



Commonwealth Edison

One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

October 16, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: LaSalle County Station Unit 1
Requested Additional Information
Regarding SRV Blowdown Test
NRC Docket Nos. 50-373

Reference (a): August 17, 1984 letter from A. Schwencer
to D. L. Farrar.

Dear Mr. Denton:

This letter provides the additional information regarding the LaSalle Unit 1 SRV Blowdown Test requested in Reference (a). The attachments to this letter include data plots of untouched automated recordings made by Wyle Laboratories during the tests. Also included is a discussion and justification of the methodology used in determining the average local-to-bulk pool temperature difference to be 8.1°F.

Please direct any question you may have regarding this matter to this office.

One signed original and fifteen copies of this letter and the attachments are provided for your use.

Very truly yours,

8410230020 841016
PDR ADCK 05000373
PDR

B. Pfeiffer
for J. B. Marshall
Nuclear Licensing Administrator

lm

cc: A. Bournia - NRR w/Att.
Region III Inspector - LSCS w/o Att.

Attachments (1): Sargent & Lundy Responses to Request for Additional Information Regarding SRV Blowdown Test dated 9/27/84
(2): Wyle Laboratories Extended Blowdown Transient Plots.

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9/27/84

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING SRV BLOWDOWN TEST

This response provides the information requested in the A. Schwencer letter of August 17, 1984 [1]. Attachment 1 is a sketch of the test temperature sensor locations relative to the quencher end cap holes. Attachment 2 is a set of recorded temperature responses for all the sensors. These plots were prepared by Wyle Laboratories.

We strongly disagree with the conclusions of the staff's evaluation that the report "does not provide sufficient...data...to permit"...a determination of a "local-to-bulk temperature difference value" and that the criteria set forth in NUREG-0487 and NUREG-0783 were not met. We believe the following points support our analysis:

1) NUREG-0783 [2] states

"Local pool temperature denotes an average water temperature in the vicinity of the discharge device and represents the relevant temperature which controls the condensation process..." and "...the temperature which controls the condensation process... is best characterized by that which would occur at a point directly above and below the quencher arms..." (Section 4.3, pg. 18)

We agree with this characterization of the general flow pattern surrounding a discharging quencher. Consequently the sensors chosen to represent the local pool temperature were those mounted directly above and below the quencher. Other sensors were not used because:

- a) they were farther from the quencher, and/or
- b) were located in the rising thermal plume.

It should be noted that conservatisms were introduced in the determination of local-to-bulk pool temperature difference by

- a) the conservative time averaging method employed for individual sensors
- b) the combination of all readings to obtain a 95/95 local-to-bulk pool temperature.

The sensors mounted above the quencher showed much better repeatability (probably due to a stronger more uniform flow field in this region). If the test readings from only these sensors are combined, the 95/95 local-to-bulk temperature difference becomes 9.7°F.

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2) NUREG-0487 [3] states

"For practical purpose, measurement from the temperature sensors, which are located on the containment wall in the sector containing the discharge device...can be used as local temperature."
(Section D.II.3(b) pg. D-9)

While it may be permissible to use these sensors, NUREG-0783, as previously mentioned, supercedes these guidelines and clearly states a preference for more locally mounted sensors. These were the sensors used in the computations of local-to-bulk pool temperature (e.g., T2, T4, T32, T33).

3) The four sensors used to compute local pool temperature (two per quencher) were mounted upstream of the quencher centerline relative to the bulk pool motion induced by steam discharge from the end caps as well as by RHR flow. These sensors were mounted in this location to better measure the temperature of the inflowing water. It has been correctly pointed out that sensors mounted downstream of the quencher center would have provided a more conservative measure of the local-to-bulk pool temperature difference. However the following points should be noted

- a) we believe the induced pool motion does not significantly influence the local flows very near the quencher but rather serves to sweep away the rising thermal plume. Evidence to support this is found in the temperature traces from the local sensors which showed oscillatory patterns of localized flows.
- b) the steam jet discharge from the end cap represents less than 8% of the total steam flow. The predominant flow is that depicted in Figure 11 of NUREG-0783 [2] where inflow is vertical and radially directed toward the quencher arm centerline and outflow is horizontal and radially directed outward from the quencher arm centerline. Axial flow along the quencher arm centerline is of secondary importance.
- c) The submergence depth for the LaSalle quencher in the Mark-II containment is much greater than that of quenchers in earlier Mark-I tests. The local flow near the Mark-II quencher is thus much more vertical with buoyancy more dominant than bulk pool motion.

References

- 1) Letter from A. Schwencer, Licensing Branch 2, [NRC], to D. L. Farrar, Director of Nuclear Licensing [CWE], entitled "Request for Additional Information Regarding SRV Blow-down Test," dated August 17, 1984.

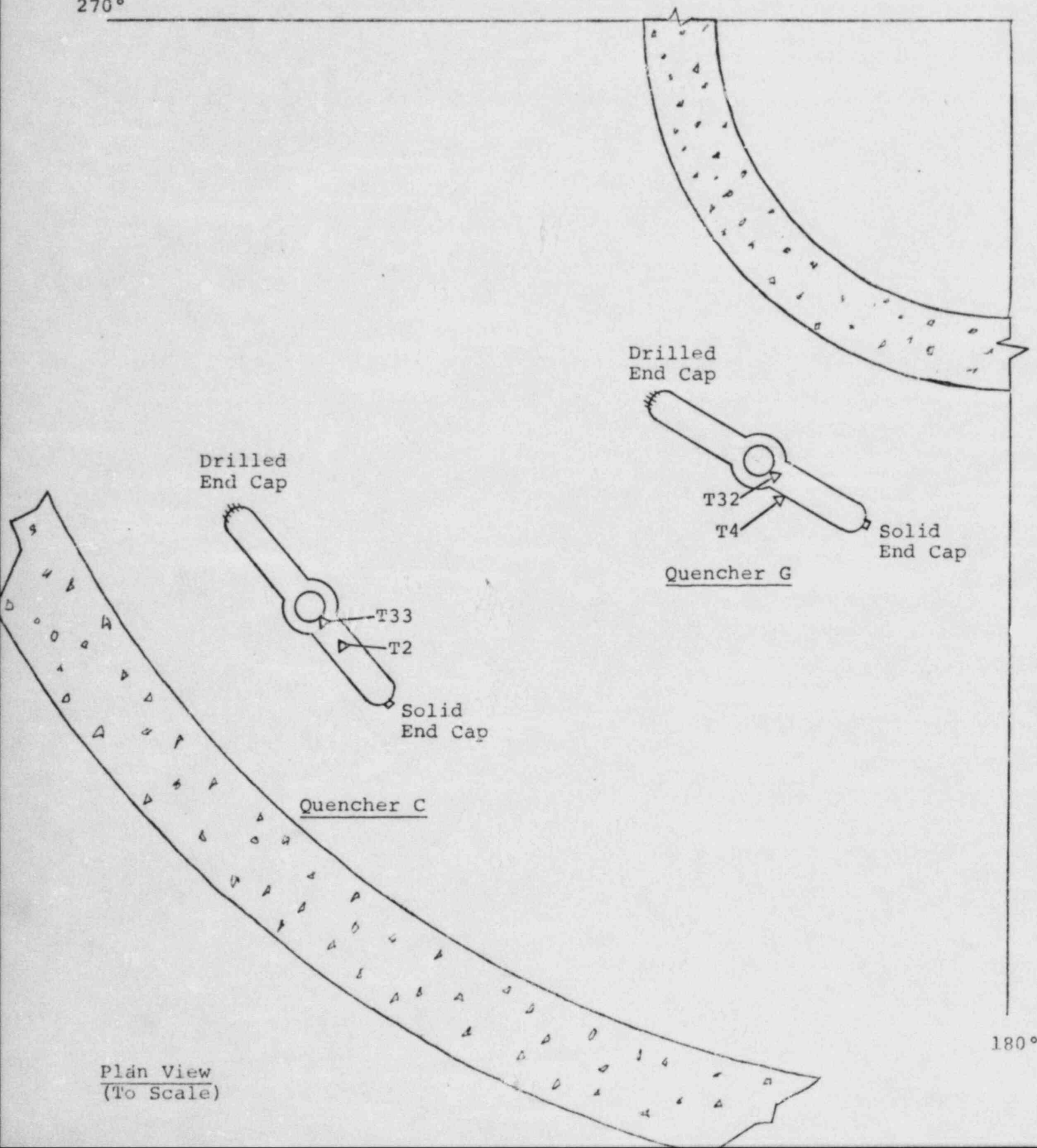
9/27/84

- 2) U.S. Nuclear Regulatory Commission, "Suppression Pool Temperature Limits for BWR Containments," NUREG-0783, November 1981.
- 3) U.S. Nuclear Regulatory Commission, "Mark II Containment Lead Plant Program Load Evaluation and Acceptance Criteria," NUREG-0487, October 1978.

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SKETCH OF SENSOR ORIENTATION
IN LASALLE UNIT 1 SUPPRESSION POOL
(0.5 cm = 1'-0")

270°



180°

Plan View
(To Scale)

WYLE
LABORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP

January 24, 1983

IN RESPONSE REFERENCE: 44529S-080U

Commonwealth Edison Company
One First National Plaza
Chicago, IL 60603

Attention: Mr. Richard Ralph
Station Nuclear Engineer
35th Floor

Subject: CECO Purchase Order No. 234139

Reference: Wyle Laboratories Job No. 44529

Gentlemen:

Enclosed are Extended Blowdown Transient Plots (Temperature Channels 1-33 and 48) for Test Runs 69 through 75.

Please acknowledge receipt of these documents in the space indicated below by signing and returning one copy of this letter.

Sincerely,

WYLE LABORATORIES
Eastern Operations

Richard Ralph
Signature

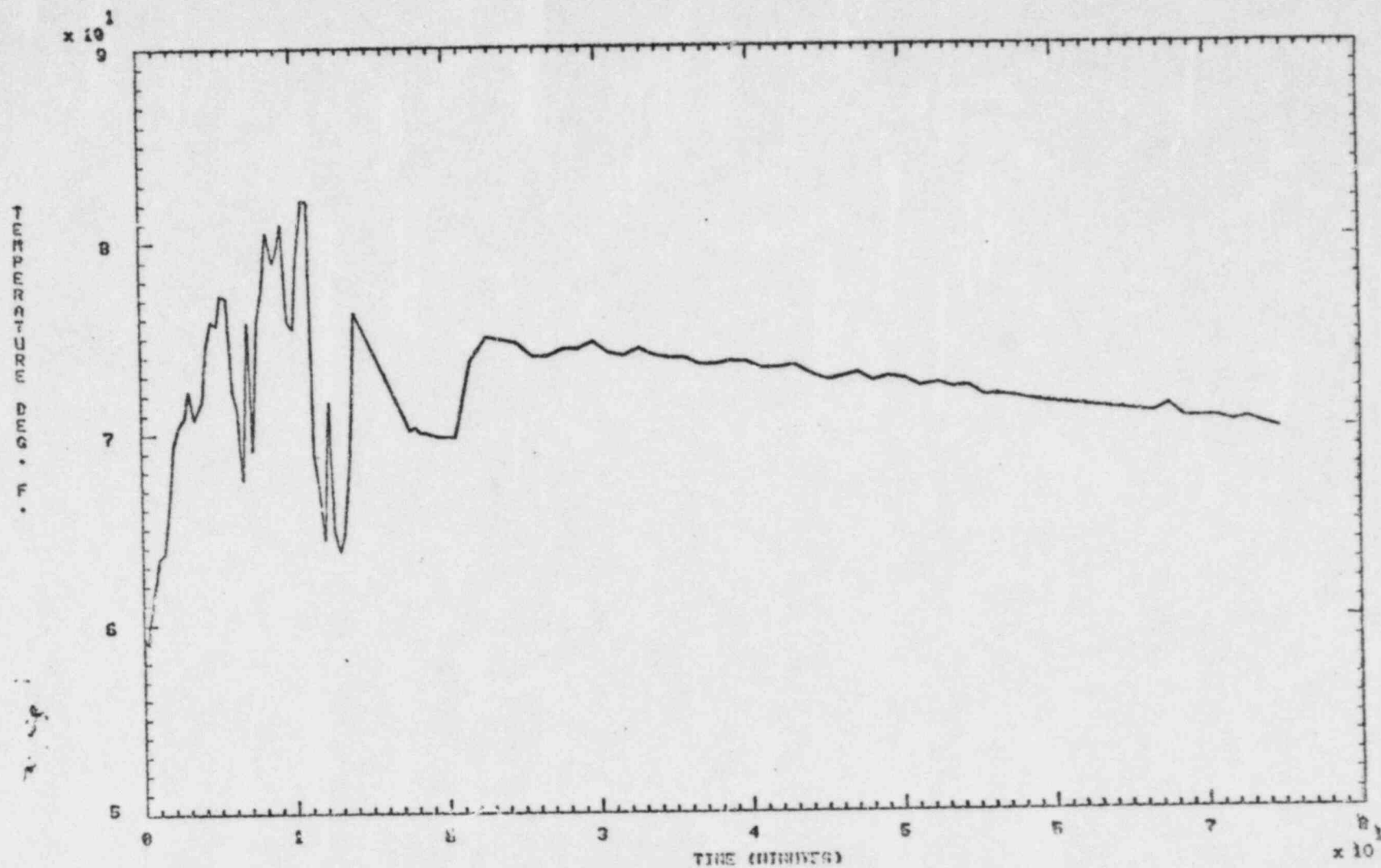
for Edward W. Smith
Director, Contracts & Purchasing

