



CHARLES CENTER • P. O. BOX 1475 • BALTIMORE, MARYLAND 21203

ARTHUR E. LUNDVALL, JR.
VICE PRESIDENT
SUPPLY

September 14, 1982

U. S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2: Docket Nos. 50-317 & 50-318
1982 Emergency Response Plan Exercise

ATTENTION: Mr. Ronald C. Haynes, Director.

Gentlemen:

The 1982 Emergency Response Plan Exercise is scheduled for September 28, 1982. Attached is the scenario for this exercise, including the plant parameters and radiological information (Sections 4.0 & 5.0).

We have expanded the scenario by introducing more complications in the initial stages, thereby, requiring more response from the Emergency Organization. The scenario changes can be easily identified by the vertical line on the right hand margin of the page.

Should you have any questions regarding this matter, we would be pleased to discuss them with you.

Very truly yours,

Vice President - Supply

AEL/JMM/sab

cc: J. A. Biddison, Esquire, w/o attachment
G. F. Trowbridge, Esquire, w/o attachment
D. H. Jaffe, NRC, w/o attachment
R. E. Architzel, NRC, w/o attachment

IE35

8210080072 820914
PDR ADOCK 05000317
F PDR

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT 1982 EMERGENCY RESPONSE EXERCISE SEPTEMBER 28, 1982

TABLE OF CONTENTS

- 1.0 Introduction
- 2.0 Objectives & Guidelines
- 3.0 Scenario
- 4.0 Plant Parameters
- 5.0 Radiological Information
- 6.0 Controllers' Instructions
- 7.0 Evaluators' Instructions
- 8.0 Special Instructions & Supplementary Material

SUBMITTED:

J. M. McNeill
Supervisor - Emergency Planning Unit

1 9/14/82
Date

APPROVED:

L. B. Russell
Plant Superintendent

1 9-14-82
Date

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

1.0 INTRODUCTION

- 1.1 To demonstrate the on-going preparedness capabilities of the Baltimore Gas & Electric Company, its personnel and equipment, for maintaining the safety of the public in the unlikely event of an emergency at the Calvert Cliffs Nuclear Power Plant, an annual exercise is conducted to test the adequacy and implementation of the Baltimore Gas & Electric Emergency Response Plan (ERP).
- 1.2 This document contains information necessary to conduct the 1982 Exercise:
Section 2. Objectives and Guidelines - This section defines the exercise objectives and sets forth guidelines for the conduct of the exercise to meet those objectives.
Section 3. Exercise Scenario - This section describes the postulated sequence of events occurring at the Calvert Cliffs Nuclear Power Plant which will require the various on-site and off-site emergency response organizations to respond.
Section 4. Plant Parameters - This section contains time-related information concerning plant conditions, which corresponds to the development of the exercise scenario.
Section 5. Radiological Information - This section contains time-related information concerning radiological conditions at various on-site and off-site locations. Also, included in this section is information concerning primary coolant radiochemistry, radiological release rates, and on-site emergency worker exposure and contamination.

CONFIDENTIAL

Section 6. Controllers' Instructions - This section provides general instructions to the exercise controllers' for the conduct of the exercise.

Section 7. Evaluators' Instructions - This section provides general instructions and evaluation criteria to the exercise evaluators' for assessing the responses of the exercise participants and the progress of the exercise.

Section 8. Special Instructions and Supplementary Material - This section contains supplementary material for use by the exercise controllers during the course of the exercise. Any special instructions will also be included in this section.

- 1.3 The State of Maryland participated in Peachbex 1982, a major nuclear facility exercise, therefore, their participation in Calvert Cliffs 1982 Exercise, will be limited to tests of the communication links, emergency medical services, and public information programs. The Prompt Notification System sirens will be tested.
- 1.4 The exercise shall be conducted on Tuesday, September 28, 1982, commencing at approximately 0600 hours; and terminating at approximately 1600 hours.
- 1.5 Participating Baltimore Gas & Electric organizations include:
 - 1.5.1 Nuclear Power Department
 - 1.5.2 Production Maintenance Department
 - 1.5.3 Real Estate & Office Services Department
 - 1.5.4 Corporate Communications Department
 - 1.5.5 Transportation Department
 - 1.5.6 Purchasing & Stores Department
 - 1.5.7 Project Management Department
 - 1.5.8 Electric Engineering Department
 - 1.5.9 Quality Assurance Department

1.6 Participating Organizations State/Local

- 1.6.1 Maryland Emergency Management & Civil Defense Agency (includes three (3) plume zone and ten (10) contiguous counties).
- 1.6.2 Department of Health and Mental Hygiene, Division of Radiation Control.
- 1.6.3 Department of Natural Resources, Power Plant Siting Group.
- 1.6.4 Department of Agriculture.
- 1.6.5 Maryland State Police.
- 1.6.6 State Fire Marshal.
- 1.6.7 Department of Human Resources.
- 1.6.8 Department of Transportation.
- 1.6.9 Department of Education.
- 1.6.10 Department of Economic and Community Development.
- 1.6.11 The Adjutant General.
- 1.6.12 Maryland Institute for Emergency Medical Services Systems.
- 1.6.13 American Red Cross, Baltimore Region, and the Chapter in the plume zone counties.
- 1.6.14 State Public Information Office.
- 1.6.15 Calvert Memorial Hospital.
- 1.6.16 Solomons Volunteer Rescue - Fire Department

1.7 Critique

- 1.7.1 BG&E - To be held Wednesday, September 29, 1982, 1000 hours at Calvert Cliffs Nuclear Power Plant, Warehouse #2, Security Training Classroom.

Attendance is requested for the following individuals:

- a. Recovery Manager (or alternate)
- b. Support Recovery Managers (or alternates)

- c. Corporate Spokesperson (or alternates)
- d. Site Emergency Coordinator (or alternates)
- e. Plant Superintendent
- f. Radiological Assessment Director
- g. Radiological Protection Director
- h. Technical Support Center Director
- i. Operational Support Center Director
- j. Director, Alternate Emergency Control Center
- k. Shift Supervisor (or alternate)
- l. Chemistry Director
- m. Lead Evaluator
- n. Lead Controller
- o. Nuclear Regulatory Commission Representative

Any participant in the emergency exercise may attend the critique as an observer.

1.7.2 State/County - To be held Thursday, September 30, 1982, at 1000 hours at the Prince Frederick Volunteer Fire Department. BG&E will be represented by the Supervisor-Emergency Planning. Attendance is requested for the following:

- a. Plume Zone Counties, Emergency Management and Civil Defense Agency Directors.
- b. Maryland Emergency Management and Civil Defense Agency Director (or representative).
- c. Nuclear Regulatory Commission Representative.
- d. Federal Emergency Management Agency Representative.

- 1.7.3 BG&E Management/NRC Post Exercise Meeting - To be held
Wednesday, September 29, 1982, 1500 hours at the Calvert Cliffs
Nuclear Power Plant, Warehouse #2, Security Training Classroom,

1.8 Facilities

Due to scheduling conflicts with County activities at the Prince Frederick Fairgrounds, an interim facility Media Communications Center will be established at the Prince Frederick Volunteer Fire Department. The Fire Department building is located about one mile south of the intersection of MD Routes 2/4 and 402 (Dares Beach Road).

1.9 Official Observers

- 1.9.1 Copies of this document are available in advance of the exercise by contacting:

Baltimore Gas & Electric Company
Supervisor - Emergency Planning
Calvert Cliffs Nuclear Power Plant
Lusby, MD 20657
(301) 269-4996

Copies less Section 4, "Plant Parameters," and Section 5, "Radiological Information," are available after August 13, 1982. Plant Parameters and Radiological Information will be available after September 14, 1982. Issue will be by mail, or personal distribution upon arrival at Calvert Cliffs Nuclear Power Plant and on a need to know basis.

- 1.9.2 Observers must contact the Supervisor-Emergency Planning, who will arrange authorization for entry to the emergency facilities. Official observers will be provided name tags identifying them as such.

CONFIDENTIAL

**CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982**

2.0 OBJECTIVES & GUIDELINES

2.1 OBJECTIVES - BALTIMORE GAS & ELECTRIC COMPANY

2.1.1 Emergency Organization

- a. Demonstrate the necessary understanding of Emergency Action Levels (EALs) and proficiency in recognizing and classifying emergency conditions.
- b. Demonstrate proficiency in taking appropriate corrective action(s) in response to and recovery from an emergency.
- c. Demonstrate effective and proper procedure for alerting, notifying, and reporting to the Federal, State, local, Corporate, and plant personnel.
- d. Demonstrate proper procedure for on-site and off-site radiological monitoring to include collection and analysis of all sample media (e.g., water, vegetation, soil, and air) and provisions for communications and record keeping associated with these survey and monitoring activities.
- e. Demonstrate timely and effective estimation and assessment of radiological releases. Also, demonstrate the radiological consequences of accidents or accidental releases.
- f. Demonstrate familiarity with Radiological Emergency Protective Actions considered for use to protect people and other resources both in-plant and off-site.

- g. Test and demonstrate the adequacy and effectiveness of plant emergency facilities, equipment, and communication networks.
- h. Demonstrate proper procedure for first aid and handling of a contaminated accident victim.
- i. Demonstrate proper procedure for emergency security measures to include control of access and egress, personnel accountability, etc.
- j. Demonstrate precise and clear transfer of command responsibilities to the Recovery Organization (mandatory for Site Emergency & General Emergency).

2.1.2 Recovery Organization

- a. Demonstrate that participating organizations can alert, notify, and mobilize emergency response personnel to respond to an emergency in a timely fashion.
- b. Demonstrate primary functional responsibilities and/or problem solving capabilities.
- c. Demonstrate proper procedure for communicating with state and local governments within the plume exposure emergency planning zone (10 mile EPZ).
- d. Demonstrate the ability to perform radiological assessments, and off-site dose assessment projections necessary to provide advance warning to Local, State, and Federal agencies, and to the general public.
- e. Demonstrate that decisions can be made with regard to protective measures for both the plume and ingestion exposure pathway emergency planning zones (EPZ).

- f. Demonstrate the ability to integrate its activities with those of other participating emergency response organizations (County, State, and Federal).
- g. Demonstrate capability to produce public information releases and handle public inquiries.
- h. Demonstrate the ability to maintain continuity of command control throughout the exercise.
- i. Demonstrate recovery techniques in the ability to deescalate (deactivate) corporate and site response activities and the general public.
- j. Demonstrate proper procedure for preparation of reports, messages, and records.
- k. Demonstrate the physical adequacy of the various emergency facilities for individual member working space and communication usage.

2.2 OBJECTIVES - STATE & COUNTIES

- 2.2.1 Demonstrate the adequacy of communication links.
- 2.2.2 Demonstrate an understanding of the emergency action levels.
- 2.2.3 Demonstrate the adequacy and effectiveness of procedures and equipment for handling a contaminated accident victim.
- 2.2.4 Demonstrate the ability to prepare reports, messages, and records associated with the emergency exercise.
- 2.2.5 Demonstrate the operability of the prompt notification system sirens.
- 2.2.6 Demonstrate the ability to implement the Public Information Program including the Emergency Broadcast System.

2.3 GUIDELINES

The purpose of these guidelines is to define the "extent of play" by the exercise participants and to meet the aforementioned objectives.

- 2.3.1 Players will not possess prior knowledge of the exercise start time, all personnel will follow their normal routines for the day.
- 2.3.2 The exercise will commence with a postulated plant condition necessitating a declaration of an Unusual Event or higher level emergency.
- 2.3.3 The postulated accident conditions will result in a simulated radiological release which necessitates the consideration of protective actions for the general public. Meteorological conditions may be varied throughout the exercise.
- 2.3.4 Exercise participants will perform, as appropriate, radiological monitoring, dose assessment, and ingestion pathway sampling activities.
- 2.3.5 Radiological Monitoring Field Teams (including the BG&E Mobile Environmental Monitoring Laboratory as needed) will be dispatched for the purpose of testing response time, communications, and monitoring and sampling procedures. The field teams will gather sample media and simulate routing such samples to the appropriate laboratory facilities for analysis.

Radiological Monitoring Field Teams will be accompanied by a controller/evaluator throughout the exercise. Each field team will rendezvous with its controller/evaluator at the location at which it obtains its emergency kits.

- 2.3.6 The Media Communications Center will be manned (see Section 1.0, Item 1.9) and perform its prescribed functions. Member(s) of the press in the area will be invited to participate in the exercise. Exercise press releases will be prepared and submitted to the media.
- 2.3.7 Medical facilities and their capabilities will be tested through the evacuation of a simulated injured power plant worker for treatment and decontamination. Monitoring and decontamination actions and procedures will be demonstrated at the receiving hospital.
- 2.3.8 The postulated accident conditions may warrant the assembly and evacuation of site personnel. If required by the exercise scenario, the site emergency alarm shall be sounded and personnel assembled/evacuated.
- 2.3.9 Participation by BG&E on-site personnel directly involved in responding to an emergency shall be carried out to fullest extent possible, including the deployment of radiological monitoring teams, emergency maintenance teams, and other emergency workers.
- 2.3.10 If required by the exercise scenario, alternate means of accessing the plant shall be simulated and not actually implemented. On-site security personnel should exercise their emergency procedures for restricting normal access to the site without actually redirecting incoming and outgoing personnel.
- 2.3.11 The exercise shall not be initiated until word is received from the Lead Controller who, after having received prior concurrence from the Plant Superintendent and Shift Supervisor, is confident that conditions are compatible for the safe performance of the exercise.

- 2.3.12 All emergency communications that relate to the exercise shall be identified as part of the drill. Verbal communications shall be initiated and closed by the statement, "This is a drill."
- 2.3.13 All communications that relate to an actual emergency shall be unequivocally identified as such. If at any time a real emergency occurs, or plant operations warrant, all actions relating to the exercise shall cease and response shall be directed to the actual operational needs.

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT 1982 EMERGENCY RESPONSE EXERCISE SEPTEMBER 28, 1982

3.0 EXERCISE SCENARIO

3.1 General Description

A. Casualty

The exercise will simulate a small loss of coolant accident complicated by a loss of all offsite AC power. The exercise will be initiated by Unit 2 Reactor Coolant activity being greater than Technical Specification limits, requiring the unit to be placed in a safe condition within six hours (Shutdown). Personnel errors will create a coolant release path through the Power Operated Relief Valves (PORVs) and containment sump. Further complications will be introduced by a single engine aircraft crash within the protected area; an injured, contaminated worker; and the failure of the on-site diesel generators to operate as designed.

- B. Meteorology Conditions will be controlled by this scenario. This will allow for preplanning of both the areas affected by the release. The actual meteorological conditions of the day of the exercise will not be used.

Initially the wind direction will be 135° , which will take the plume northwest over Prince Frederick in Calvert County. At 1530 the wind will shift 40° and stabilize at 175° .

- C. This exercise will be conducted so as not to cause any change to actual plant conditions. During the exercise, only the Lead Controller (BG&E) may authorize changes. These shall include sequence, additions, or deletions. All changes must be requested in advance.

3.2 Initial Conditions

A. Unit 1

MODE 1, operating at approximately 96% power and increasing to 100% power. The unit is recovering from a Reactor Coolant Pump Seal Replacement Outage, which lasted approximately 5 days. Reactor Coolant System Activity is 0.1 μ Ci/cc Iodine¹³¹ Dose Equivalent. The unit is at the halfway point of its fuel cycle.

B. Unit 2

MODE 1, operating at approximately 85% power. Reactor Coolant System Activity has been fluctuating at approximately 1.5 μ Ci/cc Iodine¹³¹ Dose Equivalent for the past 100 hours. The activity has never decrease below 1.0 μ Ci/cc Iodine¹³¹ Dose Equivalent during this time frame. The unit is scheduled to start a refueling outage in 32 days.

C. Related Plant Operating Conditions

Liquid Waste Tanks at full capacity on both units.

In Action Statement 3.8.1.1.a, #21 Diesel Generator out-of-service for past twelve hours.

CONFIDENTIAL

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=00:00 0600	NONE	Unit 2. Due to RCS Activity being greater than 1.0 $\mu\text{Ci/cc}$ Iodine ¹³¹ Dose Equivalent for 100 hours. 85% Power Operation Wind Direction 135° Wind Average Band Width 30° Wind Speed 10 mph Differential Temperature -1°F	1, 2	Initiate Controlled SD of Unit 2 per Tech Spec 3.4.8, MODE change required. The Unit must be placed in HOT STANDBY (MODE 3 with Tavg less than 500° F) within 6 hours. Declare UNUSUAL EVENT. Notify off-site agencies. Sample Unit 2 RCS and Analyze.
T=01:00 0700	UNUSUAL EVENT	Unit 2 Controlled Shutdown continues. RCS = 2.3 $\mu\text{Ci/cc}$ Iodine ¹³¹ Dose Equivalent	3	Continue Unit 2 RCS Sampling & Analysis.
T=02:00 0800	UNUSUAL EVENT	Unit 2 Controlled Shutdown continues. RCS = 4.1 $\mu\text{Ci/cc}$ Iodine ¹³¹ Dose Equivalent	4	Continue Unit 2 RCS Sampling & Analysis.

CONFIDENTIAL

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=2:00 0800	UNUSUAL EVENT	A single engine aircraft crashed into #11 Condensate Storage Tank. Smoke and flames visible inside the aircraft. The pilot has been thrown from the wreckage and is unconscious on the ground. The tank is leaking from a crack about 20" from the top of the dome.	5	Declare ALERT (EAL VII.B) Notify off-site agencies and Recovery Organization. Activate on-site emergency centers. Assemble plant personnel. Summon Emergency First Aid and Decon Team, Emergency Repair and Damage Control Team and Fire Brigade to scene.
T=02:15 0815	ALERT	Pilot needs hospitalization (unconscious).	6,8	Request ambulance (simulate). Notify Calvert Memorial Hospital of injured, uncontaminated victim (simulate). Combat fire. Evaluate extent and effects of damages. Estimate repair needs and time required.
T=02:30 0830	ALERT	Fire Brigade extinguishes fire in aircraft.	7,9	Assembly and accountability in progress. Investigate, analyze crash.
T=02:45 0845	ALERT	Rescue Squad arrives at plant (Simulated).	10	Security escort on-site, within protected area.

CONFIDENTIAL

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=03:00 0900	ALERT	Unit 2 Controlled Shutdown Continues. RCS Activity = $5.2 \mu\text{Ci/cc}$ Iodine ¹³¹ Dose Equivalent	11	Continue Unit 2 RCS Sampling & Analysis.
T=03:15 0915	ALERT	Injured pilot ready for transport to Calvert Memorial Hospital (Simulated).	12	Security escort off-site.
T=03:30 0930	ALERT	Leak stops. #11 Condensate Storage Tank level is below crack.	13	Continue repair analysis. Consider Emergency Downgrading.
T=03:45 0945	ALERT or UNUSUAL EVENT			Notify off-site agencies of downgrade.
T=-4:00 1000	UNUSUAL EVENT	Unit 2 Controlled Shutdown Continues. RCS Activity = $6.7 \mu\text{Ci/cc}$ Iodine ¹³¹ Dose Equivalent	14	Continue Unit 2 RCS Sampling & Analysis. Incorporate Recovery Organization into aircraft casualty response. Start aircraft casualty recovery planning.

CONFIDENTIAL

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=04:50 1050	UNUSUAL EVENT	Unit 2 is in MODE 3, HOT STANDBY Tc=532°F. Modified Cntmt Vent initiated thru sump. MPT Circuit control loop check, STP-M-672B starts. RCS Activity = 10.1 μ Ci/cc Iodine ¹³¹ Dose Equivalent	15, 16	Continue Unit 2 RCS Sampling & Analysis. Prepare news releases for aircraft incident. Repair #11 Condensate Storage Tank
T=04:59 1059	UNUSUAL EVENT	I&C Technician working on Unit 2 MPT Circuit causes pressure spike and a PORV sticks open.	17	Attempt to close PORV. NOTE: There will be inadequate time to close PORV.
T=05:00 1100	UNUSUAL EVENT	Loss of all off-site AC power. Unit 1 turbine generator trip, reactor trip. DG #11 starts.	17, 18	Declare ALERT Notify off-site agencies and Recovery Organization. Assemble plant personnel (simulate).
T=05:00 1100	ALERT	DG #12 starts, but fails to come up to speed (binding fuel rack).	17, 19 20, 20A 24	Dispatch Emergency Repair & Damage Control Teams to investigate DG problems. Operators dispatched to Remote Shutdown Panel 2C43. Auxiliary Feedwater Started. Combat casualty.

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=05:02 1102	ALERT	Unit 2 Quench Tank fills & rupture Disc ruptures as designed. Coolant exits the CNTMT via CNTMT Sump Drain Pipe. Emergency Core Cooling Pump Room #102 (#22) is flooding.	21	Declare GENERAL EMERGENCY (EAL III.D). Notify off-site agencies and Recovery Organization. Combat casualty.
T=05:15 1115	GENERAL EMERGENCY	Bulk load dispatcher notifies Calvert Cliffs that a fire is causing relay problems at Waugh Chapel. More information will be provided as it becomes available.	22	
		Emergency Repair & Damage Control Team reports #12 DG problem is in the fuel racks. Anticipate repairs will be complete within a half hour.	23	Operators dispatched to SMECO tie.
		Off-site AC power not restored within 15 minutes.		Condiser EAL VII.C
		Flooding of Unit 2 ECCS Pump Room continues.		Calvert County initiates 2-mile precautionary evacuation.
T=05:20 1120	GENERAL EMERGENCY	Contaminated person exits Aux Bldg Face: 10,000 dpm Clothes: 10,000 to 80,000 dpm Nasal: 4,000 dpm Dosimeter is reading off scale. Reports that co-worker is injured on -15' Level of Bldg (leg broken and bleeding).	25	Summon Emergency First Aid & Decontamination Team to aid injured person. Decontaminate worker.

CONFIDENTIAL

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=05:30 1130	GENERAL EMERGENCY	Accountability Complete (Simulated)	26	
		Emergency Repair & Damage Control Team repairs DG.	27	Start #12 DG and pick-up loads.
		Unit 2 Main Vent fan trip circuit fails to function as designed. Fan starts when #12 DG energizes 480 V Bus. Fan will not deenergize remotely.	28,	Deenergize Main Vent fan locally. Recover Unit 2. Shut PORV blocking valve and reestablish containment integrity. Shut containment sump valve.
		Unit 2 Main Vent Radiogas 2-RE-5415 indicates 5E5 cpm. Projected dose rate at site boundary 250 mrem/hr.		Dispatch off-site monitoring teams.
T=05:35 1135	GENERAL EMERGENCY	Emergency First Aid & Decon Team locates injured person. Reports victim is contaminated. (Clothes: 10,000 to 80,000 dpm; Wound: 4,000 dpm) and has compound fracture of right leg. Victim requires hospitalization.	29, 30, 31	Notify Calvert Memorial Hospital of contaminated, injured person. Notify Solomons Rescue Squad for ambulance. Control casualty.
		Operator manually trips Unit 2 Main Vent Fan.	28A	Consider emergency downgrade based on radiological data after containment integrity is reestablished.

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=05:45 1145	GENERAL EMERGENCY	Friskers alarming on 69' Level of Aux Bldg. Projected dose rate at site boundary is 68 mrem/hr Whole body.	32	Initiate air sampling for noble gases and Iodine. Monitor the release.
		Emergency First Aid & Decon Team reports ECCS pump room floor has about 2" of water on it. Water-tight door cannot be shut.	33	Summon Emergency Repair & Damage Control Team to investigate and repair door.
T=05:55 1155	GENERAL EMERGENCY	Solomons Rescue Squad arrives.	Actual Event	Escort into the protected area after dosimetry issued. If not done so, downgrade emergency to ALERT (EAL I.B.1).
T=06:00 1200	ALERT	SMECO tie closed	34, 35	Energize loads with SMECO tie power. Monitor release
		Projected dose rate at site boundary is 1.4 mrem/hr Whole Body. Emergency Repair & Damage Control Team reports Unit 2 ECCS pump room (door closest to stairs from -10' level) has a jammed closing mechanism. Door will not fully shut and lock. Estimate 2 hours for repairs. There is about 2 inches of water on the floor of the room.	36	Combat casualty. Notify off-site agencies of emergency downgrade.

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=06:30 1230	ALERT	Bulk Load Dispatcher notifies Calvert Cliffs that emergency repairs are in-progress at Waugh Chapel and reconnection into the grid is expected in approximately four (4) hours.	37	Combat casualty. Monitor release.
T=06:40 1240	ALERT	Projected Dose Rate at Site Boundry is 0.5 mrem/hr Whole Body.		Monitor the radioactive release off-site.
T=07:00 1300	ALERT	Injured person exits in ambulance to Calvert Memorial Hospital	Actual Event	
T=07:15 1315	ALERT	Radiological release monitoring results.		Consider emergency classification downgrade to UNUSUAL EVENT.
T=07:30 1330	UNUSUAL EVENT			Notify off-site of emergency classification downgrade.
T=09:00 1500	UNUSUAL EVENT	Radiological release monitoring results		Consider emergency classification downgrade to NONE.

3.5 DETAILED SEQUENCE

TIME SCENARIO ACTUAL	EMERGENCY CLASSIFICATION	EVENT	CONTROLLER MESSAGE NUMBER	EXPECTED ACTION
T=09:15 1515	NONE			Notify off-site agencies of emergency classification downgrade.
T=09:30 1530	NONE	Wind shift from 135° to 175° (from South) Band width = 45° Wind Speed = 5 mph T = -1.4 °F	38	Formulate short and long term recovery plans. Consider Recovery Organization needs.
T=10:00 1600	NONE	Bulk Load Dispatcher telephones that in 15 minutes power will be restored to Calvert Cliffs.	39	Prepare to pick-up plant loads.
T=10:15 1615	NONE	Normal off-site power restored. Waste Receiver Tank, High Level Alarm. Unless manually isolated, #15 sump automatically pumps down the Unit 2 ECCS Pump Room Sump and overflows the Waste Receiver Tanks. This contaminates the entire -5' Elevation of the Auxiliary Building.	40	Recover plant. Secure sump pump. Isolate sump. Terminate Drill.

