ABB
ASEA BROWN BOVERI

February 19, 1992
LD-92-026

Docket No. 52-002

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Proprietary Information Transmittal

Reference: C-E Letter LD-92-023, dated February 18, 1992

Dear Sirs:

The response to Request for Additional Information (RAI) #722.22 (Reference letter) included a non-proprietary version of the attachments to that response. This letter transmits a copy of the proprietary version of those attachments. For convenience, the non-proprietary version is also enclosed.

The material enclosed as Attachments 1 and 2 to the response to RAI 722.22 is considered to be proprietary. As such, it is requested that the material be withheld from public disclosure in accordance with the provisions of 10 CFR 2.790 and that this material be appropriately safeguarded. The reasons for the classification of this material as proprietary are delineated in the enclosed affidavit.

If you have any questions, please contact Mr. Stan Ritterbusch of my staff at (203) 285-5206.

Very truly yours,

COMBUSTION ENGINEERING, INC.

C. B. Brinkman
Acting Director
Nuclear Systems Licensing

Change: NRC PDR 1 w/out Prop
4r Encl

ser/lw
Enclosures: As Stated

D032
1/1

Combustion Engineering, Inc.
1000 Prospect Hill Road
Post Office Box 500
Windsor, Connecticut 06095-0500
Telephone (203) 688-1911
Fax (203) 285-9512
Telex 99297 COMBEN WSOR

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

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

I, C. B. Brinkman, depose and say that I am the Acting Director, Nuclear Systems 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 for withholding this information.

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

Response to NRC Request for Additional Information #722.22 (Attachment to letter LD-92-023, dated February 18, 1992)

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, which is owned and has been held in confidence by Combustion Engineering, is MAAP computer code input listings and data files for System 80+™ severe accident analysis.

2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in 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 document herein is 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 reactor competitors of Combustion Engineering.

   b. Development of this information by C-E required thousands of manhours 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 to develop the computer code model and design data in the MAAP code input listings and data files.

   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 MAAP computer code input listings and data files for System 80+™ severe accident analysis, 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.

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.

Charles B. Brinkman
Acting Director
Nuclear Systems Licensing

Sworn to before me
this 20th day of February, 1992

Laurie J. White
Notary Public

My commission expires: 3/31/94

QUESTION 722.22

Please provide MAAP input listings for a representative set of those accident scenarios used to develop the source term information for each release category. For several accident sequences which have relatively high frequencies of occurrence, provide MAAP output (in graphical form) showing: containment pressure (including partial pressures of steam and non-condensible gas); temperature of water and air space; distribution of core material and non-condensible gases in each compartment; mass of water in the IRWST and cavity; heat loss through the containment wall; fission product release fractions; and erosion depth of the basemat and the cavity wall. Include a basemat melt-through sequence (i.e., a dry cavity case) in these outputs.

RESPONSE 722.22

A listing of the MAAP Parameter File which contains the plant design and operations data for the System 80+ design is provided in Attachment 1. The parameter file along with specific case data file are employed to perform MAAP analyses for specific accident scenarios used to develop the source term information. Case data file listings for a representative set of accident scenarios are provided in Attachment 2. These accident scenarios consist of the following Release Classes (RCs):

RC 2.2 -- Small LOCA (0.02 sq ft) in hot leg with no safety injection and no emergency feedwater; containment isolation failure at the start of the transient.

RC 2.4 -- Loss of Offsite Power transient with diesel generators available.

RC 3.1 -- Total Loss of Feedwater transient with manual feed and bleed cooling of the RCS. Containment heat removal is assumed to be unavailable.

RC 4.1 -- Large hot leg LOCA coincident with failure of safety injection.

RC 5.1 -- Station Blackout with battery depletion at 8 hours.

RC 6.2 -- Large cold leg LOCA with coincident failure of safety injection; no cavity flooding (dry cavity).

RC 7.1 -- Station Blackout with battery depletion at 8 hours and late recovery of power and containment heat removal.

Readily available output parameters for the above accident scenarios are provided in Attachment 3. These include the containment pressure plot, tabular data for fission product release fractions, height of water level in the cavity and/or the IRWST, concrete erosion of the basemat, and mass of hydrogen generated.

ATTACHMENT 1

LISTING OF MAAP PARAMETER FILE FOR THE SYSTEM 80+ DESIGN

THE FOLLOWING 16 PAGES CONTAIN COMBUSTION ENGINEERING PROPRIETARY INFORMATION

ATTACHMENT 2

LISTING OF CASE DATA FILE FOR REPRESENTATIVE ACCIDENT SCENARIOS

THE FOLLOWING 11 PAGES CONTAIN COMBUSTION ENGINEERING PROPRIETARY INFORMATION

ATTACHMENT 3

MAAP OUTPUT FOR REPRESENTATIVE ACCIDENT SCENARIOS

LEAKED FROM CONTMT:	GAS MASS(LB)	AEROSOL MASS(LB)	RELEASE FRACTION
NOBL.IN	2.9892E+02	7.6472E-03	1.8849E-01
CSI	-7.2752E-23	1.4732E-02	1.0943E-04
TEO2	0.0000E+00	0.0000E+00	0.0000E+00
SRO	0.0000E+00	8.5466E-05	2.9258E-07
MOO2	0.0000E+00	1.0109E-03	8.2970E-06
CSOH	2.3102E-11	8.6979E-02	1.1136E-04
BAO	0.0000E+00	1.3530E-03	3.0846E-06
LA2O3	0.0000E+00	3.9238E-05	1.6830E-08
CEO2	0.0000E+00	3.2091E-04	3.3955E-07
SB	2.0973E-12	3.3796E-04	3.6815E-05
TE2	0.0000E+00	0.0000E+00	0.0000E+00
UO2.ACT	0.0000E+00	0.0000E+00	0.0000E+00

RELEASE CLASS 2.2
Case 9
t = 24 hours

NO. ITERATIONS IN PRIM SYS TRANSPORT MODEL: 7 IN CONTMT GAS TRANSPORT MODEL: 1

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

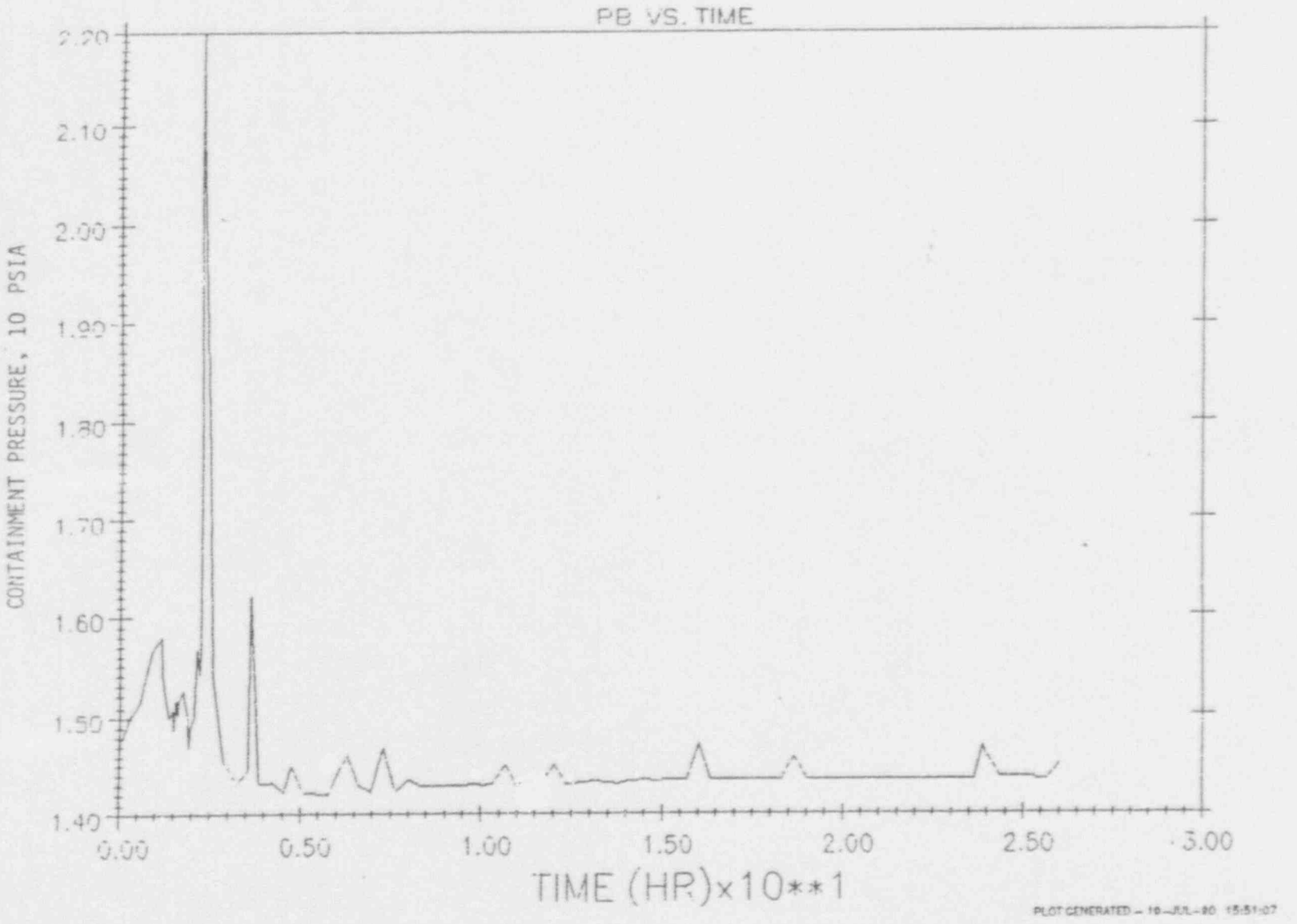
	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	712.10120	61.06284	0.00000	133.30383	556.01569	354.29037
BAL. 2:	712.10010	61.06260	0.00000	133.28671	555.92700	354.29022
INITIAL:	712.09998	61.06259	-0.45515	132.50000	552.65625	354.29031
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	0.00000	0.00000	132.69112	514.14886	0.00000
PS:	10.56961	41.03510	0.00000	0.50412	28.85357	240.39081
CONT:	701.53156	19.72774	0.00000	0.10859	13.01324	113.89957
INV REL:	712.10010	61.06260	0.00000	0.59560	41.77815	354.29022
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	200.33818	1063.83435	431.24356	4.17682	61.53891	113399.40625
BAL. 2:	200.09187	1063.83057	431.24207	4.17681	61.53891	113399.40625
INITIAL:	198.95653	1057.52490	428.68570	4.16393	61.17422	113392.09375
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	191.07890	1062.63000	430.17029	2.38530	61.53891	113399.40625
PS:	7.54105	0.15566	0.69973	1.44551	0.00000	0.00000
CONT:	1.71822	0.04864	0.37335	0.34601	0.00000	0.00000
INV REL:	9.01296	0.20060	1.07179	1.79151	0.00000	0.00000
EXV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