Jan 25, 1983
Date

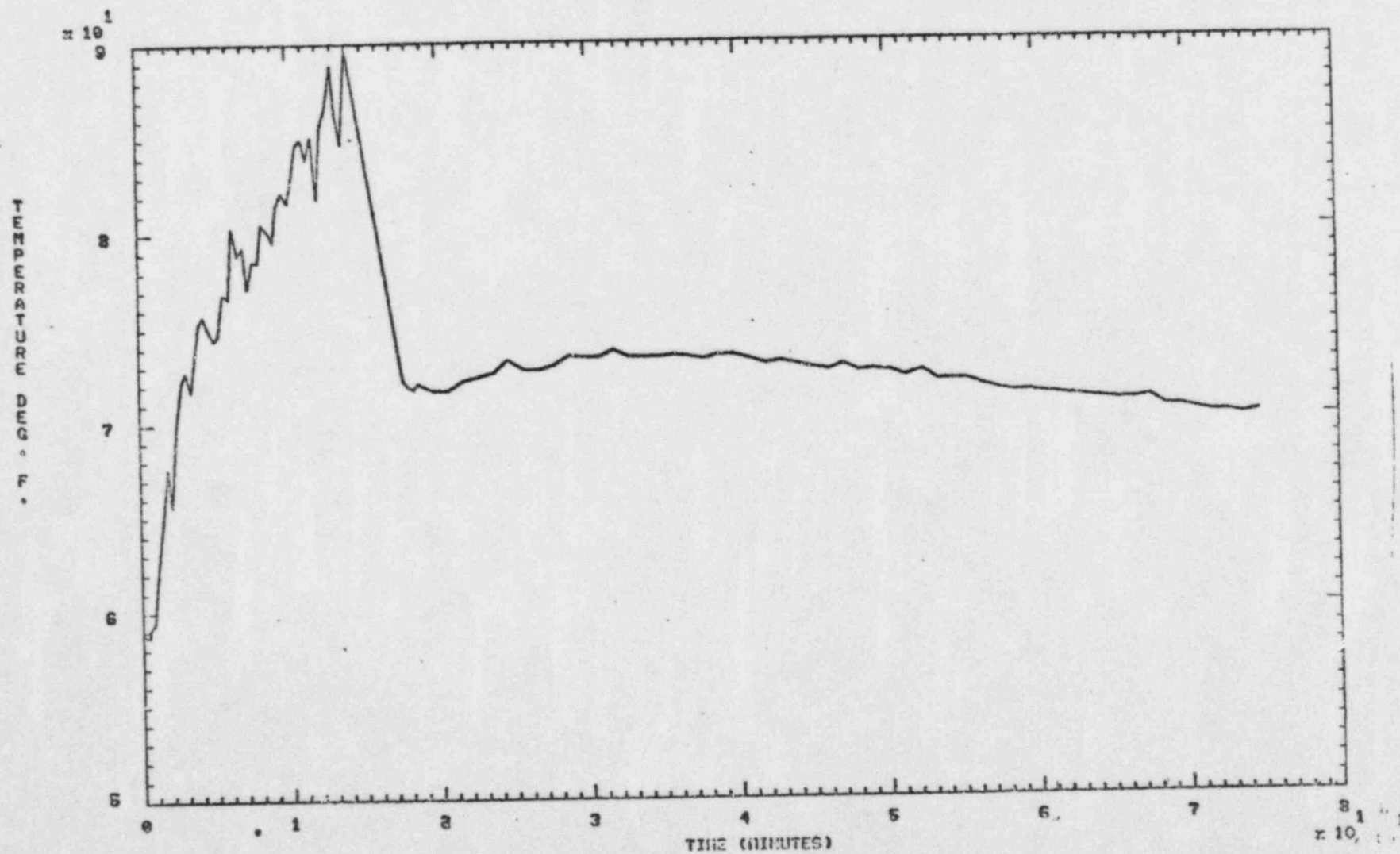
EWS/paw

Enclosures

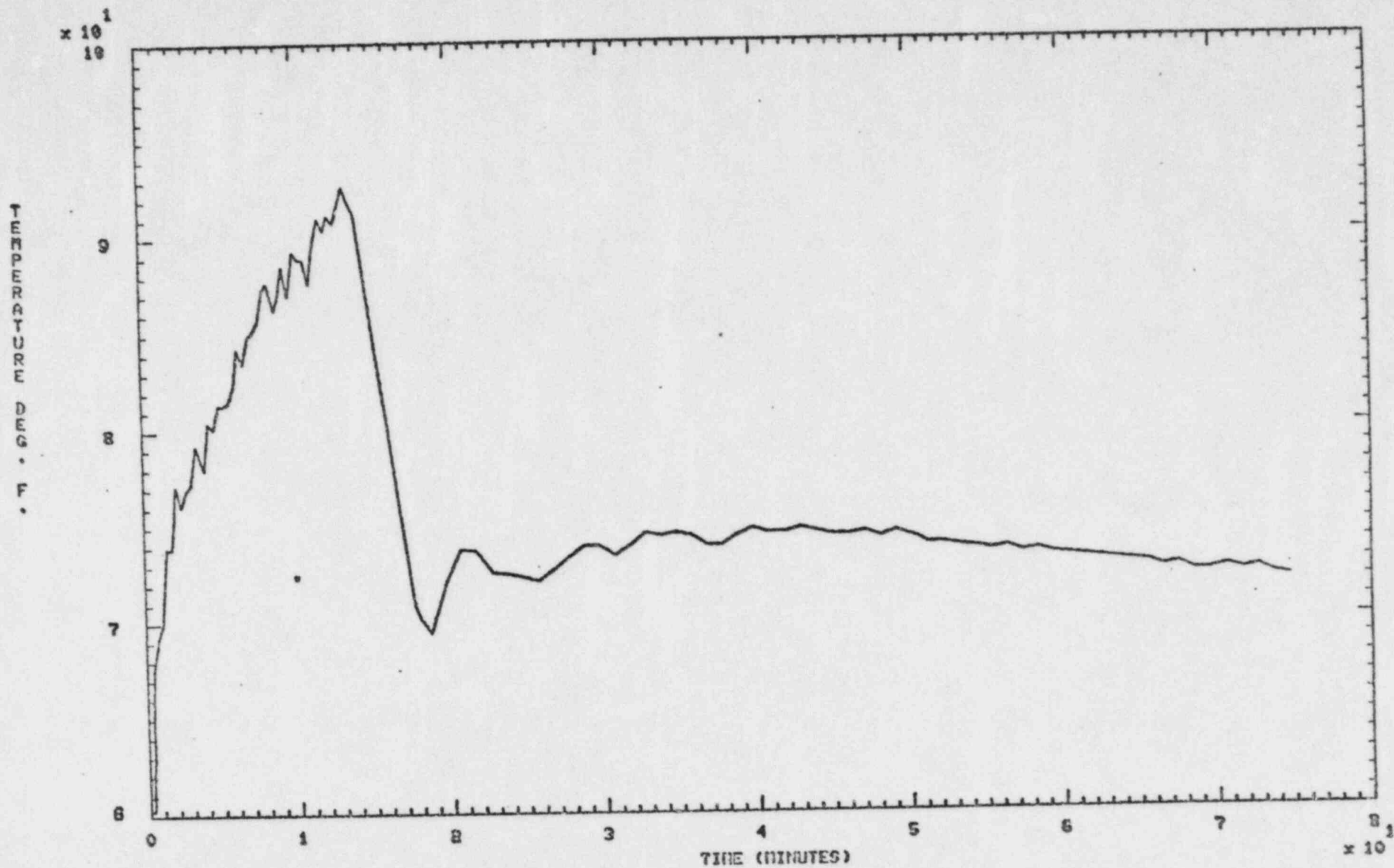
cc: Jim Redmond



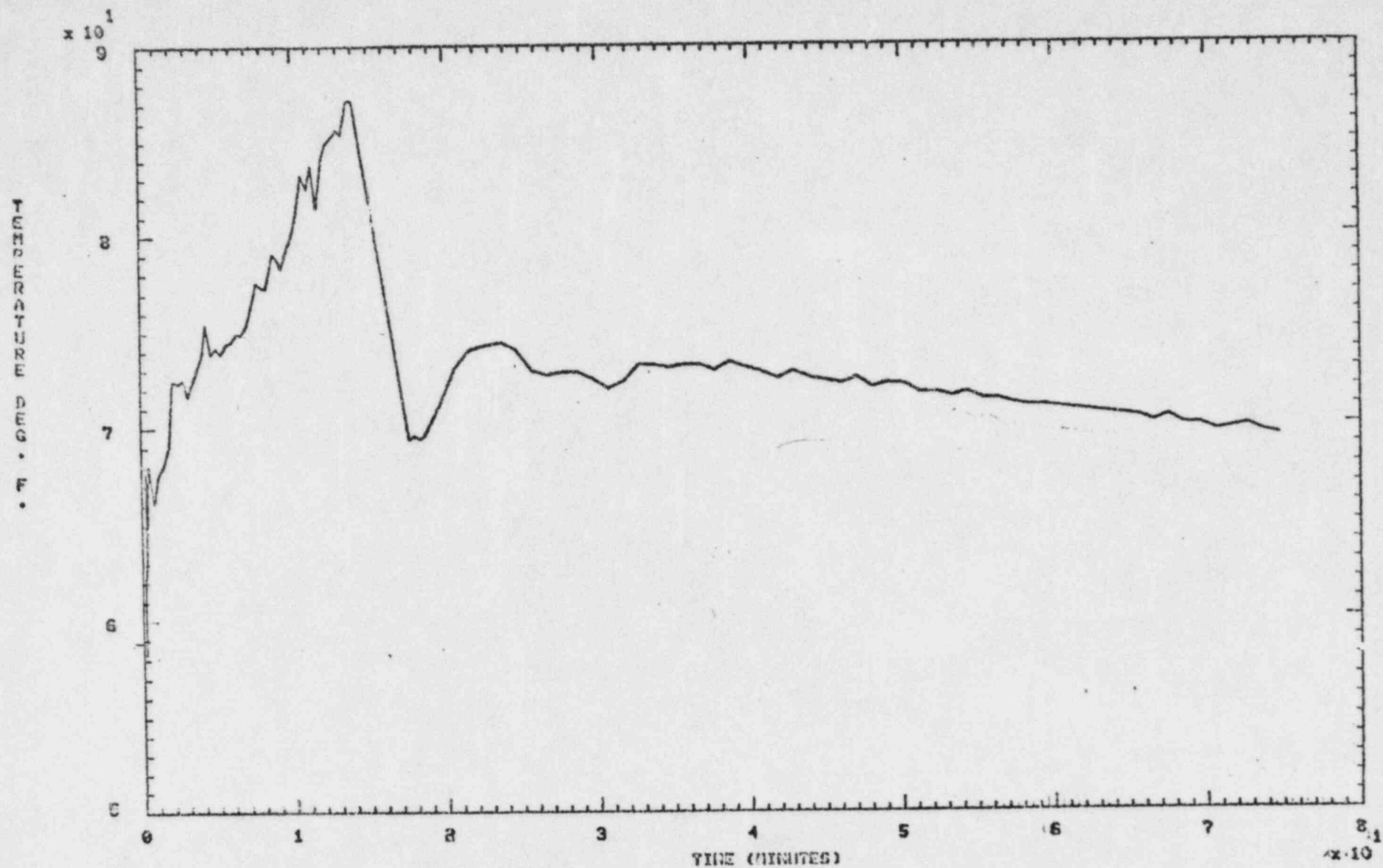
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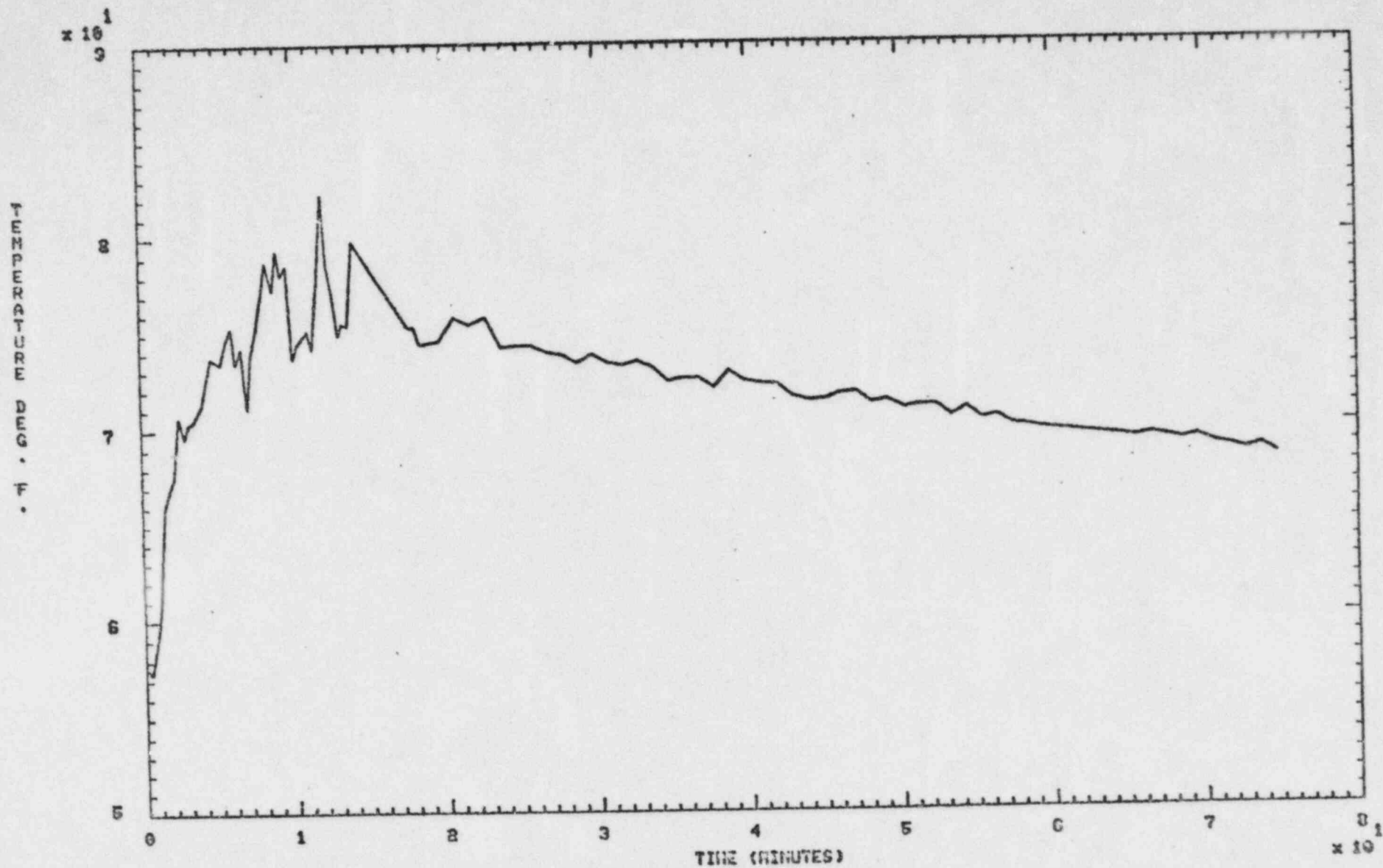
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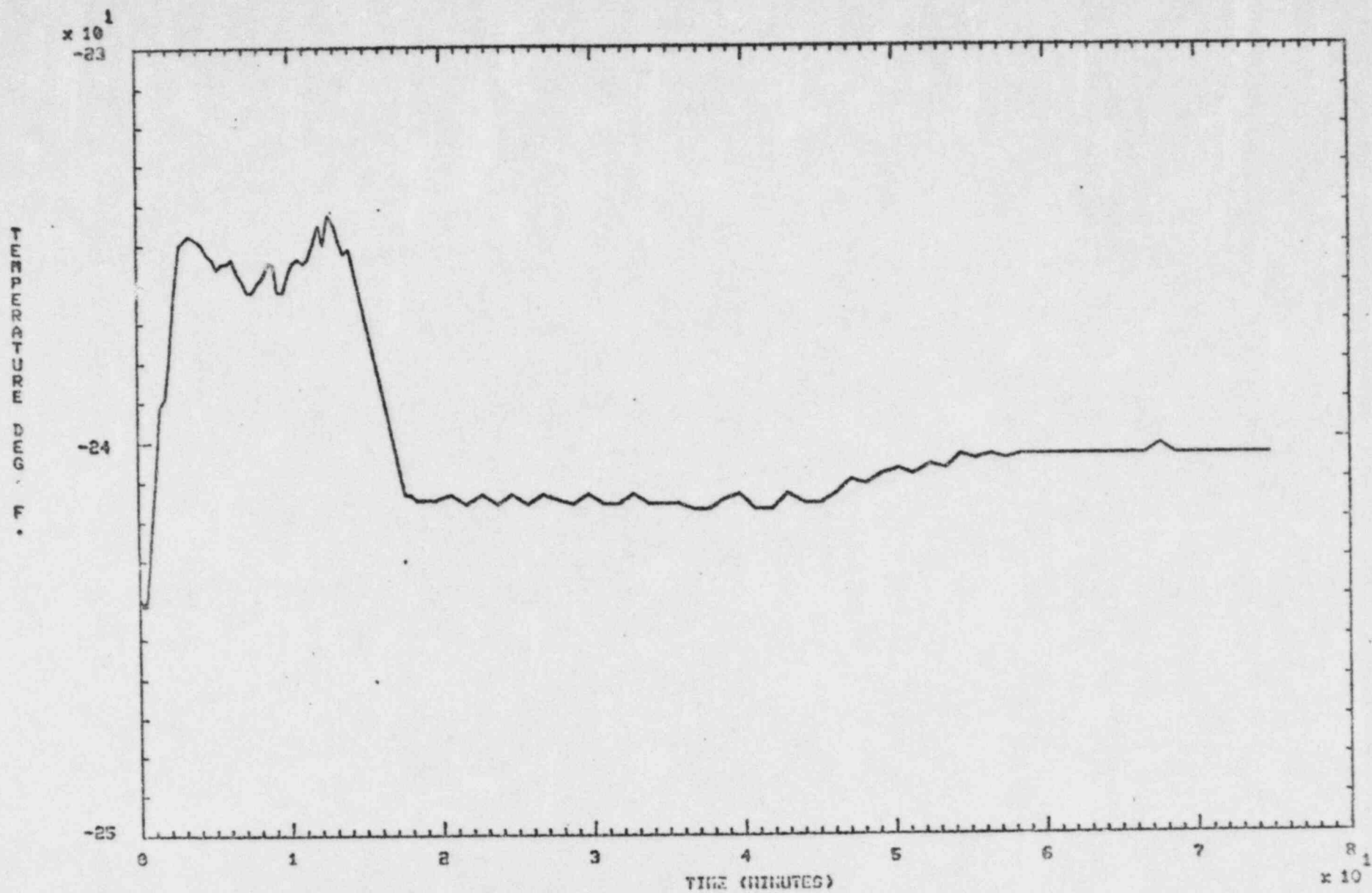
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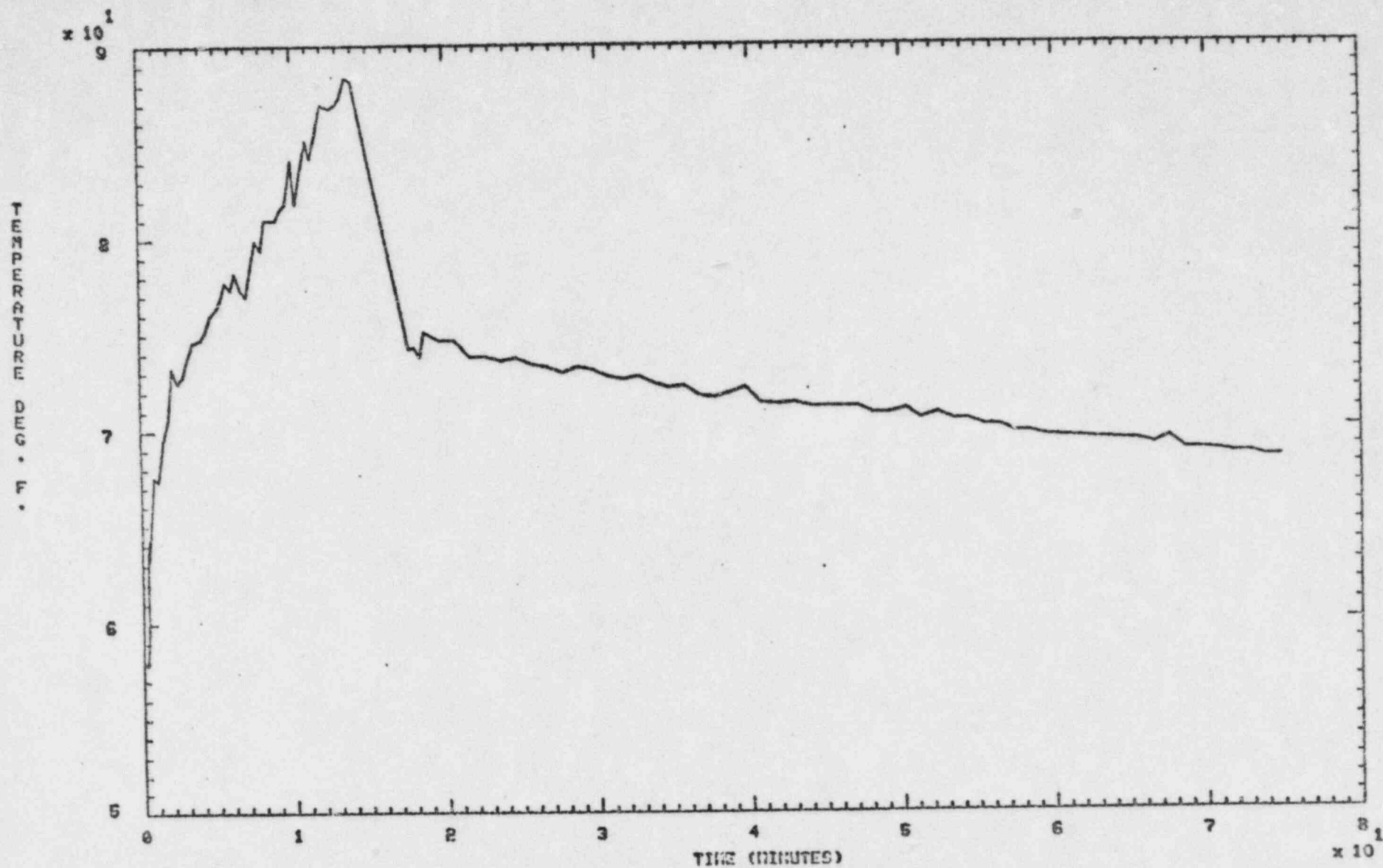
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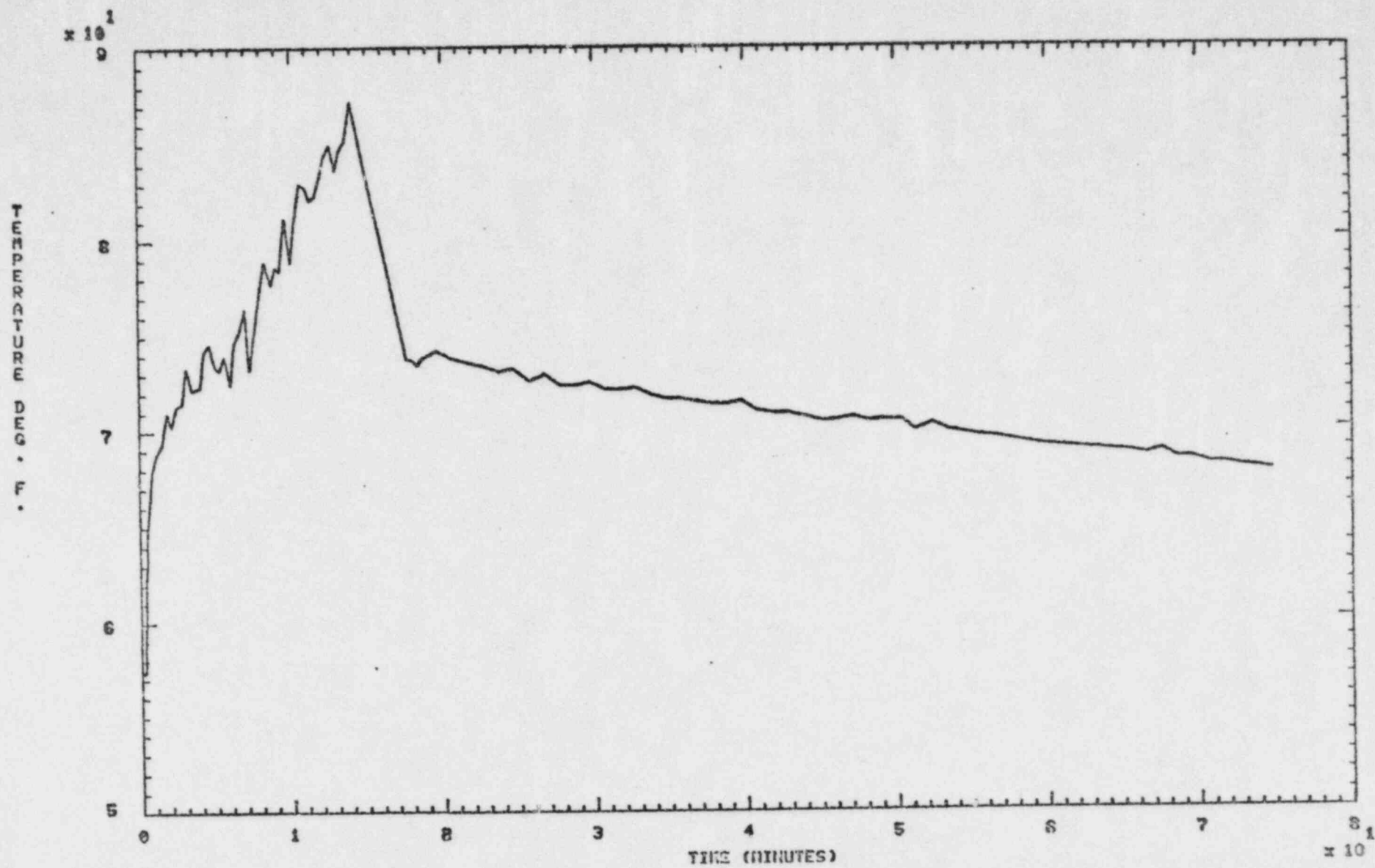