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: -00:15 MESSAGE NO. 1
Actual: 0545

TO: Shift Supervisor/Senior Control Room Operator

LOCATION: Control Room

MESSAGE: Initial Conditions

1. Meteorological Data: Wind avg. band width = 30°.
Wind Direction = 135° at 10 mph.
Difference in temperature at 200 ft. = 10°F.
2. Unit 1: MODE 1, about 96% power increasing to 100%. Recovering from a reactor coolant pump seal replacement outage (5 day outage). Reactor Coolant activity is 0.1 uCi/cc Iodine¹³¹ Dose Equivalent. Unit is at the midpoint of its fuel cycle.
3. Unit 2: Mode 1, about 85% power. Reactor Coolant activity has been fluctuating at approximately 1.5 uCi/cc Iodine¹³¹ Dose Equivalent for the past 100 hours. Activity has not been below 1.0 uCi/cc Iodine¹³¹ Dose Equivalent during this time. Unit is scheduled to start a refueling outage in 32 days.
4. Related Plant Conditions:
 1. Liquid Waste Tanks are full, both Units.
 2. In action statement 3.8.1.1.a, #21 Diesel Generator out-of-service for past twelve hours.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 00:00 MESSAGE NO. 2
Actual: 0600

TO: Shift Supervisor/Senior Control Room Operator

LOCATION: Control Room

MESSAGE: Unit 2

The specific activity of the primary coolant has been greater than 1.0uCi/gram Dose Equivalent I-131 for more than 100 hours during one continuous time interval.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 01:00 MESSAGE NO. 3
Actual: 0700

TO: Chemistry Technician

LOCATION: Chemistry Lab

MESSAGE: Unit 2

Reactor coolant specific activity is 2.3 uCi/cc
Dose Equivalent I-131

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>02:00</u>	MESSAGE NO.	<u>4</u>
Actual:	<u>0800</u>		

TO: Chemistry Technician

LOCATION: Chemistry Lab

MESSAGE: Unit 2

Reactor coolant specific activity is 4.1 uCi/cc
Dose Equivalent I-131.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 02:00

MESSAGE NO. 5

Actual: 0800

TO: Outside Operator

LOCATION: Tank Farm

MESSAGE: A single engine aircraft has crashed into #11 Condensate Storage Tank. The tank is leaking from a crack about 20 inches from the top of the dome. The pilot has been thrown from the plane and appears unconscious. Some flames and smoke are visible inside the aircraft.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 02:15+

MESSAGE NO. 6

Actual: 08:15+

TO: First Aid & Decontamination Team

LOCATION: #11 Condensate Storage Tank

MESSAGE: Injured Person #1
Unconscious: minor contusions (forehead, arms, chest);
sweating; pupils equal and reactive.

Vital Signs: Pulse: 110-strong
B/P: 190/110
Respirations: 22 - shallow

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 02:15+
Actual: 08:15+

MESSAGE NO. 7

TO: Emergency Fire Team

LOCATION: #11 Condensate Storage Tank

MESSAGE: Flames and smoke are visible inside the aircraft. The dashboard, aircraft interior (seats, walls) are the fire source.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>02:30+</u>	MESSAGE NO.	<u>8</u>
Actual:	<u>08:30+</u>		

TO: First Aid & Decontamination Team

LOCATION: #11 Condensate Storage Tank

Time: When Requested

MESSAGE: Injured Person #1

Vital Signs: Pulse: 112-strong
B/P: 200/112
Respirations: 22-shallow

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 02:30+

MESSAGE NO. 9

Actual: 08:30+

TO: Emergency Fire Team

LOCATION: #11 Condensate Storage Tank

MESSAGE: About 15 minutes after fire fighting starts.

The fire is out.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 02:45

MESSAGE NO. 10

Actual: 0845

TO: Security

LOCATION: South Gate

MESSAGE: Simulated

Rescue squad has arrived.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 03:00

MESSAGE NO. 11

Actual: 09:00

TO: Chemistry Technician

LOCATION: Chemistry Lab

MESSAGE: Unit 2
Reactor coolant specific activity is 5.2 uCi/cc
Dose Equivalent I-131.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 03:15+

MESSAGE NO. 12

Actual: 09:15+

TO: First Aid & Decontamination Team

LOCATION: #11 Condensate Storage Tank

Time: When requested, after ambulance arrival

MESSAGE: Injured person is ready for transport to hospital.. (SIMULATE)

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>03:30</u>	MESSAGE NO.	<u>13</u>
Actual:	<u>09:30</u>		

TO: Emergency Repair/Damage Control Team

LOCATION: #11 Condensate storage tank

MESSAGE: #11 condensate storage tank leak stops. Tank level
below crack.

If pumped down by Control Room leak would stop earlier

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>04:00</u>	MESSAGE NO.	<u>14</u>
Actual:	<u>1000</u>		

TO: Chemistry Technician

LOCATION: Chemistry Lab

MESSAGE: Unit 2

Reactor coolant specific activity is 6.7 uCi/cc
Dose Equivalent I-131.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>04:50</u>	MESSAGE NO.	<u>15</u>
Actual:	<u>1050</u>		

TO: Chemistry Technician

LOCATION: Chemistry Lab

MESSAGE: Unit 2

Reactor Coolant specific activity is 10.1 uCi/cc
Dose Equivalent I-131.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 04:50 MESSAGE NO. 16
Actual: 1050

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: Unit 2. Reactivity condition, Keff. is less than .99.
Zero % rated thermal power (excluding decay heat).
Tc is 532°. STP-M-672 B started (Pressurizer ERV Channel Functional Test).
Modified containment vent initiated in accordance with
OI36 through containment sump.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 04:59 & 05:00

MESSAGE NO. 17

Actual: 1100

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: The following occurs almost simultaneously:

1. 2-ERV-402 indicates open.
2. Low bus voltage indications and alarms on all bus sections.
3. Unit 1 reactor and turbine trip.
4. Low reactor coolant pump trip.
5. Reactor coolant pump trip.
6. Emergency lighting energized.
7. Main generator low voltage indication.
8. Diesel generator #11 starts as designed.
9. Diesel generator #12 fails to comp up to speed.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 05:00 MESSAGE NO. 18
Actual: 1100

TO: Shift Supervisor/Plant Superintendent/Site Emergency Coordinator

LOCATION: Control Room/ECC/AECC

MESSAGE: If assembly of plant personnel is warranted, it will
be simulated.

- NOTE -

An actual assembly was done at 0800 for the ALERT
declared for the simulated aircraft incident.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 05:00

MESSAGE NO. 19

Actual: 1100

TO: Control Room

LOCATION: Control Room

MESSAGE: Contingency Message

#11 Diesel Generator will not be shifted to power Unit
2 loads.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>05:00</u>	MESSAGE NO.	<u>20</u>
Actual:	<u>1100</u>		

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: Contingency Message

Operators must be dispatched to the Remote Shutdown Panel 2C43 and to the Auxiliary Building (bypass to 2MOV4070 and 2MOV4071) to manually initiate Aux. Feedwater.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 05:00+ MESSAGE NO. 20A
Actual: 1100+

TO: Person Requesting Information
LOCATION: Alternate Emergency Control Center
MESSAGE: Power is available in the Alternate
Emergency Control Center.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>05:01</u>	MESSAGE NO.	<u>21</u>
Actual:	<u>1101</u>		

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: Unit 2 Quench tank pressure and level increasing rapidly. Quench tank rupture eminent.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>05:15</u>	MESSAGE NO.	<u>22</u>
Actual:	<u>11:15</u>		

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: From Bulk Load Dispatcher: A fire is causing relay problems at Waugh Chapel. Further information will be provided as it becomes available

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>05:15</u>	MESSAGE NO.	<u>23</u>
Actual:	<u>1115</u>		

TO: Emergency Repair & Damage Control Team

LOCATION: #12 Diesel Generator Room

MESSAGE: Diesel Generator #12 has a binding fuel rack. There are score marks on the fuel rack linkage between #11 & #12 cylinder. Must file and debur the linkage. Estimate 30 minutes to repair.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 05:20 -

MESSAGE NO. 24

Actual: 1120 -

TO: Operator

LOCATION: Remote Shutdown Panel 2C43

MESSAGE: Unit 2.

Aux. Feedwater is operable and being controlled manually.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 05:20

MESSAGE NO. 25

Actual: 1120

TO: Health Physics Technicians

LOCATION: 69 ft. level, Auxiliary Building

MESSAGE: Contaminated Person #1

This person was working in Unit #2 ECCS pump Room

Self reading dosimeter is off-scale.

Contamination levels:

Face: 10,000 dpm

Clothes: 10,000 to 80,000 dpm

Nasal: 4,000 dpm

Reports that his co-worker is injured (broken leg and bleeding) on the -15' elevation Aux. Building, passageway, and needs help.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 05:30

MESSAGE NO. 26

Actual: 1130

TO: Emergency Security Team Leader

LOCATION: South Gate House

MESSAGE: Accountability complete. All personnel are accounted for.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>05:30</u>	MESSAGE NO.	<u>27</u>
Actual:	<u>11:30</u>		

TO: Emergency Repair and Damage Control Team - Mechanical

LOCATION: #12 Diesel Generator Room

MESSAGE: #12 Diesel Generator fault has been corrected. Diesel generator is ready for testing/operation.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: ~~Scenario~~: 05:30+ MESSAGE NO. 28
Actual: 1130+

TO:

LOCATION:
Time:
MESSAGE:

Control Room Operator

Control Room

When requested

#12 Diesel Generator starts and functions normally.

As diesel assumes loads, the Unit 2 Main Vent fan starts (apparent fault in trip circuit).

Fan will not deenergize remotely.

Unit 2 Main Vent Radiogas alarms actuate. 2RE5415 indicates 5E5 cpm.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 0535+ MESSAGE NO. 28A
Actual: 1135+

TO: Plant Operator
LOCATION: Unit 2 Main Vent Fan Breaker (local)
MESSAGE: Breaker opens when manually tripped.

THIS IS A DRILL

CONFIDENTIAL
CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

TIME:	Scenario:	05:35		MESSAGE NO.	29
	Actual:	1135			

TO: Emergency First Aid and Decontamination Team

LOCATION: - 15 ft level Auxiliary Building Passageway

Time: When requested

MESSAGE: Injured person #2
Injured right leg.
Bone is medially protruding out of leg 6 inches above knee
Profuse bleeding at wound.
Vital signs: Pulse: 90-thready
Respirations: 18-shallow
B/P: 110/80

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>05:40</u>	MESSAGE NO.	<u>30</u>
Actual:	<u>1140</u>		

TO: Emergency First Aid & Decontamination Team

LOCATION: -15 ft. level Auxiliary Building Passageway

Time: When requested

MESSAGE: Injured Person #2. Contamination levels:
Clothes: 10,000 to 80,000 dpm
Wound: 4,000 dpm

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIMF: Scenario: 05:45

MESSAGE NO. 31

Actual: 1145

TO: Emergency First Aid and Decontamination Team

LOCATION: -15 ft. Auxiliary Building, or where ever moved by EFADT

MESSAGE: Injured person #2

Updated vital signs: Pulse: 98 thready
Respiration: 20 shallow
B/P: 90/70

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 05:45

MESSAGE NO. 32

Actual: 1145

TO: Health Physics Technicians

LOCATION: 69 ft. level, Auxiliary Building

MESSAGE: All friskers are alarming.

THIS IS A DRILL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

CONFIDENTIAL

TIME: Scenario: 05:45

MESSAGE NO. 33

Actual: 1145

TO: Emergency First Aid & Decontamination

LOCATION: -15 ft. level Auxiliary Building Passageway

MESSAGE: ECCS pump room floor has 2" of water on it, and the water tight door can not be shut.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>06:00</u>	MESSAGE NO.	<u>34</u>
Actual:	<u>1200</u>		

TO: Operator/Technician at Location
LOCATION: SMECO Tie
MESSAGE: SMECO tie is closed.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>06:00+</u>	MESSAGE NO.	<u>35</u>
Actual:	<u>12:00+</u>		

TO: Control Room Operator

LOCATION: Control Room

Time: When requested

MESSAGE: SMECO tie power is available and functioning normally.

THIS IS A DRILL

CONFIDENTIAL

CALVER : CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 06:00

MESSAGE NO. 36

Actual: 1200

TO: Emergency Repair & Damage Control Team

LOCATION: Uni 2 ECCS Pump Room Door (door closest to stairs from 10 ft. level).

MESSAGE: Door is broken. Closing mechanism is jammed and will not fully shut and lock door. Estimate 2 hours for repairs. There is about two inches of water on the floor of the ECCS Pump Room.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario:	<u>06:30</u>	MESSAGE NO.	<u>37</u>
Actual:	<u>1230</u>		

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: From the Bulk Load Dispatcher. Emergency repairs at Waugh Chapel are in progress. Expect reconnection of CCNPP to power grid in about 4 hours.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 09:30

MESSAGE NO. 38

Actual: 1530

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: Met Data: Wind Direction: 175°
Band Width: 45°
Speed: 5 mph
Difference in temperature at 200' -1.4°F

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

TIME: Scenario: 10:00

MESSAGE NO. 39

Actual: 1600

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: From the Load Dispatcher. Power will be restored to CCNPP
in 10 minutes.

THIS IS A DRILL

CALVERT CLIFFS NUCLEAR POWER PLANT

1982 EMERGENCY RESPONSE EXERCISE

SEPTEMBER 28, 1982

CONFIDENTIAL

TIME: Scenario: 10:15 MESSAGE NO. 40
Actual: 1615

TO: Control Room Operator

LOCATION: Control Room

MESSAGE: Offsite Power restored.
Waste Receiver Tank high level alarm actuates.
Unless manually isolated, No. 15 sump automatically pumps
down Unit 2 ECCS pump room sump and overflows the Waste
Receiver Tanks. This contaminates the -5 ft. elevation of
the Auxillary Building.

THIS IS A DRILL

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

4.0 PLANT PARAMETERS

THIS IS A DRILL
CONFIDENTIAL

PRIMARY PRESSURE

(TIME DATA)
(CEN 125)

SIAS
NO AC AVAILABLE TO PUMPS

PORT BLOCK VALVES SHUT
HPSI PUMPS ON

12 DG STARTED

DRILL SHEET PROTECTION: CIVIL

DRILL SHEET PROTECTION: CIVIL

THIS IS A DRILL
CONFIDENTIAL

PZR LEVEL (TMI DATA)

D6 STARTED 6
5

4

3

2

1

0

9

8

7

6

5

4

3

2

1

0

Time

(hours)

GRAPHIC USER INTERFACE
Printed in U.S.A.

9

8

7

6

5

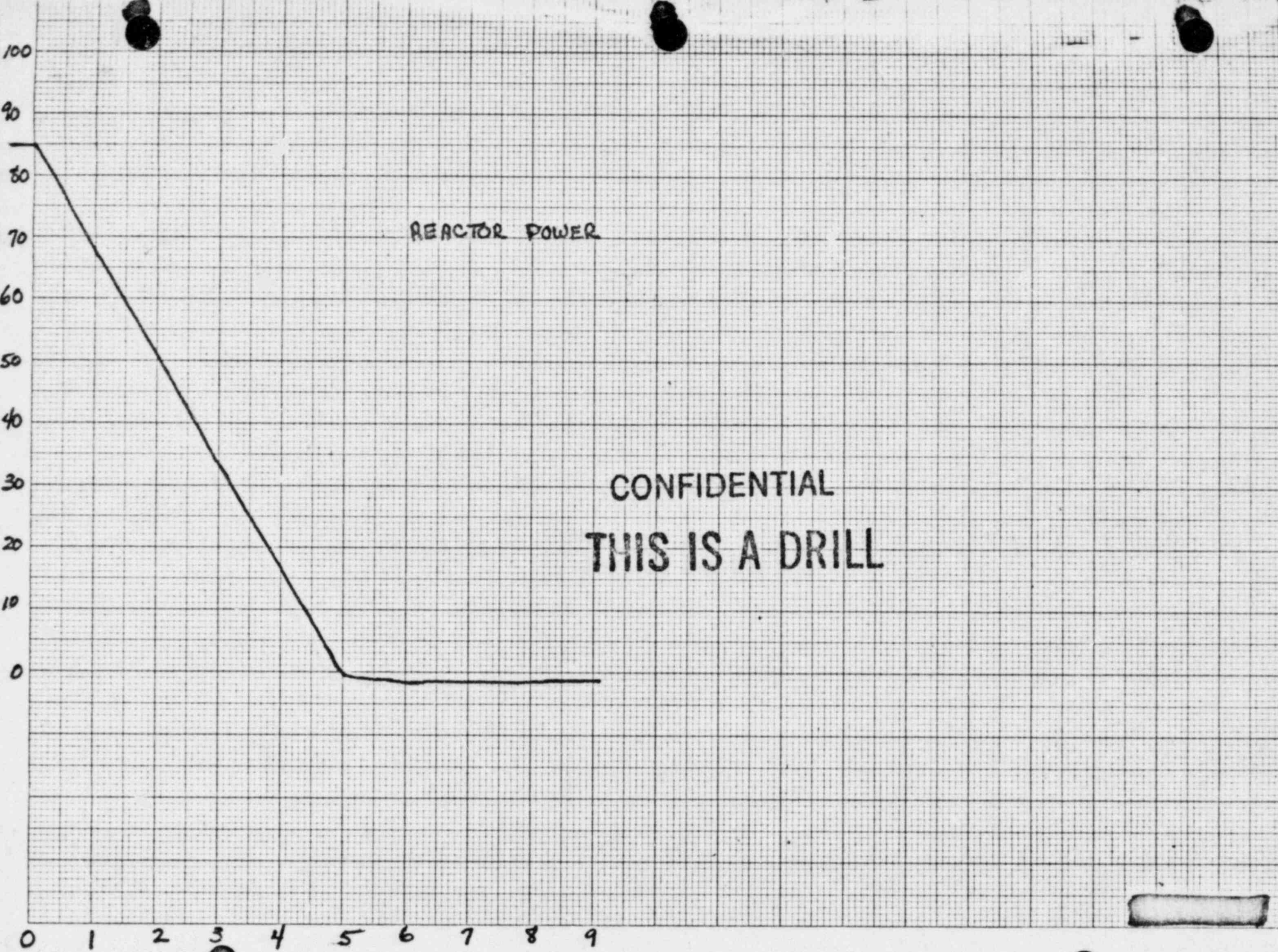
4

3

2

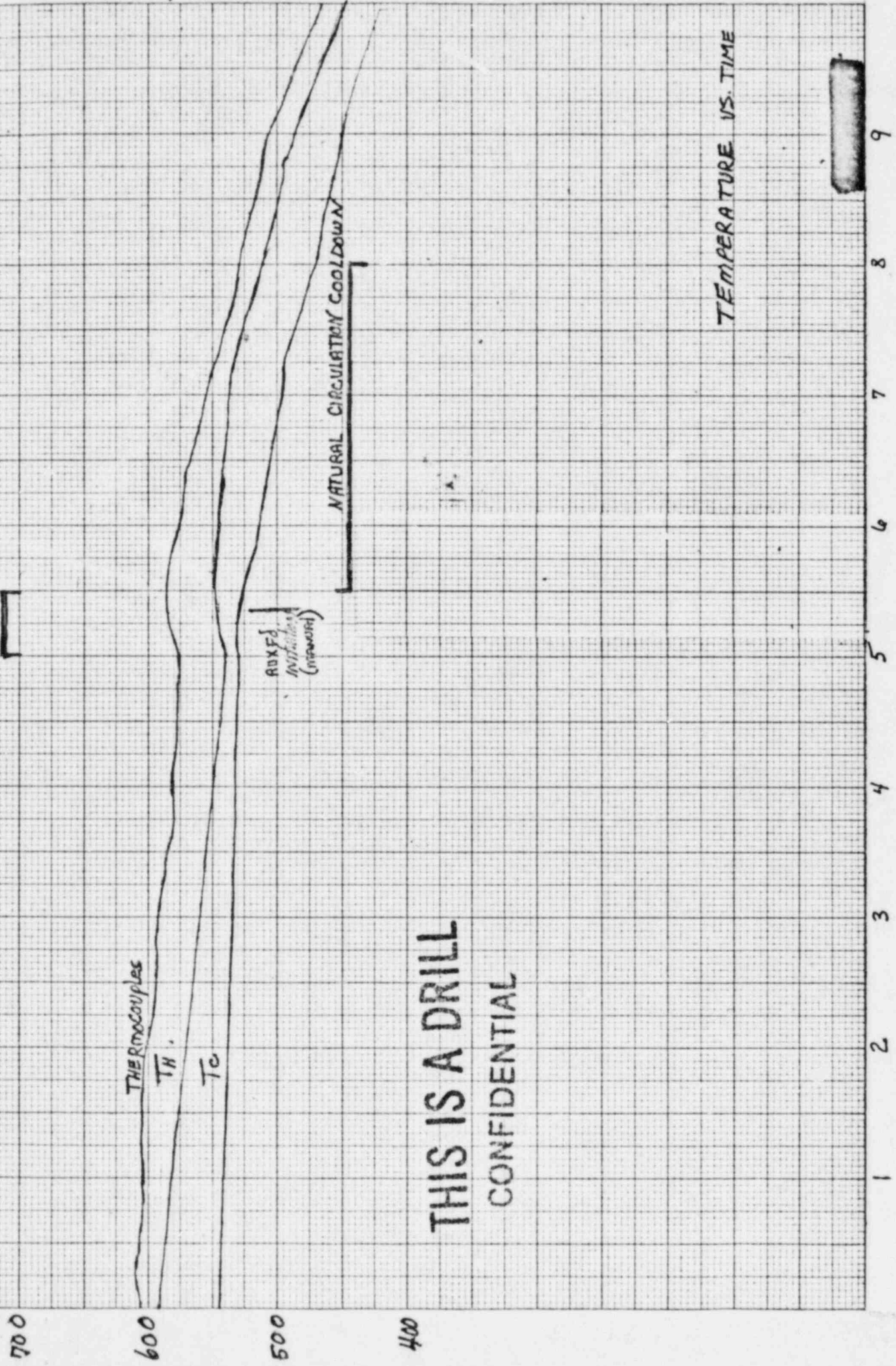
1

0



4-4

BOILOFF OF S/G's
MANUAL MITIGATION OF AUX FEED



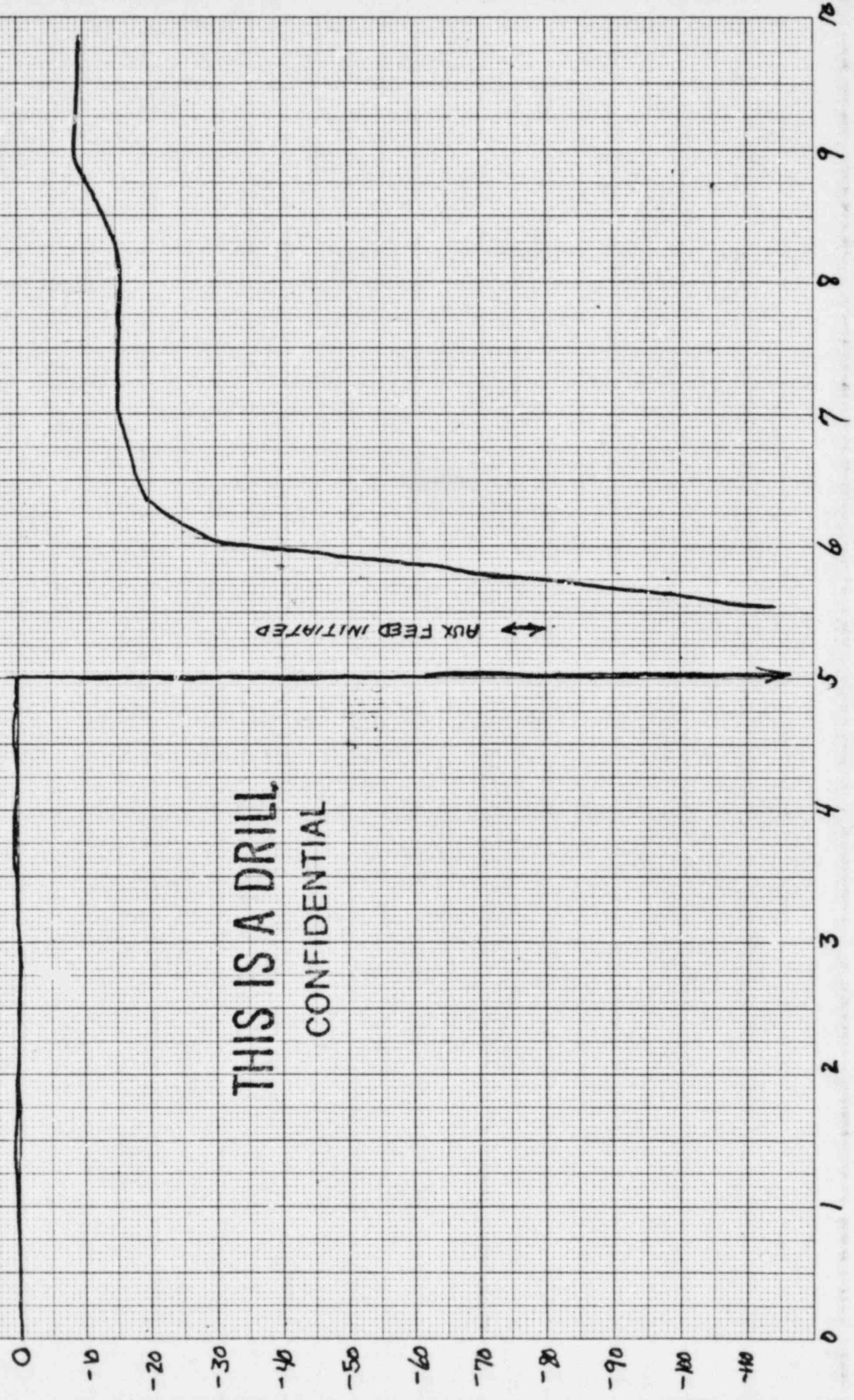
THIS IS A DRILL
CONFIDENTIAL

AS 1110 -60 20 X 20
 WORLD SAFETY PROTECTOR MY-11
 DIVISIONS TO THE INCH
 Printed in U.S.A.