RELEASE CLASS 2.2

Case 9

SBL T=0 HOLE SP WET



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UO2, ACT GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
DEP AERO/GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
IN CORIUM	0.0000E+00	0.0000E+00	2.5001E+05				

LEAKED FROM CONTMT:	GAS MASS(LB)	AEROSOL MASS(LB)	RELEASE FRACTION
NOBL, IN	1.5420E+03	2.0707E-01	9.8221E-01
CSI	-6.0273E-24	4.7803E+00	3.5510E-02
TEO2	0.0000E+00	0.0000E+00	0.0000E+00
BRO	0.0000E+00	1.9777E-02	6.7704E-05
MOO2	0.0000E+00	4.1173E+00	3.3793E-03
CSOH	1.3366E-06	2.0614E+01	2.6391E-02
BAO	0.0000E+00	1.8091E-01	4.1246E-04
LA2O3	0.0000E+00	2.2504E-03	9.6523E-07
CEO2	0.0000E+00	2.5711E-02	2.7205E-05
SB	8.6976E-08	7.9807E-01	8.6936E-02
TE2	0.0000E+00	0.0000E+00	0.0000E+00
UO2, ACT	0.0000E+00	0.0000E+00	0.0000E+00

RELEASE CLASS 2.4

Case 10
t=36 hours

NO. ITERATIONS IN PRIM SYS TRANSPORT MODEL: 2 IN CONTMT GAS TRANSPORT MODEL: 1

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

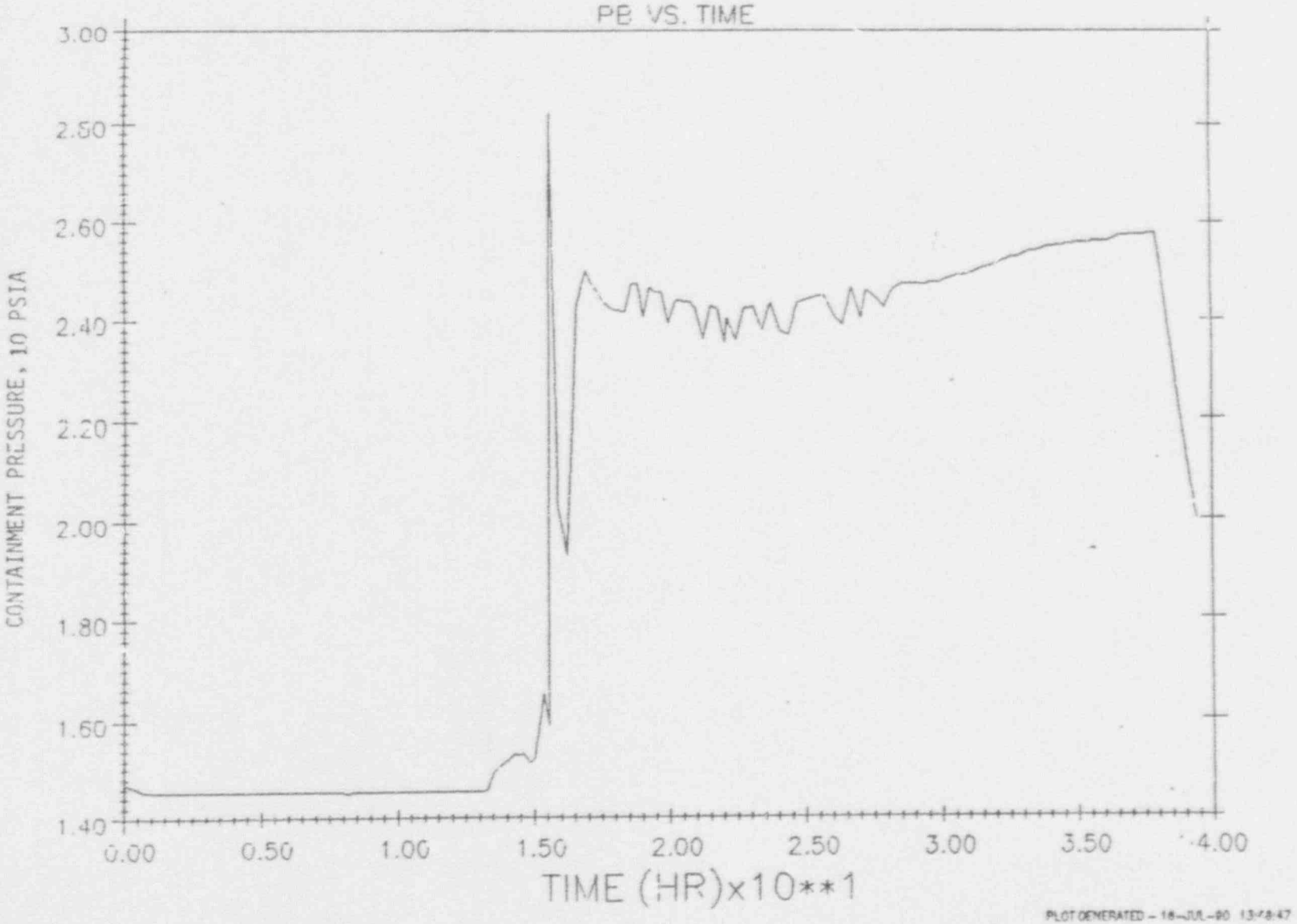
	NOBLES	CSI	TEO2	BRO	MOO2	CSOH
BAL. 1:	712.09875	61.06263	0.00000	133.53587	555.59937	354.29053
BAL. 2:	712.09991	61.06264	0.00000	133.53468	555.45697	354.29034
INITIAL:	712.09998	61.06259	-0.60084	132.50000	552.65625	354.29031
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	0.00000	0.00000	132.70961	427.19827	0.00000
PB:	1.36874	53.55537	0.00000	0.78049	120.31207	320.09421
CONT:	710.73004	7.50725	0.00000	0.04578	8.08900	34.19633
INV REL:	712.09991	61.06264	0.00000	0.82507	128.25867	354.29034
ENV REL:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	200.42085	1065.85315	432.05881	4.17603	61.65564	113400.68750
BAL. 2:	200.40009	1065.84985	432.05746	4.17441	61.65564	113400.68750
INITIAL:	198.93653	1057.52490	428.68570	4.16393	61.17422	113392.09375
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	188.85867	1065.58472	430.90033	2.33761	61.65564	113400.68750
PB:	11.08803	0.26125	1.10423	0.83416	0.00000	0.00000

RELEASE CLASS 2.4

Case 10

LOOP T=0 HOLE NOSP LATE WET



	GAS MASS (LB)	AEROSOL MASS (LB)	RELEASE FRACTION
NOBL, IN	1.5369E+03	8.0695E+02	9.7896E-01
CSI	3.7522E-28	1.3609E+01	1.0109E-01
TEO2	4.0958E-34	1.4456E-01	9.5886E-04
SRO	0.0000E+00	5.4676E+00	1.0717E-02
MOO2	0.0000E+00	8.5031E-01	6.9789E-04
CSOH	4.8215E-05	8.2226E+01	1.0527E-01
BAO	0.0000E+00	3.3068E+00	7.5391E-03
LA2O3	0.0000E+00	1.0467E-01	4.4895E-05
CEO2	0.0000E+00	9.8831E-01	1.0457E-03
SB	6.3329E-06	1.5089E+00	1.6437E-01
TE2	3.5065E-04	7.5413E+00	7.0749E-02
UO2, ACT	0.0000E+00	9.7935E-01	3.9176E-06