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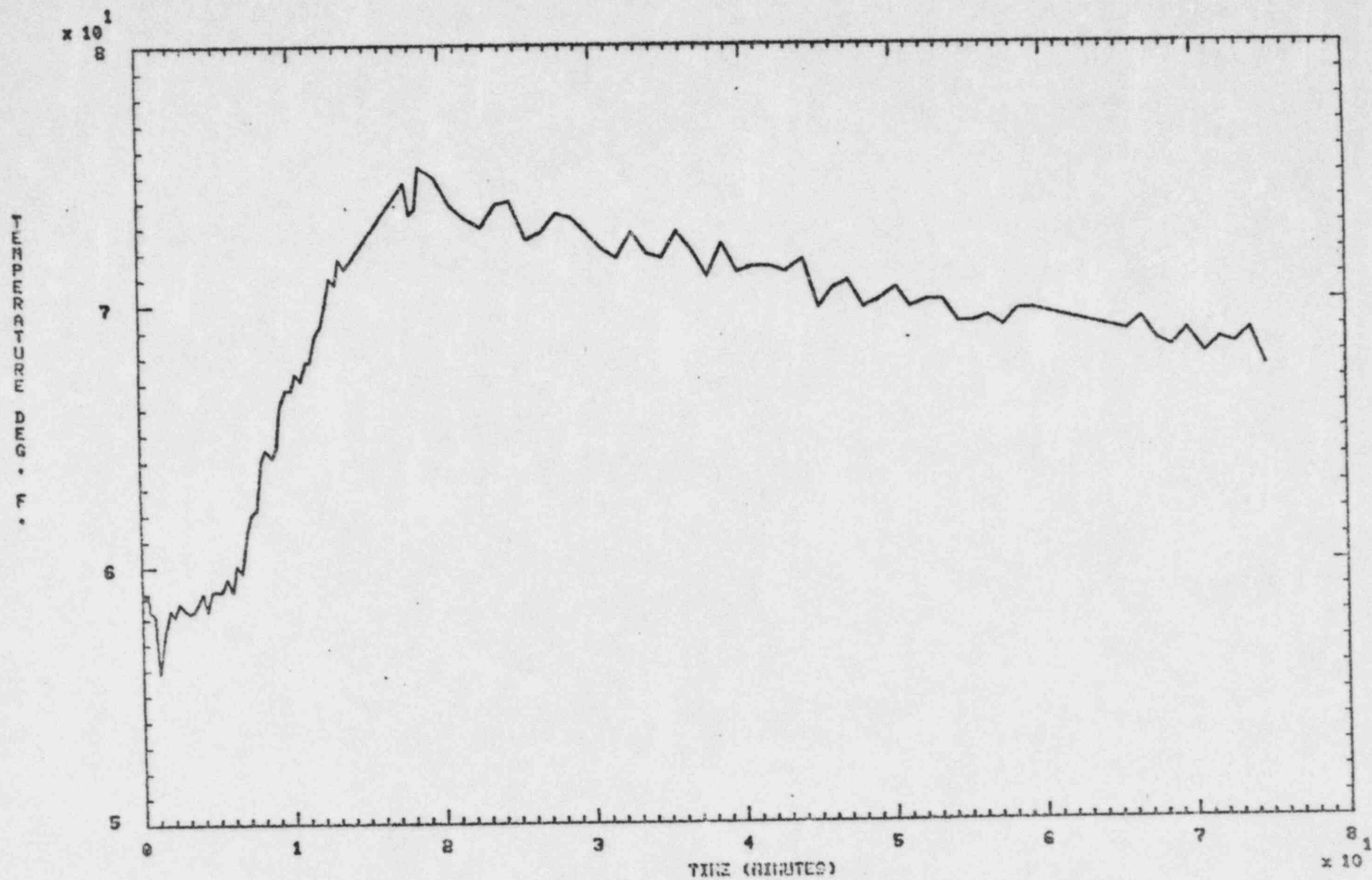
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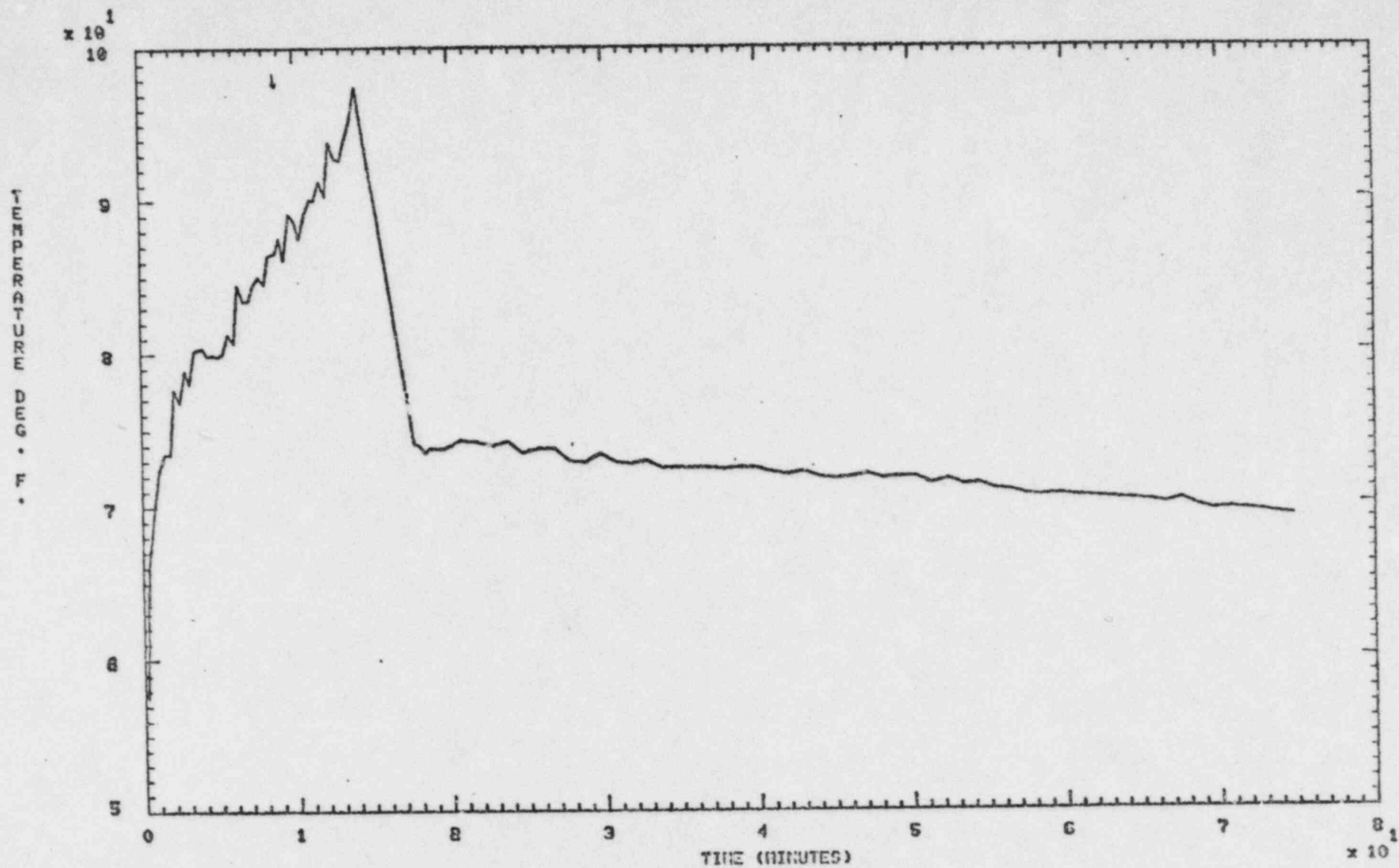
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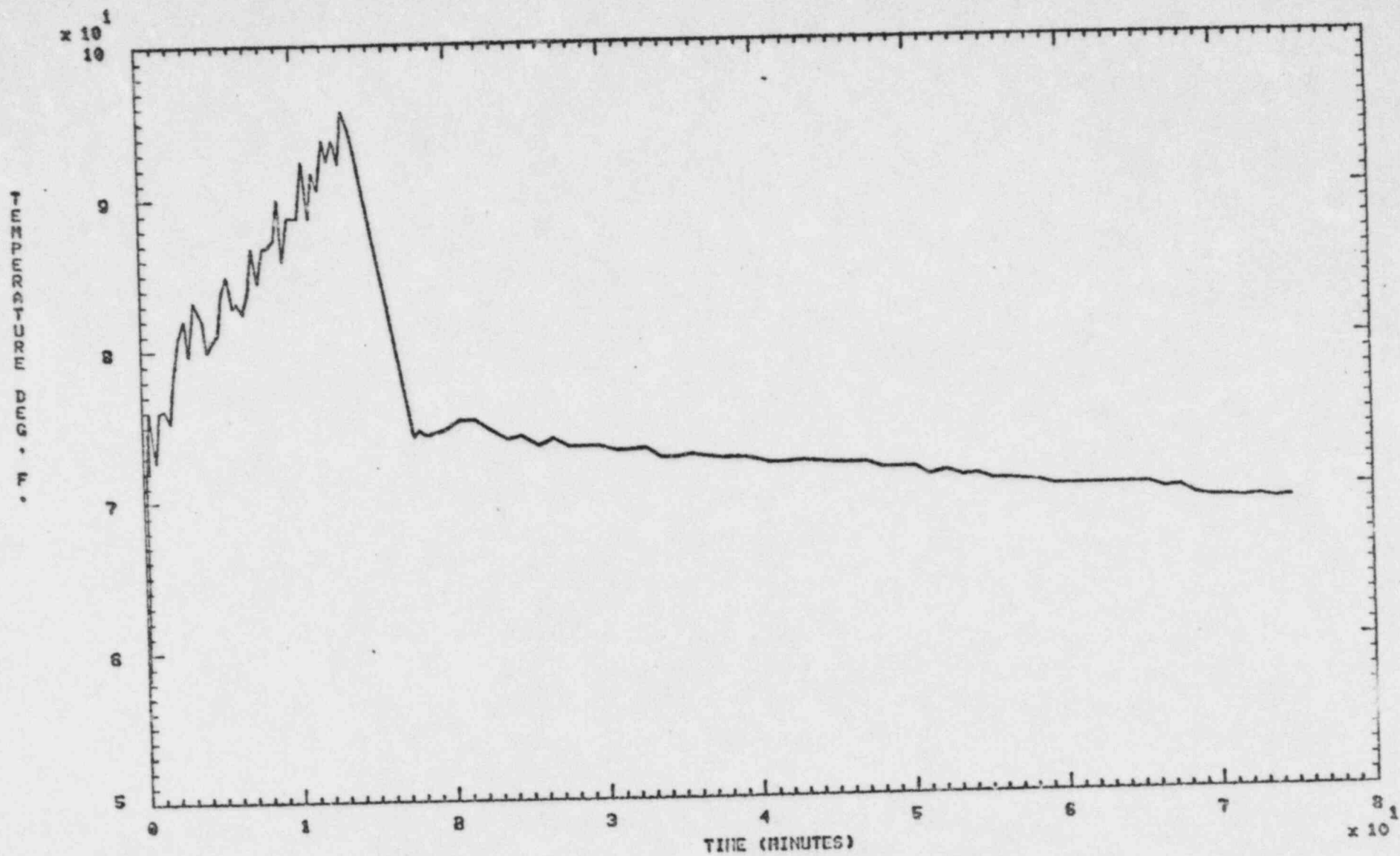
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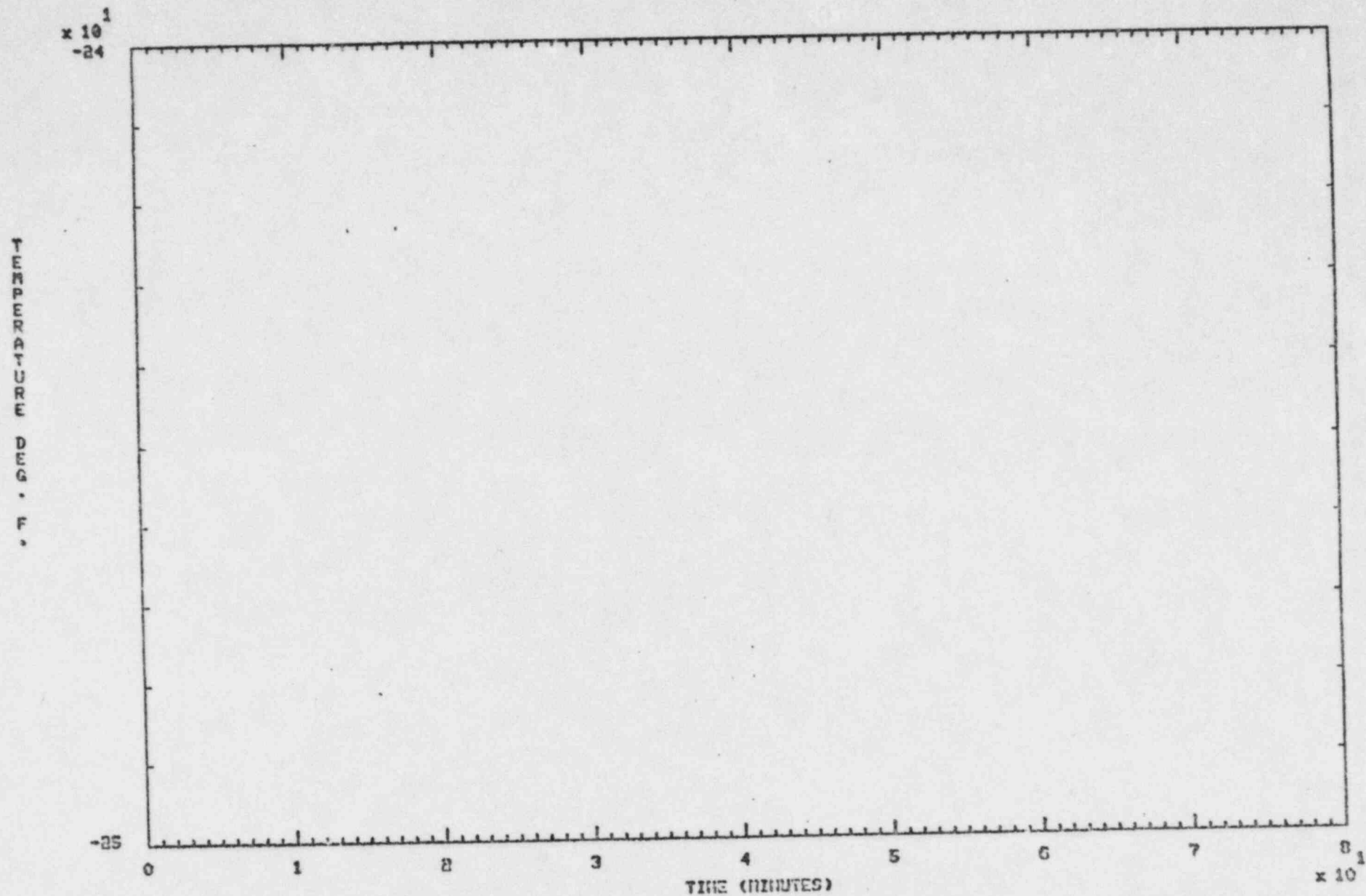
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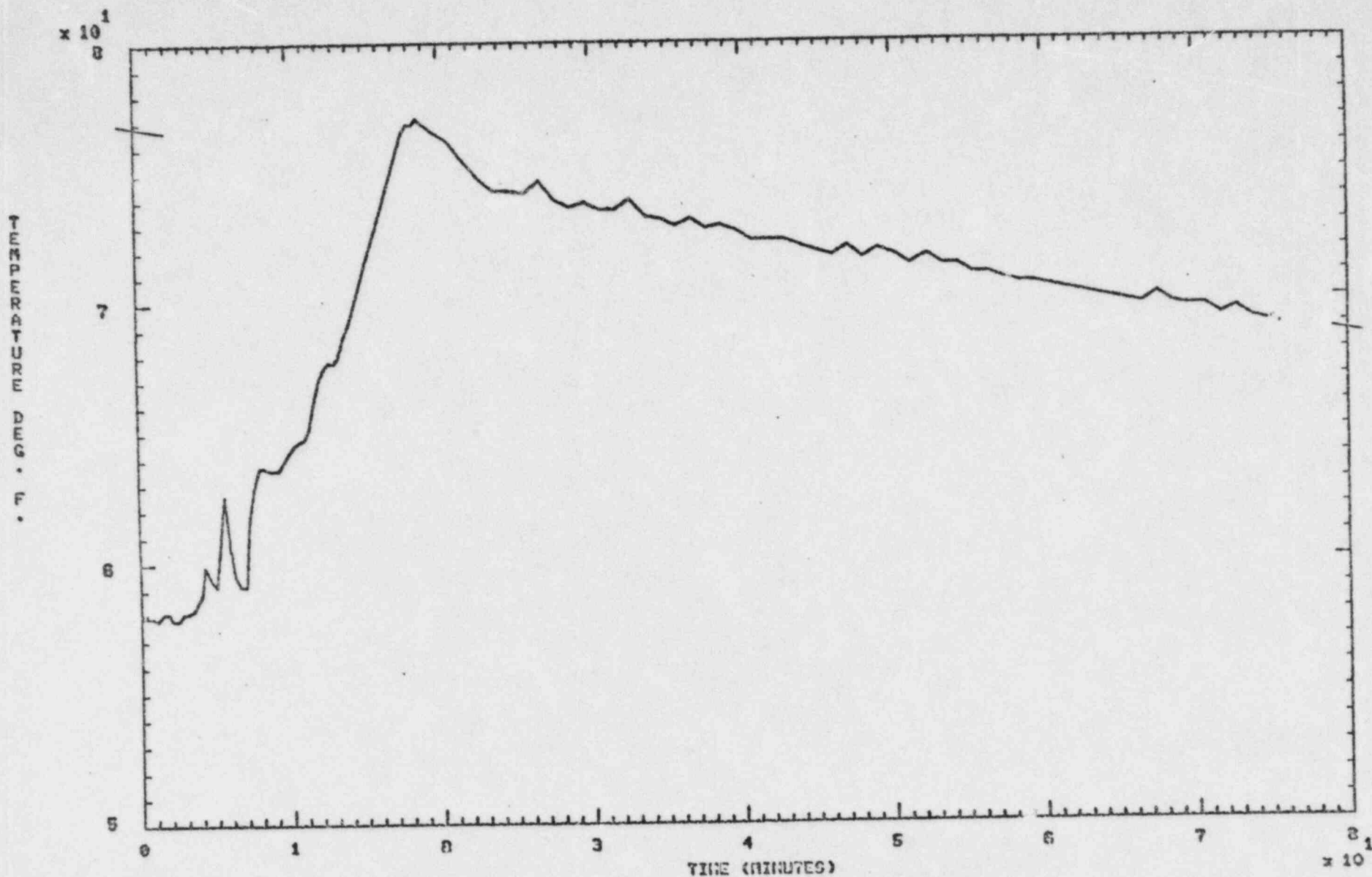
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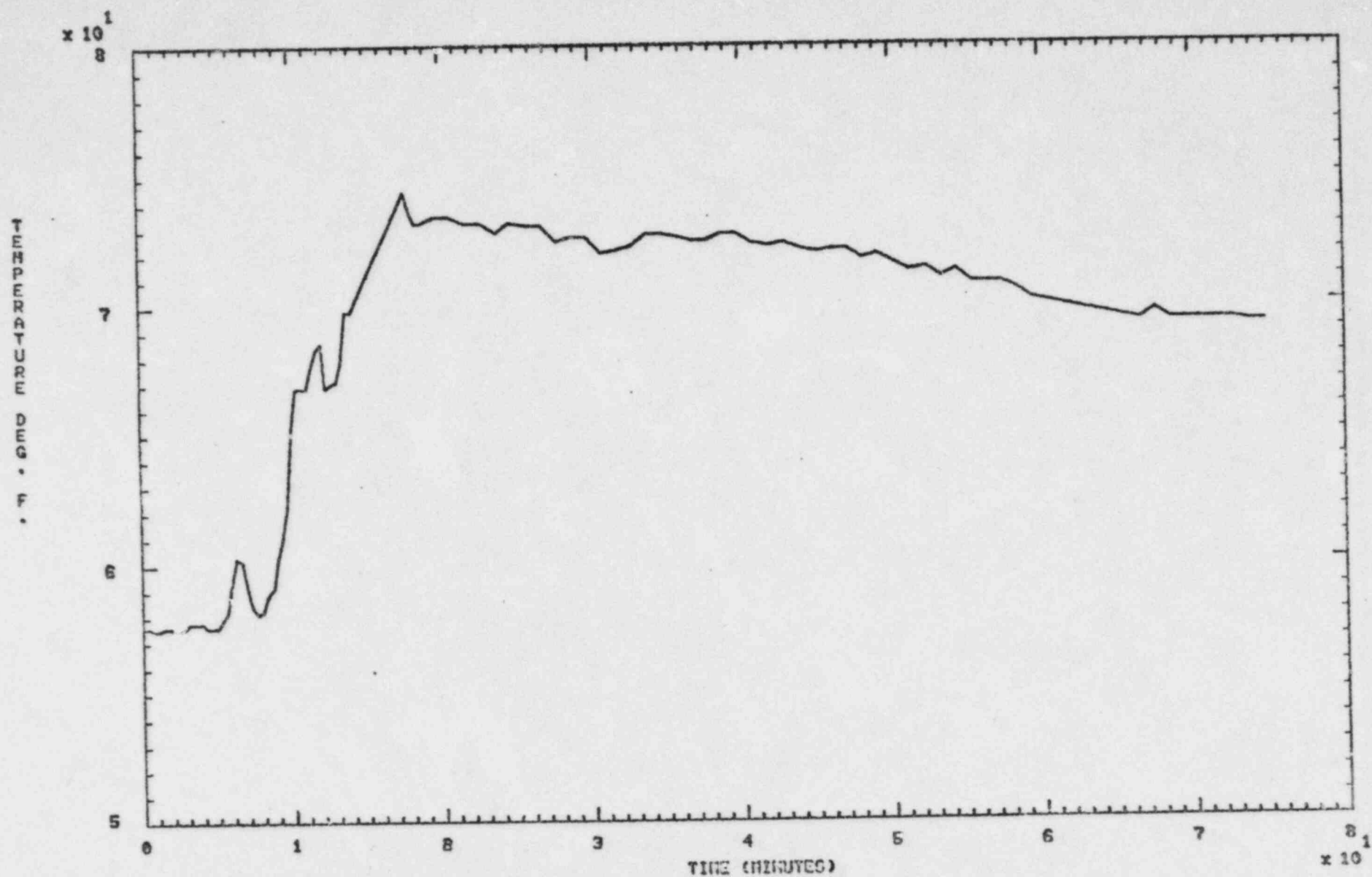
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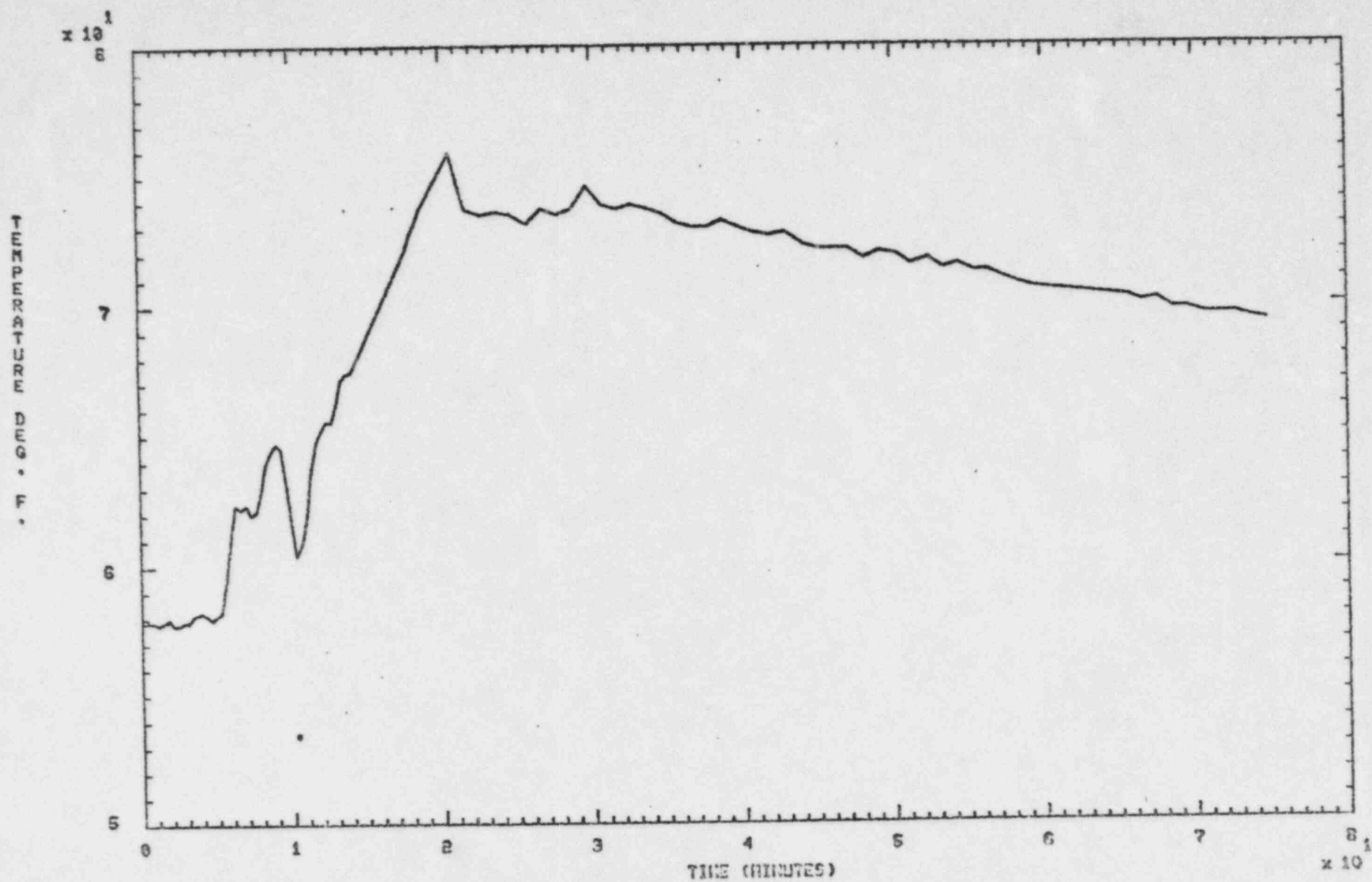