11 1/2 12 S/G LEVELS VS. TIME

THIS IS A DRILL
 CONFIDENTIAL

← AUX FEED INITIATED



AS 1110 -60 20 x 20 DIVISIONS TO THE INCH

AS 1110 -60 20 x 20 DIVISIONS TO THE INCH

AS 1110 -60 20 x 20 DIVISIONS TO THE INCH

AS 1110 -60 20 x 20 DIVISIONS TO THE INCH

AS 1110 -60 20 x 20 DIVISIONS TO THE INCH

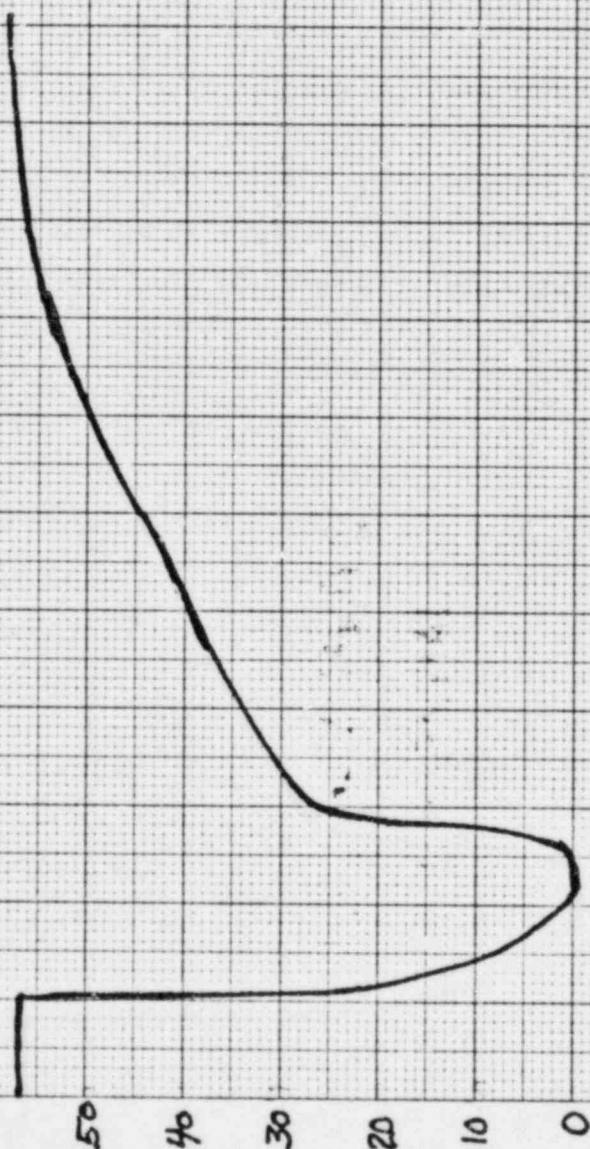
AS 1110 -60 20 x 20 DIVISIONS TO THE INCH

AS 1110 -60 20 x 20 DIVISIONS TO THE INCH

AS 1110 -60 20 x 20 DIVISIONS TO THE INCH

SUBCOOLED MARGIN MONITOR

THIS IS A DRILL
CONFIDENTIAL



45 5 6 7 8 9 10

RWT level (inches)

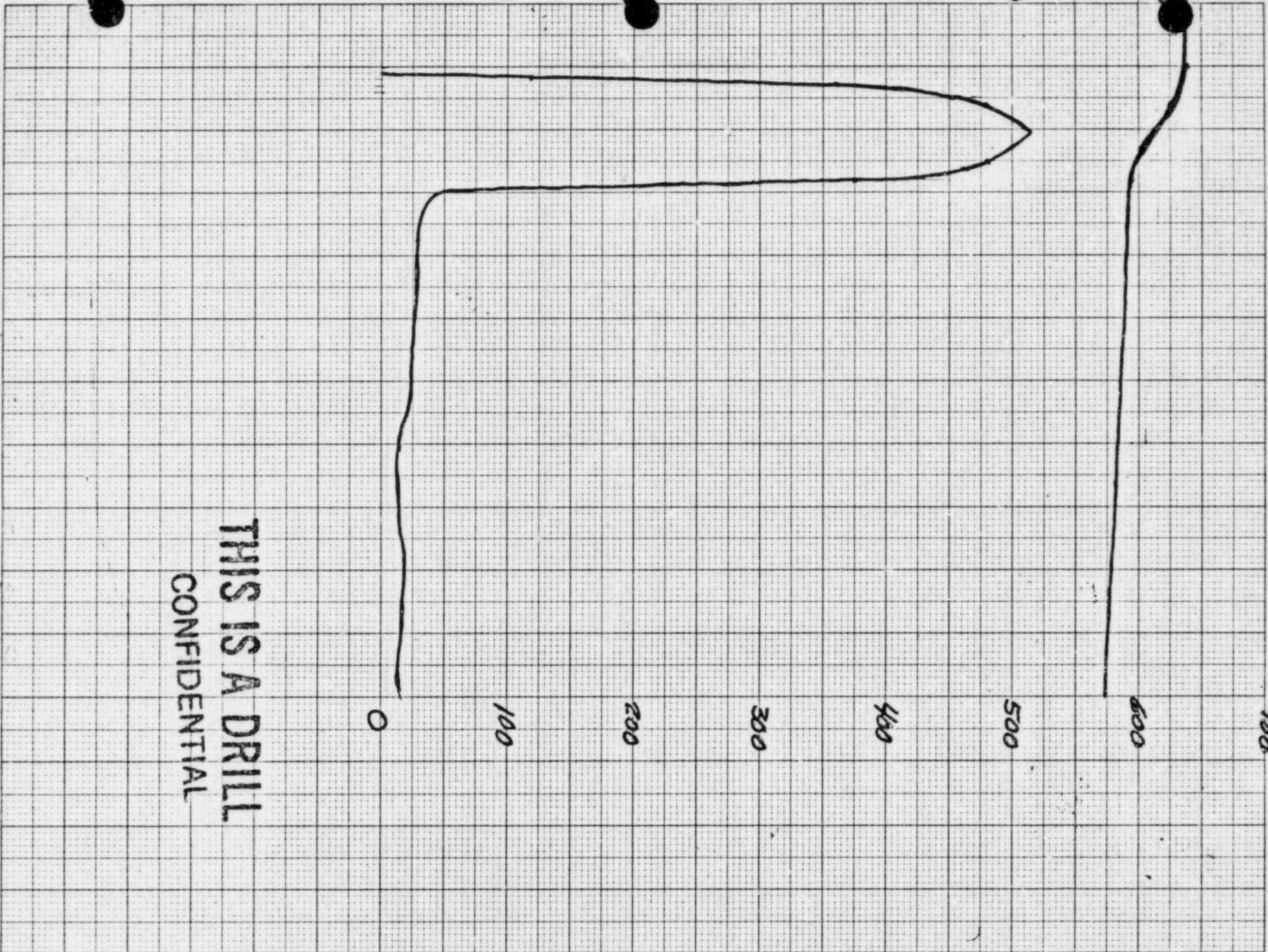
4-8

HPST flow
GPM
700

THIS IS A DRILL
CONFIDENTIAL

600
500
400
300
200
100
0

5
6
7
8
9
10



CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

5.0 RADIOLOGICAL INFORMATION

CALVEX 82
REACTOR COOLANT ACTIVITY
TIME = 0600 T = 00:00

<u>ISOTOPE</u>	<u>ACTIVITY</u> uCi/cc
K-85m	0.14
K-85	0.08
K-87	0.08
K-88	0.3
I-131	1.11
I-132	0.7
I-133	1.18
I-134	0.08
I-135	0.44
Xe 131m	0.15
Xe 133	20
Xe 135	0.8
Co-58	0
Cs-138	0.07
Ba-133	0
Ce-139	0.001
Nb-95	0
Ce-144	0.001
Cs-137	0.02
Zr-95	0.001
Co-60	0.001
Cs-134	0.04

THIS IS A DRILL
CONFIDENTIAL

CALVEX 82
REACTOR COOLANT ACTIVITY
TIME = 0700 T = 01:00

<u>ISOTOPE</u>	<u>ACTIVITY</u> uCi/cc
K-85m	0.15
K-85	0.09
K-87	0.08
K-88	0.3
I-131	1.7
I-132	1.13
I-133	1.92
I-134	0.13
I-135	0.67
Xe 131m	0.15
Xe 133	20
Xe 135	0.8
Co-58	0
Cs-138	0.16
Ba-133	0
Ce-139	0.001
Nb-95	0
Ce-144	0.01
Cs-137	0.02
Zr-95	0
Co-60	0.01
Cs-137	0.02

THIS IS A DRILL
CONFIDENTIAL

CALVEX 82
REACTOR COOLANT ACTIVITY
TIME = 0800 T = 2:00

<u>ISOTOPE</u>	<u>ACTIVITY</u> uCi/cc
K-85m	1.1
K-85	0.3
K-87	0.3
K-88	1.0
I-131	3.11
I-132	2.08
I-133	3.3
I-134	0.25
I-135	1.25
Xe 131m	0.5
Xe 133	60
Xe 135	2.6
Co-58	0
Cs-138	0.24
Ba-133	0
Ce-139	0
Nb-95	0
Ce-144	0
Cs-137	0.065
Zr-95	0
Co-60	0
Cs-134	0.002
Cs-137	0.02

THIS IS A DRILL

CONFIDENTIAL

CALVEX 82
REACTOR COOLANT ACTIVITY
TIME = 0900 T = 3:00

<u>ISOTOPE</u>	<u>ACTIVITY</u> uCi/cc
K-85m	0.6
K-85	0.36
K-87	0.32
K-88	1.2
I-131	3.8
I-132	2.6
I-133	4
I-134	0.3
I-135	1.5
Xe 131m	0.5
Xe 133	82
Xe-135	3.2
Co-58	0
Cs-138	0.34
Ba-133	0.001
Ce-139	0.001
Nb-95	0
Ce-144	0.001
Cs-137	0.08
Zr-95	0
Co-60	0.001
Cs-134	0.04

THIS IS A DRILL
CONFIDENTIAL

CALVEX 82
REACTOR COOLANT ACTIVITY
TIME = 10:00 T = 4:00

<u>ISOTOPE</u>	<u>ACTIVITY</u>	uCi/cc
K-85m	0.71	
K-85	0.42	
K-87	0.52	
K-88	1.8	
I-131	4.74	
I-132	3.16	
I-133	5.05	
I-134	0.38	
I-135	1.89	
Xe 131m	1.05	
Xe 133	120	
Xe 135	4.8	
Co-58	0.03	
Cs-138	0.46	
Ba-133	0.02	
Ce-139	0.02	
Nb-95	0.07	
Ce-144	0.03	
Cs-137	0.016	
Zr-95	0.01	
Co-60	0.02	
Cs-134	0.08	

THIS IS A DRILL

CONFIDENTIAL

CALVEX 82
REACTOR COOLANT ACTIVITY
TIME = 1050 T = 04:50

<u>ISOTOPE</u>	<u>ACTIVITY</u> uCi/cc
K-85m	1.5
K-85	0.9
K-87	0.8
K-88	3.0
I-131	7.5
I-132	5
I-133	8
I-134	0.6
I-135	3
Xe 131m	1.5
Xe 133	200
Xe 135	8
Co-58	0.62
Cs-138	1.86
Ba-133	0.06
Ce-139	0.038
Nb-95	0.24
Ce-144	0.22
Cs-137	0.08
Zr-95	0.02
Co-60	0.006
Cs-134	0.06
Cs-138	1.86

THIS IS A DRILL

CONFIDENTIAL

REACTOR COOLANT SAMPLE ACTIVITY
(uCi/cc)

<u>ISOTOPE</u>	<u>TIME 11:00</u>	<u>12:00</u>	<u>FROM 1:00 UNTIL END OF DRILL</u>
Kr-85m	1.5E-3	1.3E-3	1.1E-3
Kr-85	9E-4	8E-4	6E-4
Kr-87	8E-4	6E-4	7.2E-4
Kr-88	3E-3	1.5E-3	1.1E-3
I-131	1.1E-1	1E-1	1.0E-3
I-132	5E-2	4E-2	1E-3
I-133	8E-2	5E-2	2E-3
I-134	6E-3	3E-3	3E-4
I-135	3E-2	2E-2	1E-3
Xe 131m	2E-3	1E-3	5E-4
Xe 133	2E-1	1.5E-1	1.5E-1
Xe 135	4E-3	2E-3	2E-3
Co-58	3E-3	1.8E-3	1.8E-3
Ce-139	2E-4	2.1E-4	2.2E-4
Nb-95	1.2E-3	1.2E-3	1.2E-3
Ce-144	1.1E-3	1.1E-3	1.2E-3
Cs-137	3E-4	2.8E-4	2.7E-3
Zr-95	1E-3	1E-3	1E-3
Co-60	3E-4	3E-3	3.1E-3
Cs-134	3E-3	2.8E-3	2.85E-3
Cs-137	2.2E-3	2.2E-3	2.22E-3

Cs-137

0.4E-3

Cs-138

1.8E-3

THIS IS A DRILL

CONFIDENTIAL

CALVEX 82
CONTAINMENT AIR SAMPLE
TIME = 0600 T = 00:00

<u>ISOTOPE</u>	<u>uCi/cc</u>	<u>ISOTOPE</u>	<u>uCi/cc</u>
Xe 131m	2.9E-2	Kr-85	5.5E-4
Xe 133	1.39	Kr 85m	6E-4
Xe 133m	6.9E-3	Kr 87	9E-3
Xe 135	1.76E-2	Kr 88	1E-4
Na 24	1.35E-3		
Rb 88	6.3E-2		
I-131	2.43E-3		
I-133	3.45E-3		
I-135	2E-3		
Cs-134	6.3E-4		
Cs-137	1.57E-3		
Cs-138	8E-3		
Ba-139	6.9E-4		
Ce-139	4E-4		
F-18	6E-3		
Br-82	1.45E-3		

TOTAL ACTIVITY = 1.54

THIS IS A DRILL
CONFIDENTIAL

THIS IS A DRILL
5-10

CONFIDENTIAL

CALVEX 82
CONTAINMENT AIR SAMPLE
TIME = 0700 T = 1:00

<u>ISOTOPE</u>	<u>uCi/cc</u>	<u>ISOTOPE</u>	<u>uCi/cc</u>
Xe 131m	3.4E-2	Kr-85	7E-4
Xe 133	2.0	Kr-85m	4E-4
Xe 133m	9.2E-3	Kr-87	9E-3
Xe 135	1.9E-2	Kr-88	7E-4
Na 24	1.5E-3		
Rb 88	9E-2		
I-131	4E-3		
I-133	6E-3		
I-135	2.5E-3		
Cs-134	6.3E-4		
Cs-137	1.8E-3		
Cs-138	9E-3		
Ba-139	6.E-4		
Ce-139	3.E-4		
F-18	7.E-3		
Br-82	1.9E-3		

TOTAL ACTIVITY = 2.20

THIS IS A DRILL.

CONFIDENTIAL

CALVEX 82
CONTAINMENT AIR SAMPLE
TIME = 0800 T = 2:00

<u>ISOTOPE</u>	<u>uCi/cc</u>	<u>ISOTOPE</u>	<u>uCi/cc</u>
Xe 131m	4E-2	Kr-85	4.7E-4
Xe 133	6.8	Kr-85m	6.5E-4
Xe 133m	2.8E-2	Kr-87	1E-2
Xe 135	1.E-1	Kr-88	3E-3
Na 24	1.3E-3		
Rb 88	2.4E-2		
I-131	1.8E-2		
I-133	9E-3		
I-135	8E-3		
Cs-134	3E-4		
Cs-137	2E-3		
Cs-138	6E-2		
Ba-139	4.5E-4		
Ce-139	6E-4		
F-18	7E-3		
Br-82	2E-3		

THIS IS A DRILL
CONFIDENTIAL

TOTAL ACTIVITY = 7.11

CALVEX 82
CONTAINMENT AIR SAMPLE
TIME = 0900 T = 3:00

<u>ISOTOPE</u>	<u>uCi/cc</u>	<u>ISOTOPE</u>	<u>uCi/cc</u>
Xe 131m	4.6E-2	Kr-85	4.5E-3
Xe 133	16.3	Kr-85m	6.8E-4
Xe 133m	2.9E-2	Kr-87	1.9E-2
Xe 135	1.2E-1	Kr-88	7E-3
Na 24	1.33E-3		
Rb 88	2.47E-2		
I-131	4.8E-2		
I-133	5E-3		
I-135	2.7E-3		
Cs-134	7E-4		
Cs-137	2.2E-3		
Cs-138	6E-3		
Ba-139	2E-4		
Ce-139	5E-4		
F-18	7E-3		
Br-82	4.2E-4		

THIS IS A DRILL
CONFIDENTIAL

TOTAL ACTIVITY = 16.6

CALVEX 82
CONTAINMENT AIR SAMPLE
TIME = 1000 T = 4:00

<u>ISOTOPE</u>	<u>uCi/cc</u>	<u>ISOTOPE</u>	<u>uCi/cc</u>
Xe 131m	2.1E-1	Kr-85	1.3E-3
Xe 133	10.8	Kr-85m	3.2E-4
Xe 133m	4.9E-2	Kr-87	7E-2
Xe 135	9E-2	Kr-88	6.2E-3
Na 24	1.2E-3		
Rb 88	4.2E-2		
I-131	7.4E-2		
I-133	6.4E-3		
I-135	4.8E-3		
Cs-134	7.2E-4		
Cs-137	1.9E-3		
Cs-138	7E-2		
Ba-139	6E-4		
Ce-139	7E-4		
F-18	6.2E-3		
Br-82	4.7E-3		

THIS IS A DRILL
CONFIDENTIAL

TOTAL ACTIVITY = 11.4

CALVEX 82
CONTAINMENT AIR SAMPLE
TIME = 11:02 T = 5:02

<u>ISOTOPE</u>	<u>uCi/cc</u>	<u>ISOTOPE</u>	<u>uCi/cc</u>
Xe 131m	1.2E-1	Kr-85	4.4E-2
Xe 133	22.6	Kr-85m	5.5E-2
		Kr-87	3.8E-2
Xe 135	3.8E-1	Kr-88	1.45E-1
Na 24	1.2E-2		
Rb 88	4.2E-1		
I-131	12.7	Cs-137	2E-5
I-132	2.4E-1	Co-60	2E-5
I-133	3.9E-1	Co-58	7E-6
I-134	2.9E-1		
I-135	1.4E-1		
Cs-138	3E-2		
Ba-139	5E-5		
Ce-139	4E-4		
F-18	0		
Br-82	0		
Cs-134	1E-5		

THIS IS A DRILL
CONFIDENTIAL

TOTAL ACTIVITY = 37.6

CONTAINMENT ATMOSPHERE ACTIVITY (pg. 1)
(WITHOUT CONTAINMENT SPRAY ACTUATION)

ISOTOPE	HALF LIFE (DAYS)	EXPOSURE RATE R/hr per Ci/m ³	ACTIVITY (Ci/m ³) T = 5:02 (11:02 A.M.)	ACTIVITY (Ci/m ³) T = 6:00 (12:00 NOON)	ACTIVITY (Ci/m ³) T = 7:00 (1:00 P.M.)	ACTIVITY (Ci/m ³) T = 8:00 (2:00 P.M.)
K-85m	0.183	118	4.4E-2	3.78E-2	3.2E-2	2.7E-2
K-85	3.93E3	1.65	5.5E-1	5.5E-3	5.5E-3	5.5E-3
K-87	5.28	526	3.8E-1	2.24E-3	1.32E-3	1.32E-3
K-88	1.71E-1	7770	1.45E-2	1.23E-2	1.18E-2	8.8E-3
I-131	8.06	295	1.27	1.26	1.26	1.25
I-132	9.58E-2	1790	2.4E-2	1.8E-2	1.3E-2	9.7E-3
I-133	8.67E-1	460	3.9E-2	3.8E-2	3.6E-2	3.5E-2
I-134	3.61E-2	1768	2.9E-2	1.3E-2	5.8E-3	2.6E-3
I-135	2.78E-1	1388	1.4E-2	1.26E-2	1.1E-2	1E-2
Xe 131m	11.8	2.56	1.2E-2	1.20E-2	1.19E-2	1.19E-2
Xe 133	5.31	23.3	2.26	2.25	2.24	2.23
Xe 135	0.38	1930	3.8E-2	3.53E-2	3.28E-2	3.03E-2
TOTALS		1.6E4	3.75	.37	3.66	3.62

THIS IS A DRILL
CONFIDENTIAL

CONTAINMENT ATMOSPHERE ACTIVITY (pg. 2)
(WITHOUT CONTAINMENT SPRAY ACTUATION)

ISOTOPE	ACTIVITY (Ci/m ³) T = 9:00 (3:00 P.M.)	ACTIVITY (Ci/m ³) T = 10:00 (4:00 P.M.)	ACTIVITY (Ci/m ³) T = 11:00 (5:00 P.M.)
K-85m	2.35E-2	2.0E-2	1.71E-2
K-85	5.5E-3	5.5E-3	5.5E-3
K-87	4.3E-4	2.5E-4	1.5E-4
K-88	7.4E-3	6.2E-3	5.3E-3
I-131	1.251	1.25	1.24
I-132	7E-3	5.3E-3	3.9E-3
I-133	3.4E-2	3.3E-2	3.2E-2
I-134	1.1E-3	5E-4	2E-4
I-135	9E-3	8E-3	7E-3
Xe 131m	1.19E-2	1.18E-2	1.18E-2
Xe 133	2.21	2.20	2.19
Xe 135	2.81E-2	2.60E-2	2.42E-2
TOTALS	3.58	3.56	3.54

THIS IS A DRILL
CONFIDENTIAL

THIS IS A DRILL CONFIDENTIAL

CALVEX 82

CONTAINMENT ATMOSPHERE IODINE ACTIVITY *

		<u>I-131</u>		<u>I-132</u>		<u>I-133</u>		<u>I-134</u>		<u>I-135</u>		<u>TOTAL IODINES</u>	
		<u>WITH</u>	<u>WITHOUT</u>	<u>WITH</u>	<u>WITHOUT</u>	<u>WITH</u>	<u>WITHOUT</u>	<u>WITH</u>	<u>WITHOUT</u>	<u>WITH</u>	<u>WITHOUT</u>	<u>WITH</u>	<u>WITHOUT</u>
T = 5:02	(11:02 A.M.)	1.27	1.27	2.4E-2	2.4E-2	3.9E-2	3.9E-2	2.9E-2	2.9E-2	1.4E-2	1.4E-2	1.376	1.376
T = 6:00	(12:00 P.M.)	0.35	1.265	4.9E-3	1.8E-2	7.8E-3	2.9E-2	3.6E-2	1.3E-3	3.4E-3	1.26E-2	0.4	1.33
T = 7:00	(1:00 P.M.)	0.1	1.261	3.5E-3	1.3E-2	5.4E-3	2E-2	1.5E-3	5.8E-3	3E-3	1.1E-2	0.11	1.31
T = 8:00	(2:00 P.M.)	0.025	1.256	2.6E-3	9.7E-3	3.8E-3	1.4E-2	7E-4	2.6E-3	2.7E-3	1E-2	3.5E-2	1.29
T = 9:00	(3:00 P.M.)	0.01	1.251	1.9E-3	7E-3	2.7E-3	1E-2	3E-4	1.1E-3	2.4E-3	9E-3	1.7E-2	1.27
T = 10:00	(4:00 P.M.)	0.002	1.247	1.4E-3	5.3E-3	1.9E-3	7E-3	1.4E-4	5E-4	2.2E-3	8E-3	7.6E-3	1.267
T = 11:00	(5:00 P.M.)	0.004	1.242	1E-3	3.9E-3	1.3E-3	5E-3	6E-5	2E-4	2E-3	7E-3	4.8E-3	1.258

* Concentration in uCi/cc -

WITH = With Containment Spray

WITHOUT = Without Containment Spray (Radioactive Decay Only)

THIS IS A DRILL CONFIDENTIAL

CONTAINMENT ATMOSPHERE ACTIVITY
(W/O CONTAINMENT SPRAY ACTUATION)

<u>TIME</u>	<u>CONTAINMENT</u> <u>HI-RANGE MONITOR</u> <u>RI 5317 D (R/hr.)</u>	<u>CONTAINMENT</u> <u>HI-RANGE MONITOR</u> <u>RI 5317 C (R/hr.)</u>
11:02 A.M.	751.9	797.0
12:00 P.M.	685.1	726.2
1:00 P.M.	649.1	688.0
2:00 P.M.	604.9	641.2
3:00 P.M.	577.8	612.5
4:00 P.M.	557.0	590.5
5:00 P.M.	539.2	571.5

THIS IS A DRILL
CONFIDENTIAL

CONTAINMENT RADIATION MONITOR READINGS

DRILL TIME	ACTUAL TIME	LOW RANGE RI-5316C&D (10 ⁻⁴ -10 ¹) READING IN R/HR	W/CONTAINMENT SPRAY ¹		W/O CONTAINMENT SPRAY ²	
			HI-RANGE RI-5317-C (10 ⁻⁰ -10 ⁸) READING IN R/HR	HI-RANGE RI-5317-D	HI-RANGE RI-5317-C R/h	HI-RANGE RI-5317-D R/h
T = 0	0600	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
T = 1	0700	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
T = 2	0800	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
T = 3	0900	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
T = 4	1000	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
T = 5	1100	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
T = 5:02	1102	OFFSCALE	79.7	75.1	797.0	751.9
T = 5:04	1104	OFFSCALE	65.8	63.0	793.0	744.0
T = 5:32	1132	OFFSCALE	20.3	19.5	755.0	711.5
T = 5:47	1147	OFFSCALE	18.2	17.5	739.0	697.0
T = 6:02	1202	OFFSCALE	16.8	16.0	726.2	685.1
T = 7:02	1:02	OFFSCALE	12.2	12.0	688.0	649.1
T = 8:02	2:02	OFFSCALE			641.2	604.9
T = 9:02	3:02				612.5	577.8
T = 10:02	4:02				590.5	557.0
T = 11:02	5:02				571.5	539.2

NOTE: 1. Decrease is ~27%/h due to removal of Iodines
2. Decrease is due only to the decay of the Isotopes.

