= 50.00 HEIGHT ABOVE GROUND= 45.00

NEW HAMPHSIRE YANKEE

VL-04

METEOROLOGICAL INPUT CONDITIONS

H1= 13.11 METERS H2= 63.70 METERS

YEAR	SEASON	MONTH	DATE	HOUR	WIND DIRECTION	WIND SPEED(MPS) H1	WIND SPEED(MPS) H2	TEMPERATURE(C) H1	TEMPERATURE(C) H2	RELATIVE HUMIDITY	BAROMETRIC PRESSURE(MM OF HG)
1988	S	7	1	12	90.0	3.8	4.7	21.6	20.9	40.0	760.0

NEW HAMPHSIRE YANKEE

VL-04

SOUND PRESSURE LEVELS IN DBC

UNDER MET CONDITION 1

DISTANCE IN FEET

AZIMUTH	500.	1000.	2000.	4000.	6000.	8000.	12000.
E	113.5	100.5	90.1	83.1	76.0	68.4	54.1
ENE	113.5	100.5	90.1	83.1	76.6	69.2	55.2
NE	113.5	100.5	90.1	83.1	77.8	71.9	59.2
NNE	113.5	100.5	90.1	83.1	77.8	73.1	64.3
N	113.5	100.5	90.1	83.1	77.8	73.1	64.3
NNW	113.5	100.5	90.1	83.1	71.5	73.1	64.3
NW	113.5	100.5	90.1	83.1	77.8	73.1	55.8
WNW	113.5	100.5	90.1	83.1	77.8	73.1	59.3
W	113.5	100.5	90.1	83.1	72.2	67.1	58.4
WSW	113.5	100.5	90.1	83.1	71.2	67.0	58.8
SW	113.5	100.5	90.1	71.1	67.9	64.0	57.4
SSW	113.5	100.5	90.1	72.3	67.1	64.0	56.5
S	113.5	100.5	90.1	83.1	72.1	67.9	59.3
SSE	113.5	100.5	90.1	83.1	77.8	73.1	58.8
SE	113.5	100.5	90.1	83.1	77.8	71.9	59.2
ESE	113.5	100.5	90.1	83.1	76.6	69.2	55.2

APPENDIX B

Sample Size Determination

APPENDIX B

SAMPLE SIZE DETERMINATION

The number of households that need to be surveyed is determined based upon the need to obtain a sample size sufficient to obtain a 95% confidence interval with precision (half-width) of 0.05 for the estimate of the proportion alerted. The exact number of households to be surveyed can be derived from the following statistical considerations. For relatively large sample sizes ($n \geq 30$), taken without replacement from a population (N), the sampling distribution for proportions (e.g., the proportion of the population alerted) is nearly a normal distribution, the mean of which is the proportion (p) of the population alerted and the variance of which is

$$p(1 - p)/n \left(\frac{N - n}{N - 1}\right)$$

If P is the observed sample proportion, then for a particular confidence level with confidence coefficient Z_c,

$$(P - p)^2 \leq z_c^2\, p(1 - p)/n \left(\frac{N - n}{N - 1}\right)$$

Thus, for this confidence level, the actual proportion of the population alerted satisfies the following inequalities:

$$\frac{P + \frac{z_c^2}{2n}\left(\frac{N - n}{N - 1}\right) - z_c\sqrt{\frac{P(1 - P)}{n}\left(\frac{N - n}{N - 1}\right) + \frac{z_c^2}{4n^2}\left(\frac{N - n}{N - 1}\right)^2}}{1 + \frac{z_c^2}{n}\left(\frac{N - n}{N - 1}\right)} \leq p \text{ and}$$

$$P \leq \frac{P + \frac{z_c^2}{2n}\left(\frac{N-n}{N-1}\right) + z_c\sqrt{\frac{P(1-P)}{n}\left(\frac{N-n}{N-1}\right) + \frac{z_c^2}{4n^2}\left(\frac{N-n}{N-1}\right)^2}}{1 + \frac{z_c^2}{n}\left(\frac{N-n}{N-1}\right)}$$

Thus, the precision (W) is simply given by

$$W = \frac{z_c\sqrt{\frac{P(1-P)}{n}\left(\frac{N-n}{N-1}\right) + \frac{z_c^2}{4n^2}\left(\frac{N-n}{N-1}\right)^2}}{1 + \frac{z_c^2}{n}\left(\frac{N-n}{N-1}\right)}$$

This equation can be solved to determine the sample size (n) required to yield a given precision (W) with a given observed sample proportion (P) as follows:

$$n = \frac{\frac{z_c^2}{2W^2}\left[P(1-P) - 2W^2 + \sqrt{W^2\left[1 - 4P(1-P)\right] + P^2(1-P)^2}\right]}{1 + \frac{z_c^2}{2W^2N}\left[P(1-P) - 2W^2\left(1 + \frac{1}{z_c^2}\right) + \sqrt{W^2\left[1 - 4P(1-P)\right] + P^2(1-P)^2}\right]}$$

Although this expression for n can be used directly, it is customary to make several approximations. First, since the term in N in the denominator (the finite population term) is positive definite for all reasonable values of W ($0 < W < 0.5$), omitting this term will result in an approximation to n that is slightly larger than its true value. This is an acceptable practice in sizing the sample since a larger sample gives greater precision.

A second approximation that can be made is to neglect the terms in W^2 within the bracket in the numerator. Analysis demonstrates that this underestimates n when $P < 1/2 - 1/4\sqrt{2 + 8W^2}$ or $P > 1/2 + 1/4\sqrt{2 + 8W^2}$ and overestimates n for P between those two values. For the case of interest (a 95% confidence interval with precision of 0.05), this approximation provides an overestimation of n when a sample size greater than 191 is required. Since the sampling plan calls for a minimum sample size of 250, regardless of the value of P, this approximation is acceptable because it also yields an estimate of n larger than the true value. Therefore, for the purposes of the pilot test and subsequent surveys, the following approximate equation can be used to determine whether a sample size larger than 250 is required:

$$n = \frac{Z_c^2}{W^2} P(1 - P)$$

or using 1.96 for Z_c and 0.05 for W,

$$n = 1536.64\ P(1 - P)$$

Data from the pilot test can be used to illustrate the effects of these approximations. In the pilot test, the population of tone alert households from which the sample was to be drawn (N) was approximately 4500 and the observed proportion alerted (P) was 0.675. This yields 311 as the exact result for n. Neglecting the finite population term yields an estimate of 334 for n, and the simplified final approximation estimates n as 338. Thus, the final simplified approximation overestimates the required sample size by 27 in this case.

SOURCE: International Energy Associates Limited. "Analysis of Tone Alert Pilot Test." IEAL-321. September 27, 1983.