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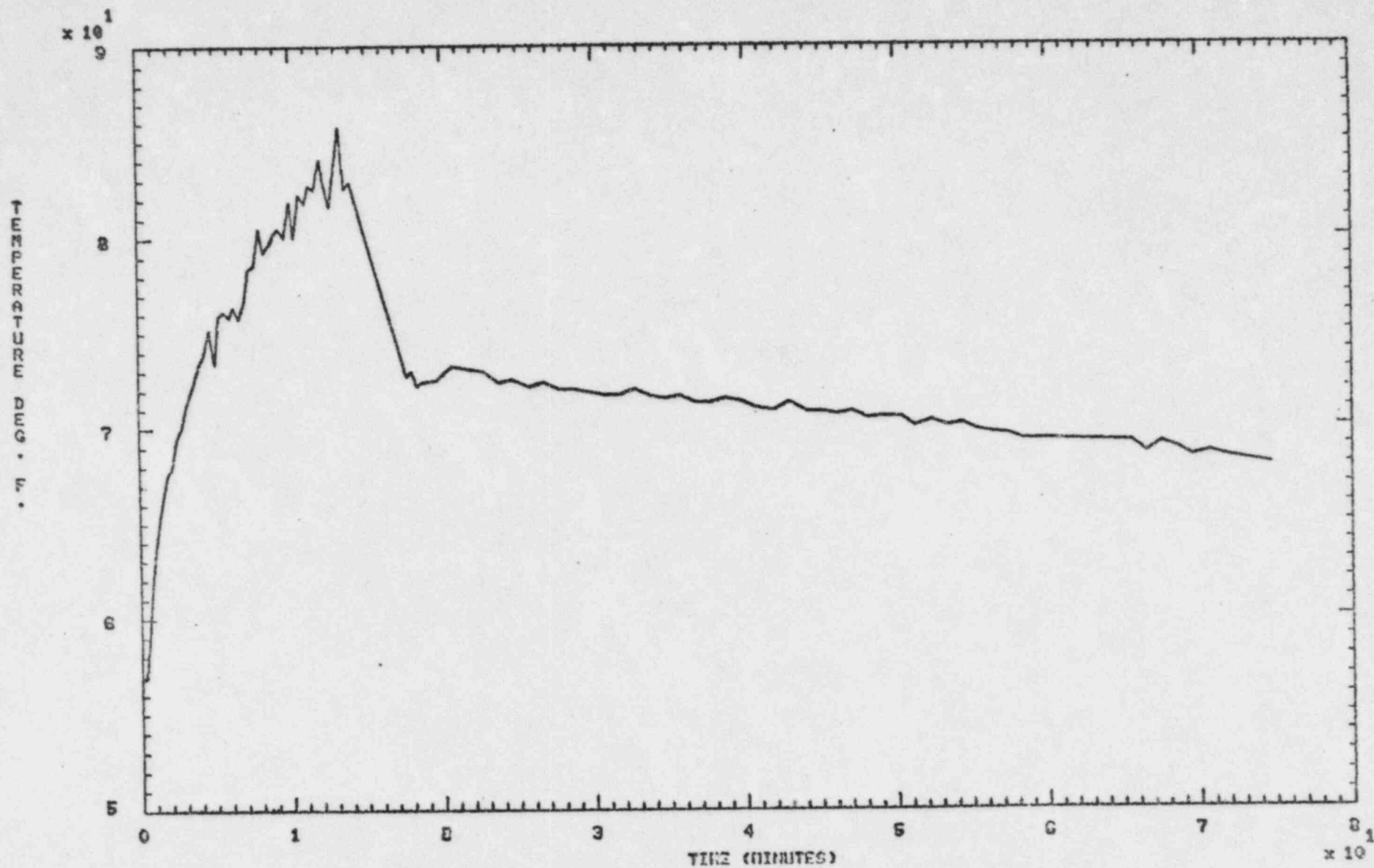
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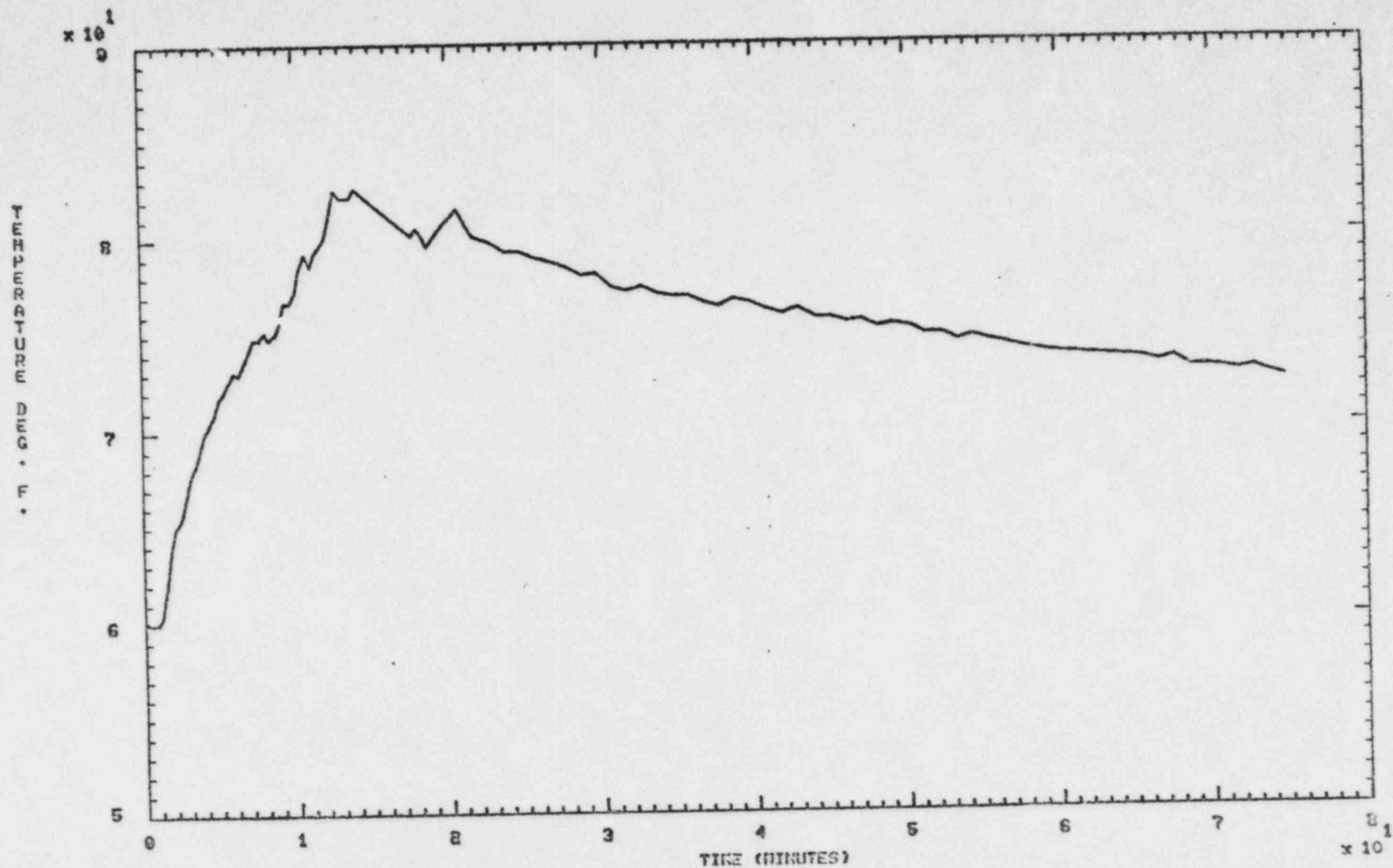
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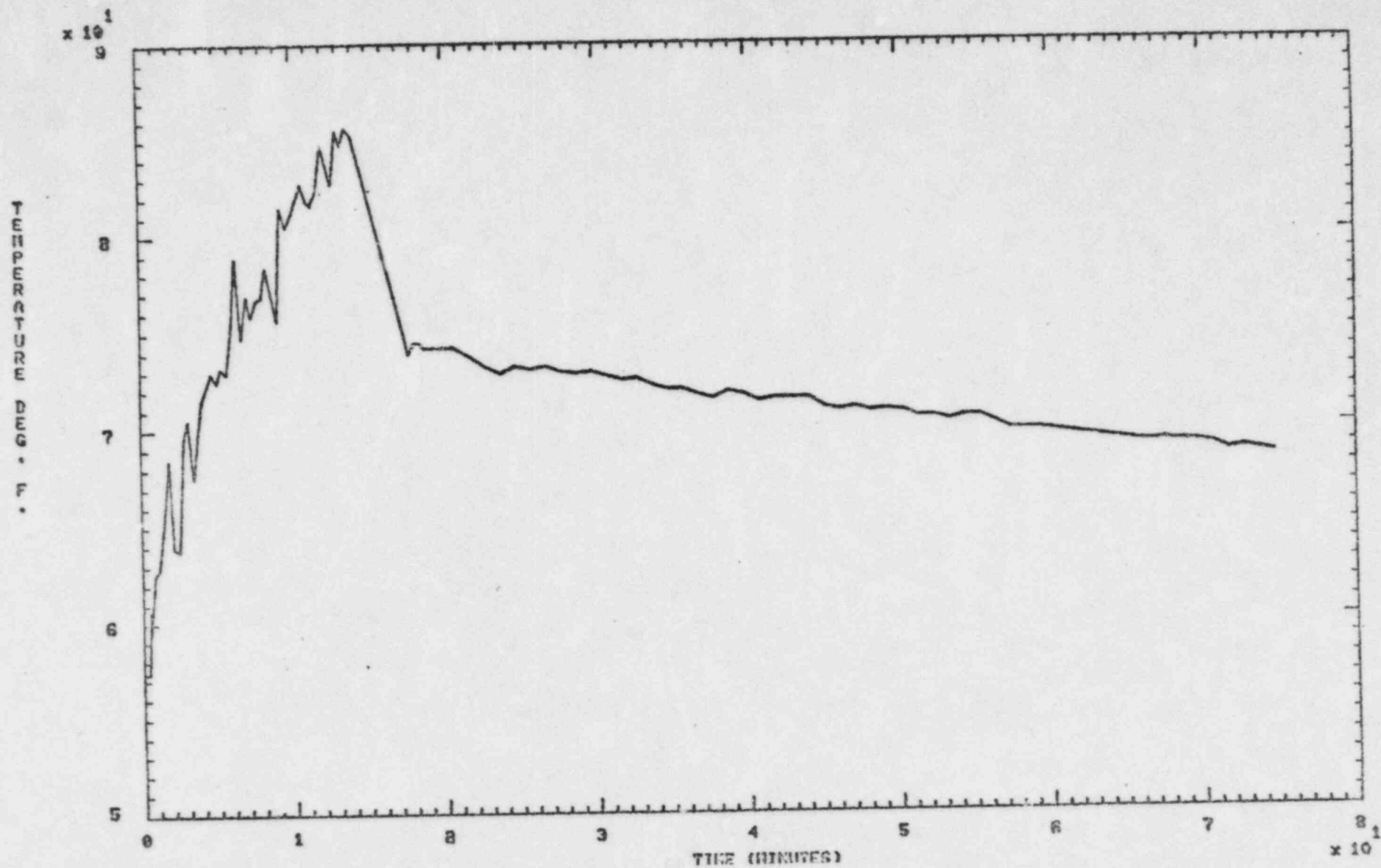
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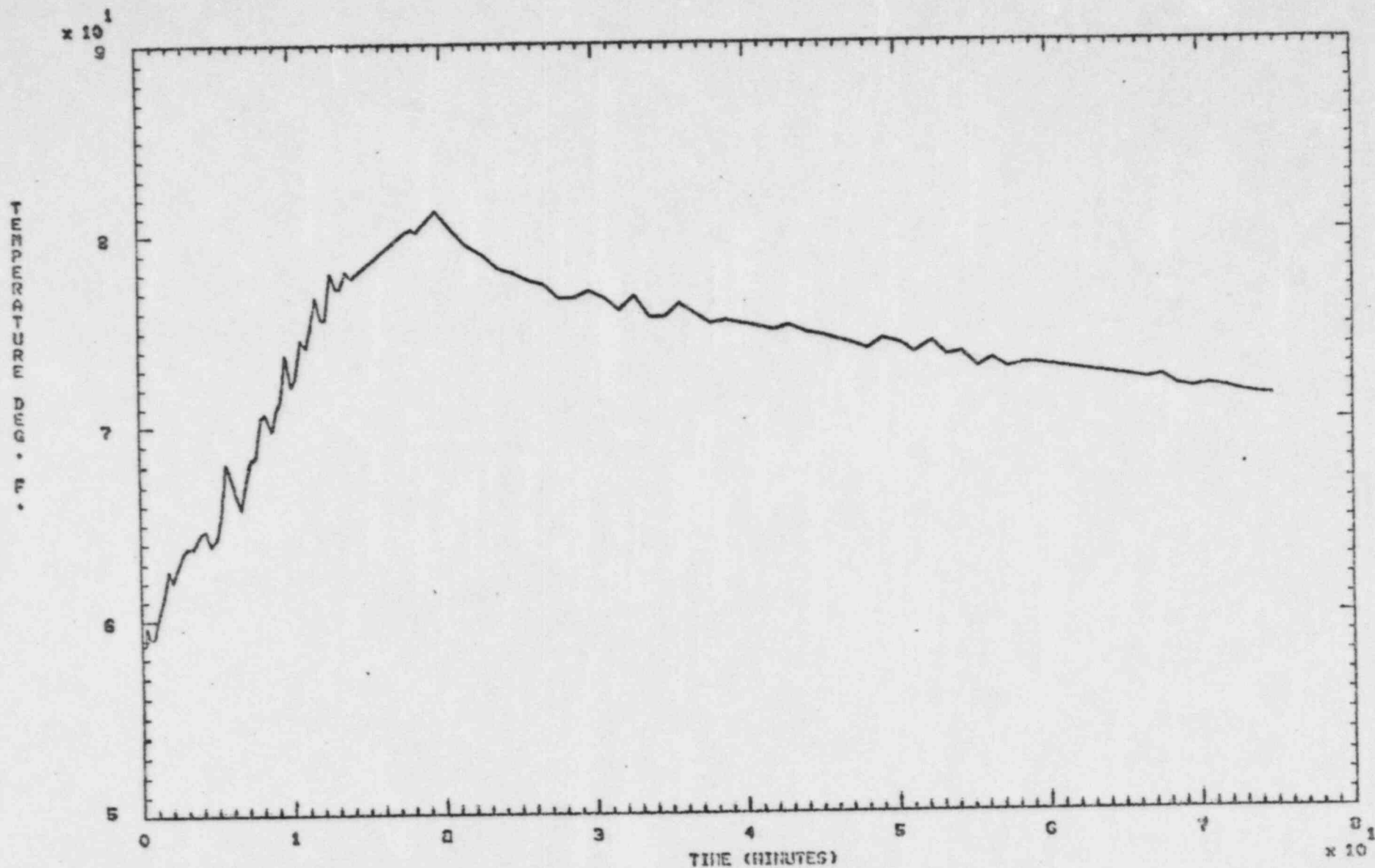
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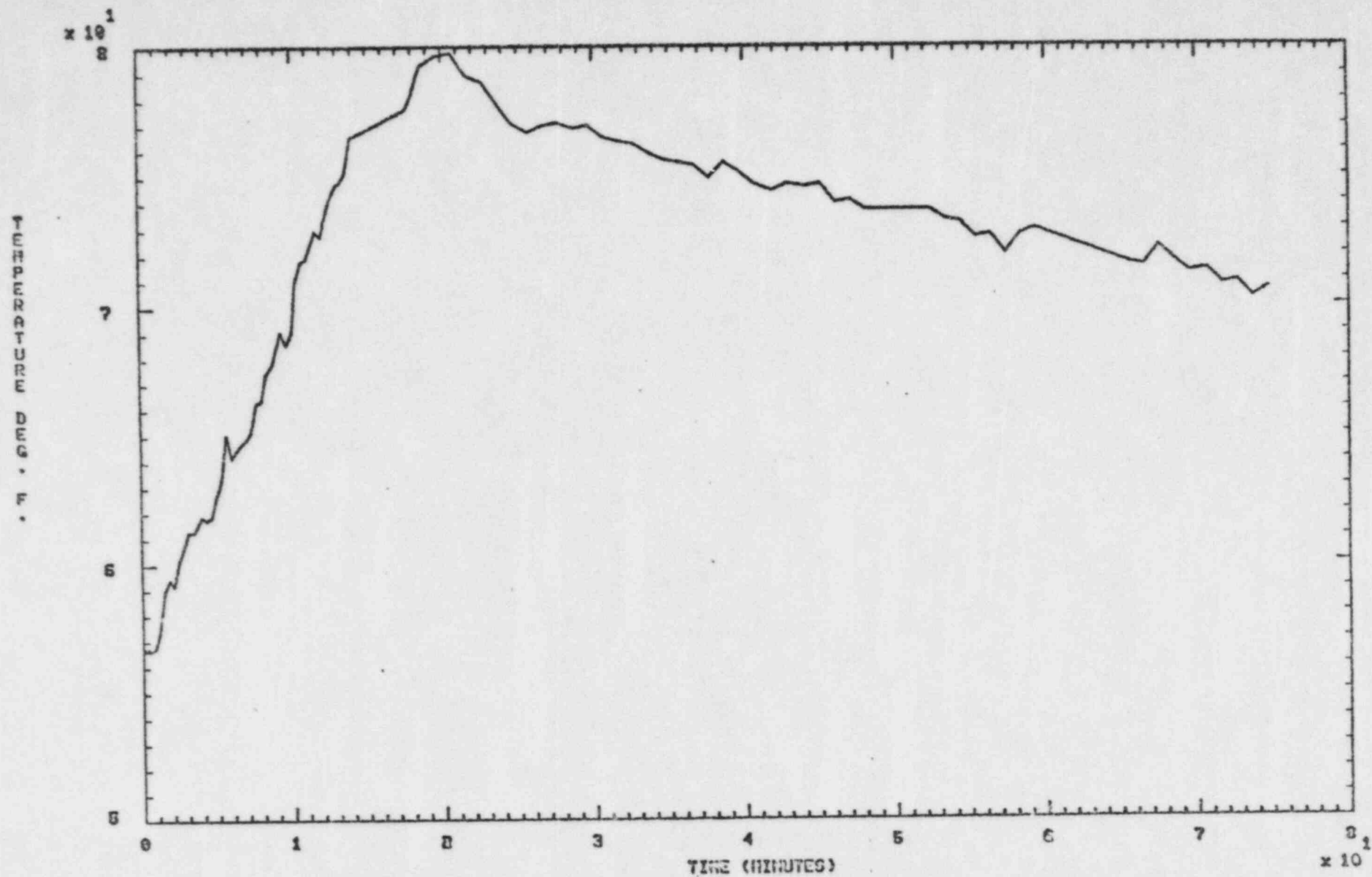
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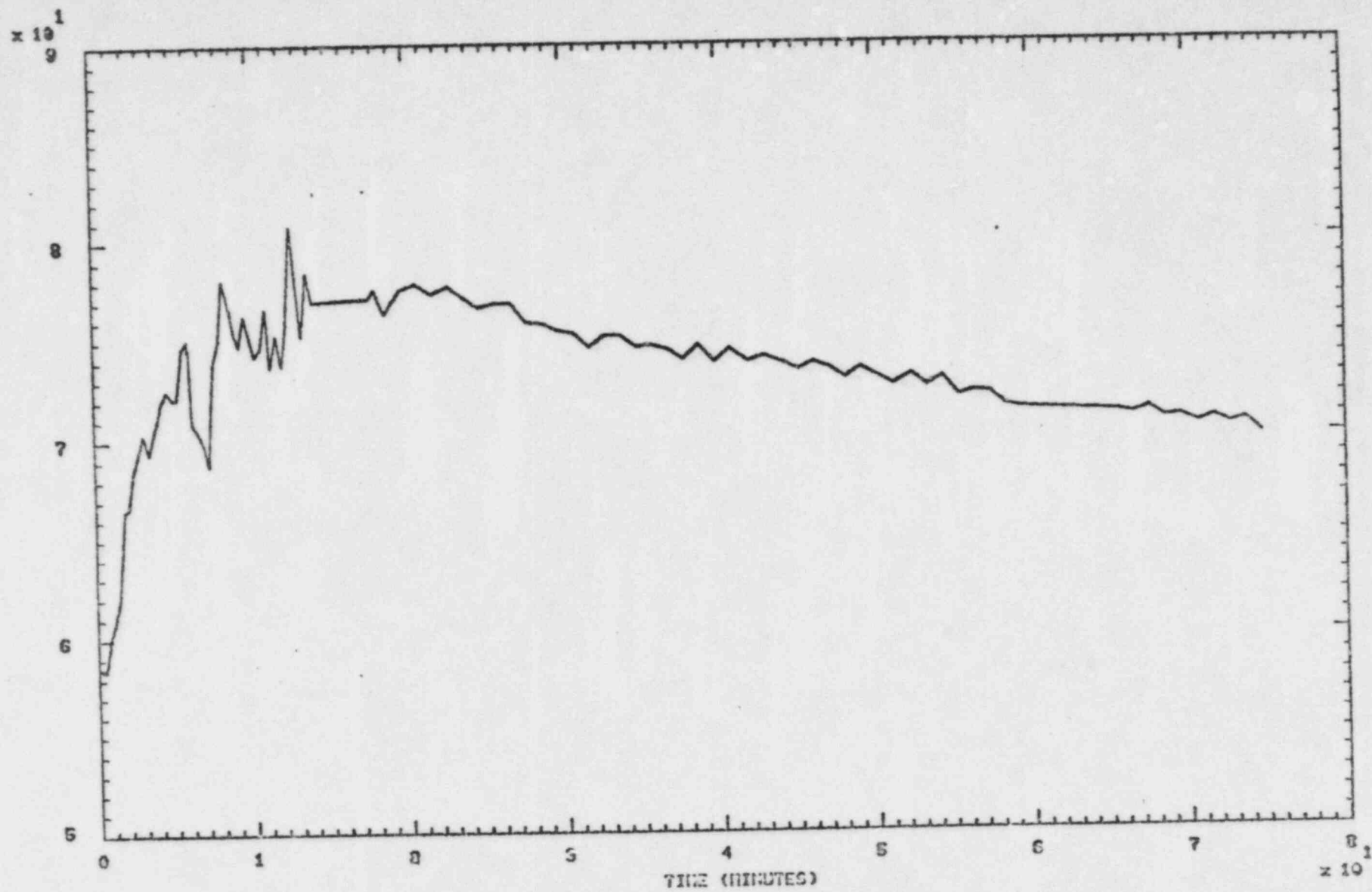