THIS IS A DRILL
CONFIDENTIAL

IODINE ACTIVITY
AUXILIARY BUILDING
T = 05:30 1130

[illegible]

AUXILIARY BUILDING
DOSE RATE (R/h) VS TIME

AUX. BLDG.	11:02	11:30	12:00	1:00	2:00	3:00	4:00	5:00
-15 ft.	0.715	0.67	0.51	0.4	0.37	0.32	0.3	0.28
+ 5 ft.	0	0.08	0.06	0.05	0.04	0.04	0.035	0.034
+ 27 ft.	0	0.073	0.056	0.044	0.041	0.035	0.032	0.031
+ 45 ft.	0	0.008	0.006	0.005	0.004	0.0038	0.0035	0.034
+ 69 ft.	0	0.00036	0.00028	0.00022	0.00022	0.00017	0.00016	0.00016

**THIS IS A DRILL
CONFIDENTIAL**

ECCS PUMP ROOM

	Total Activity Ci/m^3 11:02 <u>T = 5:02</u>	Total Activity Ci/m^3 11:30 <u>T = 5:30</u>	ACTIVITY AVAILABLE FOR RELEASE THRU HEPA-C <u>Ci/m^3</u>
K-85m	4.4E-2	4E-2	4E-2
K-85	5.5E-3	5.5E-3	5.5E-3
K-87	3.8E-3	2.9E-3	2.9E-3
K-88	1.45E-2	1.34E-2	1.34E-2
I-131	1.27	1.27	3.8E-4
I-132	2.4E-2	2E-2	6E-2
I-133	3.9E-2	3.8E-2	1.1E-5
I-134	2.9E-2	2.E-2	6E-4
I-135	1.4E-2	1.33E-2	4E-6
Xe-131m	1.2E-2	1.2E-2	1.2E-2
Xe-133	2.26	2.26	2.26
Xe-135	3.8E-2	3.67E-2	3.67E-2
TOTAL ACTIVITY	<u>3.75 Ci/m^3</u>	<u>3.73 Ci/m^3</u>	<u>2.37 Ci/m^3</u>

**THIS IS A DRILL
CONFIDENTIAL**

—

1
2
3
4

THIS IS A DRILL

Major Isotopes

Cs-137 Co-60
Cs-134 Co-58
I-131

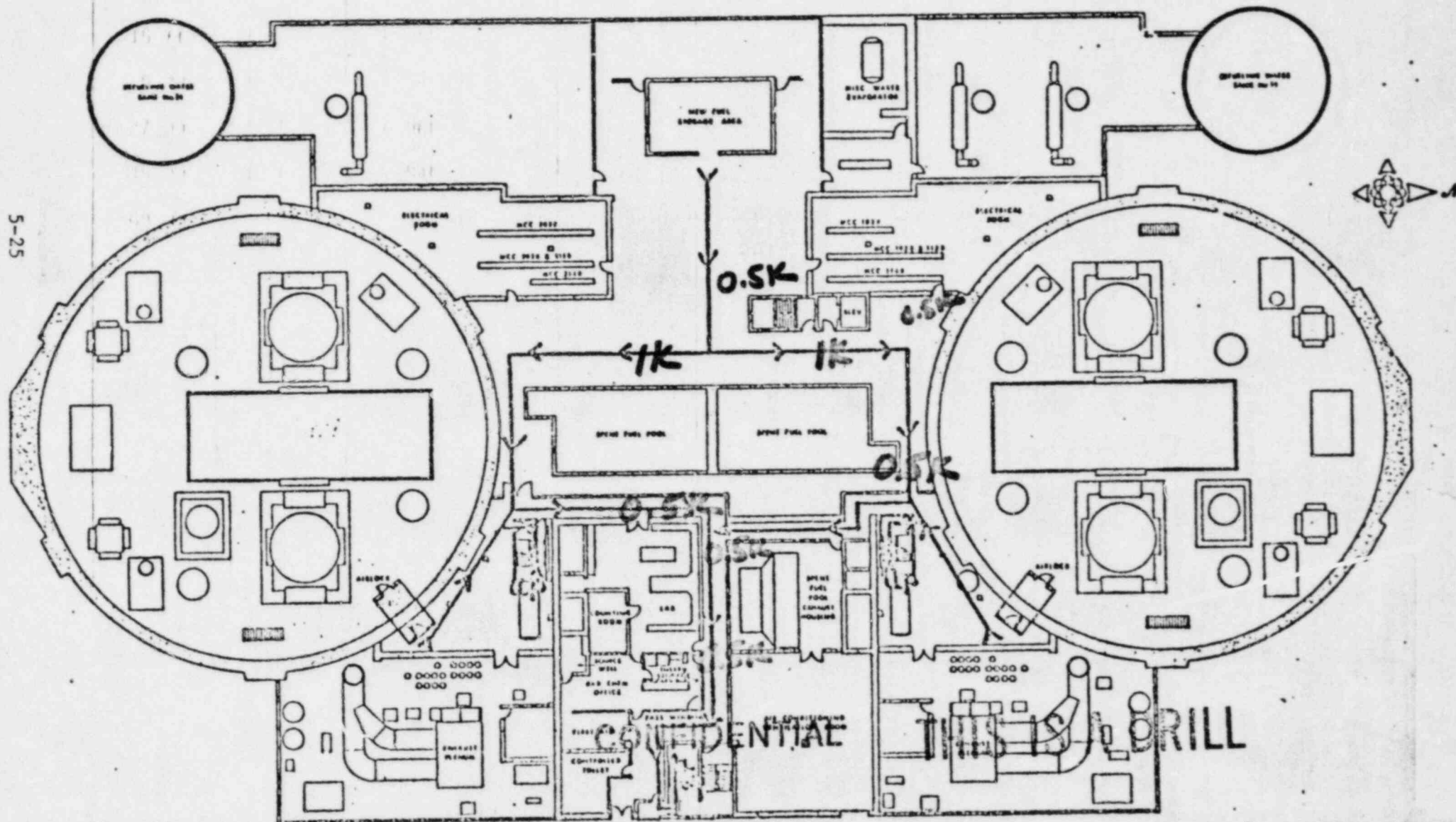
(In 1,000's (K) dpm/100 Cm²)

CALVEX 82 CALVERT CLIFFS NUCLEAR POWER PLANT Baltimore Gas & Electric Company

CONTAMINATION LEVELS UNITS 1 & 2 CONTAINMENT AND AUXILIARY BUILDING PLAN AT 69'-0" ELEVATION

AT ~ 11:30

THIS IS A DRILL
CONFIDENTIAL



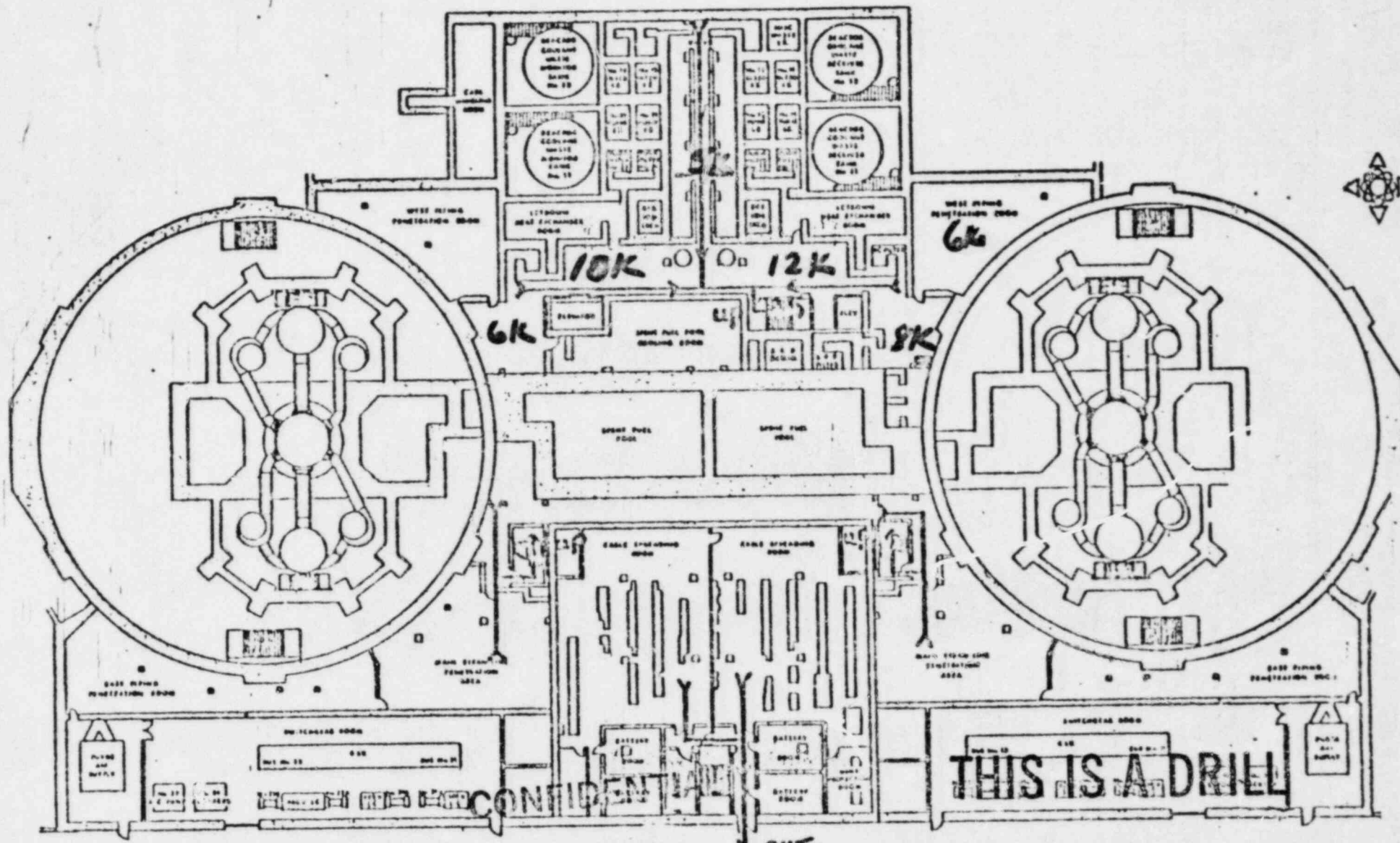
CALVEX

Belmonte Gas & Electric Company

CONTAMINATION LEVELS

27'-0" ELEVATION
AT ~ 11:30

(in 1,000's (K) dpm/100 cm²)



5-27

CALVEX 82

Major Isotopes

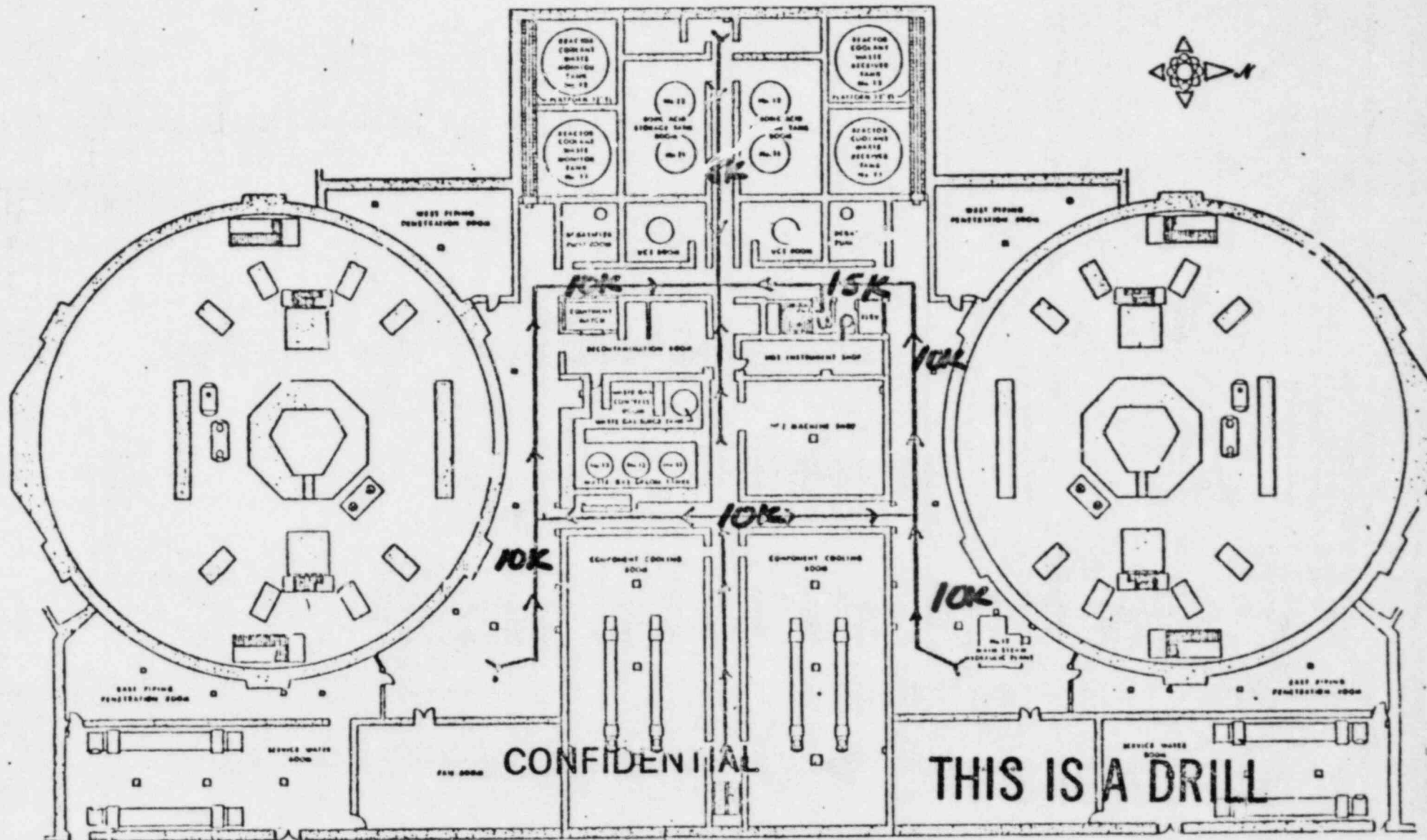
Cs-137 Co-60
Cs-134 Co-58
I-131

CALVERT CLIFFS NUCLEAR POWER PLANT
Baltimore Gas & Electric Company

CONTAMINATION LEVELS
UNITS 1 & 2 CONTAINMENT AND AUXILIARY BUILDING PLAN AT
5'-0" & 10'-0" ELEVATIONS
AT ~11:30

(in 1,000's (K) dpm/100 Cm²)

5-28



Major Isotopes

Major Isotopes
Cs-137 Co-60
Cs-134 Co-58
I-131

(in 1,000's (K) dpm/100 Cm²)

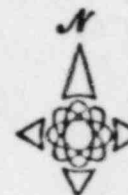
CALVEX 82 CALVERT CLIFFS NUCLEAR POWER PLANT Baltimore Gas & Electric Company

CONTAMINATION LEVELS

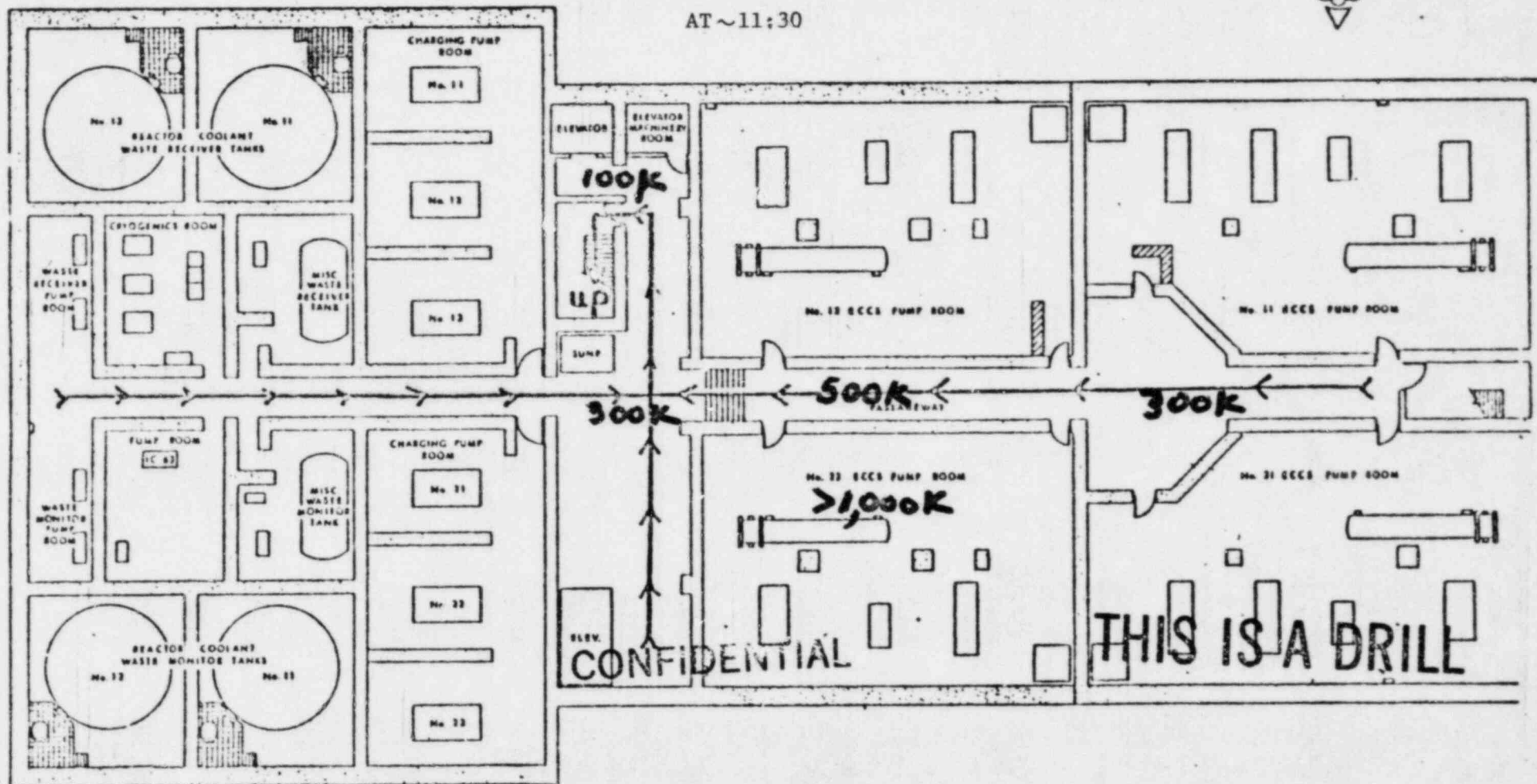
UNITS 1 & 2 AUXILIARY BUILDING PLAN

(-) 8'-0"
AT (-) 10'-0"
(-) 15'-0" } ELEVATIONS

AT ~11:30



5-29



ECCS PUMP ROOM

DOSE RATES CONTACT WITH THE
WATER TIGHT DOORS (R/H)

<u>TIME</u>	<u>DOSE RATE (R/h)</u>
11:02	24
11:30	22.7
12:00	17
12:30	7.5
1:00	0.850
2:00	0.850
3:00	0.850
4:00	0.850

THIS IS A DRILL

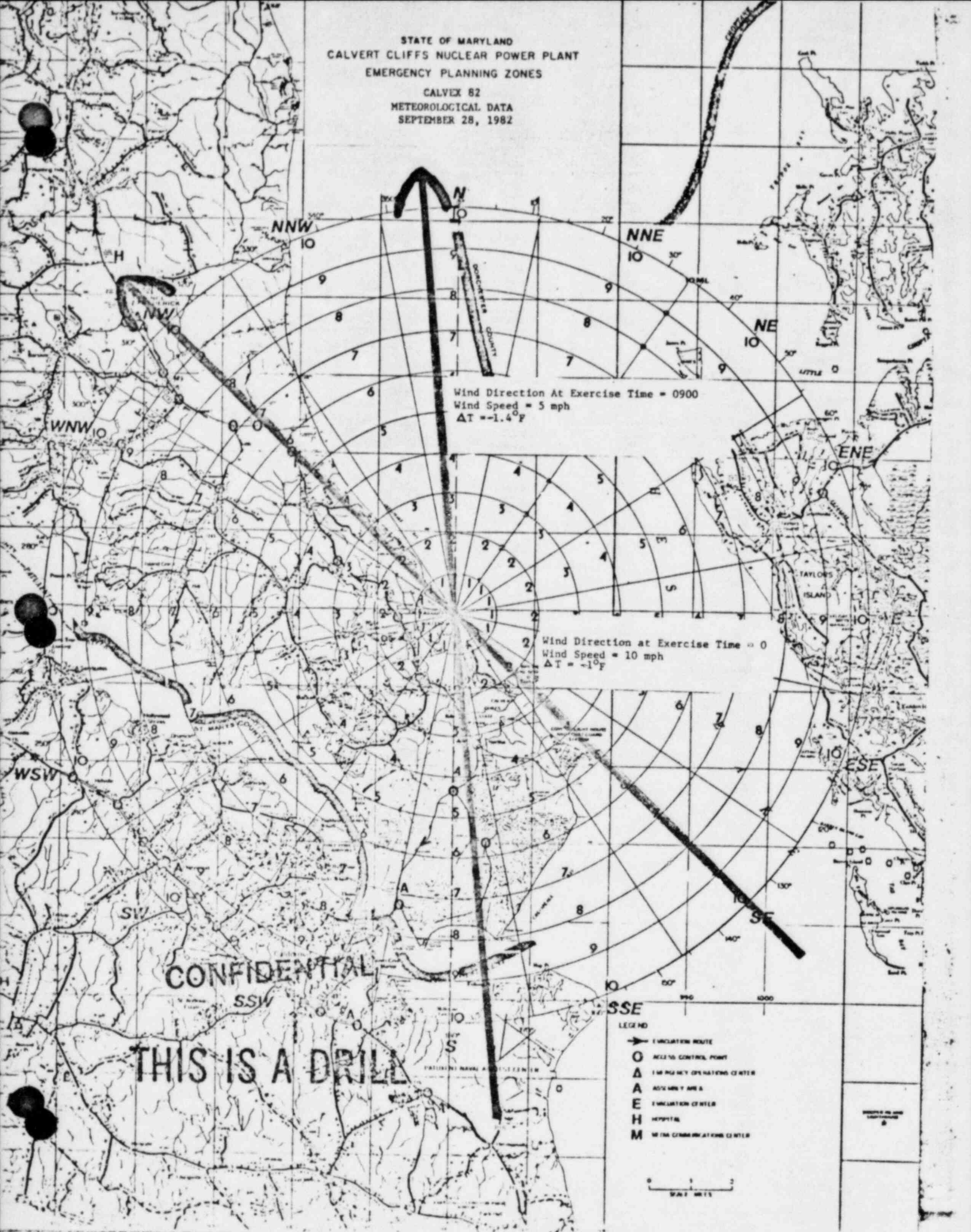
CONFIDENTIAL

5-30

5-20

STATE OF MARYLAND
CALVERT CLIFFS NUCLEAR POWER PLANT
EMERGENCY PLANNING ZONES

CALVEX 82
METEOROLOGICAL DATA
SEPTEMBER 28, 1982



Calvert Cliffs Nuclear Power Plant

9.28.82

WIND FROM 135°

$\Delta T(200'-30') = -1^{\circ}F$

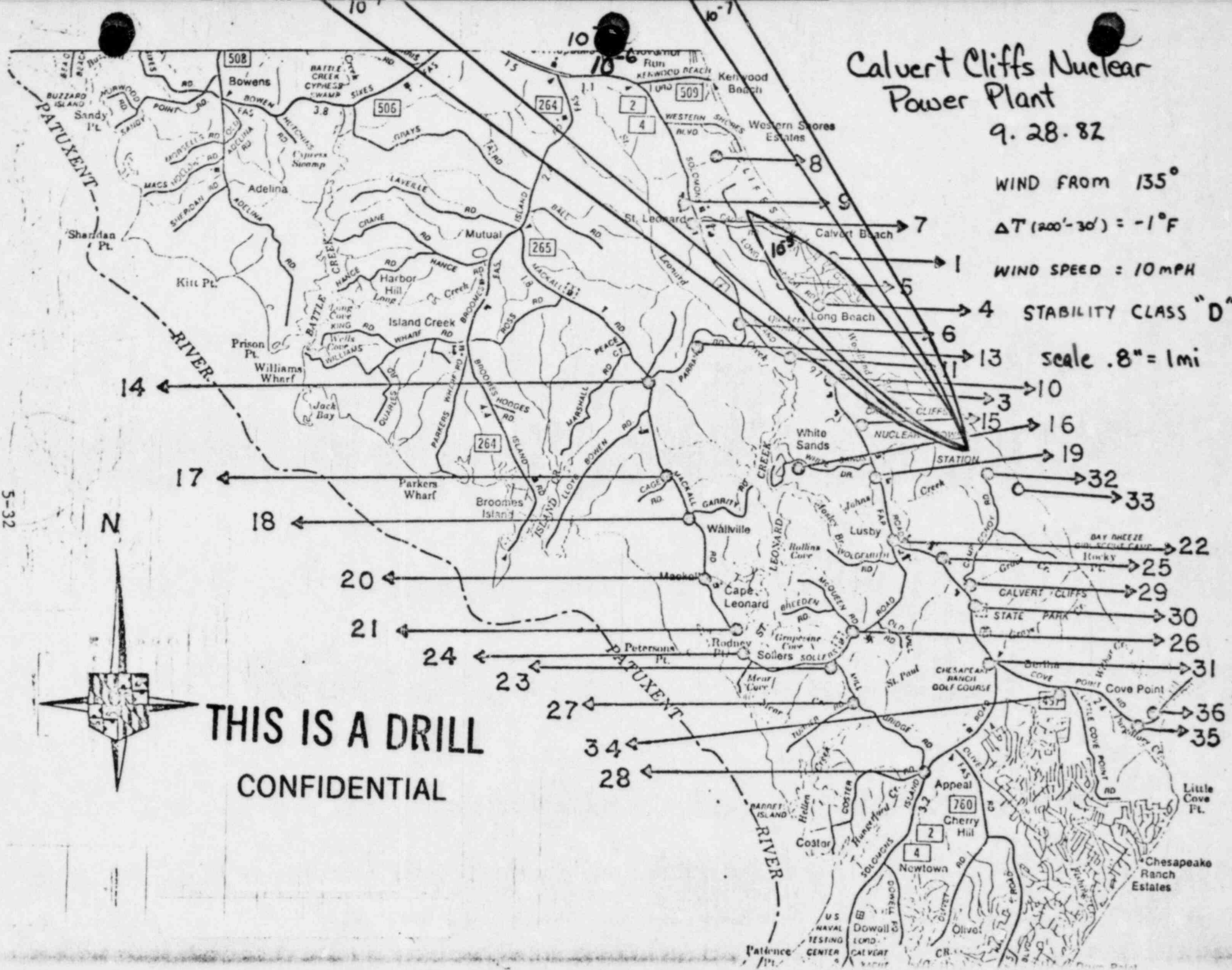
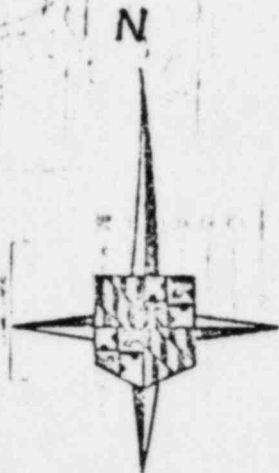
WIND SPEED = 10 MPH