RELEASE CLASS 3.1

Case 8
t=40 hours

NO. ITERATIONS IN PRIM SYS TRANSPORT MODEL: 1 IN CONTMT GAS TRANSPORT MODEL: 7

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	712.34180	61.06352	0.70777	133.38124	555.16205	354.29794
BAL. 2:	712.33557	61.06355	0.70777	133.38077	555.08331	354.29703
INITIAL:	712.09998	61.06259	0.19845	132.50000	552.65625	354.29031
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	0.00000	0.00000	97.90195	281.66031	0.00000
PS:	3.92870	52.54654	0.00114	2.19301	272.29065	303.04590
CONT:	708.41309	8.51678	0.70663	33.28629	1.21108	51.25203
INV REL:	712.33557	61.06355	0.00000	2.17733	273.42291	354.29703
EXV REL:	4641.00977	0.00000	0.70777	33.30449	0.00004	0.00000

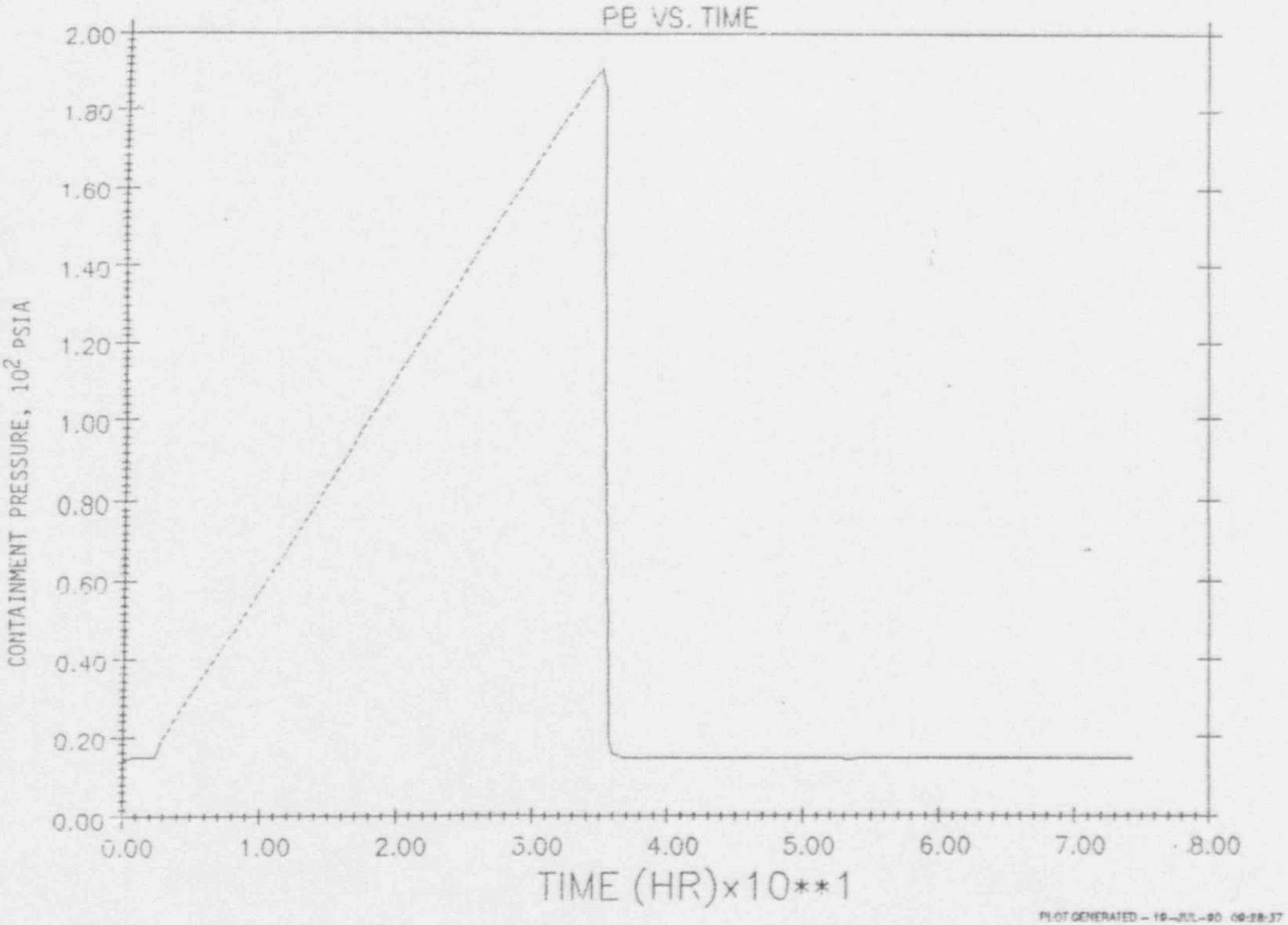
	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	200.17035	1064.59302	431.51526	4.17629	61.01521	113403.17969
BAL. 2:	200.16180	1064.59302	431.51517	4.17569	61.01535	113403.17969
INITIAL:	198.95653	1057.52490	428.68570	4.16393	60.60712	113392.09375
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	151.30380	1063.24011	410.66852	0.33854	0.00604	113398.53125
PS:	29.48168	0.77718	15.28096	2.60452	0.04928	0.00422
CONT:	19.38486	0.57568	5.56578	1.23322	60.95990	4.64107
INV REL:	29.57733	0.77729	15.27999	3.47814	0.00000	0.00000
EXV REL:	19.28067	0.57551	5.56667	0.35901	61.00932	4.64529

ADDITIONAL FIGURES-OF-MERIT OF THIS RUN

RELEASE CLASS 3.1

Case 1

TRCP TRIP LATE WET



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IN CORIUM	0.0000E+00	0.0000E+00	2.2830E+03				
CF02 GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	2.7345E-09	3.4056E-00	7.4173E-08	6.0540E-08	0.0000E+00	0.0000E+00	2.8224E-09
DEP AERO/GAS	9.3369E-09	5.1262E-07	9.1804E+00	4.2226E+00	0.0000E+00	0.0000E+00	1.0138E+02
IN CORIUM	0.0000E+00	0.0000E+00	7.2884E+02				
SB GAS	5.4684E-14	8.6769E-14	3.0133E-06	3.4309E-13	0.0000E+00	0.0000E+00	3.7246E-14
AERO	1.9291E-06	2.1838E-03	1.3511E-14	4.2928E-05	0.0000E+00	0.0000E+00	2.0863E-06
DEP AERO/GAS	6.8445E-06	3.2682E-04	7.8911E-12	1.4009E-01	0.0000E+00	0.0000E+00	7.7303E+00
IN CORIUM	0.0000E+00	0.0000E+00	2.4697E-01				
TE2 GAS	3.5837E-09	3.2916E-09	1.1515E-11	1.2497E-08	0.0000E+00	0.0000E+00	9.5566E-10
AERO	1.5863E-06	1.3476E-05	0.0000E+00	3.4767E-05	0.0000E+00	0.0000E+00	1.7583E-06
DEP AERO/GAS	5.8130E-06	2.6154E-04	0.0000E+00	8.2113E-01	0.0000E+00	0.0000E+00	3.6775E+01
IN CORIUM	0.0000E+00	0.0000E+00	1.1082E-04				
UO2.ACT GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	1.9582E-06	2.4529E-05	5.3450E-05	4.3069E-05	0.0000E+00	0.0000E+00	1.9617E-06
DEP AERO/GAS	6.6796E-06	3.6739E-04	1.4573E+01	5.6184E+00	0.0000E+00	0.0000E+00	1.3100E+02
IN CORIUM	0.0000E+00	0.0000E+00	2.4978E+05				

LEAKED FROM CONTMT:	GAS MASS(LB)	AEROSOL MASS(LB)	RELEASE FRACTION
NOBL.GN	1.3962E+03	2.5627E+00	8.8935E-01
CSI	-1.3435E-20	9.9046E-02	7.3574E-04

RELEASE CLASS 4.1

Case 6
t=30 hours

TEO2	1.6006E-20	3.1328E-01	1.8612E-03
SRO	-2.2316E-27	5.8031E-03	1.9866E-05
MOO2	-3.1923E-26	7.6121E-03	6.2476E-06
CSOH	1.0256E-11	5.8558E-01	7.4971E-04
BAO	-9.9164E-30	6.6953E-03	1.5264E-05
LA2O3	0.0000E+00	1.0795E-03	4.6301E-07
CEO2	0.0000E+00	3.9668E-03	4.1973E-06
SB	1.6292E-11	2.4522E-02	2.6713E-03
TE2	2.5455E-07	1.2140E-01	9.0019E-04
UO2.ACT	0.0000E+00	1.1934E-02	4.7737E-08

NO. ITERATIONS IN PRIM SYS TRANSPORT MODEL: 4 IN CONTMT GAS TRANSPORT MODEL: 1

FISSION PRODUCT MASS BALANCES:

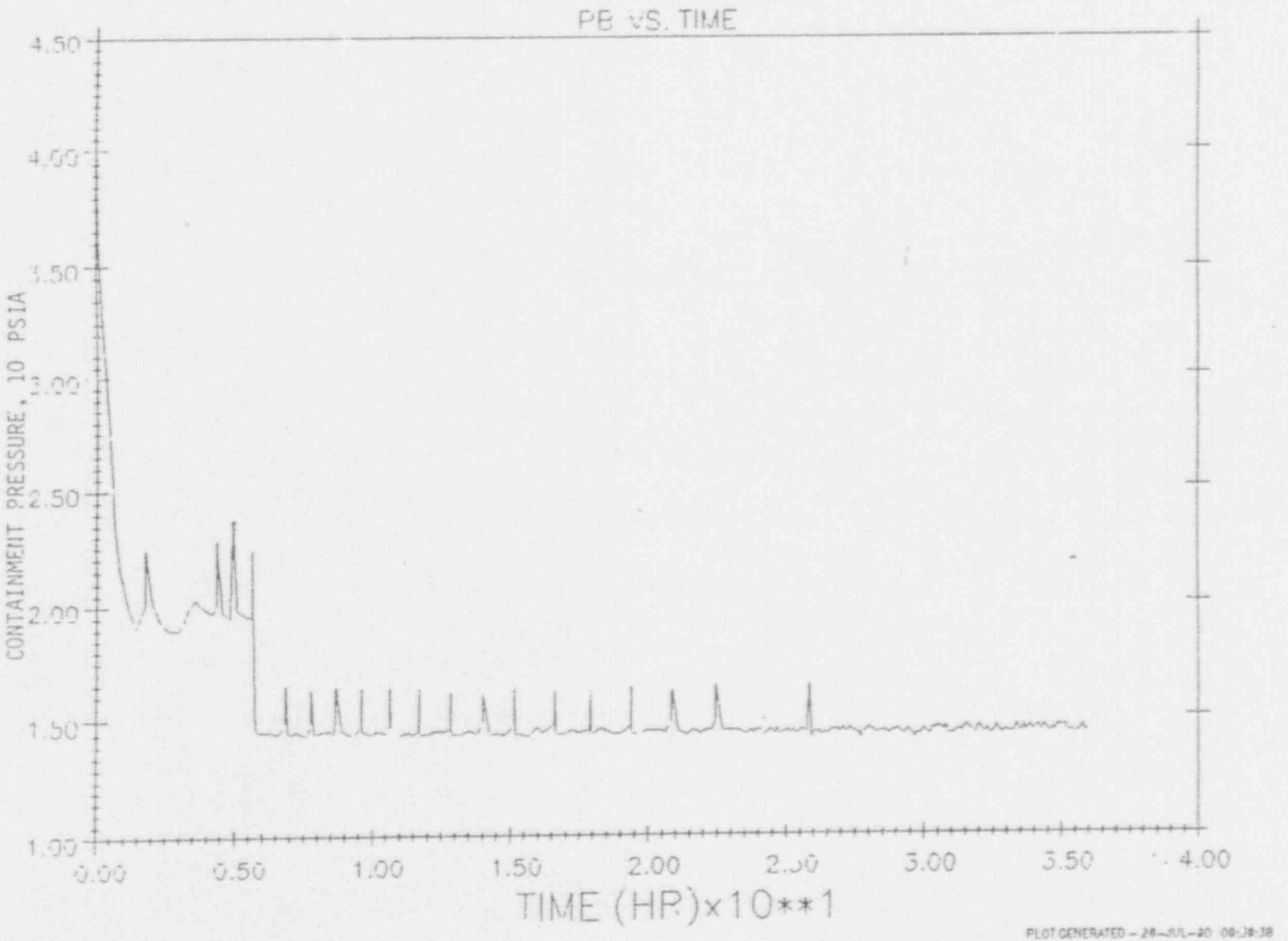
BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	712.09821	61.06258	54.99501	132.50014	352.64917	354.28506
BAL. 2	712.09869	61.06245	54.99578	132.50047	352.64970	354.29047

RELEASE CLASS 4.1

Case 6

4.91 CL EARLY FAIL DRY



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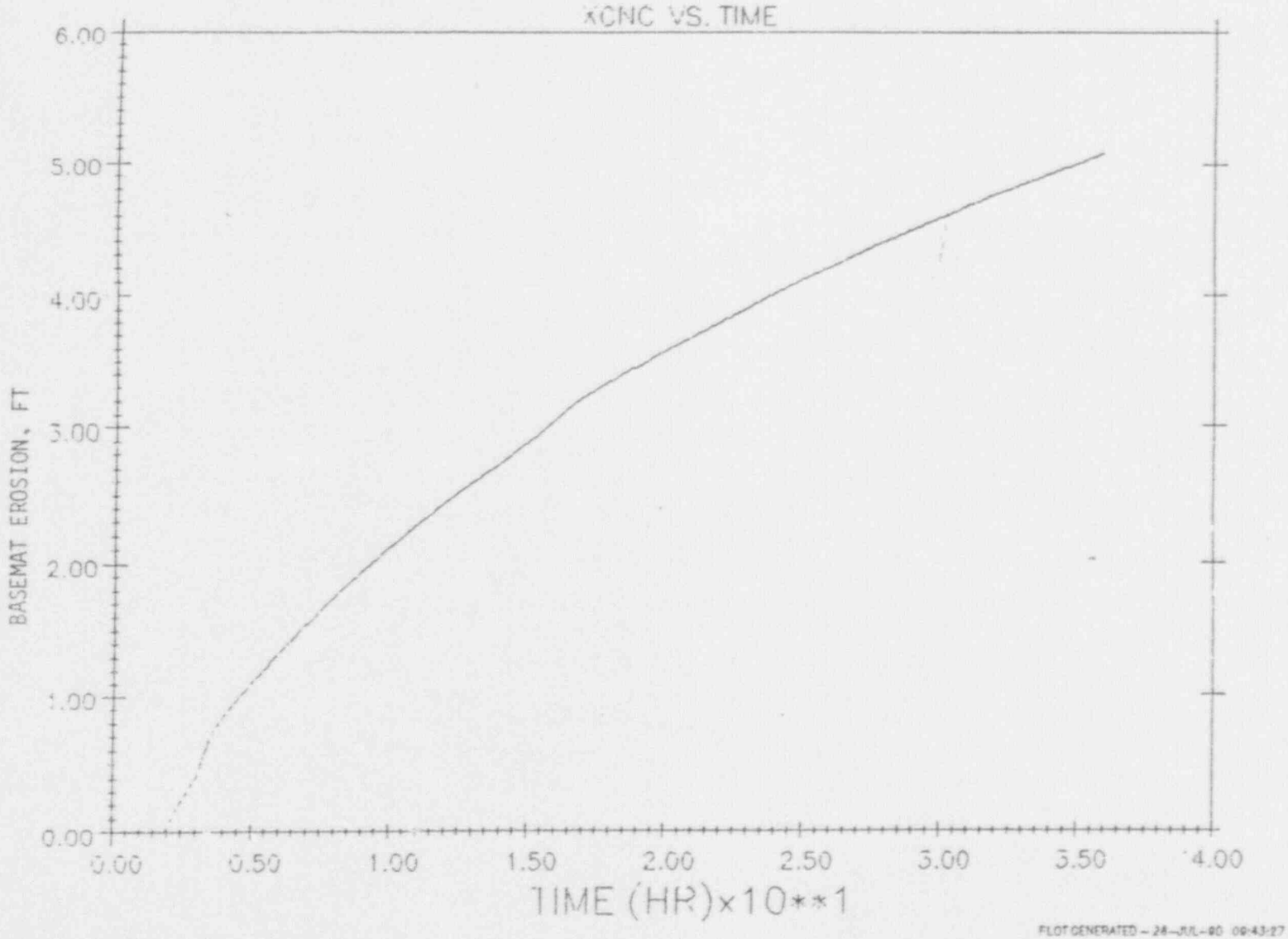
RELEASE CLASS 4.1

Case 1

4.91 CL EARLY FAIL DRY



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UO2.ACT GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	2.6404E-03	1.1766E-03	3.5328E-05	2.7504E-03	0.0000E+00	0.0000E+00	4.2961E-09
DEP AERO/GAS	6.6114E-01	1.2763E+00	9.9038E-02	1.3413E+00	0.0000E+00	0.0000E+00	7.0742E-03
IN CORIUM	0.0000E+00	0.0000E+00	2.5000E+05				

LEAKED FROM CONTMT:	GAS MASS(LB)	AEROSOL MASS(LB)	RELEASE FRACTION
NOBL.IN	1.5592E+03	3.0295E+01	9.9318E-01
CSI	8.1989E-06	5.2376E+00	3.8906E-02
TEO2	8.7014E-29	2.2399E+00	1.3307E-02
SRO	0.0000E+00	1.0928E-02	3.7411E-05
MOO2	0.0000E+00	1.7760E-02	1.4577E-05
CSOH	1.5077E-02	3.5562E+01	4.5549E-02
BAO	0.0000E+00	3.6747E-02	8.3778E-05
LA2O3	0.0000E+00	4.9348E-04	2.1166E-07
CEO2	0.0000E+00	2.3801E-03	2.5183E-06
SB	8.9238E-03	1.9074E+00	2.0875E-01
TE2	4.8811E-01	1.0952E+00	1.1740E-02
UO2.ACT	0.0000E+00	2.5730E-02	1.0292E-07

RELEASE CLASS 5.1

Case 4
t=140 hours

NO. ITERATIONS IN PRIM SYS TRANSPORT MODEL: 1 IN CONTMT GAS TRANSPORT MODEL: 3

FISSION PRODUCT MASS BALANCES:

BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL. 1:	712.10083	61.06186	3.42127	133.30748	554.92566	354.29453
BAL. 2:	712.09961	61.06260	3.42127	133.30490	554.84570	354.29013
INITIAL:	712.09998	61.06259	2.94843	132.50000	552.65625	354.29031
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	0.00000	0.00000	0.00000	123.00731	427.78699	0.00000
PS:	0.14386	50.58181	0.00178	0.72725	122.35056	303.48398
CONT:	711.95697	10.48005	3.41949	9.57292	4.78812	50.81054
INV REL:	712.09961	61.06260	0.00000	0.74544	127.05857	354.29013
ENV REL:	6206.77490	0.00000	3.42127	9.55215	0.00014	0.00000

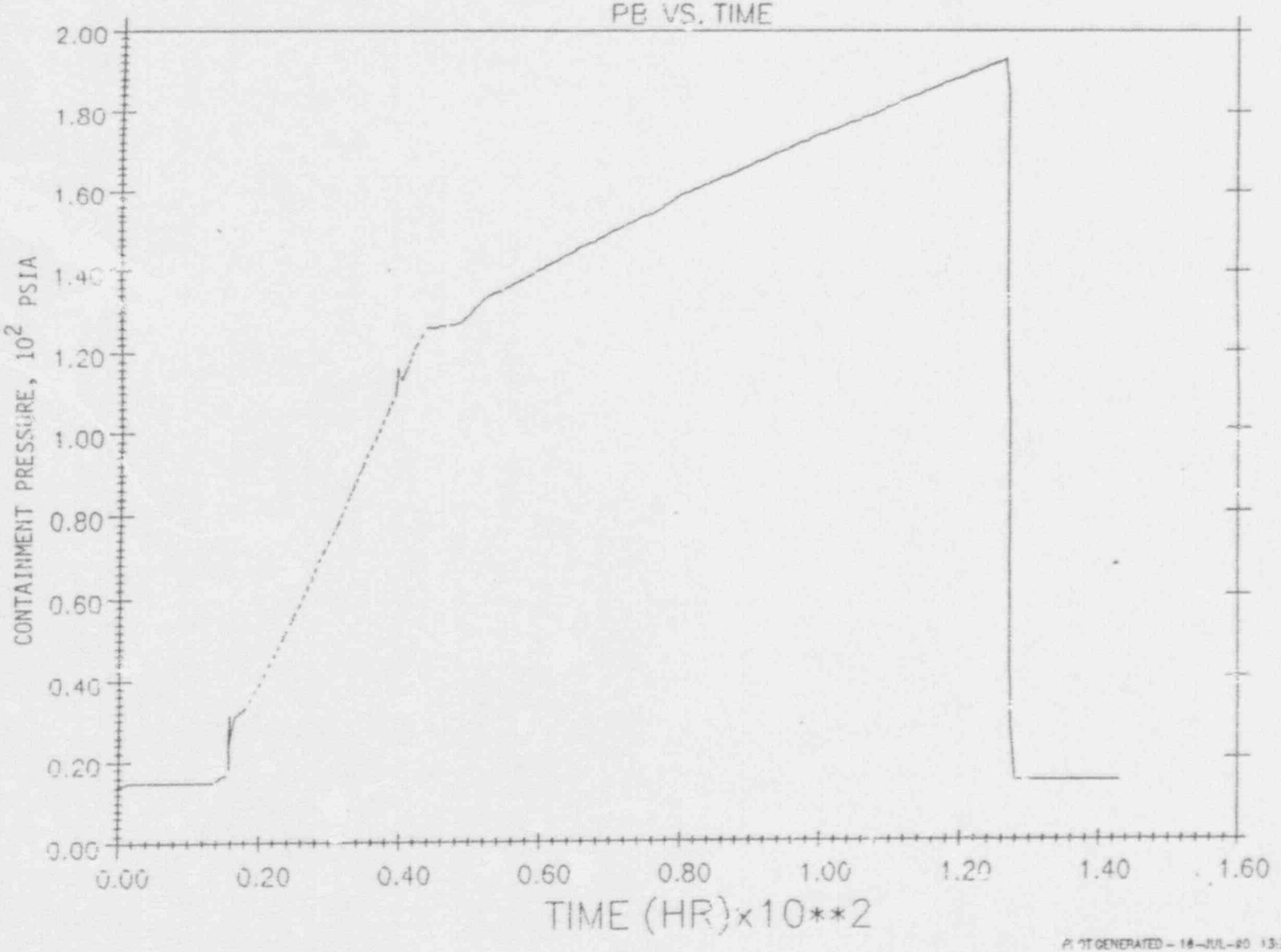
	BAO	LA2O3	CEO2	SB	TE2	UO2
BAL. 1:	200.14630	1063.86218	431.25928	4.17410	58.81182	113400.44531
BAL. 2:	200.13066	1063.86011	431.25839	4.17232	58.81169	113400.44531
INITIAL:	198.95650	1057.52490	428.68570	4.16393	58.43295	113392.09375
CORE:	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
CORIUM:	184.82861	1063.32910	428.95325	2.18885	8.90633	113398.89844
PS:	9.68557	0.27026	0.80507	0.26887	0.14393	0.00331
CONT:	5.63211	0.26283	1.50098	1.71637	49.76155	1.54676