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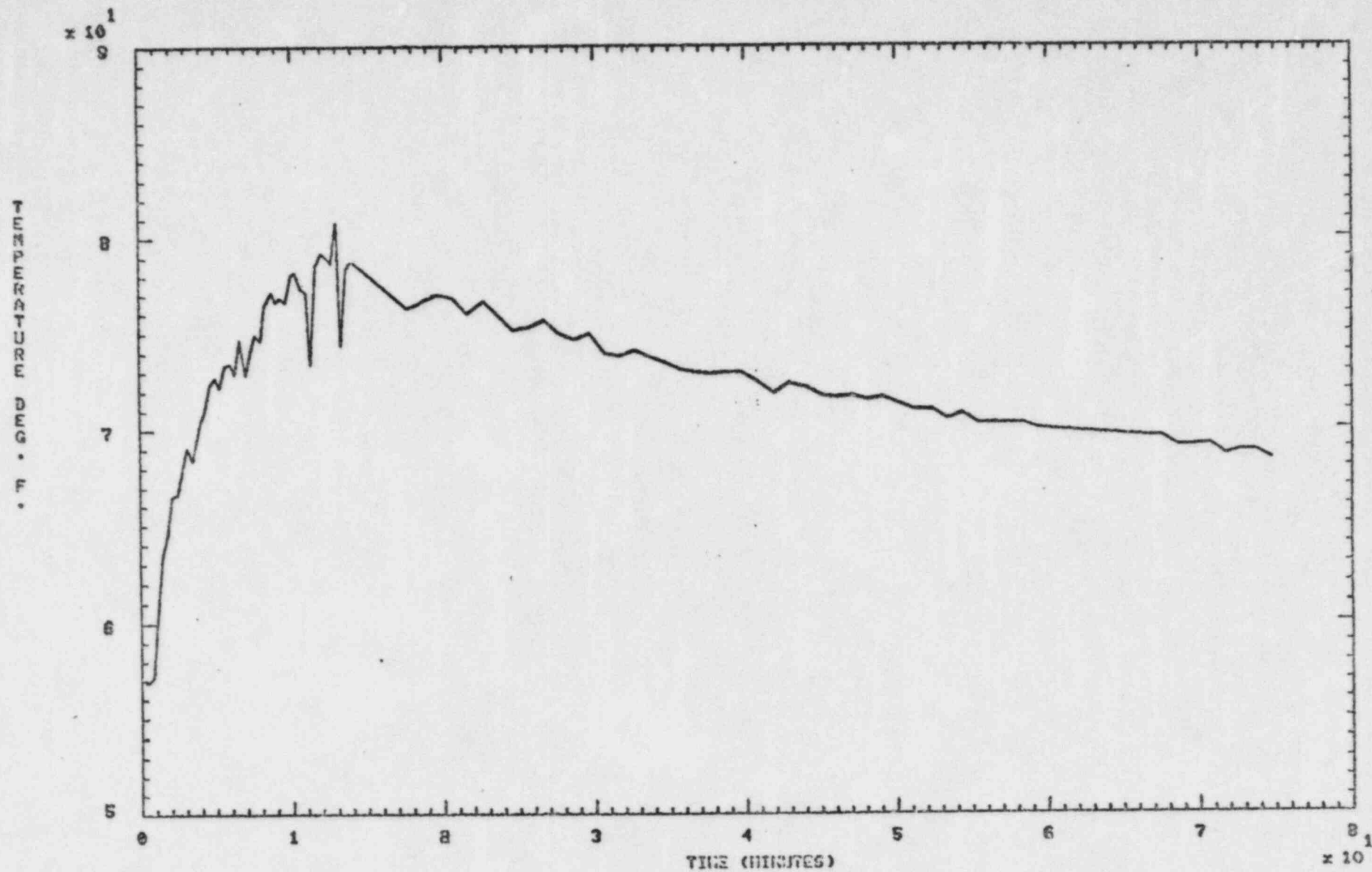