STABILITY CLASS "D"

scale .8" = 1 mi

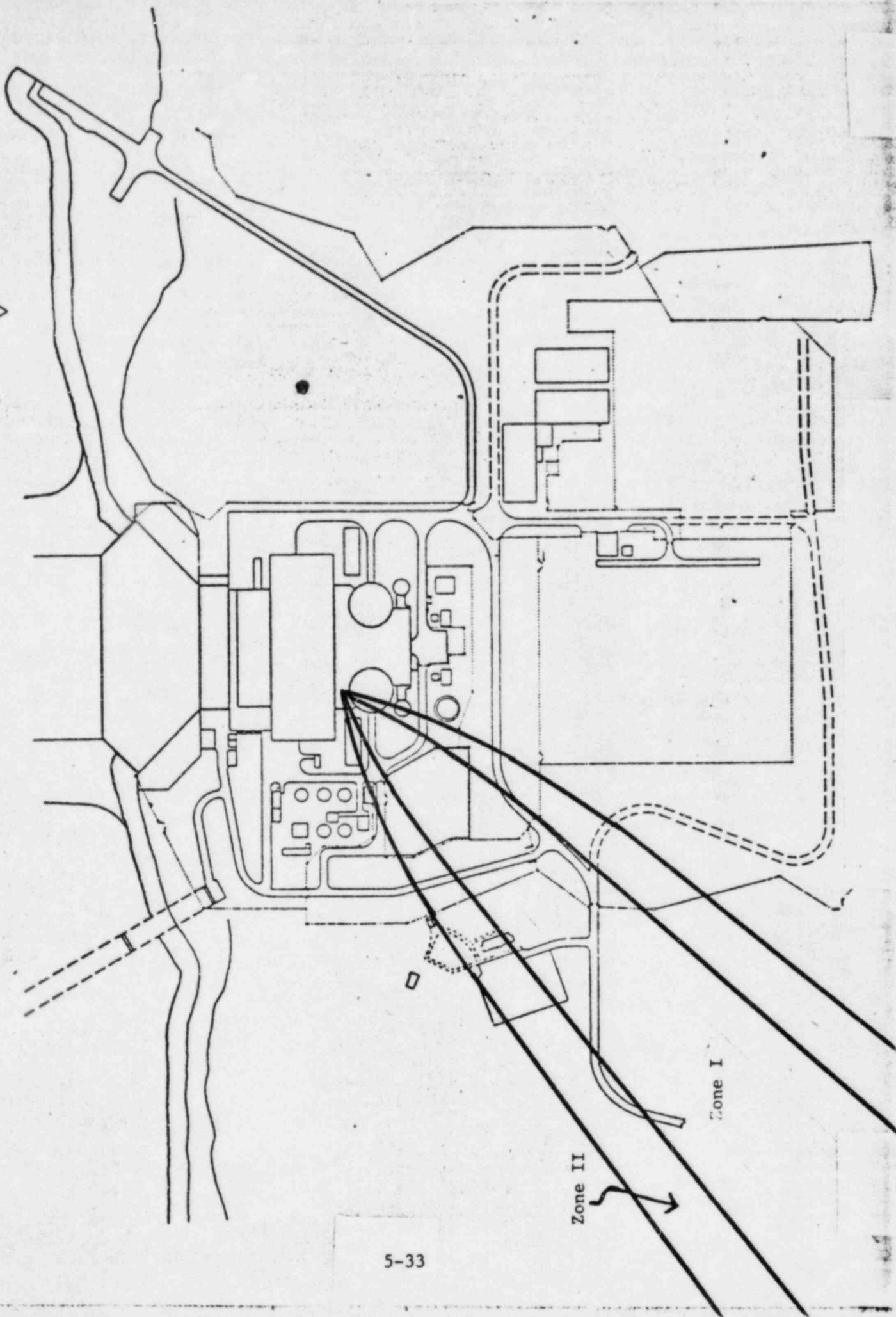
THIS IS A DRILL
CONFIDENTIAL

5-32



CALVERT CLIFFS NUCLEAR POWER PLANT
Baltimore Gas & Electric Company

ONSITE PLUME LOCATION
PLANT PLOT PLAN



OFFSITE RADIOLOGICAL RELEASE DATA

DRILL TIME	ACTUAL TIME	ECCS PUMP ROOM MONITOR (CPM)	MAIN VENT (CPM)	PROJECTED DOSE RATE (MR/h) AT THE SITE BOUNDARY	NOBLE GAS RELEASE RATE uCi/sec	TOTAL I ₂ RELEASE Ci/sec	I-131 RELEASE RATE Ci/sec	DOSE RATE R/HR 10 METERS FROM THE *	THYROID DOSE COR- RECTION FACTOR *
5:30	11:30	1E7	5E5	250	1.77E7	3E-3	2.8E-3	8.3	1.98E5
5:32	11:32	1.84E7	9.2E5	460	3.26E7	5.5E-3	5.1E-3	15.3	1.98E5
5:40	11:40	9.2E6	4.6E5	230	1.63E7	2.77E-3	2.6E-3	7.6	1.98E5
5:48	11:48	9.1E6	4.55E5	230	1.6E7	2.77E-3	2.6-3	7.6	1.98E5
5:56	11:56	9E6	4.5E5	230	1.6E7	2.77E-3	2.6E-3	7.6	1.98E5
6:04	12:04	9E6	4.5E5	230	1.6E7	2.77E-3	2.6-3	7.6	1.98E5
6:12	12:12	8.9E6	4.4E5	220	1.56E7	2.65E-3	2.46-3	7.3	1.98E5
6:20	12:20	8.8E6	4.4E5	220	1.56E7	2.65E-3	2.4E-3	7.3	1.98E5
6:28	12:28	8.5E6	4.25E5	210	1.5E7	2.55E-3	2.4E-3	7	1.98E5
6:36	12:36	4.6E6	2.3E5	115	8.1E6	1.38E-3	1.28-3	3.8	1.98E-5
6:44	12:44	2.3E6	1.15E5	57.5	4.1E6	7E-4	6.5E-4	1.9	1.98E5
6:52	12:52	1.15E6	5.75E4	29	1.9E6	3.2-4	3E-4	1	2.12E5
7:00	1:00	6E5	3E4	15	1.06E6	1.8E-4	1.67-4	0.5	2.26E5
7:03	1:08	3E5	1.50E4	7.5	5.3E5	8.8E-5	8.1E-5	0.25	2.26E5
7:16	1:16	1.15E5	5.7E3	2.9	2E5	3.4E-5	3.1E-5	0.1	2.26E5
7:24	1:24	5.75E4	2.9E3	1.4	1E5	1.7E-5	1.6E-5	0.05	2.26E5

THIS IS A DRILL
CONFIDENTIAL

* MN VENT * Rem/hr
Ci/m³

MAIN VENT SAMPLE ACTIVITY

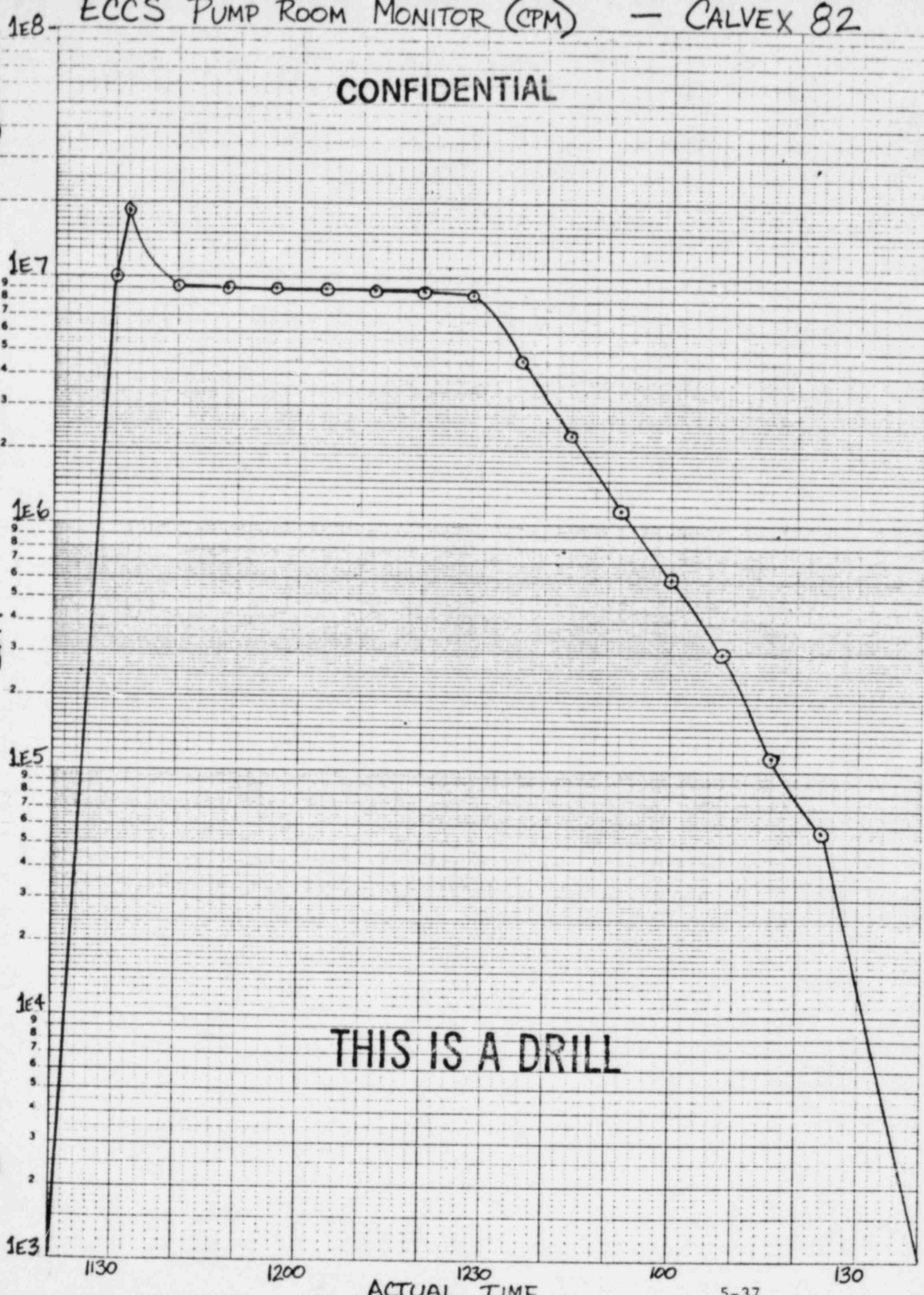
	AT T=5:30 Ci/m ³ ACTIVITY AVAILABLE	F ₂ OF A ₀	TOTAL Ci/m ³ RELEASE OF EACH uCi/cc ISOTOPE	ISOTOPIC RELEASE RATE uCi/cc AT T=6:00	ISOTOPIC RELEASE RATE uCi/cc T=6:30	ISOTOPIC RELEASE RATE uCi/cc T=7:00	ISOTOPIC RELEASE RATE uCi/cc T=7:30
K-85m	4E-1	1.6E-2	5.2E5	2.6E5	2.4E5	1.7E4	8.0E2
K-85	5.5E-2	2.3E-3	7.5E4	3.7E4	3.5E4	2.4E3	1.2E2
K-87	2.9E-2	1.2E-3	3.9E4	1.9E4	1.8E4	1.3E3	6.0E1
K-88	1.34E-1	5.6E-3	1.8E5	9.0E4	8.4E4	5.9E3	2.8E2
I-131	3.8E-3	1.6E-4	5.2E3	2.6E3	2.4E3	1.7E2	8.0
I-132	6E-5	2.5E-6	8.2E1	4.0E1	3.8E1	2.65	1.3E-1
I-133	1.1E-4	4.6E-6	1.5E2	7.4E1	6.9E1	4.88	2.3E-1
I-134	6E-5	2.5E-6	8.2E1	4.0E1	3.8E1	2.65	1.3E-1
I-135	4E-5	1.7E-6	5.5E1	2.7E1	2.6E1	1.80	8.5E-2
Xe-131m	1.2E-1	5.1E-3	1.7E5	8.2E4	7.7E4	5.4E3	2.6E-2
Xe-133	22.6	0.954	3.1E7	1.5E7	1.4E7	1.1E6	4.8E4
Xe-135	3.67E-1	1.5E-2	4.9E5	2.4E5	2.3E5	1.6E4	7.5E2
TOTAL	23.7	1	3.26E7	1.6E7	1.5E7	1.06E6	5E4

