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50-362 San Onofre Nuclear Station, Unit 3, Southern Californ 05000362
AUTH.NAME- AUTHOR AFFILIATION
BASKIN,K.P. Southern California Edison Co.
RECIP.NAME RECIPIENT AFFILIATION
MIRAGLIA,F. Licensing Branch 3

SEE Subject Folder

SUBJECT: Forwards proprietary & nonproprietary versions of "CPC/CEAC Sys,Phase II Software Verfication Test Rept," "San Onofre Nuclear Generating Station 2,Cycle 1,CPC & CEAC Data Base Document," "CPC/CEAC Sys,Phase 1,Software...."

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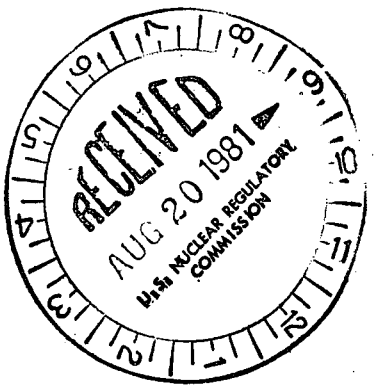
Southern California Edison Company

P. O. BOX 800
2244 WALNUT GROVE AVENUE
ROSEMEAD, CALIFORNIA 91770

K. P. BASKIN
MANAGER OF NUCLEAR ENGINEERING,
SAFETY, AND LICENSING

TELEPHONE
(213) 572-1401

August 13, 1981



Director, Office of Nuclear Reactor Regulation
Attention: Mr. Frank Miraglia, Branch Chief
Licensing Branch No. 3
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2 and 3

The following proprietary Combustion Engineering reports were previously transmitted to the NRC relative to the Core Protection Calculator (CPC) Open Item which was most recently identified as SER Open Item No. 2, CPC, in supplement No. 2 to the San Onofre Units 2 and 3 SER dated May, 1981:

1. Functional Description Document for the Control Element Assembly Calculator (CEAC) (SCE letter dated January 19, 1981).

2. Functional Description Document for the CPC (SCE letter dated January 21, 1981).

3. Preliminary version of the SONGS-2 Cycle-1 CPC and CEAC Data Base Document. (SCE letter dated February 4, 1981.)

In connection with this Open Item, please find enclosed three (3) copies each of the following proprietary Combustion Engineering documents including affidavits setting forth the basis on which the information may be withheld from public disclosure by the Commission and addressing specifically the consideration listed in 10 CFR 2.790(b) of the Commission's regulations.

Enclosure 1. CEN-173(S)-P, CPC/CEAC System, Phase II Software Verification Test Report. (Copy Nos. 002, 003 and 004.)

Enclosure 2. CEN-175(S)-P, SONGS-2 Cycle 1 CPC and CEAC Data Base Document. (Copy Nos. 002, 003 and 004.)

Enclosure 3. CEN-176(S)-P, CPC/CEAC System, Phase I Software Verification Test Report. (Copy Nos. 002, 003 and 004.)

PB01
S
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It is respectfully requested that the above information which is proprietary to Combustion Engineering, Inc., be withheld from public disclosure in accordance with 10 CFR 2.790(b) of the Commissions regulations. If you should have any questions concerning the proprietary nature of the material transmitted herewith, please address these questions directly to:

Mr. A. E. Scherer
Director of Licensing (9438-1922)
Combustion Engineering
1000 Prospect Hill Road
Windsor, Connecticut 06095

It is also requested that you provide a copy of any questions concerning the proprietary nature of this submittal to SCE and SDG&E.

Three (3) copies of the following nonproprietary documents are enclosed to satisfy the requirements for transmittal of proprietary information to the NRC:

Enclosure 4. CEN-147(S)-NP, Functional Design Specification for a Core Protection Calculator.

Enclosure 5. CEN-148(S)-NP, Functional Design Specification for a Control Element Assembly.

Enclosure 6. CEN-173(S)-NP, CPC/CEAC System Phase II Software Verification Test Report.

Enclosure 7. CEN-175(S)-NP, SONGS-2 Cycle 1 CPC and CEAC Data Base Document.

Enclosure 8. CEN-176(S)-NP, CPC/CEAC System, Phase I Software Verification Test Report.

Also enclosed (Enclosure 9) are three (3) copies of the SONGS-2 Cycle 1 Core Protection Calculator Time to Trip Analysis which was requested by the NRC staff during the March 9, 1981 meeting in Bethesda, Maryland.

The enclosed documentation addresses all previously identified NRC requirements relative to this issue and provides the information necessary to resolve the CPC Open Item.

If you have any questions or comments concerning this matter, please contact me.