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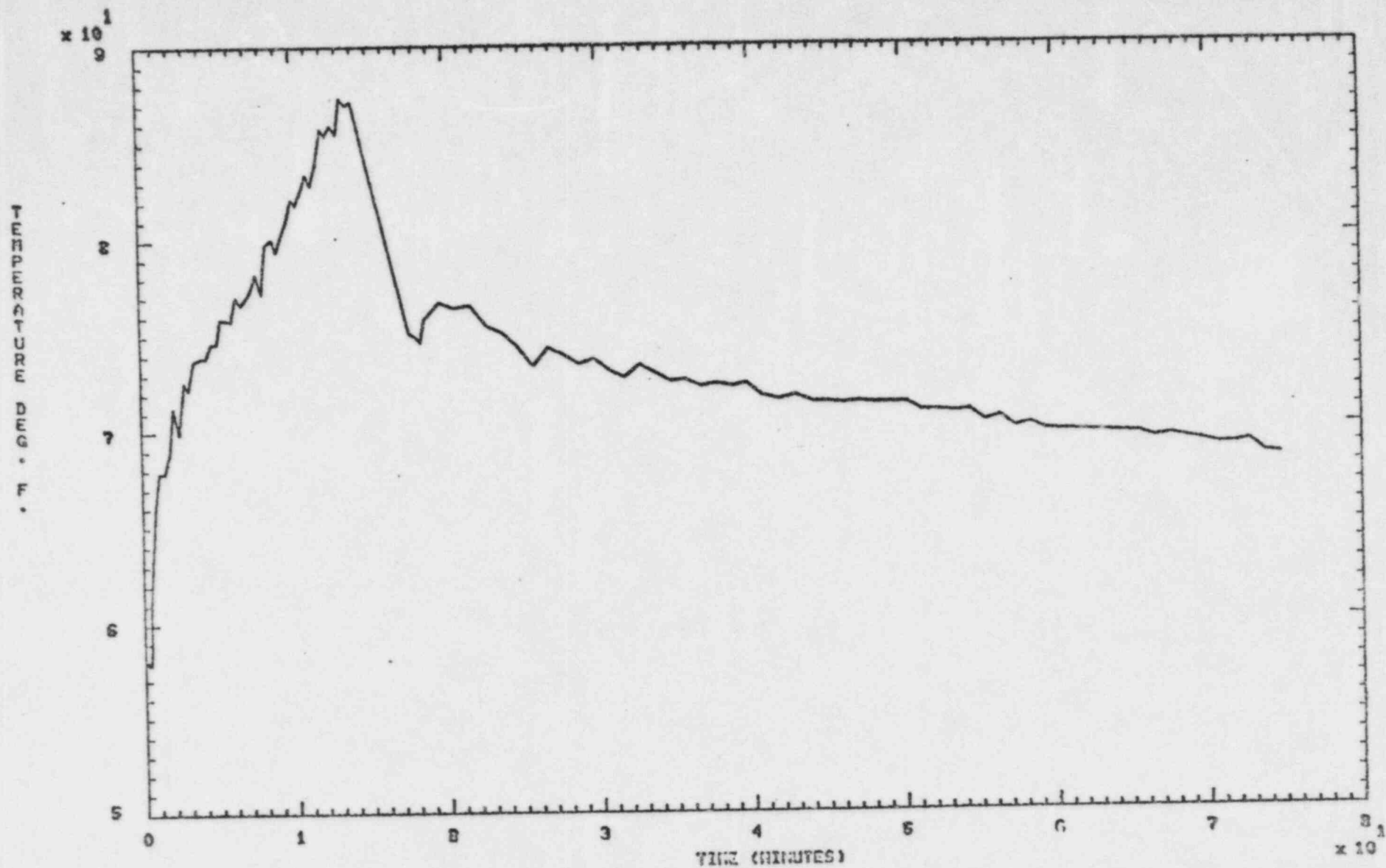
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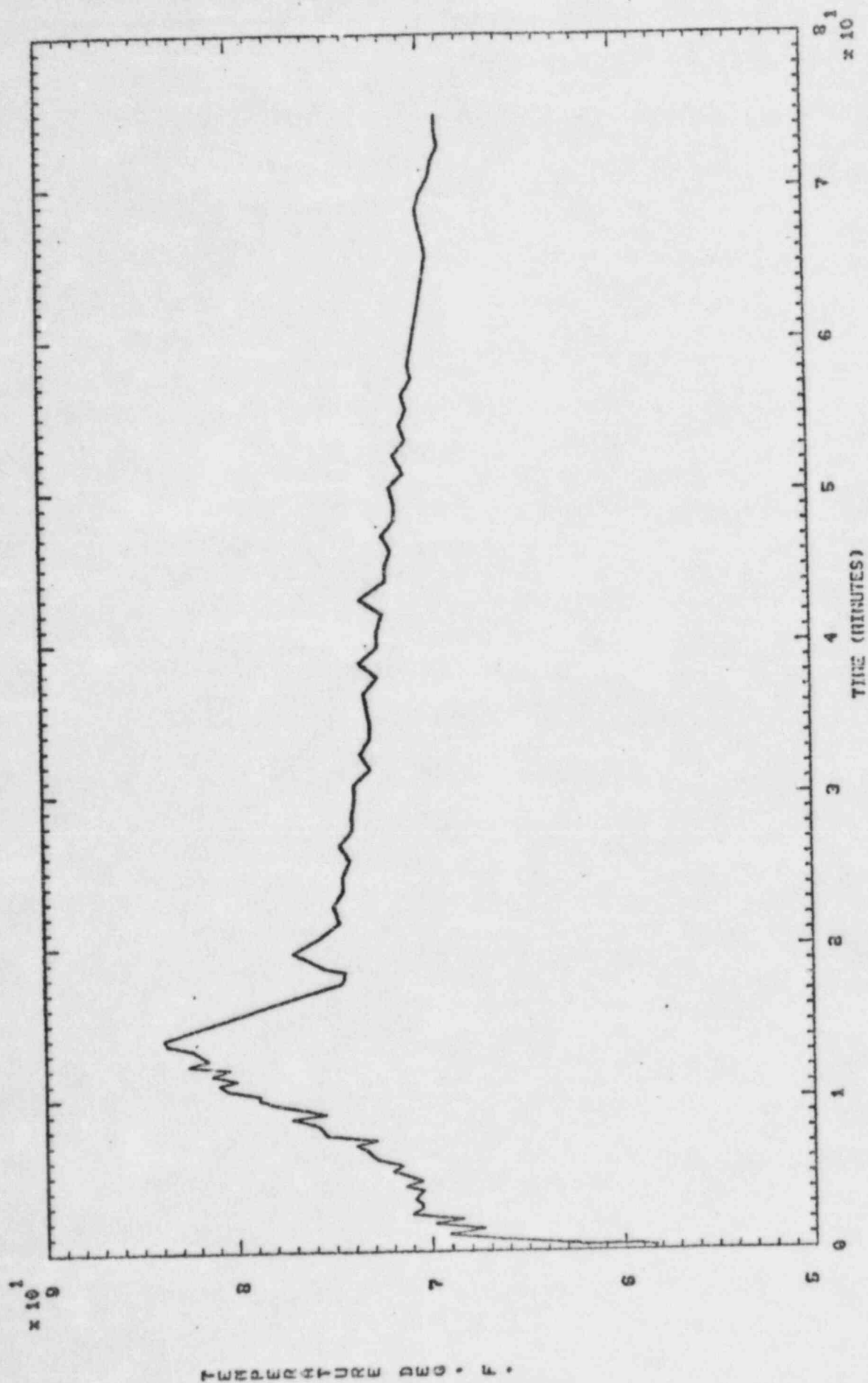
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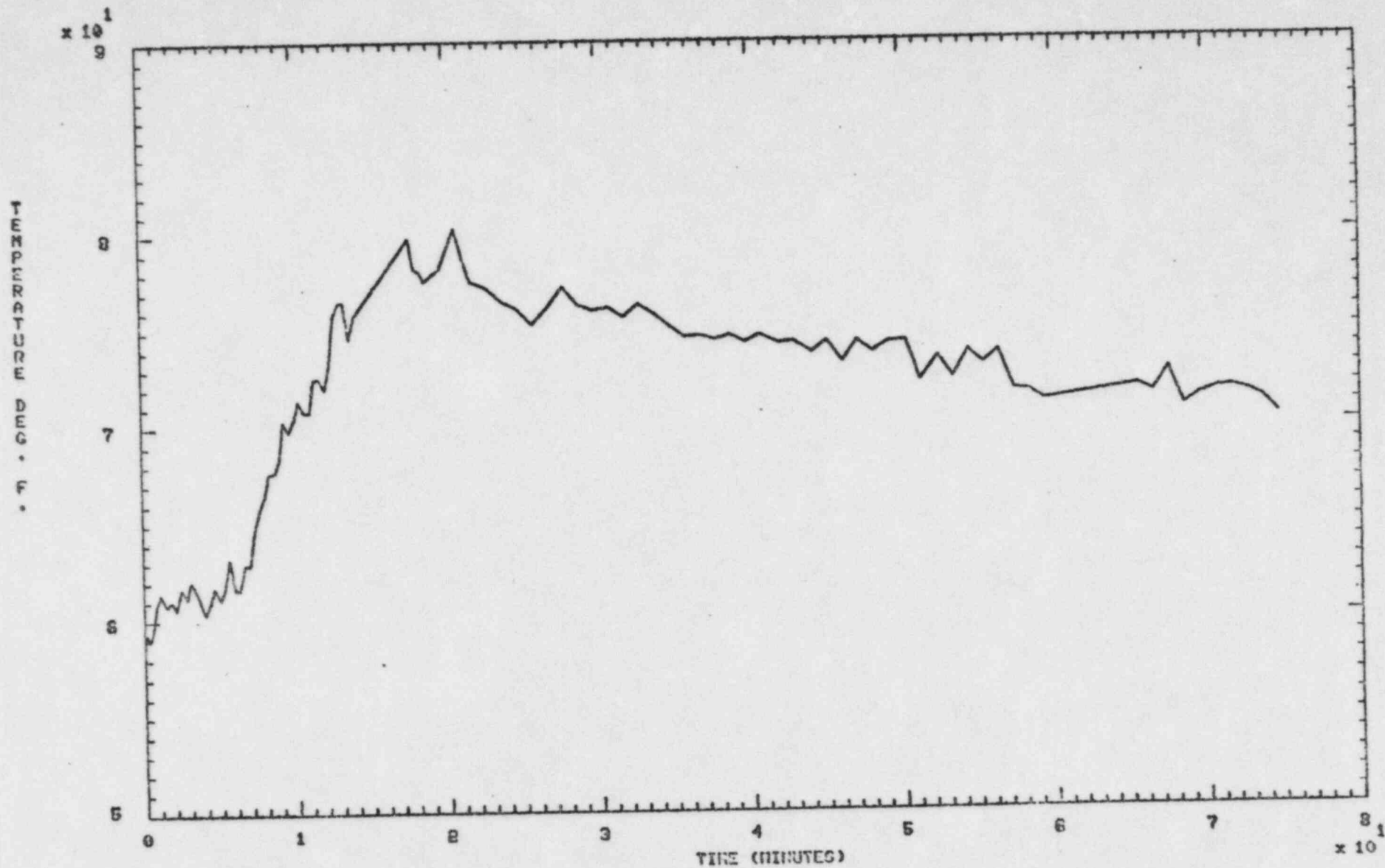


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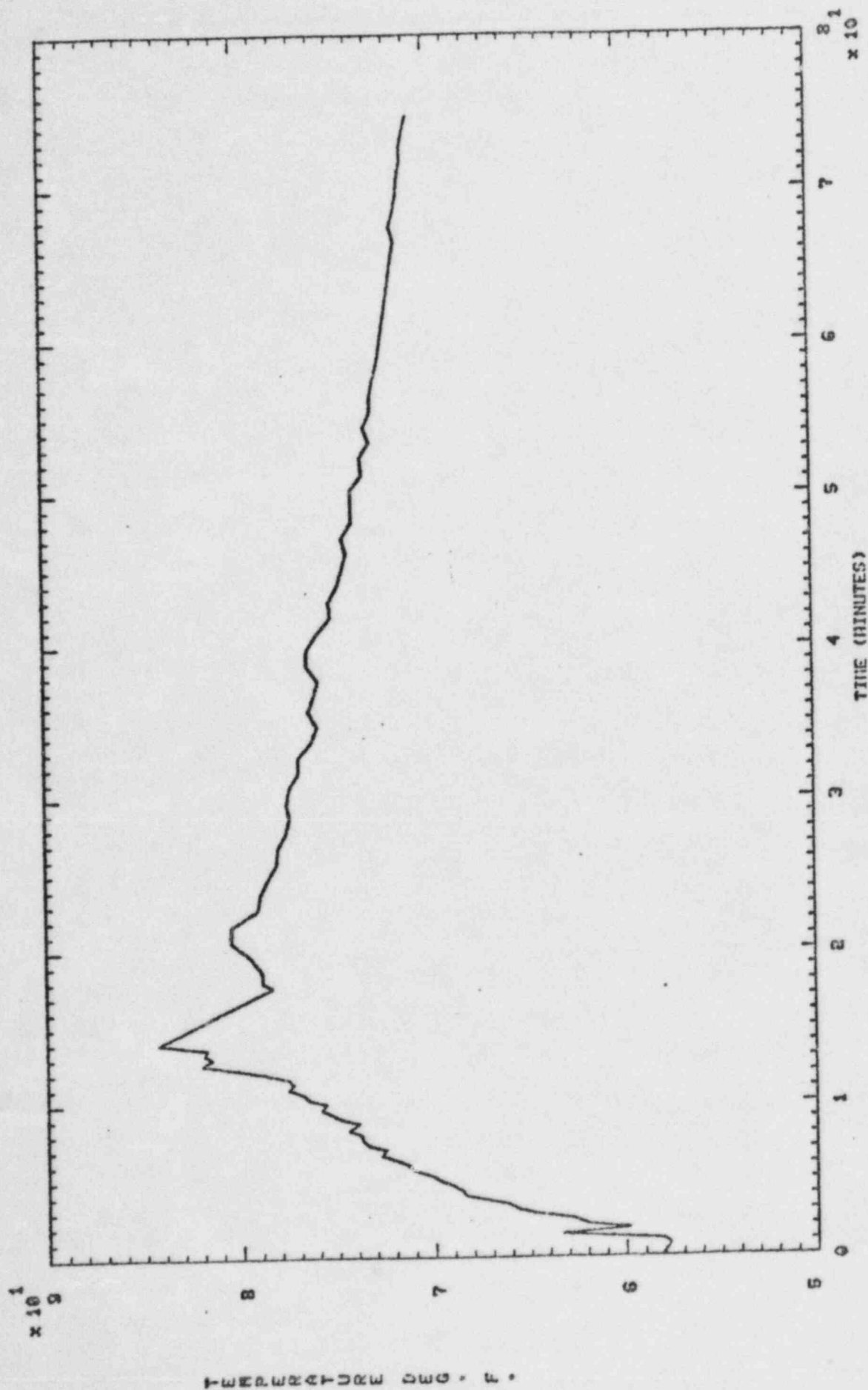