RELEASE CLASS 5.1

Case 4

LOOP DBL NOSPR LATE WET

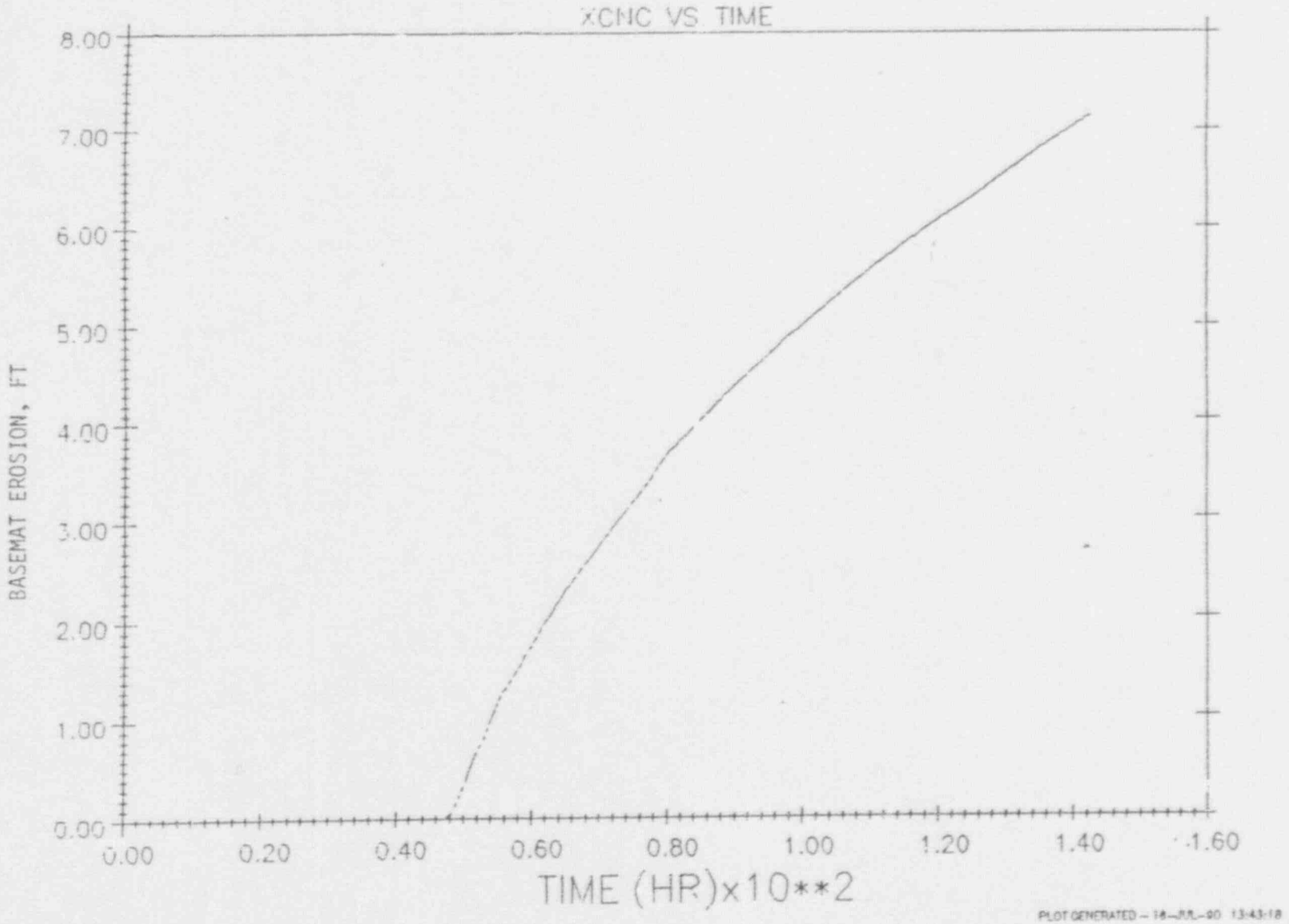
PB VS. TIME



PLOT GENERATED - 16-JUL-90 13:30:20

RELEASE CLASS 5.1
Cont

LOOP DBL NOSPR LATE WET



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CE(S) GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	3.2043E-07	1.5093E-07	4.1308E-09	3.2944E-07	0.0000E+00	0.0000E+00	1.3530E-09
DEP AERO/GAS	2.8727E-02	5.1198E+01	1.1266E+01	2.2965E+01	0.0000E+00	0.0000E+00	1.2871E+00
IN CORIUM	0.0000E+00	0.0000E+00	7.9490E+02				
SB GAS	1.9654E-03	8.7622E-03	1.0139E-05	1.5243E-02	0.0000E+00	0.0000E+00	1.3082E-10
AERO	-8.6591E-13	-7.4996E-13	-7.9819E-15	4.6744E-03	0.0000E+00	0.0000E+00	7.1525E-05
DEP AERO/GAS	1.0470E-01	3.6150E+00	6.9802E-11	2.4769E+00	0.0000E+00	0.0000E+00	8.6451E-02
IN CORIUM	0.0000E+00	0.0000E+00	1.0923E+00				
TE2 GAS	3.0820E-03	1.4264E-02	3.8867E-08	3.2370E-02	0.0000E+00	0.0000E+00	2.6794E-07
AERO	-2.8986E-17	-3.4161E-17	-9.6602E-20	-3.1858E-16	0.0000E+00	0.0000E+00	8.0712E-04
DEP AERO/GAS	0.0000E+00	5.8330E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.2637E-01
IN CORIUM	0.0000E+00	0.0000E+00	9.6963E-03				
UO2 ACT GAS	0.0000E+00	0.0000E+00	0.[illegible]E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	5.0214E-04	2.3715E-04	7.4[illegible]57E-06	5.1477E-04	0.0000E+00	0.0000E+00	1.1068E-06
DEP AERO/GAS	2.0435E-02	3.8280E+01	1.7499E+01	1.1910E+01	0.0000E+00	0.0000E+00	6.1489E-01
IN CORIUM	0.0000E+00	0.0000E+00	2.4908E+05				

RELEASED FROM CONTMT:	GAS MASS(LB)	AEROSOL MASS(LB)	RELEASE FRACTION
NOBLES	1.5282E+03	3.3065E+01	9.7388E-01
CSI	1.1260E-04	2.9340E-01	2.1003E-03
TEO2	8.9105E-09	3.0620E-01	1.8193E-03

RELEASE CLASS 6.2

Case 2
t=350 hours

SRO	0.0000E+00	1.4308E-02	4.9254E-05
MOO2	2.8469E-36	4.2447E-02	3.4838E-05
CSOH	7.3339E-02	1.6288E+00	2.1792E-03
BAO	0.0000E+00	1.9965E-02	4.5518E-05
LA2O3	0.0000E+00	2.8349E-03	1.2158E-06
CEO2	0.0000E+00	2.4226E-02	2.5430E-05
SB	6.0594E-02	1.0117E-01	1.7616E-02
TE2	1.0817E+00	1.5305E+00	1.9369E-02
UO2 ACT	0.0000E+00	1.3098E-02	5.2394E-08

NO. ITERATIONS IN PRIM SYS TRANSPORT MODEL: 2 IN CONTMT GAS TRANSPORT MODEL: 1

FISSION PRODUCT MASS BALANCES:

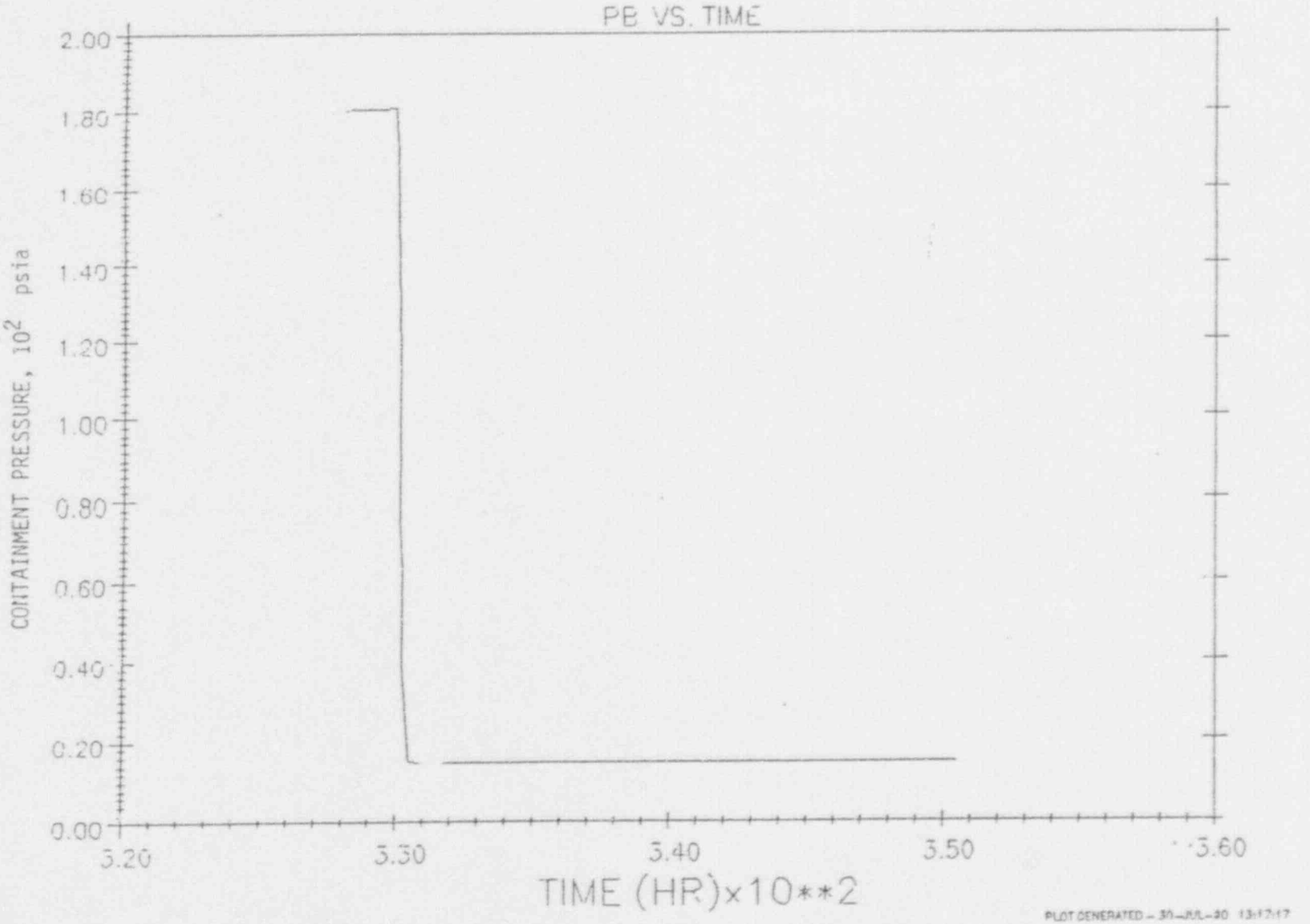
BALANCE 1 = TOTAL MASS AS USED BY MAAP
BALANCE 2 = IN FUEL + INTEGRATED RELEASE FROM FUEL

	NOBLES	CSI	TEO2	SRO	MOO2	CSOH
BAL 1:	712.09729	61.06078	71.44212	132.51192	552.61133	354.25281
BAL 2:	712.07955	61.06253	71.44342	132.51312	552.61248	354.29053
INITIAL:	712.07998	61.06259	71.44608	132.50000	552.65625	354.29031