Very truly yours,

K P Baskin

Enclosures

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

Combustion Engineering, Inc.)
State of Connecticut)
County of Hartford) SS.:

I, A. E. Scherer depose and say that I am the Director, Nuclear Licensing of Combustion Engineering, Inc., duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations and in conjunction with the application of Southern California Edison Co., for withholding this information.

The information for which proprietary treatment is sought is contained in the following document:

CEN-173(S)-P, CPC/CEAC Systems Phase II Software Verification Test Report, August 5, 1981.

This document has been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by Combustion Engineering in designating information as a trade secret, privileged or as confidential commercial or financial information.

Pursuant to the provisions of paragraph (b) (4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

f. In pricing Combustion Engineering's products and services, significant research, development, engineering, analytical, manufacturing, licensing, quality assurance and other costs and expenses must be included. The ability of Combustion Engineering's competitors to utilize such information without similar expenditure of resources may enable them to sell at prices reflecting significantly lower costs.

g. Use of the information by competitors in the international marketplace would increase their ability to market nuclear steam supply systems by reducing the costs associated with their technology development. In addition, disclosure would have an adverse economic impact on Combustion Engineering's potential for obtaining or maintaining foreign licensees.

Further the deponent sayeth not.

A. E. Scherer
Director
Nuclear Licensing

Sworn to before me
this 6th day of August, 1981

Carey J. Wenzel
Notary Public

CAREY J. WENZEL, NOTARY PUBLIC
State of Connecticut No. 59962
Commission Expires March 31, 1985

6. Public disclosure of the information is likely to cause substantial harm to the competitive position of Combustion Engineering because:

a. A similar product is manufactured and sold by major pressurized water reactors competitors of Combustion Engineering.

b. Development of this information by C-E required thousands of manhours of effort and hundreds of thousands of dollars. To the best of my knowledge and belief a competitor would have to undergo similar expense in generating equivalent information.

c. In order to acquire such information, a competitor would also require considerable time and inconvenience related to the development of test methods for Core Protection Calculator and Control Element Assembly Calculator System Software.

d. The information required significant effort and expense to obtain the licensing approvals necessary for application of the information. Avoidance of this expense would decrease a competitor's cost in applying the information and marketing the product to which the information is applicable.

e. The information consists of detailed descriptions of the testing performed and quantitative data and evaluation of the tests and test acceptance criteria, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Combustion Engineering, take marketing or other actions to improve their product's position or impair the position of Combustion Engineering's product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.

1. The information sought to be withheld from public disclosure are detailed descriptions of the testing performed and quantitative data and evaluation of the tests on the Core Protection Calculator and Control Element Assembly Calculator System Software and test acceptance criteria, which is owned and has been held in confidence by Combustion Engineering.

2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in a substantial competitive advantage to Combustion Engineering.

3. The information is of a type customarily held in confidence by Combustion Engineering and not customarily disclosed to the public. Combustion Engineering has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The details of the aforementioned system were provided to the Nuclear Regulatory Commission via letter DP-537 from F.M. Stern to Frank Schroeder dated December 2, 1974. This system was applied in determining that the subject documents herein are proprietary.

4. The information is being transmitted to the Commission in confidence under the provisions of 10 CFR 2.790 with the understanding that it is to be received in confidence by the Commission.

5. The information, to the best of my knowledge and belief, is not available in public sources, and any disclosure to third parties has been made pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

Combustion Engineering, Inc.)
State of Connecticut)
County of Hartford) SS.:

I, A. E. Scherer depose and say that I am the Director, Nuclear Licensing of Combustion Engineering, Inc., duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations and in conjunction with the application of Southern California Edison Co. for withholding this information.

The information for which proprietary treatment is sought is contained in the following document:

CEN-176(S)-P, CPC/CEAC Systems Phase I Software Verification Test Report, August 5, 1981

This document has been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by Combustion Engineering in designating information as a trade secret, privileged or as confidential commercial or financial information.

Pursuant to the provisions of paragraph (b) (4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

1. The information sought to be withheld from public disclosure are the CPC/CEAC System Phase I Software Verification Test Hardware Configuration, Test Apparatus Application programs, and Memory maps for the Application Programs and Executive Program, which is owned and has been held in confidence by Combustion Engineering.

2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in a substantial competitive advantage to Combustion Engineering.

3. The information is of a type customarily held in confidence by Combustion Engineering and not customarily disclosed to the public. Combustion Engineering has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The details of the aforementioned system were provided to the Nuclear Regulatory Commission via letter DP-537 from F.M. Stern to Frank Schroeder dated December 2, 1974. This system was applied in determining that the subject documents herein are proprietary.