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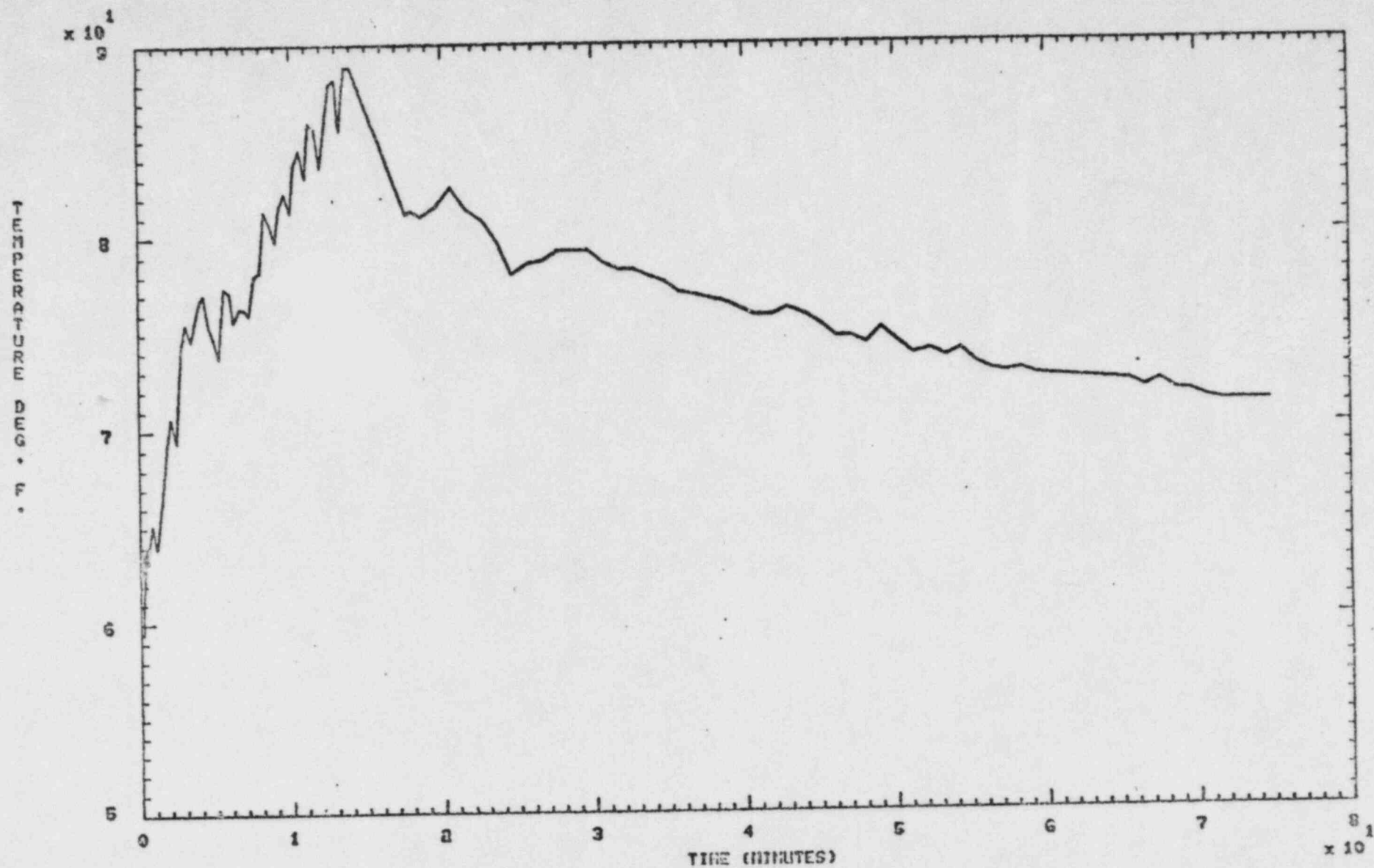
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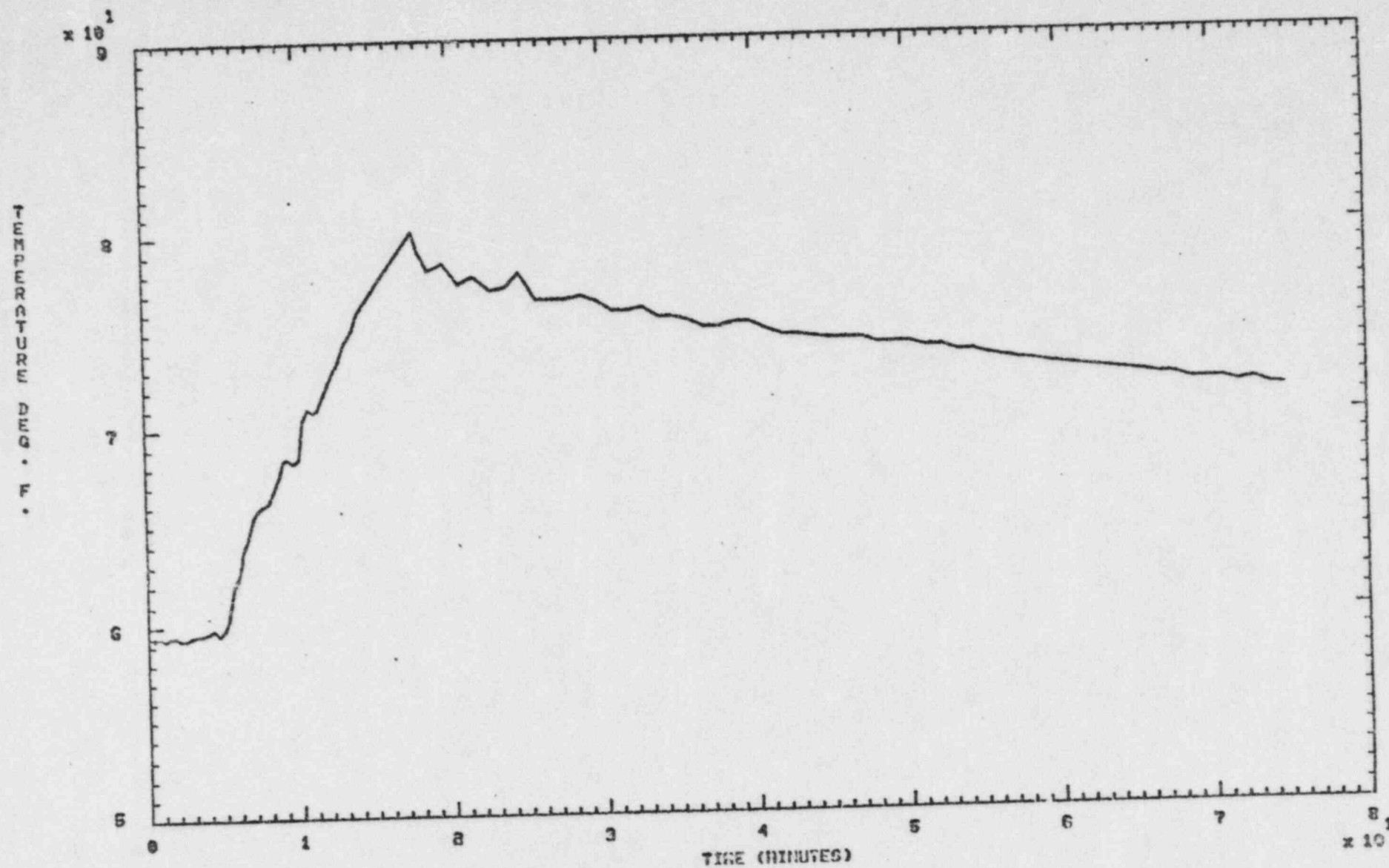
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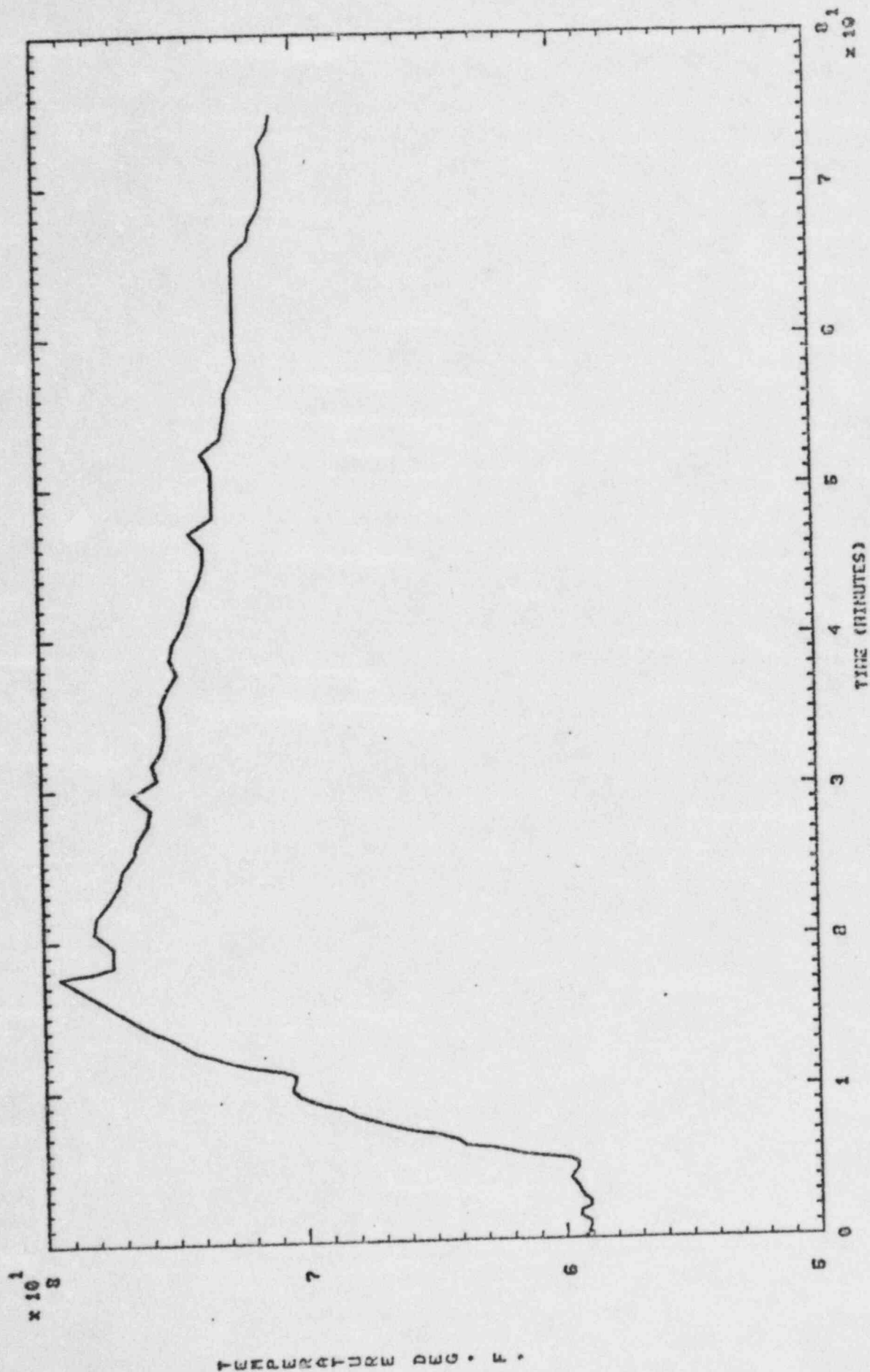
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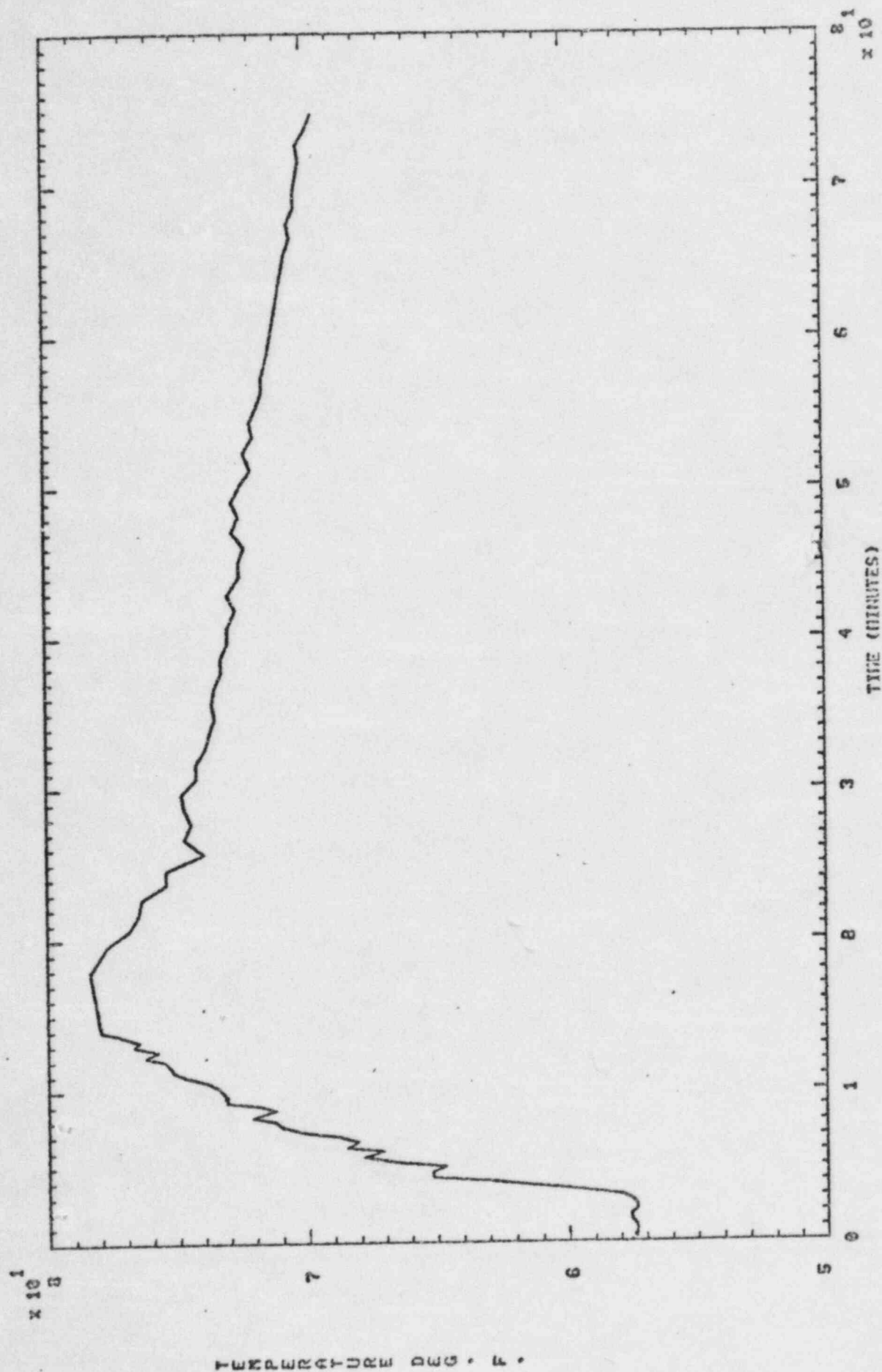
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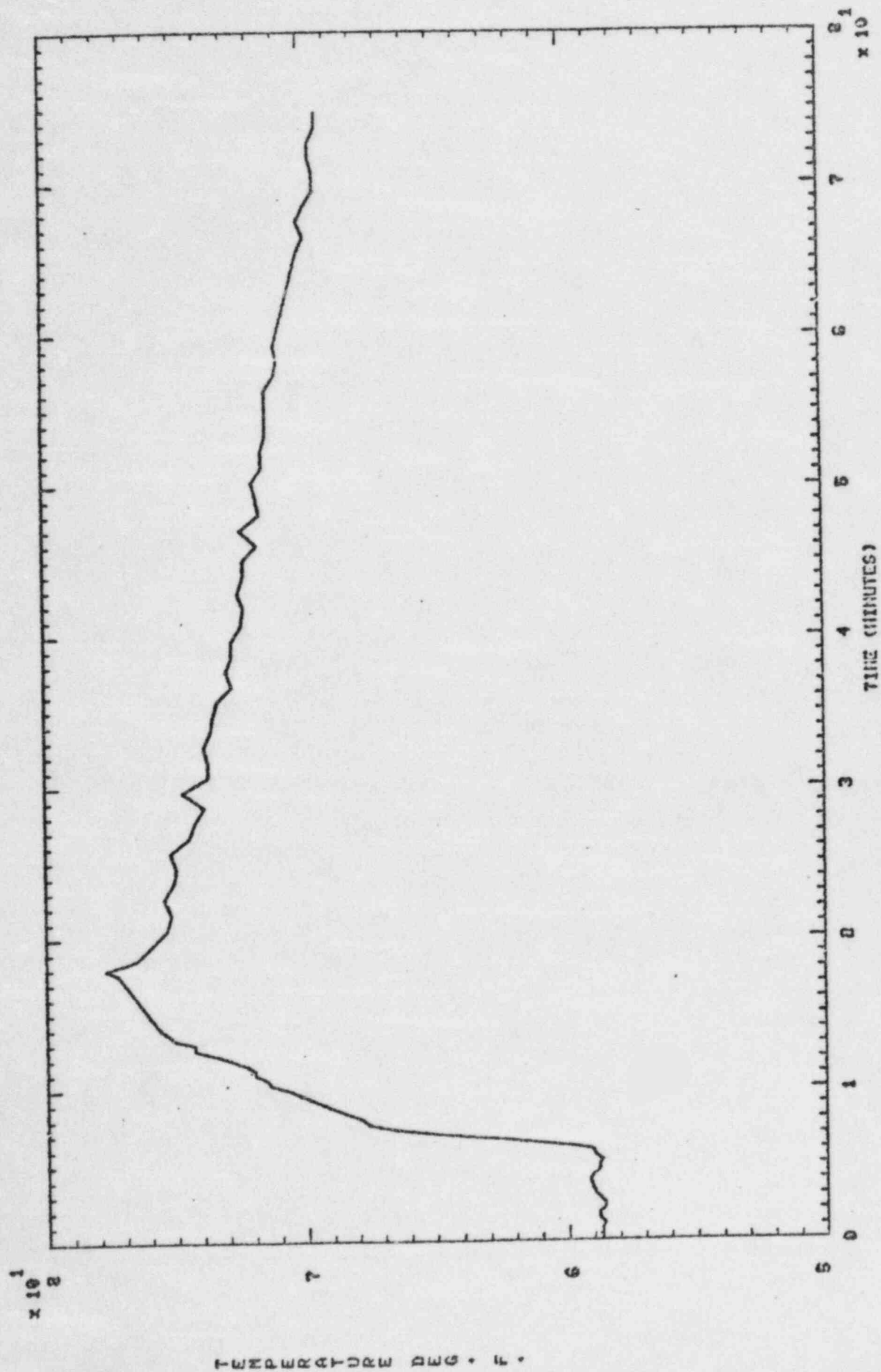