THIS IS A DRILL
CONFIDENTIAL

5-36

THIS IS A DRILL
CONFIDENTIAL

CONFIDENTIAL



THIS IS A DRILL

MAIN VENT (CPM) VS. TIME

- CALVEX 82

CONFIDENTIAL

1E6

1E5

1E4

1E3

1E2

THIS IS A DRILL

1130

1200

1230

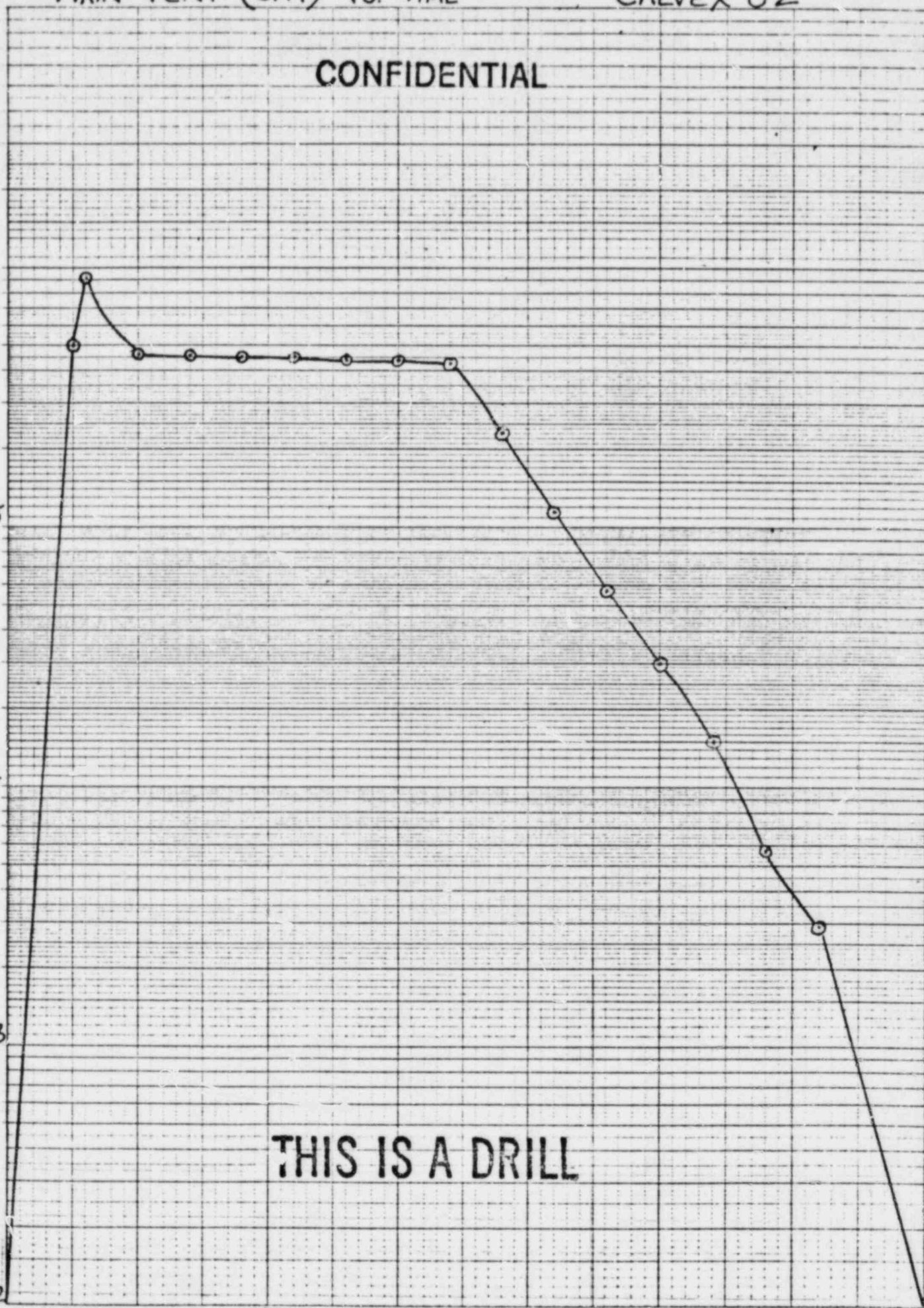
100

5-38

130

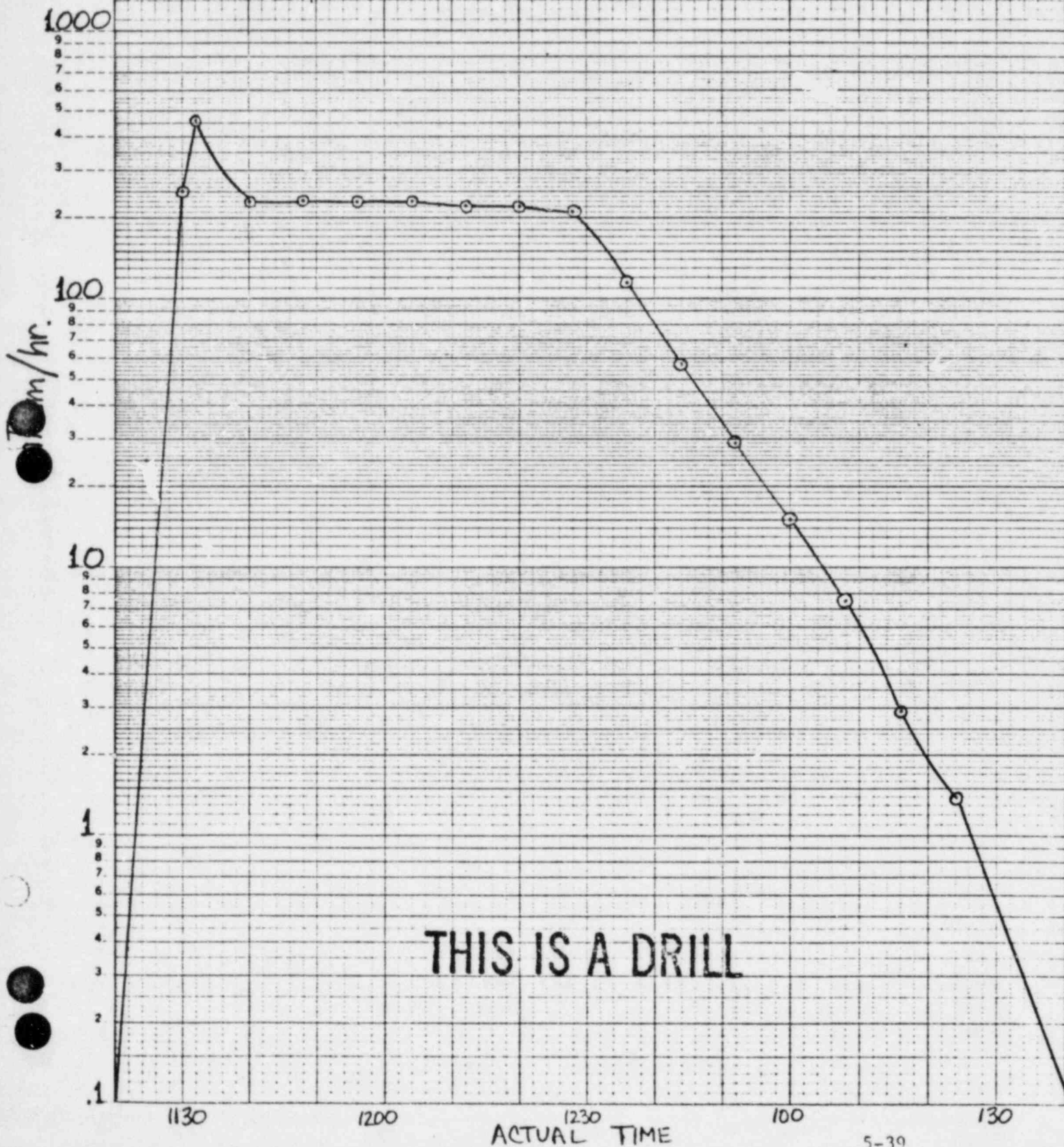
ACTUAL TIME

CPM



PROJECTED DOSE RATE (mrem/hr) AT THE SITE BOUNDARY - CALVEX 02

CONFIDENTIAL



NOBLE GAS RELEASE RATE ($\mu\text{Ci}/\text{sec}$) - CALVEX 82

CONFIDENTIAL

$\mu\text{Ci}/\text{sec}$

1E8
9
8
7
6
5
4
3
2
1E7
9
8
7
6
5
4
3
2
1E6
9
8
7
6
5
4
3
2
1E5
9
8
7
6
5
4
3
2
1E4

1130

1200

1230

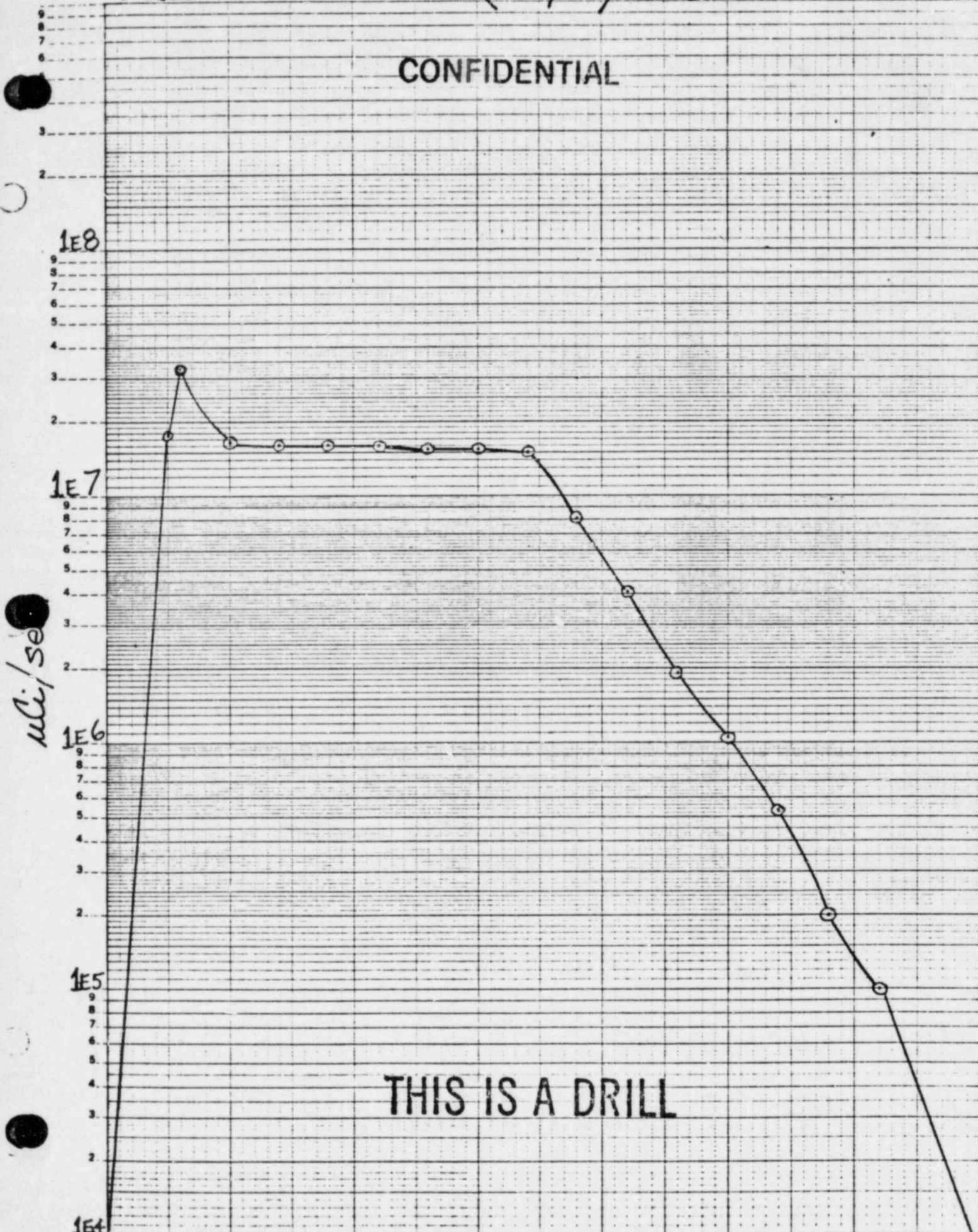
100

5-40

130

ACTUAL TIME

THIS IS A DRILL



TOTAL I₂ RELEASE RATE (Ci/sec) - CALVEX 82

CONFIDENTIAL

45 6210
Ci/sec

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

1E-2

1E-3

1E-4

1E-5

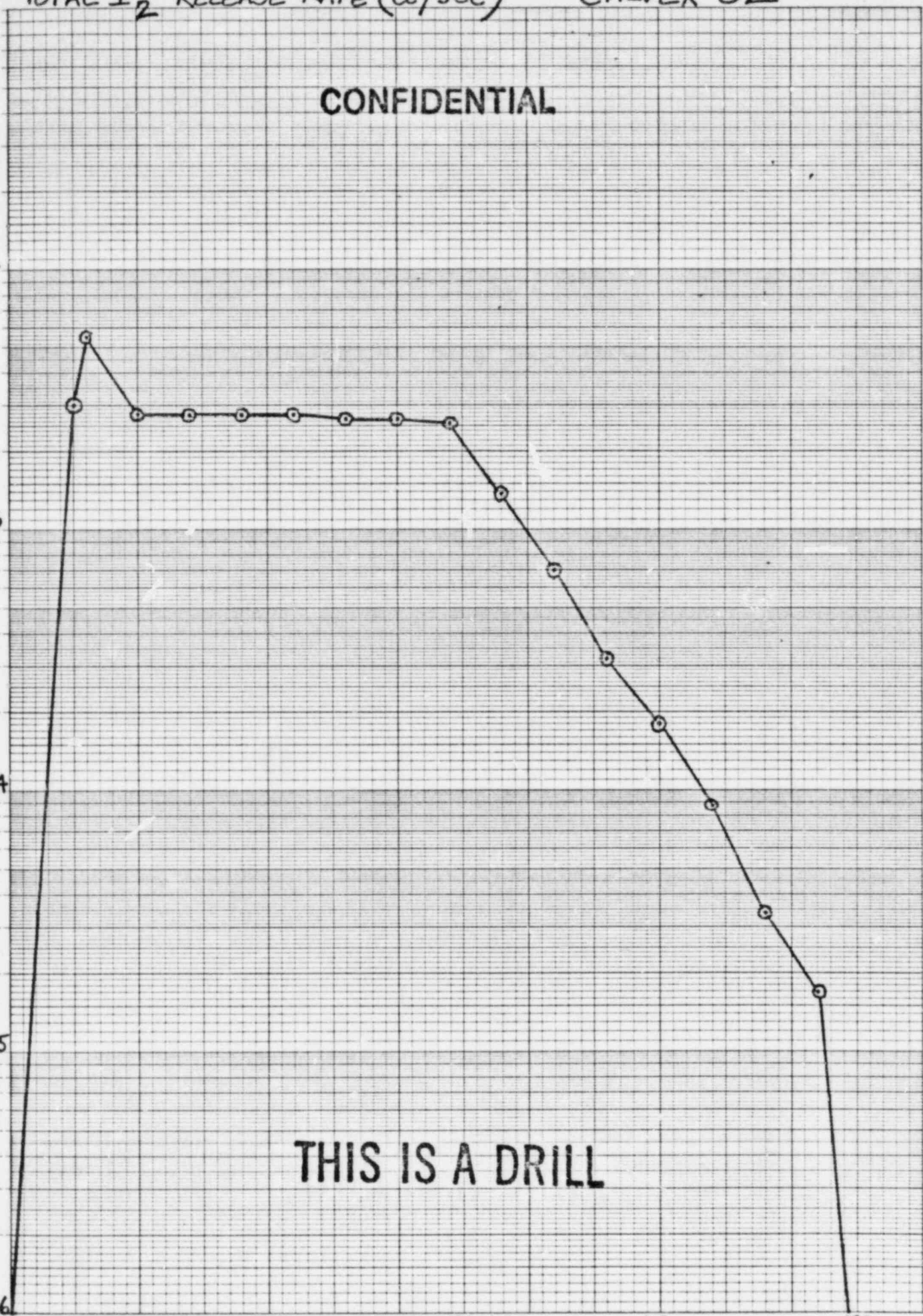
1E-6

THIS IS A DRILL

1150 1200 1230 100 150

ACTUAL TIME

5-41



I-131 RELEASE RATE (Ci/sec) - CALVEX 82

CONFIDENTIAL

46 6210

Ci/sec

SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

1E-2

1E-3

1E-4

1E-5

THIS IS A DRILL

1130

1200

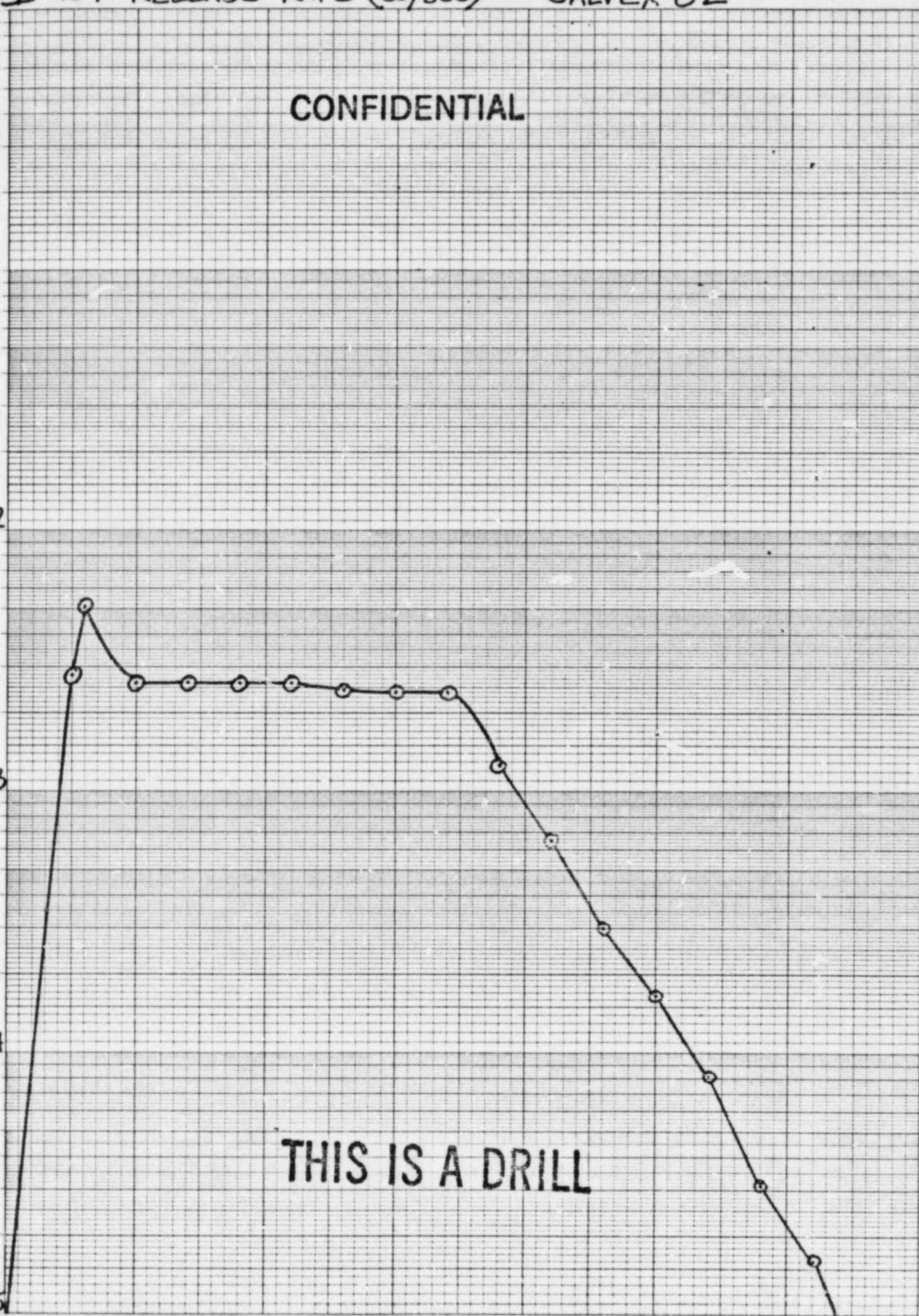
1230

100

130

ACTUAL TIME

5-42



DOSE RATE (R/hr.) 10 METERS FROM THE MAIN VENT

CALVEX 82

CONFIDENTIAL

46 6210

K-E SEMI-LOGARITHMIC 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

100

10

1

.1

.01

1130

1200

1230

100

130

ACTUAL TIME

THIS IS A DRILL



CONFIDENTIAL

OFFSITE RADIOLOGICAL RELEASE DATA THYROID DOSE

DRILL TIME	ACTUAL TIME	ZONE I	ZONE I	ZONE I
		IODINE CONC. $X/Q = 10^{-5}$ Ci/m ³ or uCi/cc	THYROID DOSE (mRem)	IODINE NET CPM PER 2 MINUTES W/MS2-SPA-3
5:30	11:30	6.66E-8	13.0 (170)	5.6E2
5:32	11:32	1.22E-7	24.0 (300)	1.025E3
5:40	11:40	6.15E-8	12.1 (160)	516.8
5:48	11:48	6.15E-8	12.1 (160)	517.0
5:56	11:56	6E-8	12.1 (160)	504.0
6:04	12:04	6E-8	12.1 (160)	504.0
6:12	12:12	5.9E-8	11.6 (160)	496.0
6:20	12:20	5.9E-8	11.6 (160)	496.0
6:28	12:28	5.7E-8	11.3 (140)	479.0
6:36	12:36	3.1E-8	6.1 (80)	260.5
6:44	12:44	1.55E-8	3.0 (38)	130.0
6:52	12:52	7.1E-8	1.5 (18)	60.0
7:00	1:00	4E-9	.8 (10)	33.6
7:08	1:08	1.9E-9	.4 (5)	16.0
7:16	1:16	7.55E-10	.2 (2.5)	6.3
7:24	1:24	3.7E-10	.1 (0.9)	3.1

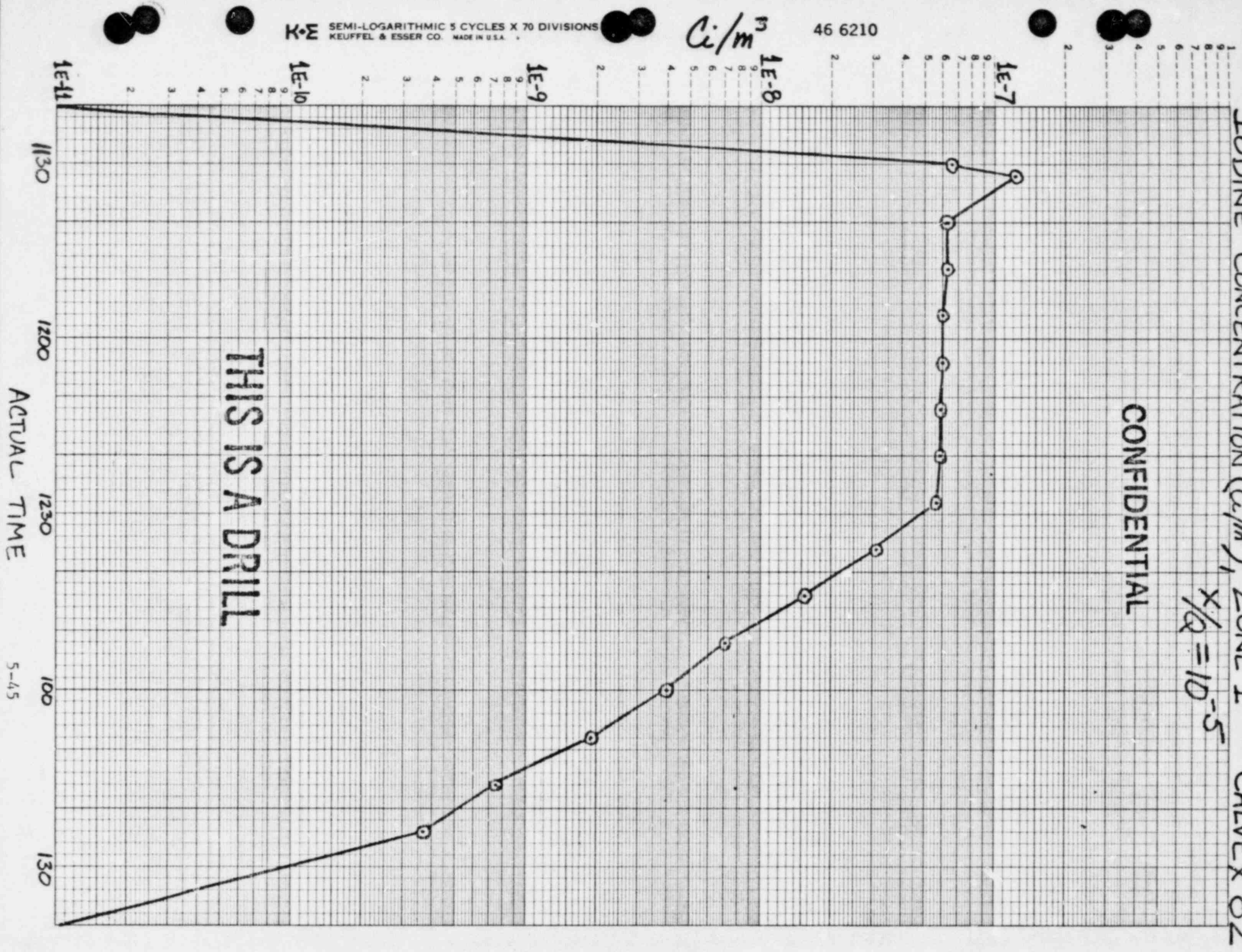
THIS IS A DRILL

IODINE CONCENTRATION (C_i/m^3), ZONE 1 - CALVEX 82

$x/a = 10^{-5}$

CONFIDENTIAL

THIS IS A DRILL



mRem

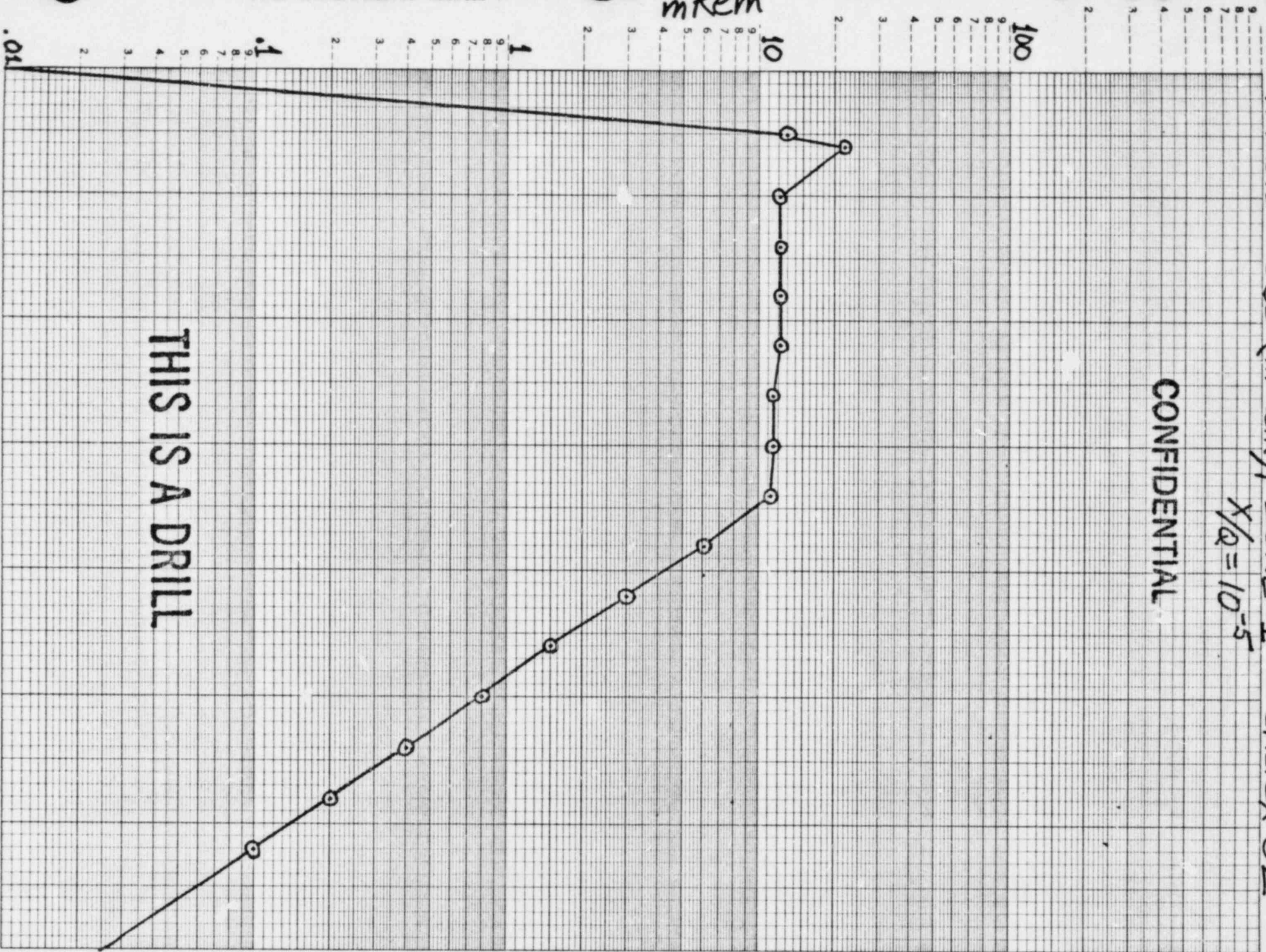
THYROID DOSE (mRem), ZONE I - CALVEX 82
 $X/Q = 10^{-5}$

CONFIDENTIAL

THIS IS A DRILL

ACTUAL TIME

5-46



ZONE I

$$x/Q = 10^{-5}$$

CALVEX 82

CONFIDENTIAL

46 6210

NCP2M

SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISION
KEUFFEL & ESSER CO. MADE IN U.S.A.

K-E

1000

100

10

1

.1

1130

1200

1230

100

130

THIS IS A DRILL

CONFIDENTIAL

OFFSITE RADIOLOGICAL RELEASE DATA THYROID DOSE

DRILL TIME	ACTUAL TIME	ZONE II		
		IODINE CONC. $X/Q = 10^{-6}$ Ci/m ³ or uCi/cc	THYROID DOSE (mRem)	THYROID IODINE NCP2M W/MS2-SPA-3
5:30	11:30	6.7E-9	1.30 (17)	56.0
5:32	11:32	1.22E-8	2.40 (30)	102.5
5:40	11:40	6.1E-9	1.21 (16)	51.7
5:48	11:48	6.1E-9	1.21 (16)	51.7
5:56	11:56	6E-9	1.21 (16)	50.4
6:04	12:04	6E-9	1.21 (16)	50.4
6:12	12:12	5.9E-9	1.16 (16)	49.6
6:20	12:20	5.9E-9	1.60 (16)	49.6
6:28	12:28	5.7E-9	1.13 (14)	47.9
6:36	12:36	3.1E-9	0.61 (8)	25.0
6:44	12:44	1.5E-9	0.30 (3.8)	13.0
6:52	12:52	7.1E-10	0.15 (1.8)	6.0
7:00	1:00	4E-10	0.08 (1.0)	3.4
7:08	1:08	2E-10	0.04 (0.5)	1.6
7:16	1:16	7E-11	0.02 (0.25)	0.63
7:24	1:24	3.7E-11	0.01 (0)	0.31

THIS IS A DRILL

IODINE CONCENTRATION (C_i/m^3), ZONE II - CALVEX 82
 $X/Q = 10^{-6}$

CONFIDENTIAL

46 6210

C_i/m^3

SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
 KEUFFEL & ESSER CO. MADE IN U.S.A.
 K-E