4. The information is being transmitted to the Commission in confidence under the provisions of 10 CFR 2.790 with the understanding that it is to be received in confidence by the Commission.

5. The information, to the best of my knowledge and belief, is not available in public sources, and any disclosure to third parties has been made pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.

6. Public disclosure of the information is likely to cause substantial harm to the competitive position of Combustion Engineering because:

a. A similar product is manufactured and sold by major pressurized water reactors competitors of Combustion Engineering.

b. Development of this information by C-E required thousands of manhours of effort and hundreds of thousands of dollars. To the best of my knowledge and belief a competitor would have to undergo similar expense in generating equivalent information.

c. In order to acquire such information, a competitor would also require considerable time and inconvenience related to the development of test methods for software verification.

d. The information required significant effort and expense to obtain the licensing approvals necessary for application of the information. Avoidance of this expense would decrease a competitor's cost in applying the information and marketing the product to which the information is applicable.

e. The information consists of detailed descriptions of the CPC/CEAC System Phase I Software Verification Test Hardware configuration, Test Apparatus, Application Programs, and Memory maps for the Application Programs and Executive Program, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Combustion Engineering, take marketing or other actions to improve their product's position or impair the position of Combustion Engineering's product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.

f. In pricing Combustion Engineering's products and services, significant research, development, engineering, analytical, manufacturing, licensing, quality assurance and other costs and expenses must be included.

The ability of Combustion Engineering's competitors to utilize such information without similar expenditure of resources may enable them to sell at prices reflecting significantly lower costs.

g. Use of the information by competitors in the international marketplace would increase their ability to market nuclear steam supply systems by reducing the costs associated with their technology development. In addition, disclosure would have an adverse economic impact on Combustion Engineering's potential for obtaining or maintaining foreign licensees.

Further the deponent sayeth not.

A. E. Scherer
Director
Nuclear Licensing

Sworn to before me
this 6th day of August, 1981

Carey J. Wenzel
Notary Public

CAREY J. WENZEL, NOTARY PUBLIC
State of Connecticut No. 59962
Commission Expires March 31, 1985

ENCLOSURE 9

SONGS-2 CYCLE 1
CORE PROTECTION CALCULATOR
TIME TO TRIP ANALYSIS

As a result of the 3-9-1981 meeting with the NRC Staff, C-E committed to provide results of a comparison of the CPC transient and design transient calculations for certain transients for SONGS-2 Cycle 1. These transients are:

1. Four pump loss of flow.
2. One pump coast down for four pumps running.
3. Full length CEA drop.
4. Primary coolant depressurization
5. CEA bank withdrawal from 1% power.

The design transient response of the NSSS was determined by simulating the event with the CESEC code. The CESEC code is normally used by C-E for portions of the Chapter 15 transient analysis. The CPC transient response was determined by simulating the events as input to the CPC FORTRAN code. Maximum CPC system calculational delays were used to assure the latest trip would be obtained. Tables 1 & 2 summarize the initial conditions for the analysis. Figures 1-5 provide traces of the CESEC analysis DNBR vs. time; the required trip time, determined from the CESEC analysis; as well as the CPC trip times as simulated by the CPC FORTRAN.

Table 3 summarizes the results. In all cases the CPC FORTRAN provided a trip before the time required from the CESEC analysis.

TABLE 1

INITIAL CONDITIONS FOR FULL POWER CASES
(CASES 1-4)

Initial Power	3410 MWt
Initial Core Inlet Temperature	553.5°F
Initial RCS Pressure	2225 psia
Initial Core Flow	2.64×10^6 lbm/hr-ft^2
Axial Shape Index	-0.212
Initial F_r	1.45
Time Interval to Generate Trip	0.15 seconds
Holding Coil Delay Time	0.30 seconds
CEA Configuration	All Rods Out

TABLE 2

CEA WITHDRAWAL FROM 1% POWER CASE DATA (CASE 5)

Initial Power	34.1 MWt
Initial Core Inlet Temperature	544.6°F
Initial RCS Pressure	2225 psia
Initial Core Flow	2.66×10^6 lbm/hr-ft^2
ASI	-.269
Initial F_r	2.13
Reactivity Insertion	1.5×10^{-4} $\Delta\rho$/sec
CEA Configuration	Bank 6-100% Inserted Bank 5-100% Inserted Bank 4-100% Inserted Bank 3-50% Inserted

End Time is 40 Seconds

TABLE 3

COMPARISON OF REQUIRED (CESEC) AND OBSERVED (CPC)
TRIP TIMES FOR SONGS-2 CYCLE 1 (IN SECONDS)