RELEASE CLASS 6.2

4.91 CL LATE FAIL DRY

Case 2

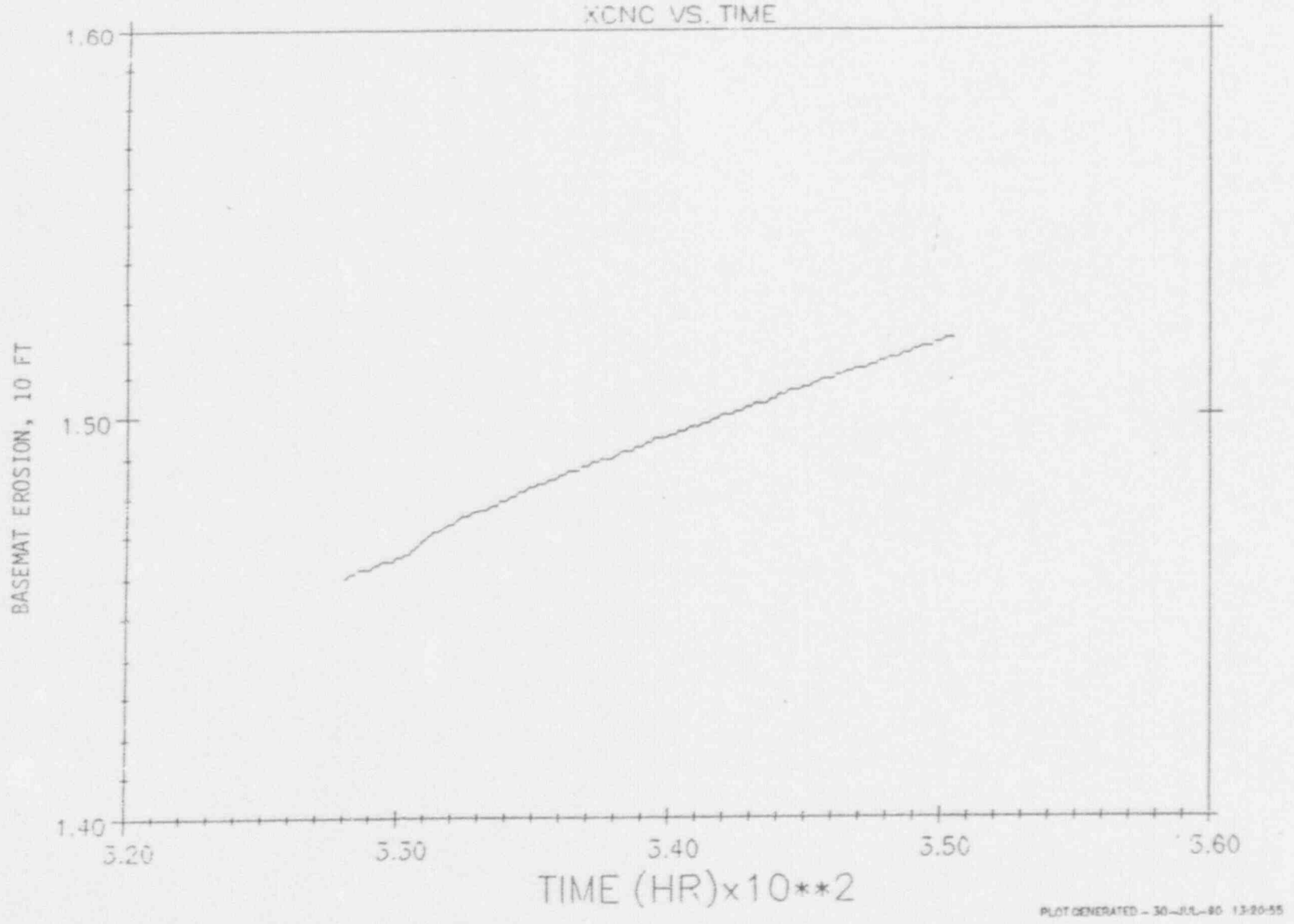


PLOT GENERATED - 30-AUG-90 13:17:17

RELEASE CLASS 6.2

4.91 CL LATE FAIL DRY

Case 2



CSOH GAS	4.5797E-07	4.2441E-09	4.0815E-09	6.8690E-08	0.0000E+00	0.0000E+00	2.3324E-09
AERO	3.8066E-03	2.8380E-04	8.1272E-07	4.6026E-02	0.0000E+00	0.0000E+00	1.6080E-03
DEP AERO/GAS	1.8717E-02	4.3017E-01	5.0894E+01	3.4836E+01	0.0000E+00	0.0000E+00	8.3424E+01
IN CORIUM	0.0000E+00	0.0000E+00	0.0600E+00				
BAO GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	1.7719E-08	5.3930E-08	6.8648E-11	2.2235E-07	0.0000E+00	0.0000E+00	7.6378E-06
DEP AERO/GAS	7.8097E-08	2.1087E-06	3.4547E+00	2.4597E+00	0.0000E+00	0.0000E+00	6.6355E+00
IN CORIUM	0.0000E+00	0.0000E+00	4.1943E+02				
LA2O3 GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	8.6495E-10	2.3829E-09	3.0432E-12	1.0815E-08	0.0000E+00	0.0000E+00	3.3662E-07
DEP AERO/GAS	3.8905E-09	1.0255E-07	1.2276E-01	8.0381E-02	0.0000E+00	0.0000E+00	2.5342E-01
IN CORIUM	0.0000E+00	0.0000E+00	2.3672E+03				
CEO2 GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	5.4310E-09	1.4059E-08	1.7994E-11	6.7771E-08	0.0000E+00	0.0000E+00	1.9826E-06
DEP AERO/GAS	2.4570E-08	6.4250E-07	8.3229E-01	4.3718E-01	0.0000E+00	0.0000E+00	1.5959E+00
IN CORIUM	0.0000E+00	0.0000E+00	9.5520E+02				
SB GAS	1.0509E-10	1.1851E-10	3.2676E-10	3.4920E-09	0.0000E+00	0.0000E+00	1.0825E-10
AERO	3.7044E-05	2.7824E-06	7.6399E-09	4.4790E-04	0.0000E+00	0.0000E+00	1.8523E-05
DEP AERO/GAS	1.8216E-04	4.2156E-03	5.1712E-01	6.4050E-01	0.0000E+00	0.0000E+00	1.5298E+00
IN CORIUM	0.0000E+00	0.0000E+00	6.3828E+00				
TE2 GAS	6.2809E-07	5.4461E-07	1.0807E-08	5.6394E-06	0.0000E+00	0.0000E+00	2.5023E-07
AERO	5.4672E-07	3.2711E-07	-2.6146E-18	-5.9242E-16	0.0000E+00	0.0000E+00	4.5037E-05
DEP AERO/GAS	1.6926E-06	2.6864E-05	1.1839E+01	1.0462E+01	0.0000E+00	0.0000E+00	2.7872E+01
IN CORIUM	0.0000E+00	0.0000E+00	8.6804E+01				
UO2.ACT GAS	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AERO	4.2268E-09	1.1589E-08	1.4803E-11	5.2844E-08	0.0000E+00	0.0000E+00	1.6269E-06
DEP AERO/GAS	1.9020E-08	5.0105E-07	4.7991E-01	3.6704E-01	0.0000E+00	0.0000E+00	1.1110E+00
IN CORIUM	0.0000E+00	0.0000E+00	2.5003E+03				

LEAKED FROM CONTMT:	GAS MASS(LB)	AEROSOL MASS(LB)	RELEASE FRACTION
NOBL. IN	4.7231E+01	2.0496E+00	3.0085E-02
CSI	1.6483E-11	3.4513E-02	2.5638E-04
TEO2	0.0000E+00	0.0000E+00	0.0000E+00
SRO	0.0000E+00	3.7072E-03	1.2698E-05
MOO2	0.0000E+00	2.4130E-02	1.9805E-05
CSOH	7.8389E-07	1.2468E-01	1.5962E-04
BAO	0.0000E+00	2.6989E-03	6.1530E-06
LA2O3	0.0000E+00	7.9140E-05	3.3945E-08
CEO2	0.0000E+00	4.1874E-04	4.4307E-07
SB	1.0143E-07	2.3289E-03	2.5372E-04
TE2	1.4053E-05	8.7507E-03	6.4988E-05
UO2.ACT	0.0000E+00	2.9960E-04	1.1985E-07