$1E-8$

$1E-9$

$1E-10$

$1E-11$

$1E-12$

1130

1200

1230

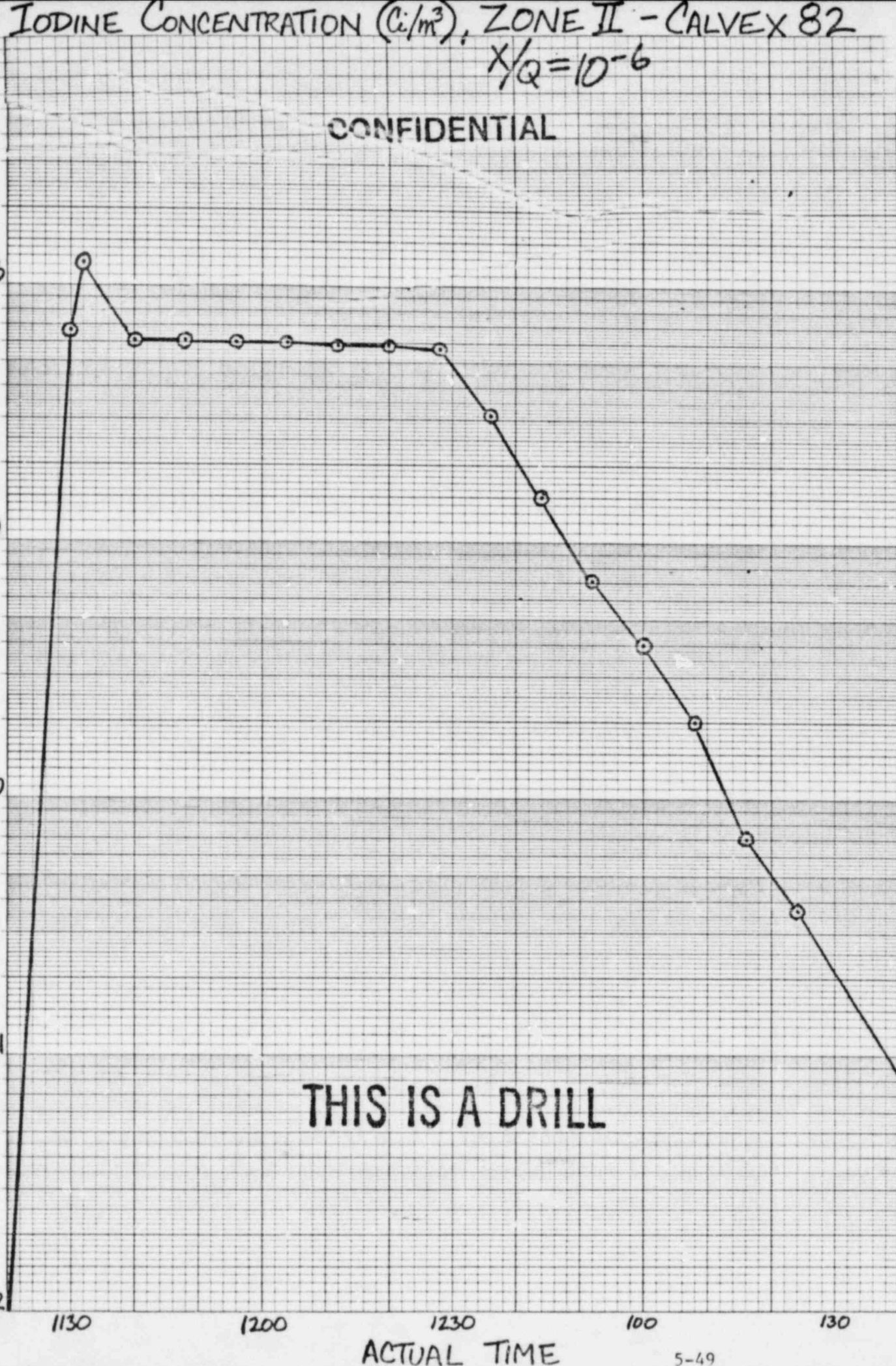
100

130

THIS IS A DRILL

ACTUAL TIME

5-49



THYROID DOSE (mRem), ZONE II - CALVEX 82
 $X/Q = 10^{-6}$

CONFIDENTIAL

46 6210
mRem

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

10

1

.1

.01

.001

1130

1200

1230

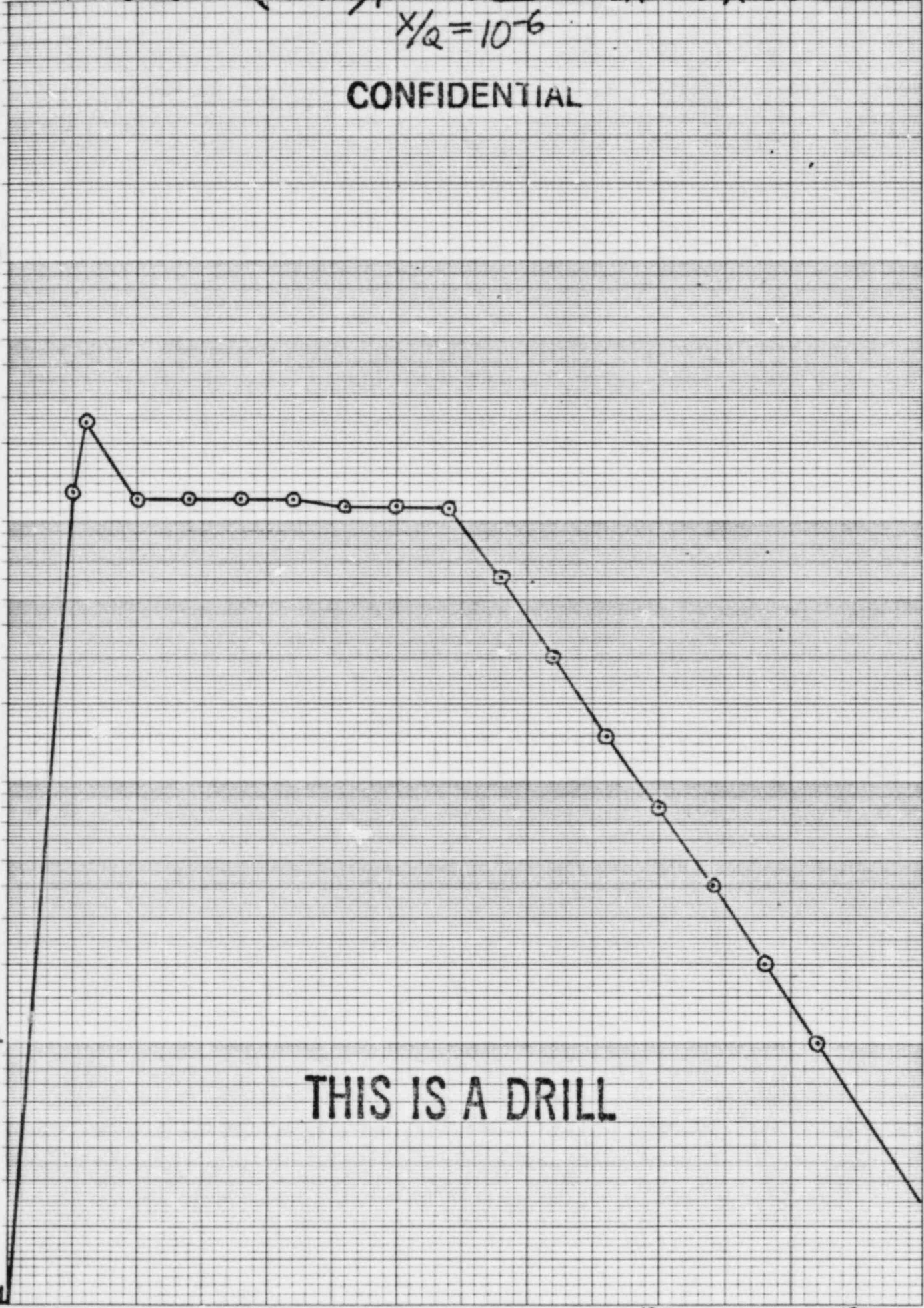
100

130

THIS IS A DRILL

ACTUAL TIME

5-50



IODINE - NET COUNTS PER 2 MINUTES W/MS2-SPA3

ZONE II
 $X/Q = 10^{-6}$

CALVEX 82

CONFIDENTIAL

46 6210

NCP2M

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

100

10

1

.1

.01

1130

1200

1230

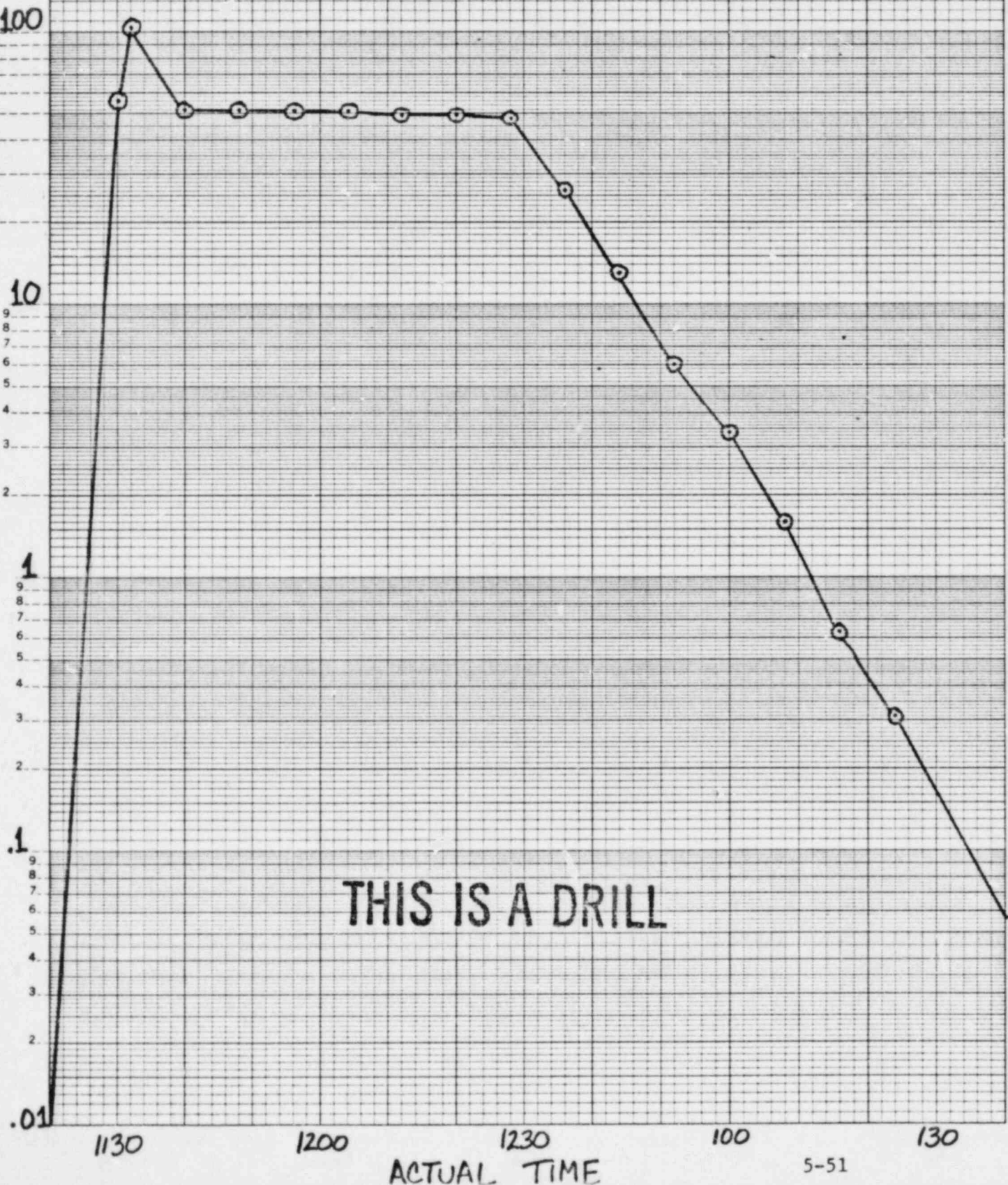
100

130

ACTUAL TIME

5-51

THIS IS A DRILL



CONFIDENTIAL

OFFSITE RADIOLOGICAL RELEASE DATA THYROID DOSE

DRILL TIME	ACTUAL TIME	ZONE III		
		IODINE CONC. X/Q = 10^{-7} Ci/ m ³ or *	THYROID DOSE (mRem)	IODINE NCP2m W/MS2-SPA-3
5:30	11:30	6.7E-10	0.13 (1.7)	5.6
5:32	11:32	1.22E-8	0.24 (3)	10.2
5:40	11:40	6E-10	0.12 (1.6)	5.1
5:48	11:48	6.1E-10	0.12 (1.6)	5.1
5:56	11:56	6E-10	0.12 (1.6)	5.0
6:04	12:04	6E-10	0.12 (1.6)	5.0
6:12	12:12	5.9E-10	0.116 (1.6)	4.9
6:20	12:20	5.9E-10	0.116 (1.6)	4.9
6:28	12:28	5.7E-10	0.11 (1.4)	4.8
6:36	12:36	3.1E-10	0.06 (0.8)	2.6
6:44	12:44	1.5E-10	0.03 (0.38)	1.3
6:52	12:52	7E-11	0.015(0.18)	0.6
7:00	1:00	4E-11	0.008 (0.1)	0.3
7:08	1:08	2E-11	0.004(0.05)	0.16
7:16	1:16	7E-12	0.002 (0)	0.03
7:24	1:24	3.7E-12	0.00 (0)	0

* uCi/cc

THIS IS A DRILL

IODINE CONCENTRATION (Ci/m^3), ZONE III - CALVEX 82

$$X/Q = 10^{-7}$$

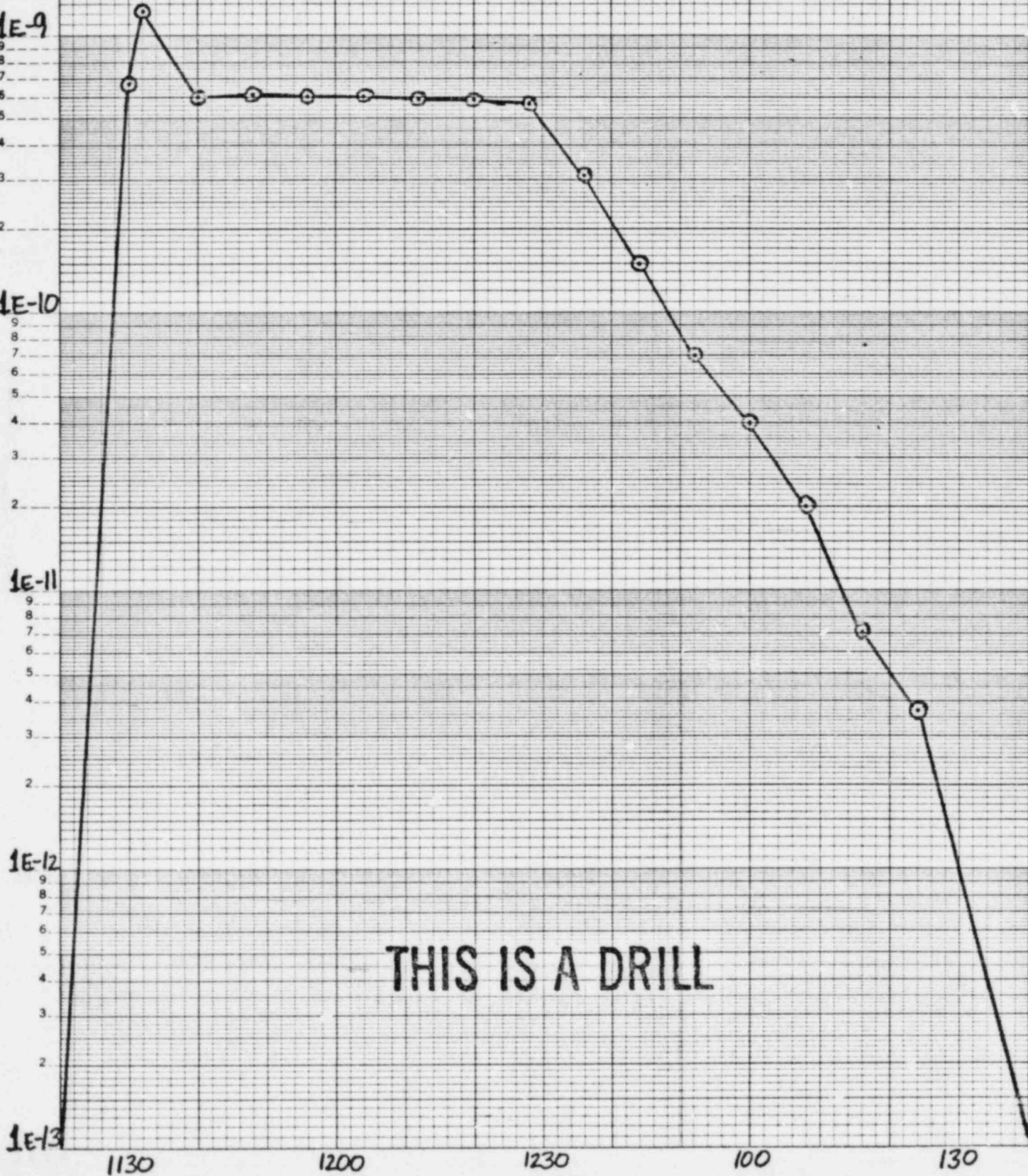
CONFIDENTIAL

46 6210

Ci/m^3

SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

K-E



THIS IS A DRILL

ACTUAL TIME

THYROID DOSE (mRem), ZONE III - CALVEX 82

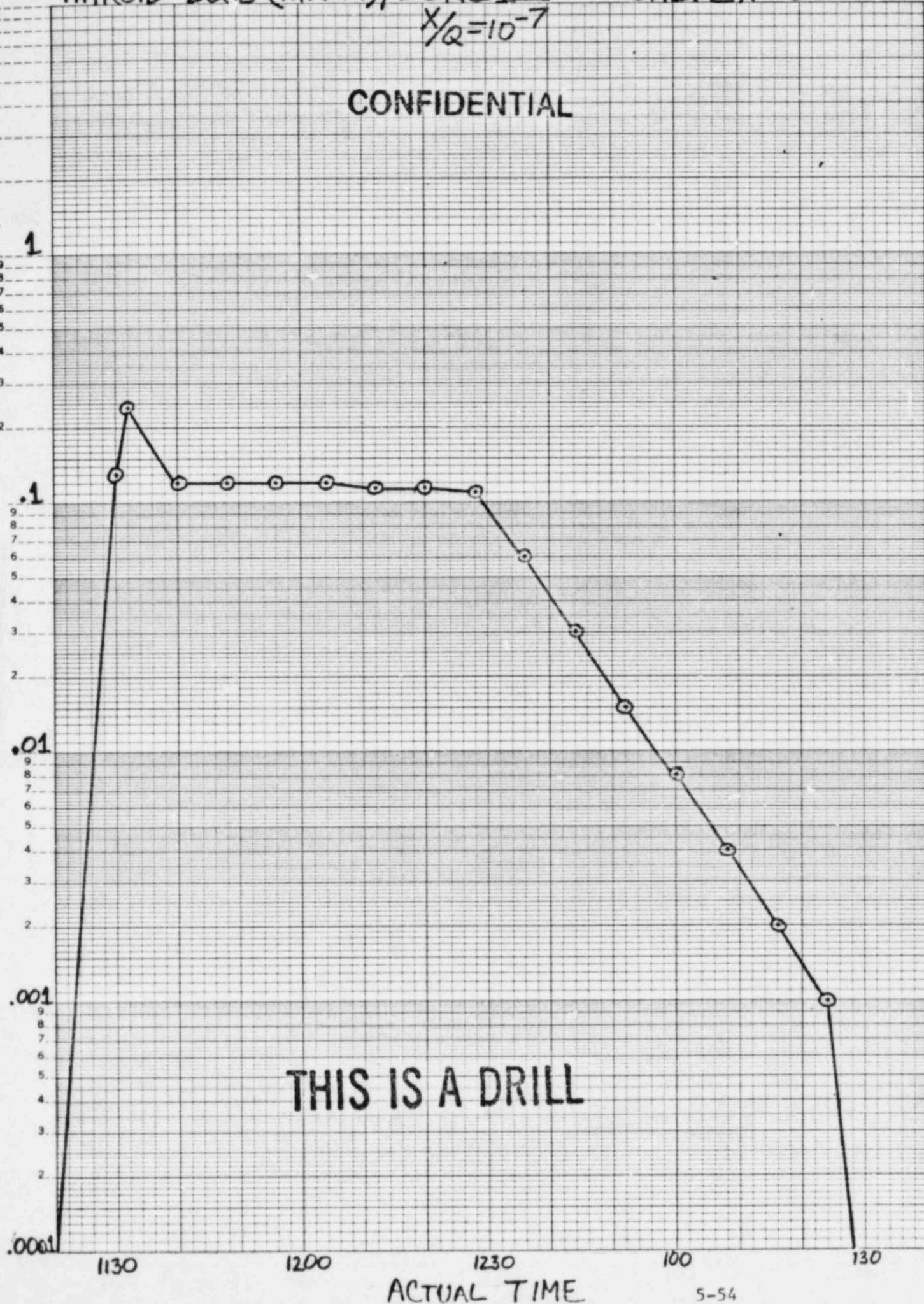
$$X/Q = 10^{-7}$$

CONFIDENTIAL

46 6210

mRem

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.



IODINE-NET COUNTS PER 2 MINUTES W/MS2-SPA3

ZONE III

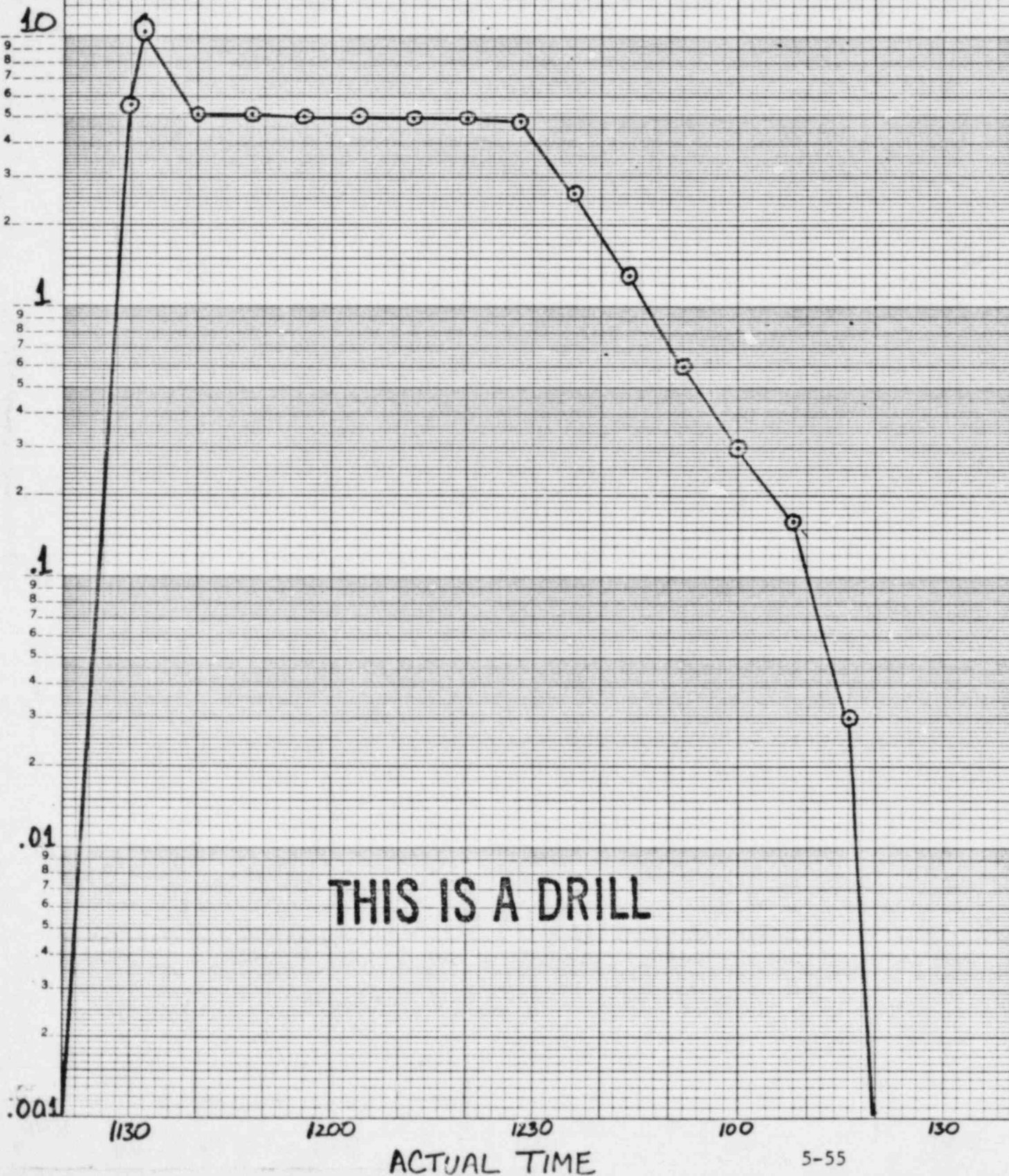
$$X/Q = 10^{-7}$$

CALVEX 82

CONFIDENTIAL

46 6210
NCP2M

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.



CONFIDENTIAL

OFFSITE RADIOLOGICAL RELEASE DATA NOBEL GAS-WHOLE BODY DOSE

DRILL TIME	ACTUAL TIME	ZONE I WHOLE BODY $X/Q = 10^{-5}$ (mrem/h)	ZONE II WHOLE BODY $X/Q = 10^{-6}$ (mrem/h)	ZONE III WHOLE BODY $X/Q = 10^{-7}$ (mrem/h)
5:30	11:30	19.2	1.92	0.19
5:32	11:32	35.2	3.5	0.35
5:40	11:40	17	1.7	0.17
5:48	11:48	17	1.7	0.17
5:56	11:56	17	1.7	0.17
6:04	12:04	17	1.7	0.17
6:12	12:12	16.8	1.68	0.17
6:20	12:20	16.8	1.68	0.17
6:28	12:28	16.2	1.62	0.16
6:36	12:36	8.7	0.87	0.08
6:44	12:44	4.4	0.44	0.04
6:52	12:52	2.1	0.21	0.02
7:00	1:00	1.1	0.1	0.01
7:08	1:08	0.57	0.06	0
7:16	1:16	0.02	0	0
7:24	1:24	0.01	0	0

THIS IS A DRILL

NOBLE GAS DOSE RATE (WHOLE BODY), ZONE I - CALVEX 82

$$X/Q = 10^{-5}$$

CONFIDENTIAL

mRem/hr. 46 6210

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

10
9
8
7
6
5
4
3
2
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001

1130

1200

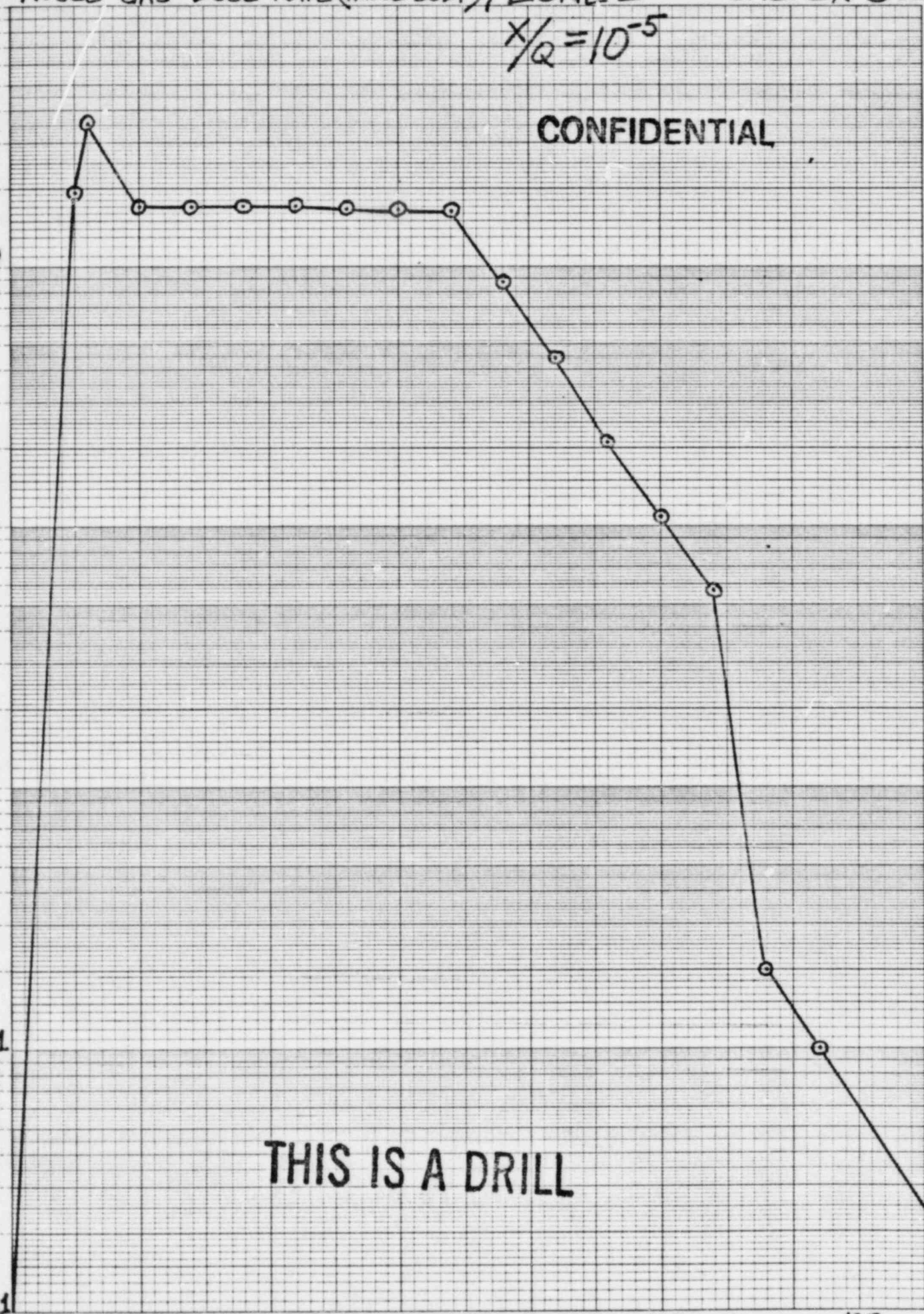
1230

100

130

ACTUAL TIME

THIS IS A DRILL



NOBLE GAS DOSE RATE (WHOLE BODY), ZONE II - CALVEX 82

$$X/Q = 10^{-6}$$

CONFIDENTIAL

mRem/hr. 46 6210

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

1

.1

.01

.001

.0001

1130

1200

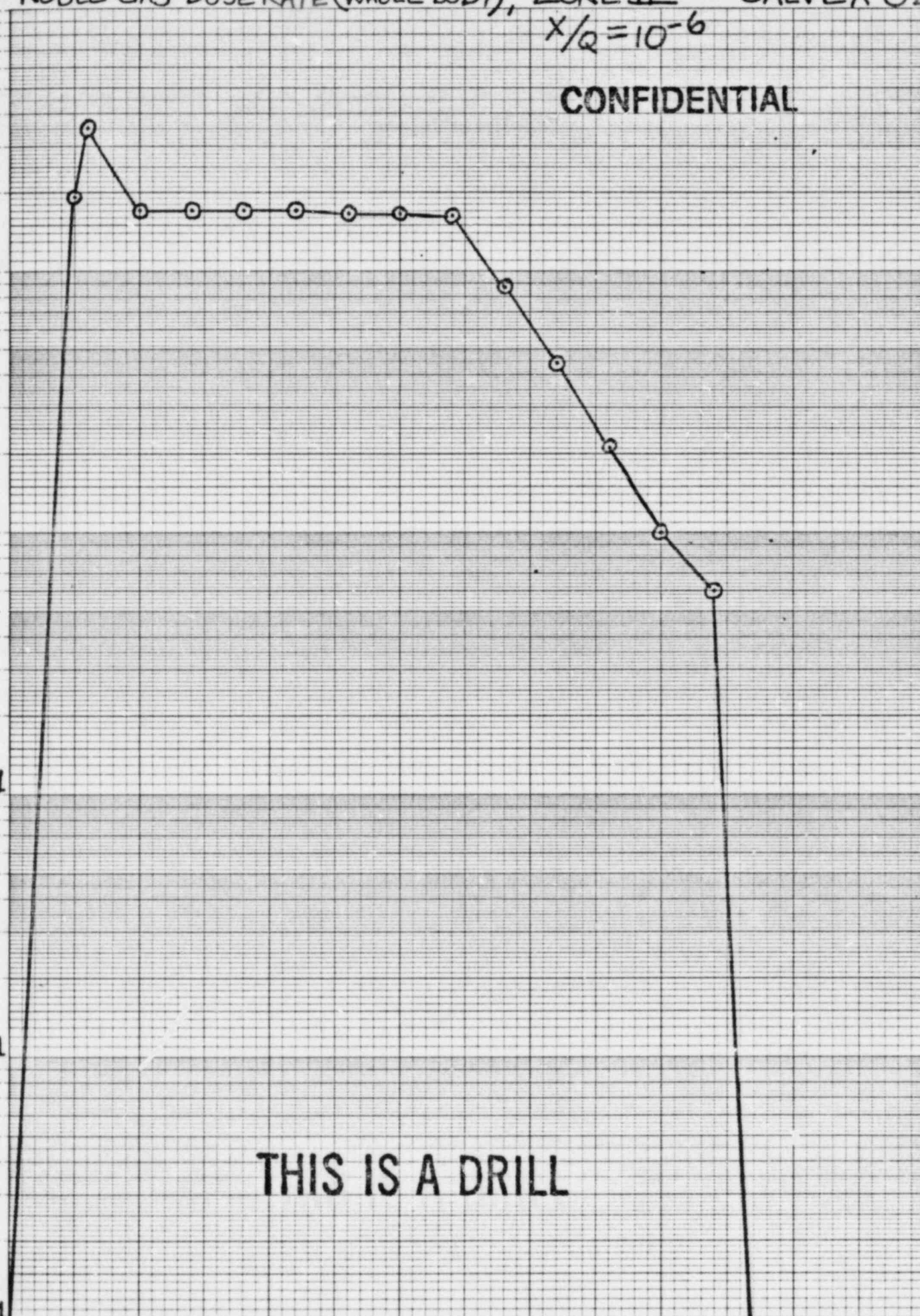
1230

100

130

ACTUAL TIME

THIS IS A DRILL



NOBLE GAS DOSE RATE (WHOLE BODY), ZONE III - CALVEX 82

$$X/Q = 10^{-7}$$

CONFIDENTIAL

mRem/hr 46 6210

K-E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.