CASE	CESEC	CPC
1. 4 pump loss of flow	4.0	0.264
2. 1/4 pump loss of flow	11.4	1.114
3. Full length CEA drop	*	*
4. Primary coolant depressurization	319.0	208.930
5. CEA withdrawal from 1% power	*	23.73

* No trip required

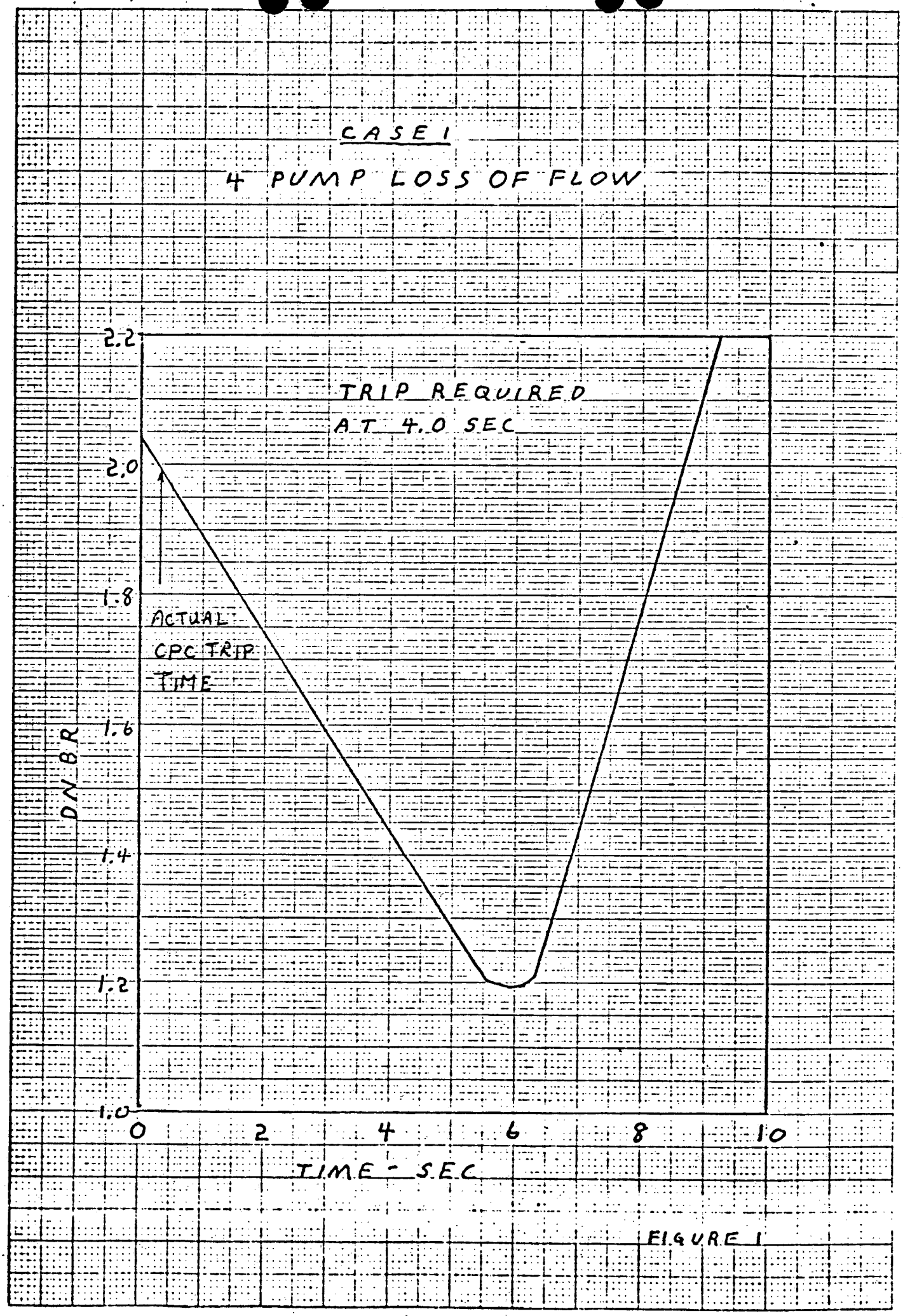

FIGURE 1

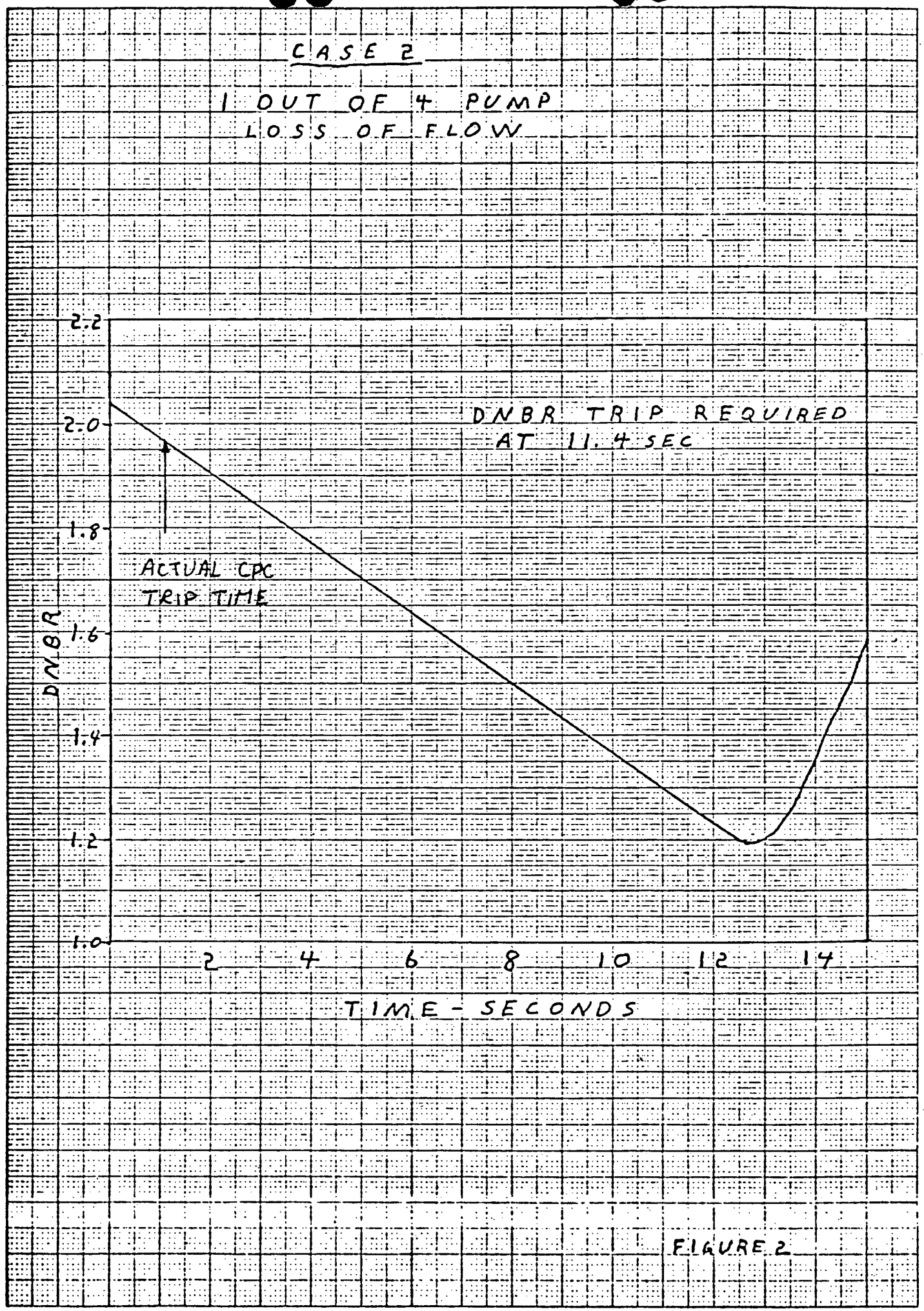
CASE 2
1 OUT OF 4 PUMP
LOSS OF FLOW
2.2
2.0
1.8
1.6
1.4
1.2
1.0
DNBR
DNBR TRIP REQUIRED
AT 11.4 SEC
ACTUAL CPC
TRIP TIME
2
4
6
8
10
12
14
TIME - SECONDS