RELEASE CLASS 7.1

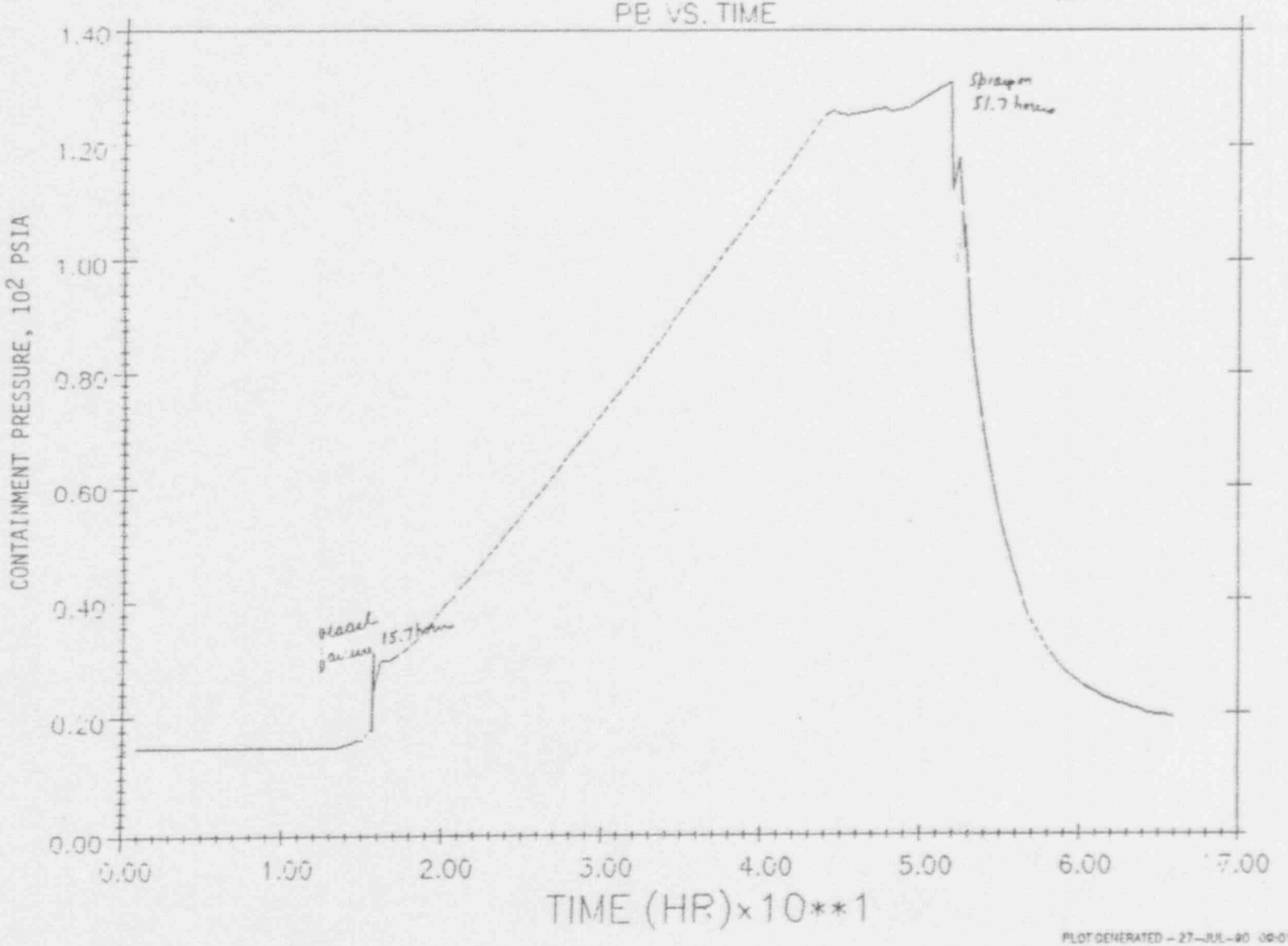
Case 1
t = 60 hours

RELEASE CLASS 7.1

LOOP DBL 1SPR LATE WET

36 hour delay
case 1

PE VS. TIME

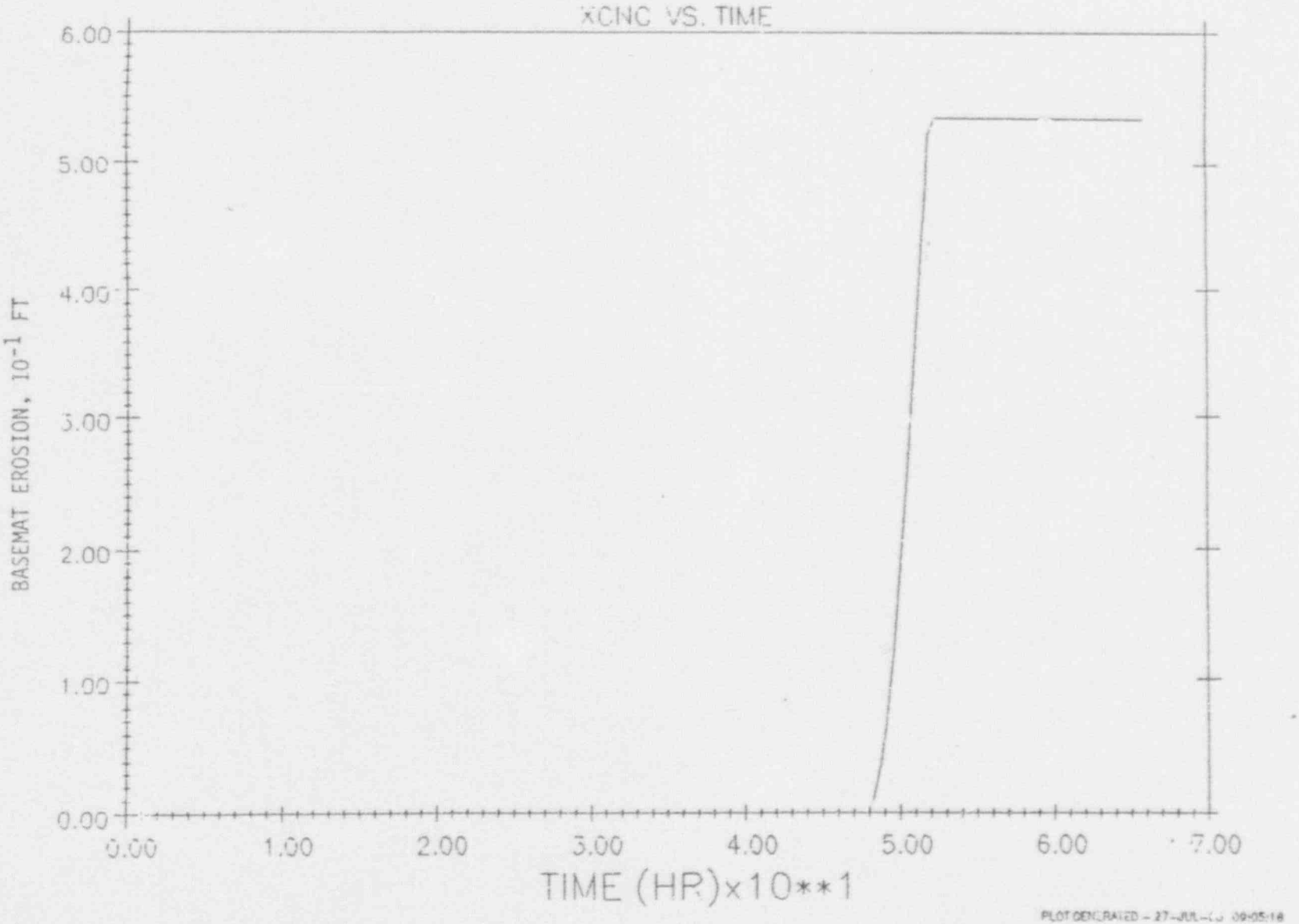


PLOT GENERATED – 27–JUL–90 09:01:18

RELEASE CLASS 7.1

LOOP DBL 1SPR LATE WET

Case 1



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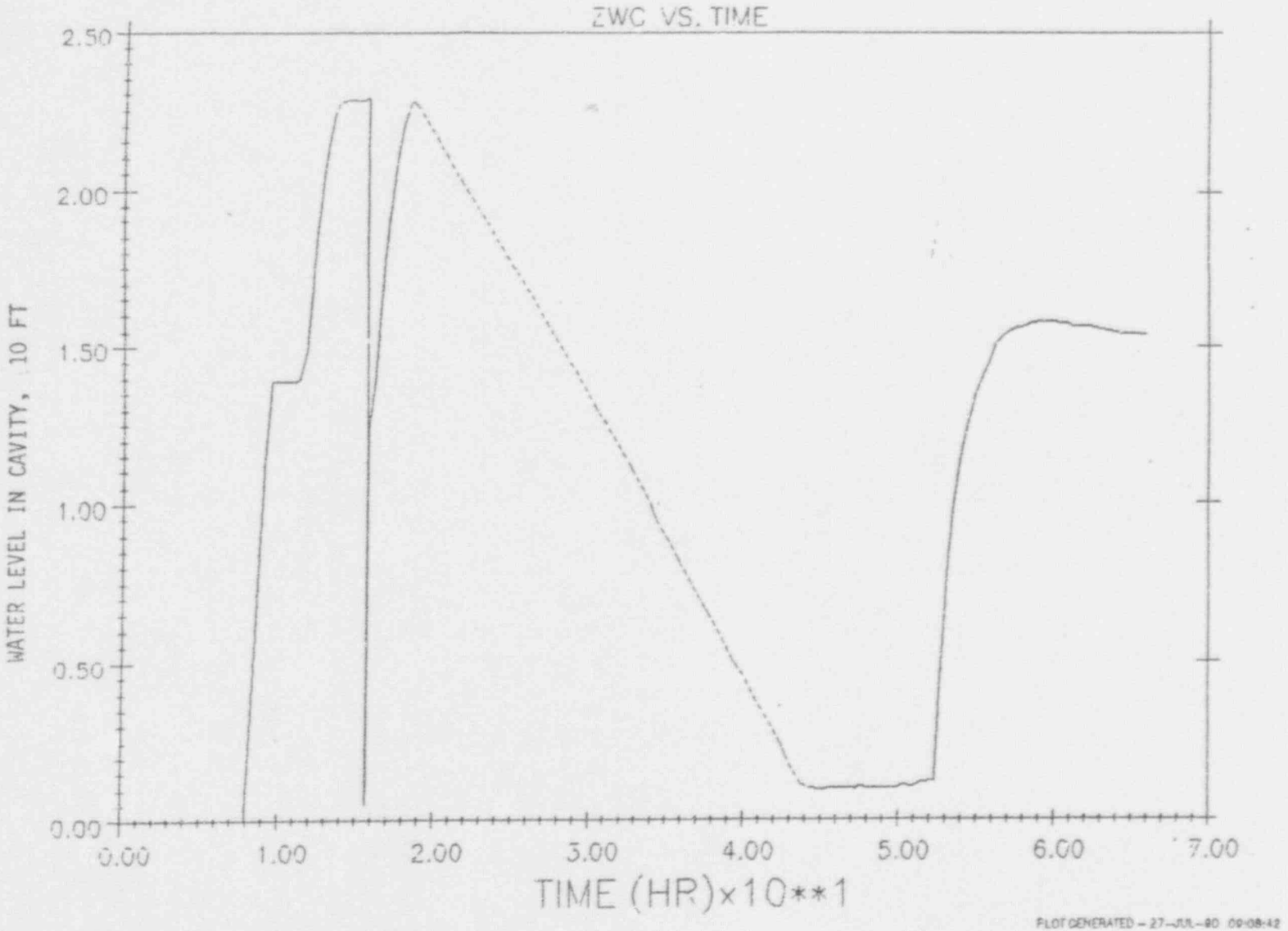
RELEASE CLASS 7.1

LOOP DBL 1SPR LATE WET

Case 1



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