10

1

.1

.01

.001

1130

1200

1230

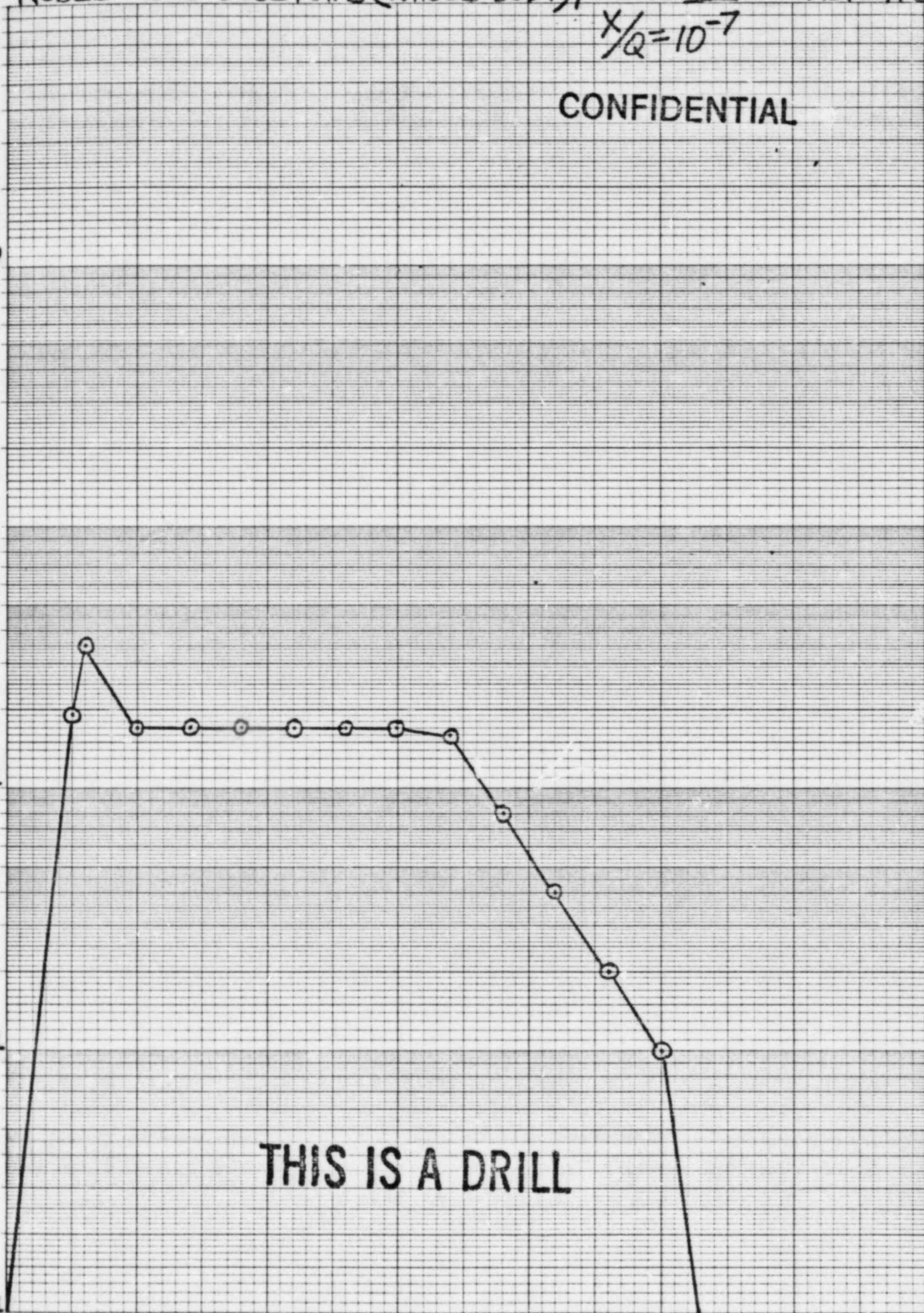
100

130

THIS IS A DRILL

ACTUAL TIME

5-59



CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

6.0 CONTROLLER'S INSTRUCTIONS

6.1 Controller Organization

	<u>Name</u>	<u>Assignment</u>
	S. E. Jones, Jr.	Lead Controller - Alternate ECC
	J. R. Hill	Control Room
	P. A. Pieringer	Control Room/Technical Support Center
*	W. E. Putman	On-Site Team #1
*	A. A. Barth	On-Site Team #2
*	A. M. Vogel	On-Site Team #3
*	C. L. Rayburn	On-Site Team #4
*	J. E. Owens	On-Site Team #5
*	J. W. Roller	Off-Site Radiological Field Monitoring Team #1
*	C. H. Griffin	Off-Site Radiological Field Monitoring Team #2
*	D. J. Drinkwater	Off-Site Radiological Field Monitoring Team #3
*	G. F. Wall	Chemistry Director/Radiological Protection Director
*	B. A. Watson	Radiological Assessment Director
*	G. T. Moses	Emergency Security Team
*	J. Peterson	Emergency Medical Team
*	Dual Responsibility Position (Controller & Evaluator)	

CONFIDENTIAL

6.2 Controller Instructions

- 6.2.1 All controllers shall meet at Calvert Cliffs Nuclear Power Plant, Warehouse #2, Security Classroom, at 1300 hours, September 27, 1982, for a pre-exercise briefing by the Lead Controller.
- 6.2.2 All controllers will comply with instructions from the Lead Controller.
- 6.2.3 All controllers shall synchronize their watches to ensure that messages are delivered at the proper time. Times on messages are set relative to the beginning of the exercise, "T+00:00."
- 6.2.4 Each controller will have copies of the messages controlling the progress of the exercise scenario. No message shall be delivered out of time sequence unless specifically instructed by the Lead Controller.

NOTE: All messages controlling the progress of the exercise scenario are noted with a number.

- 6.2.5 Each controller will have copies of time-related plant and radiological parameters corresponding to the development of the exercise scenario. This information should be issued only upon request to the appropriate exercise participants by either the Control Room Controller or controllers accompanying the radiological monitoring field teams.
- 6.2.6 Controllers shall not provide information to the exercise participants regarding scenario development. The exercise participants are expected to obtain information through their own organizations and exercise their own judgement in determining response actions and resolving problems.

CONFIDENTIAL

6.2.7 Some exercise participants may insist that certain parts of the scenario are unrealistic. The Lead Controller has the sole authority to clarify any questions regarding scenario content.

6.3 Communications

Controller communications are listed on Attachment I.

CONFIDENTIAL

ATTACHMENT I

CONTROLLER COMMUNICATIONS

<u>CONTROLLER</u>	<u>PHONE NUMBERS</u>	<u>ASSIGNED LOCATIONS</u>
S. E. Jones, Jr. B. A. Watson	4422 (4451) * Radio	Alternate ECC-Status Room Alternate ECC-Dose Assmt.
J. R. Hill/	4731 (4732)	Plant Control Room
P. A. Pieringer	4991 (4992)	Technical Support Center
G. F. Wall	4942 (4943)	Plant Emergency Control Center
J. W. Roller C. H. Griffin D. J. Drinkwater	+ Radio	Off-Site Radiological Monitoring Teams
W. E. Putman A. A. Barth G. T. Moses J. Peterson A. M. Vogel C. L. Rayburn	Establish contact through Control Room, Tech Support Center, or Emergency Control Center via Plant Paging System & Telephone	Various; On/Off-Site, In/Out of Plant

* Establish contact through Dose Assessment Radio Operator (Health Physics Frequency Only)

+ Establish contact through Field Team Radio Operator (Health Physics Frequency Only)

EMERGENCY PLAN DRILL CRITIQUE FORM

Date _____

Observer:

NAME _____

DATE _____

Exercise Title:

Exercise Start:

Time Initial Required Action Initiated:

Location of Observer:

Time Information Provided:

Observations:

(Proper use of equipment, corrective procedures, effectiveness of individual and group actions, etc.)

Comments and Recommendations:

(Specific):

Use additional pages as required.

Signature

Date _____

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

7.0 EVALUATOR'S INSTRUCTIONS

7.1 Evaluator Organization

T. N. Pritchett	(Lead Evaluator)-Alternate ECC
P. H. Elliott	Control Room (Assistant Lead Evaluator)
J. Naegle	Technical Support Center (Phila. Electric Co.)
R. Kankus	Control Room (Phila. Electric Co.)
J. M. Yoe	Control Room
T. Payne	Alternate ECC (Phila. Electric Co.)
J. L. Hoppa	Operational Support Center
S. Boyle	Media Communications Center (Phila. Electric Co.)
W. E. Putman	On-Site Team #1
A. A. Barth	On-Site Team #2
A. M. Vogel	On-Site Team #3
C. L. Rayburn	On-Site Team #4
J. E. Owens	On-Site Team #5
J. W. Roller	Off-Site Radiological Field Mntng Tm #1
C. H. Griffin	Off-Site Radiological Field Mntng Tm #2
D. J. Drinkwater	Off-Site Radiological Field Mntng Tm #3
G. F. Wall	Chemistry Director/Radiological Protection Director
B. A. Watson	Radiological Assessment Director
G. T. Moses	Emergency Security Team/Floater
J. Peterson	Emergency Medical Team

CONFIDENTIAL

Evaluators shall meet at Calvert Cliffs Nuclear Power Plant, Warehouse #2, Security Classroom, at 1300 hours, September 27, 1982, for a pre-exercise briefing with the Lead Evaluator.

7.2 Evaluation Instructions

Each evaluator shall take detailed notes regarding the progress of the exercise and the responses of the exercise participants at their respective assigned locations. Each evaluator should carefully note the arrival and departure times of exercise participants, the times at which major activities or milestones occur, and problem areas encountered. As appropriate, evaluators' comments should consider the following evaluation elements:

7.2.1 Notification, alerting, and mobilization of emergency response personnel:

- a. Procedures for communications logging and verification.
- b. Alerting procedures for each emergency action level.
- c. Timely activation and staffing of emergency response facilities.
- d. Utilization of alternate communications systems.
- e. Accurate and timely determination of emergency action levels.

7.2.2 Communications capabilities among on-site and off-site emergency response facilities:

- a. Adequate communications with field teams.
- b. Use of primary and back-up communications systems.
- c. Message handling and communications logging procedures.
- d. Adequate communications between emergency response facilities.

7.2.3 Alternate Emergency Control Center

- a. Timely activation.
- b. Staffed by personnel as prescribed in the various plans.

- c. Adequacy of internal information systems (displays, status boards, maps, message handling, etc.).
- d. Adequacy of security and access control.

7.2.4 Direction and Control

- a. Decisions made are based on correct technical assessments , and are properly coordinated and implemented in a timely manner.
- b. Coordination between local officials and Federal, State, and BG&E representatives demonstrated.

7.2.5 Emergency Preparedness Plans and Procedures

- a. Assigned personnel demonstrate familiarity with their plans and procedures.
- b. Plans and procedures are followed.

7.2.6 Public Information

- a. Capability to provide the Media Communications Center information on an on-going basis.
- b. Timely activation of the Media Communications Center.
- c. Media Communications Center staffed with individuals as prescribed in the various plans and procedures.
- d. Adequacy of communications in Media Centers.
- e. Reporting of status of emergency action levels and protective action recommendations.
- f. Ability to coordinate the release of information with the media.
- g. Adequacy of interface with the media.
- h. Coordination of public information releases with other affected jurisdictions.

7.2.7 Radiological Monitoring Field Teams

- a. Radiological monitoring equipment and emergency kits are adequate, readily available, and properly utilized.
- b. Timely deployment of Radiological Monitoring Teams.
- c. Collection of sample media (water, vegetation, milk, air, etc.) and routing of samples to appropriate laboratories.
- d. Plume pathway monitoring.
- e. A central point for receipt of radiological monitoring data is designated and adequate communications with field teams demonstrated.
- f. Use of properly calibrated instruments demonstrated by field teams.
- g. Reporting of simulated data through appropriate and prescribed channels demonstrated.

7.2.8 Accident Assessment

- a. Demonstrated timely interchange of information between Federal, State, County, and BG&E assessment points.
- b. Evidence of use of meteorological data provided.
- c. BG&E's abilities to assess plant conditions, classify the incident, develop initial protective action recommendations and notify off-site authorities in an accurate and timely manner demonstrated.
- d. Demonstrated ability to control radiological monitoring field teams for plume tracking.
- e. Demonstrated ability to process field samples at mobile and fixed laboratories to obtain results in a timely manner. This should be demonstrated for plume exposure pathway procedures.

- f. Demonstrated ability to perform dose calculations and dose projections for the general public to formulate protective action recommendations.
- g. Demonstrated ability to develop recommendations for recovery and reentry field procedures.

7.2.9 Protective Actions

- a. Demonstrated timely and accurate decisions for protective actions for the plume exposure pathway emergency planning zones.
- b. Instructions to the public for sheltering and/or evacuation are timely, adequate, and clearly understood.
- c. Demonstrated ability to provide radiation exposure control for emergency workers.
- d. Actions, if any, taken to authorize emergency workers to incur radiation exposures in excess of EPA guidelines for the public.
- e. Ability of the County to dispatch appropriate personnel and equipment to appropriate points.
- f. Provision for the use of potassium iodine (KI) on the public and/or emergency workers demonstrated.

7.2.10 Medical Emergency

- a. Adequacy of transportation of a simulated contaminated person to a local hospital.
- b. Ability of hospitals to deal with a radiological emergency demonstrated.

7.2.11 Reentry and Recovery

- a. Adequacy of decision-making process for authorizing reentry into the evacuated areas.
- b. Adequacy of the basis for making the reentry decision.

- 7.2.12 Overall adequacy of the scenario to test the various emergency preparedness plans and procedures.
- 7.2.13 Benefit of the exercise to its participants.
- 7.2.14 Capabilities and procedures of observed emergency response organizations to execute their plans to protect the public.
- 7.3 Evaluators shall use Exhibit 5.5-A (Attached) as a cover sheet for their exercise notes. Notes shall be submitted to the Lead Evaluator at the post-exercise critique. At the completion of the critique, all notes shall be given to the Supervisor-Emergency Planning.
- 7.4 Evaluators shall position themselves at their respective stations at T-00:15. Watches shall be synchronized with the corresponding station "Controller."

CONFIDENTIAL

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

8.0 SPECIAL INSTRUCTIONS

8.1 Injured Person #1

8.2 Player's Instructions & Rules

8.3 Injured Person #2

8.4 Contaminated Person #1

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

CONFIDENTIAL

THIS IS A DRILL

8.0 Special Instructions

8.3 Injured Person #1

1.0 Situation: You are an aircraft pilot who was thrown from your plane on impact with #11 Condensate Storage Tank.

2.0 Injury: Unconscious
Contamination: Face: k dpm
Clothes: k dpm

3.0 Instructions: At about 7:50 a.m. go to #11 condensate Storage Tank. Simulate the above injury at 8:00 a.m. by lying near the roadway south of #11 Condensate Storage Tank.

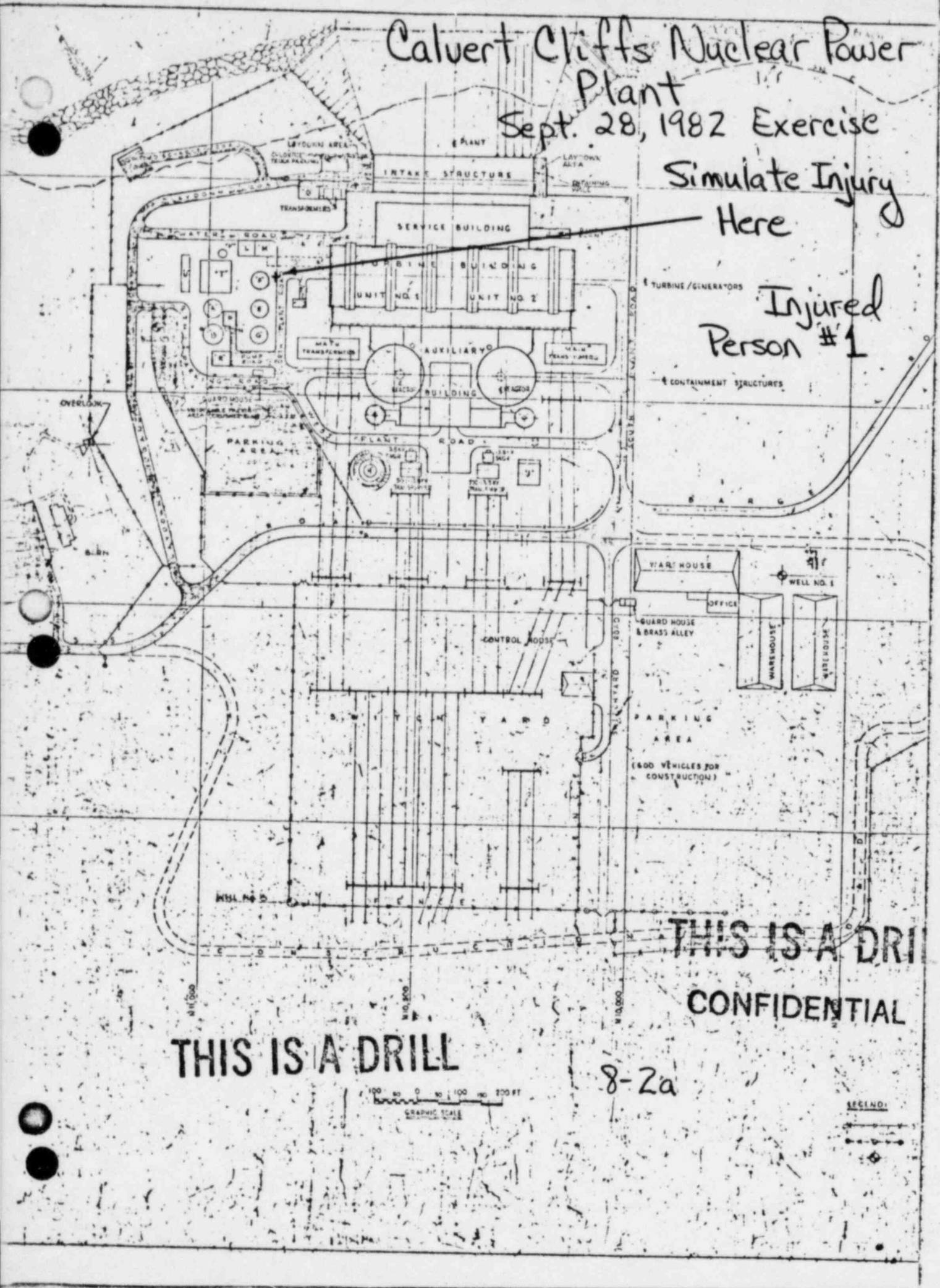
NOTE
OBSERVE EXISTING RAD-SAFETY
REQUIREMENTS

Calvert Cliffs Nuclear Power Plant

Sept. 28, 1982 Exercise

Simulate Injury
Here

Injured
Person #1



THIS IS A DRILL

THIS IS A DRILL
CONFIDENTIAL

8-2a

8.2 Players Instructions & Rules

All players (at least the leaders of the player groups) must read and follow the rules given below. This is important to the successful demonstration of emergency response capabilities.

- 8.2.1 Remember there are two clocks, the scenario time and the actual clock time. The scenario time is more important to you. Track both times on your status boards, if necessary. This is particularly important if the exercise becomes delayed for any reason.
- 8.2.2 Know the overall Controllers organization. Identify your Controller by his Identification Badge (See attached Controller Chart).
- 8.2.3 There are NRC/FEMA (Federal Agencies) Evaluators and Company Evaluators present. Identify them by their Identification Badges. They are here to judge your performance and approve our emergency plan.
- 8.2.4 There may be visitors present. Identify them by their Identification Badges.
- 8.2.5 Identify yourself by name and function to the Exercise Controllers and Evaluators. This will be a big help. Always wear your Identification Badge.
- 8.2.6 Play out all actions, as much as possible, in accordance with your Emergency Plan and procedures as if it were a real emergency. Unless authorized by the Controller, you should not simulate your actions. If authorized to simulate an action, tell the Controller and Evaluator how and when you would actually do them.

- 8.2.7 Identify your actions to the Controller and Evaluator. State whether you are going to play them out or simulate them. For your own benefit, it is recommended that you play out your actions as much as possible. It is to your advantage to exercise as many of your actions as possible.
- 8.2.8 Periodically speak out loud, identifying your key actions and decisions to the Controller and Evaluator. This may seem artificial, but it will assist in the Evaluation Process, and is to your benefit.
- 8.2.9 If you are in doubt, ask your Controller for clarification. The Controller will not prompt or coach you.
- 8.2.10 The Controller will periodically issue messages or instructions designed to initiate response actions. You must accept these messages immediately. They are essential to your successful performance.
- 8.2.11 If the Controller intervenes with your play, it is for a good reason. Obey your Controller's directions at all times. This is essential to the overall success of the exercise.
- 8.2.12 If you disagree with your Controller, you can ask him to reconsider or consult with the Lead Controller as time permits. You must, however, accept his/her word as final and proceed.
- 8.2.13 Respond to the Controller's questions.
- 8.2.14 You must not accept any messages/instructions from the Evaluators. If they want to initiate actions, test your abilities, or give you "surprises", they must work through your Controller. This is essential to the overall success of the exercise.

- 8.2.15 You must play as if radiation levels are actually present, in accordance with the information received. This will require that you wear radiation dosimeters, anti-c's, observe good radiation protection practices, be aware of, and minimize your radiation exposure. Identify the individuals in your emergency response organization who are responsible for informing you of these items. Follow their instructions.
- 8.2.16 The Controllers and Evaluators are not subject (they are exempt) from acting as if radiation levels from the emergency exercise are present. Do not let them confuse you or cause you to act unwisely.
- 8.2.17 If you are entering normal power plant radiation areas, observe all rules and procedures. No one (even the Controller and Evaluators) is exempt from normal plant radiological practices and procedures.

**NOTE: DO NOT ENTER HIGH RADIATION
AREAS IN THE PLANT WITHOUT
AUTHORIZATION. FOLLOW ALARA
PRINCIPLES.**

- 8.2.18 Demonstrate knowledge of your emergency plan, emergency operations, and procedures.
- 8.2.19 Utilize Status Boards, Log Books, 3-Part Interoffice Memo's, etc., as much as possible to document and record your actions, instructions, and reports to your co-players. This is very important. Remember, "Put it in writing."
- 8.2.20 Do not enter into conversations with the Visitors.

- 8.2.21 You may answer questions directed at you by Evaluators. If the question is misdirected to you or you do not know the answer, refer them to your lead player or the Controller.
- 8.2.22 Keep a list of items which you feel will improve your plans and procedures. Provide this to your lead player. Lead players will ensure these are considered. If necessary, they will identify it to the Controller. Remember one of the main purposes of the exercise is for you the player to assure yourself that you are adequately prepared. Areas for improvement or lessons learned when identified, will improve your overall emergency planning and preparedness.
- 8.2.23 A critique of the exercise will occur after the exercise is terminated. Provide your input to your lead player for presentation at the critique.

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

8.0 Special Instructions

8.1 Injured Person #2

1.0 Situation: You are injured leaving the Unit 2 ECCS pump room.

2.0 Injury: Compound leg fracture (right leg)
Contamination: Face: k dpm
Clothes: k dpm
Wound: k dpm

3.0 Instructions: DO NOT ASSEMBLE.
At about 11:00 a.m. enter the Aux. Building under RWP-6.
Don: Coveralls; hood; cotton gloves; rubber gloves; plastic boots.
Go to -15 ft. elevation and simulate the above injury outside the ECCS pump room door (door nearest the stairs to the -10 ft. elevation).

NOTE
OBSERVE EXISTING RAD-SAFETY
REQUIREMENTS

Exercise players should locate you around 11:15 a.m.

THIS IS A DRILL

CALVERT CLIFFS NUCLEAR POWER PLANT
1982 EMERGENCY RESPONSE EXERCISE
SEPTEMBER 28, 1982

CONFIDENTIAL

8.1 Contaminated Person #1

1.0 Situation: You were in the ECCS Pump Room, Unit 2, doing maintenance.

2.0 Clothing Requirements: Don the following anti-contamination clothing:

(This may be more than
what is listed on the
RWP listed in 3.0)

Coveralls; hood; cotton gloves
rubber gloves; plastic boots.

DO NOT ASSEMBLE.

3.0 At about 11:00 a.m. enter the Auxiliary Building under RWP-6. At 11:20 a.m. simulate coming out of the Aux. Building, -15 ft. level where you were doing maintenance. Your co-worker is hurt (broken leg and bleeding). The elevator did not work so you had to leave him and use the stairs. Announce that you are contaminated to the Health Physics personnel in the area.

THIS IS A DRILL

ATTACHMENT