FIGURE 2

CASE 3
SINGLE CEA DROP

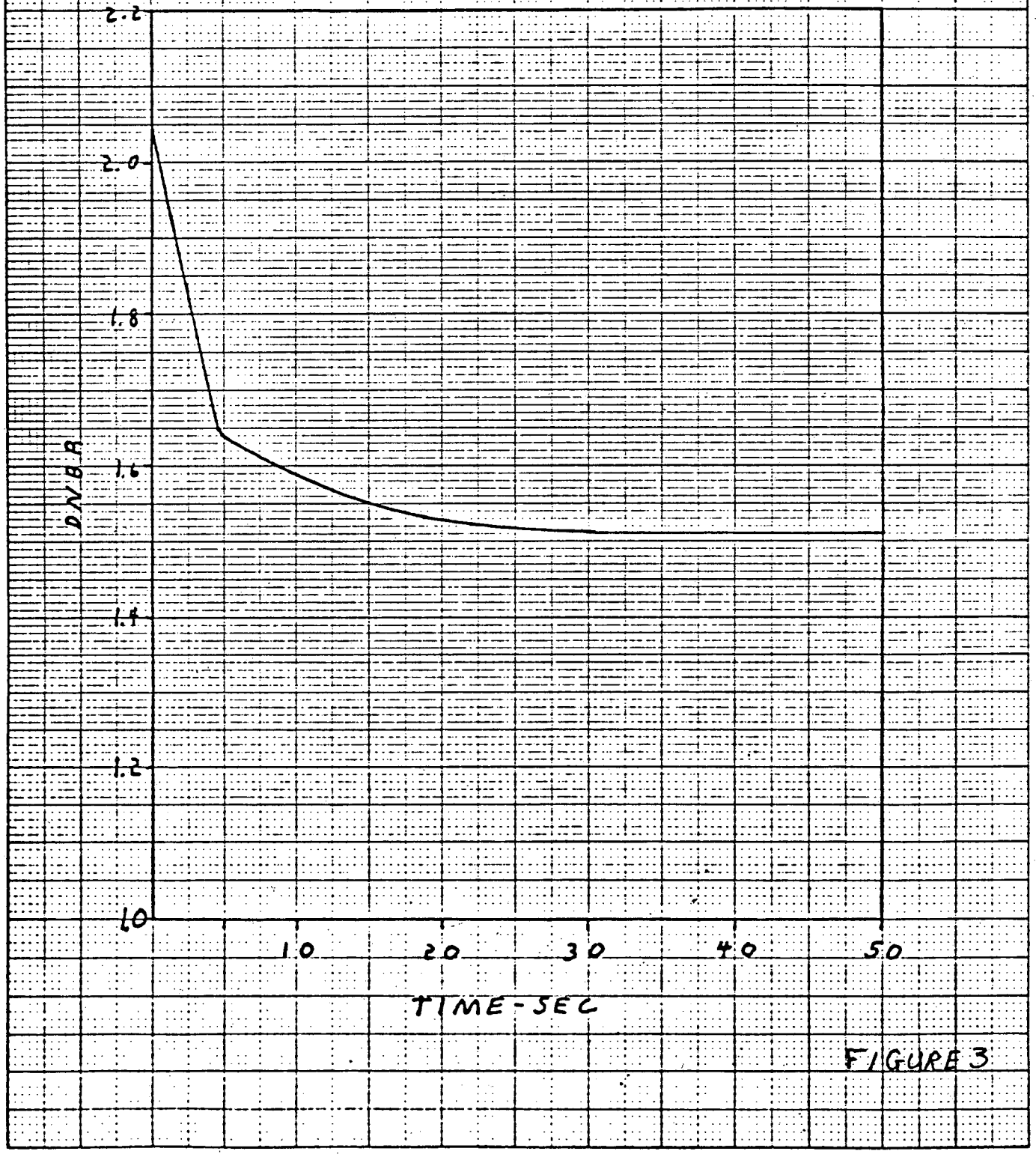

FIGURE 3

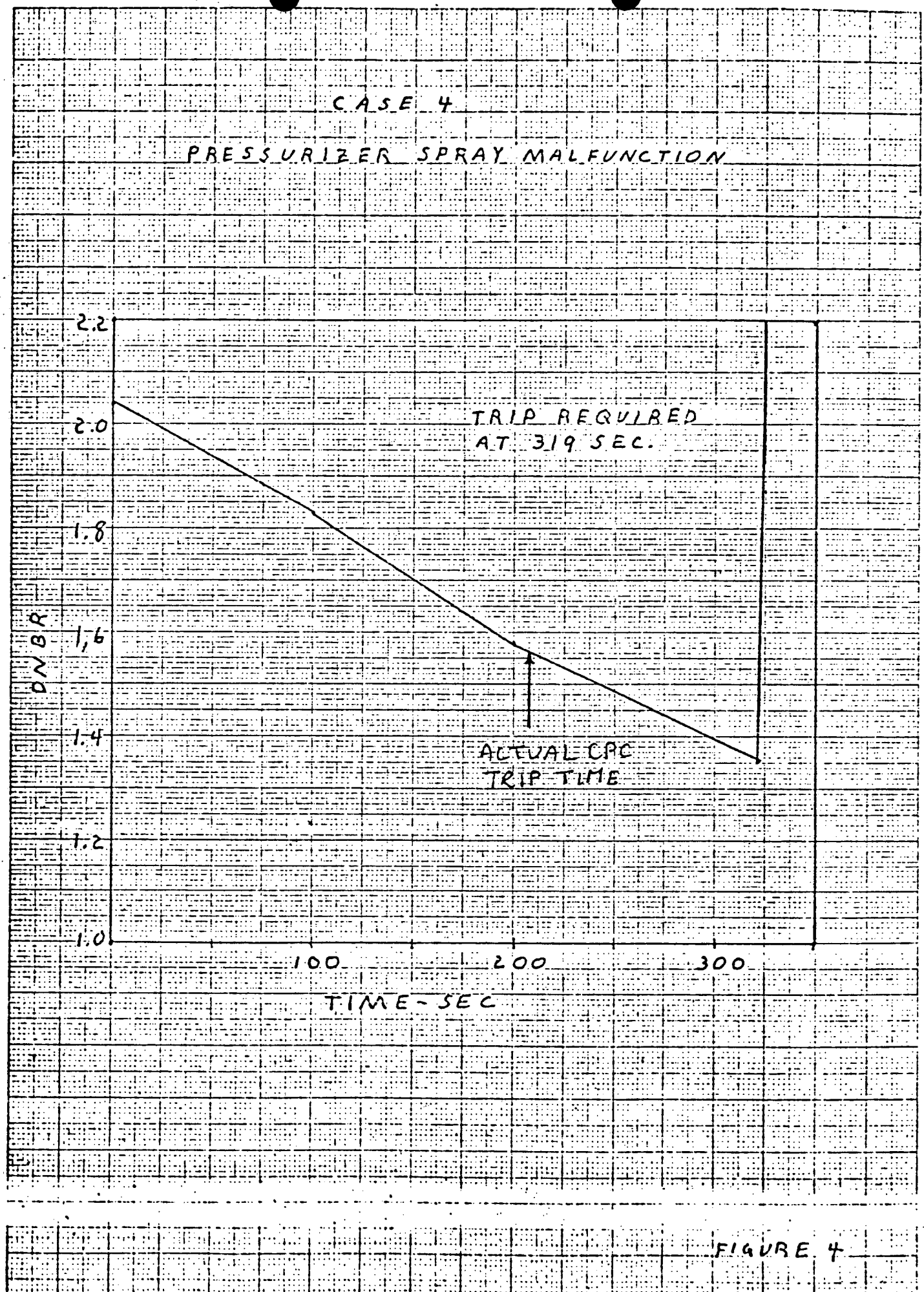
CASE 4
PRESSURIZER SPRAY MALFUNCTION
2.2
2.0
1.8
1.6
1.4
1.2
1.0
DNBR
TRIP REQUIRED
AT 319 SEC.
ACTUAL CPC
TRIP TIME
100
200
300
TIME-SEC

FIGURE 4

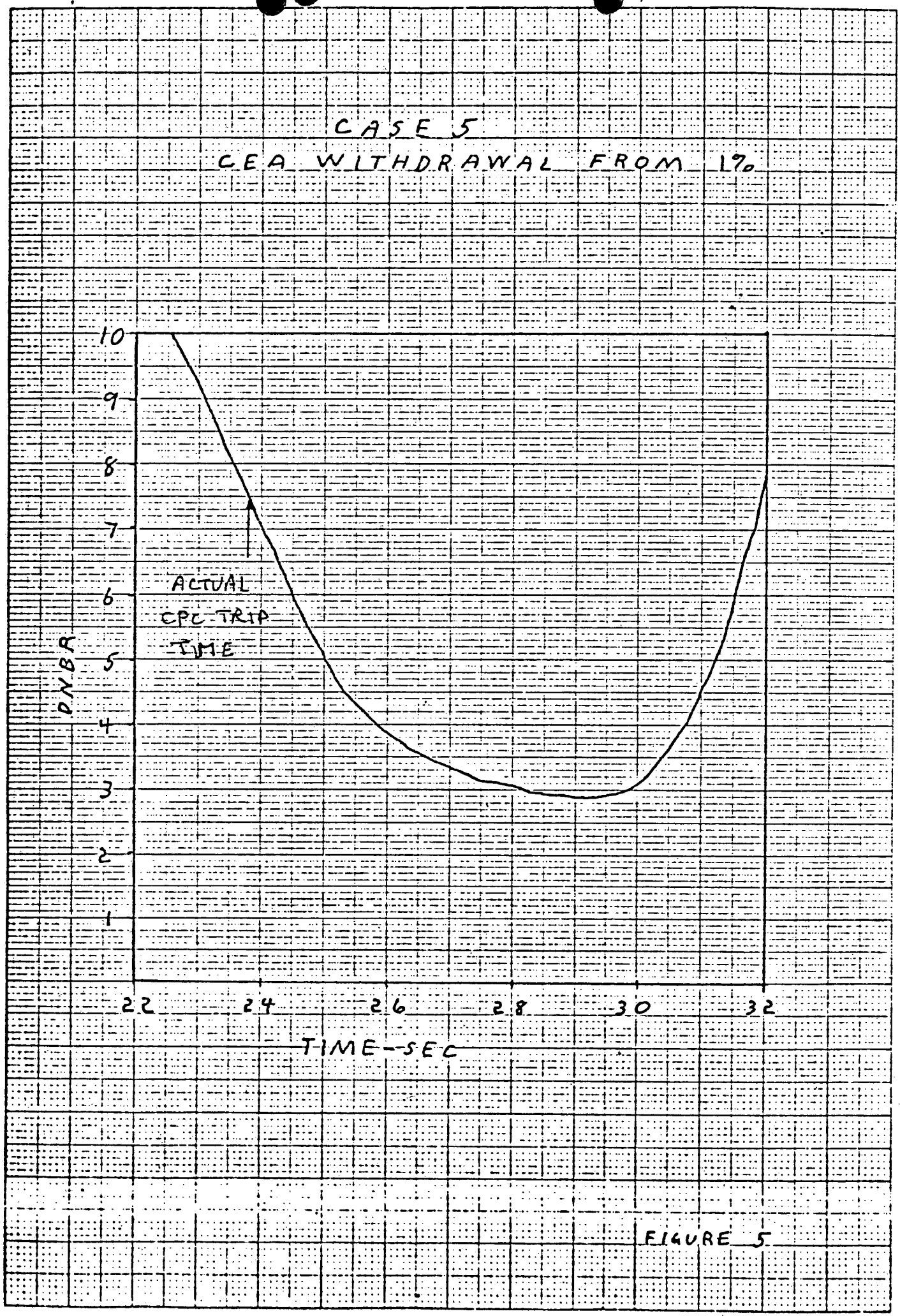
CASE 5
CEA WITHDRAWAL FROM 1%
10
9
8
7
6
5
4
3
2
1
DNBR
ACTUAL
CPC TRIP
TIME
22
24
26
28
30
32
TIME-SEC

FIGURE 5

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

Combustion Engineering, Inc.)
State of Connecticut)
County of Hartford) SS.:

I, A. E. Scherer depose and say that I am the Director, Nuclear Licensing of Combustion Engineering, Inc., duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations and in conjunction with the application of Southern California Edison Co. for withholding this information.

The information for which proprietary treatment is sought is contained in the following document:

CEN-175-(S)-P, CPC/CEAC Data Base Document, August 5, 1981.

This document has been appropriately designated as proprietary.

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1. The information sought to be withheld from public disclosure are detailed descriptions of the names of the constants and their values in the SONGS-2 Cycle 1 CPC/CEAC System data base which is owned and has been held in confidence by Combustion Engineering.

2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in a substantial competitive advantage to Combustion Engineering.

3. The information is of a type customarily held in confidence by Combustion Engineering and not customarily disclosed to the public. Combustion Engineering has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The details of the aforementioned system were provided to the Nuclear Regulatory Commission via letter DP-537 from F.M. Stern to Frank Schroeder dated December 2, 1974. This system was applied in determining that the subject documents herein are proprietary.

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6. Public disclosure of the information is likely to cause substantial harm to the competitive position of Combustion Engineering because:

a. A similar product is manufactured and sold by major pressurized water reactors competitors of Combustion Engineering.

b. Development of this information by C-E required thousands of manhours of effort and hundreds of thousands of dollars. To the best of my knowledge and belief a competitor would have to undergo similar expense in generating equivalent information.

c. In order to acquire such information, a competitor would also require considerable time and inconvenience related to the development of the constants for the system software.

d. The information required significant effort and expense to obtain the licensing approvals necessary for application of the information. Avoidance of this expense would decrease a competitor's cost in applying the information and marketing the product to which the information is applicable.

e. The information consists of detailed descriptions of the names of the constants and their values in the SONGS-2 Cycle 1 CPC/CEAC System data base the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Combustion Engineering, take marketing or other actions to improve their product's position or impair the position of Combustion Engineering's product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.

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Further the deponent sayeth not.

A. E. Scherer
Director
Nuclear Licensing

Sworn to before me
this [illegible] day of [illegible] 1981

Notary Public

CARL J. WENZEL, NOTARY PUBLIC
State of Connecticut No. 59962
Commission Expires March 31, 1983