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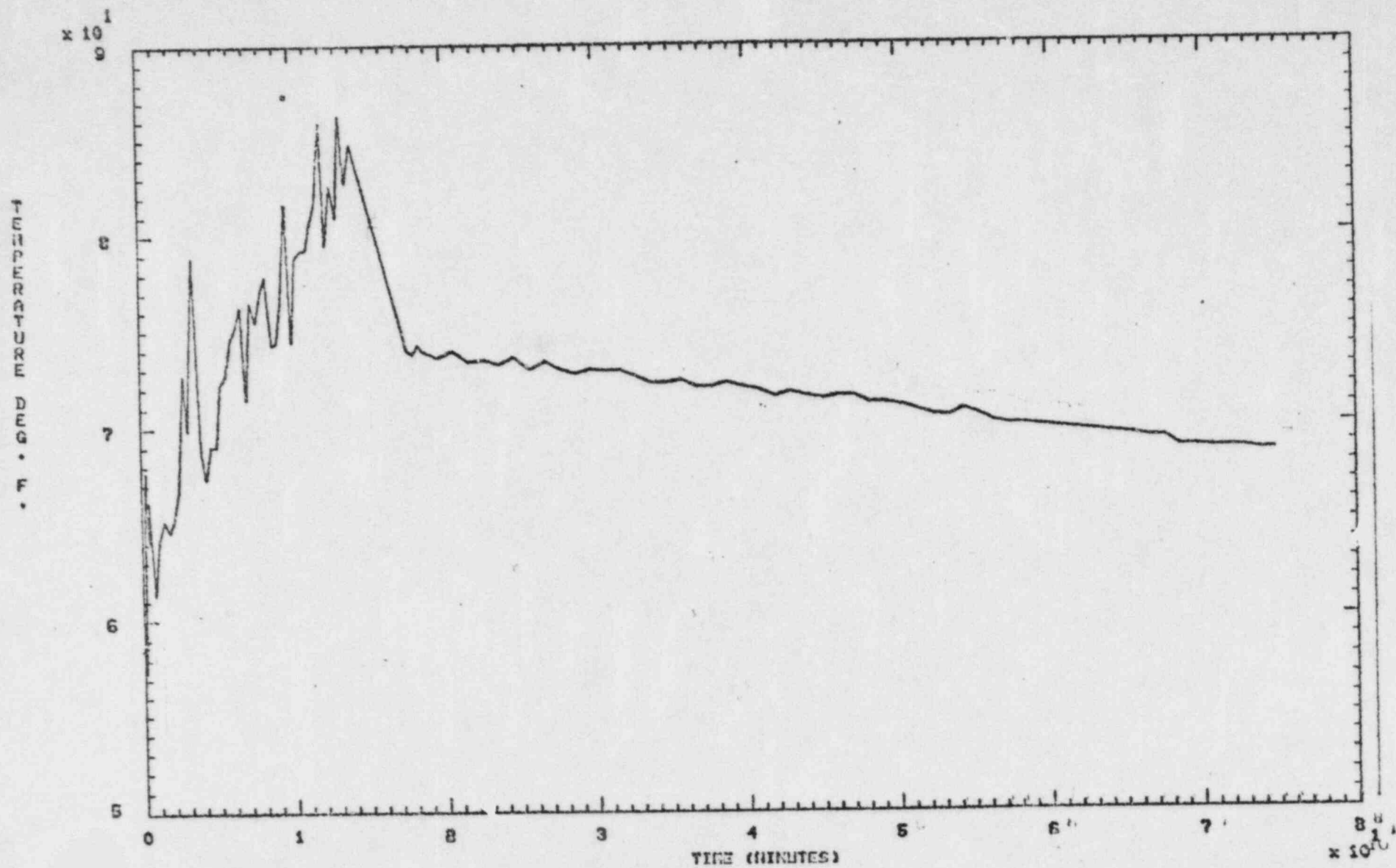


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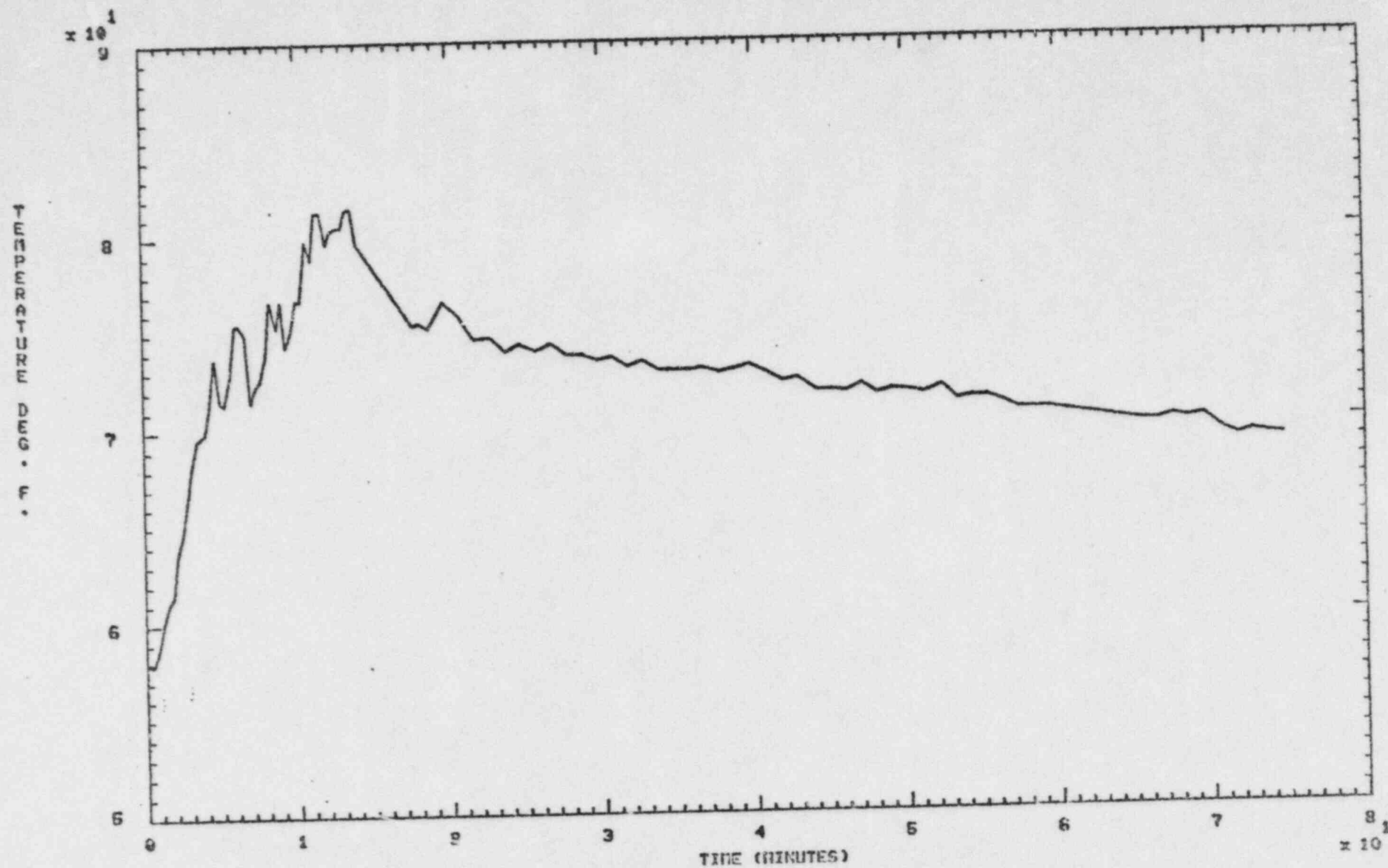
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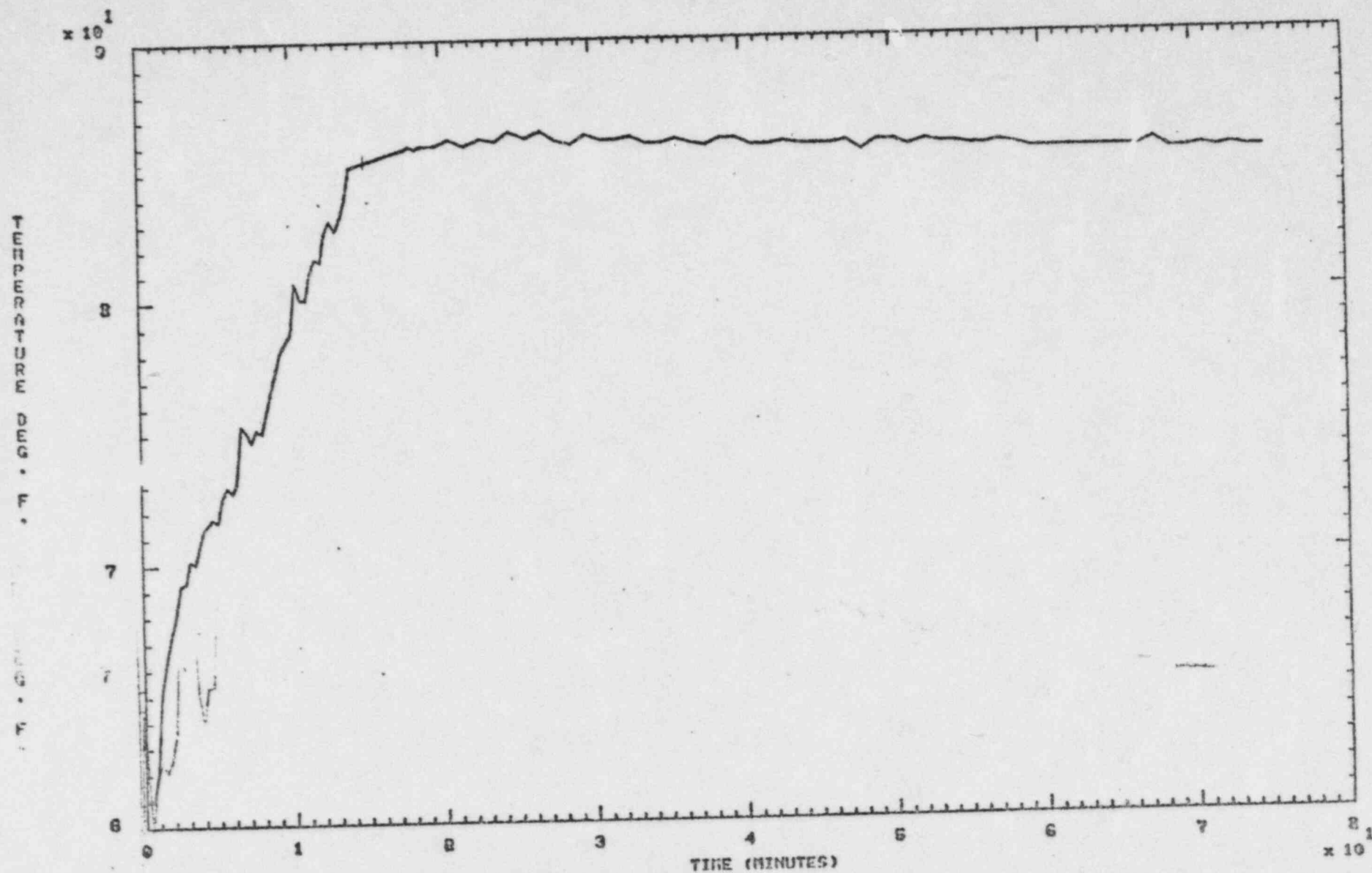
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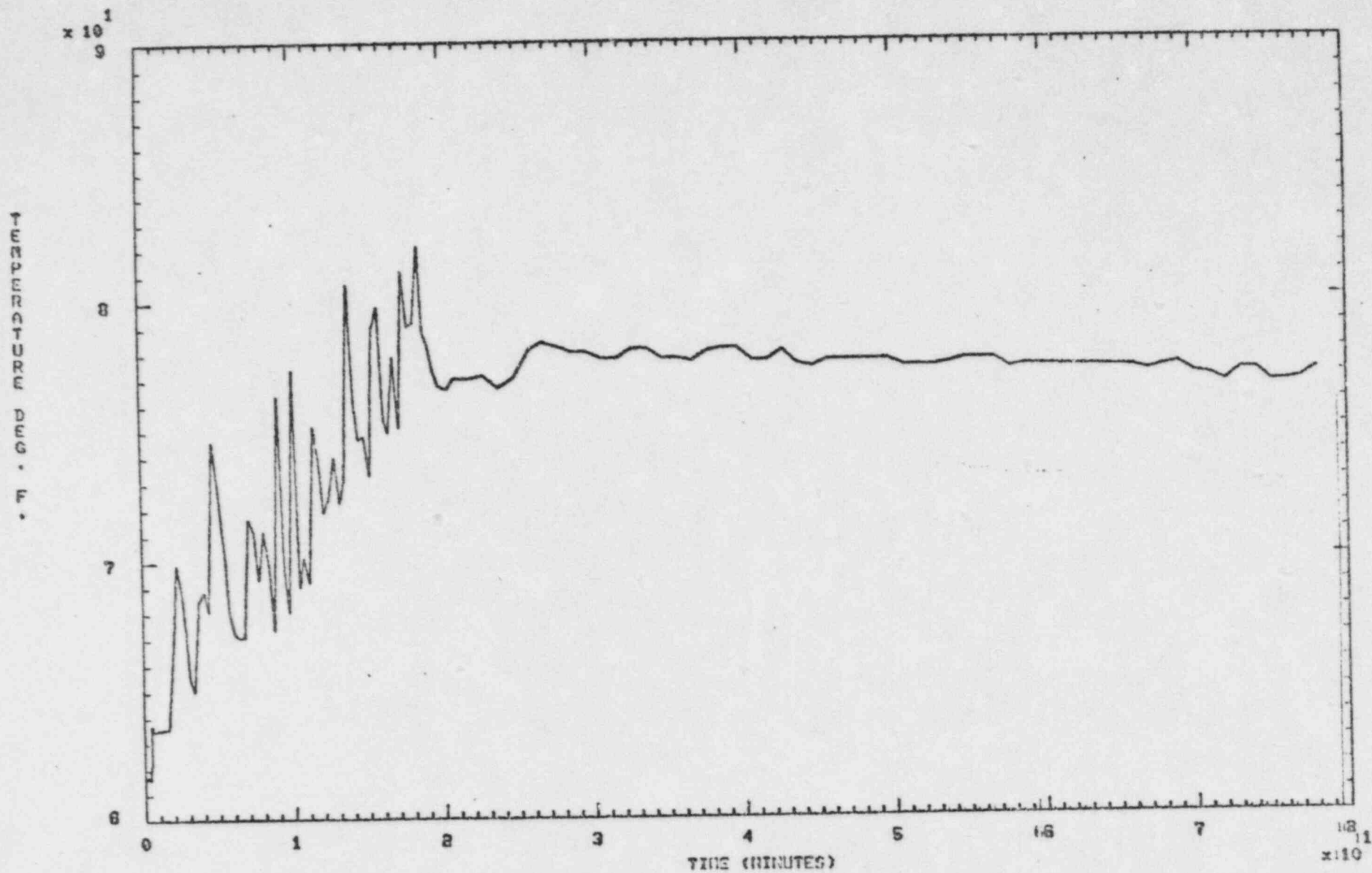
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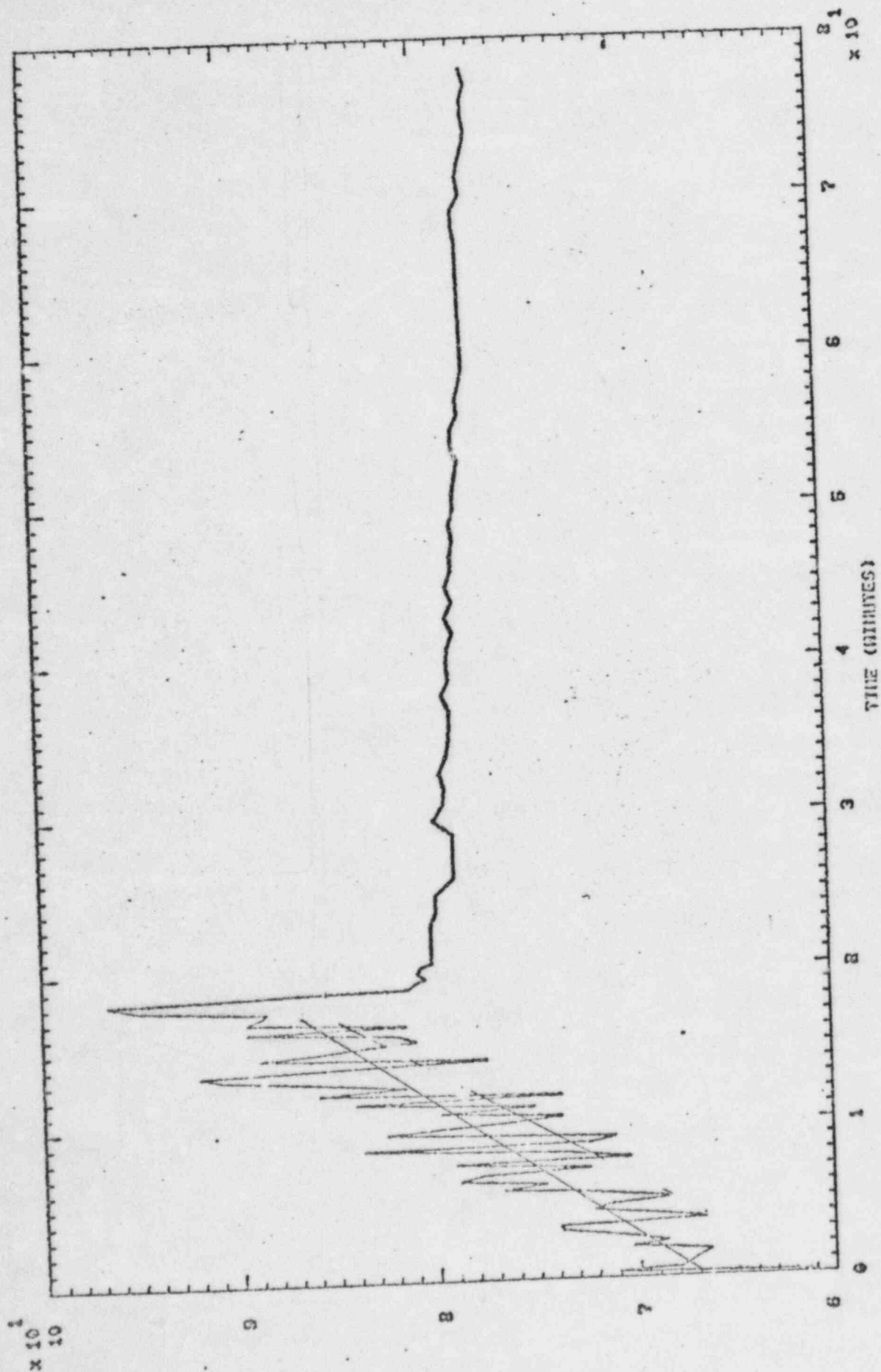
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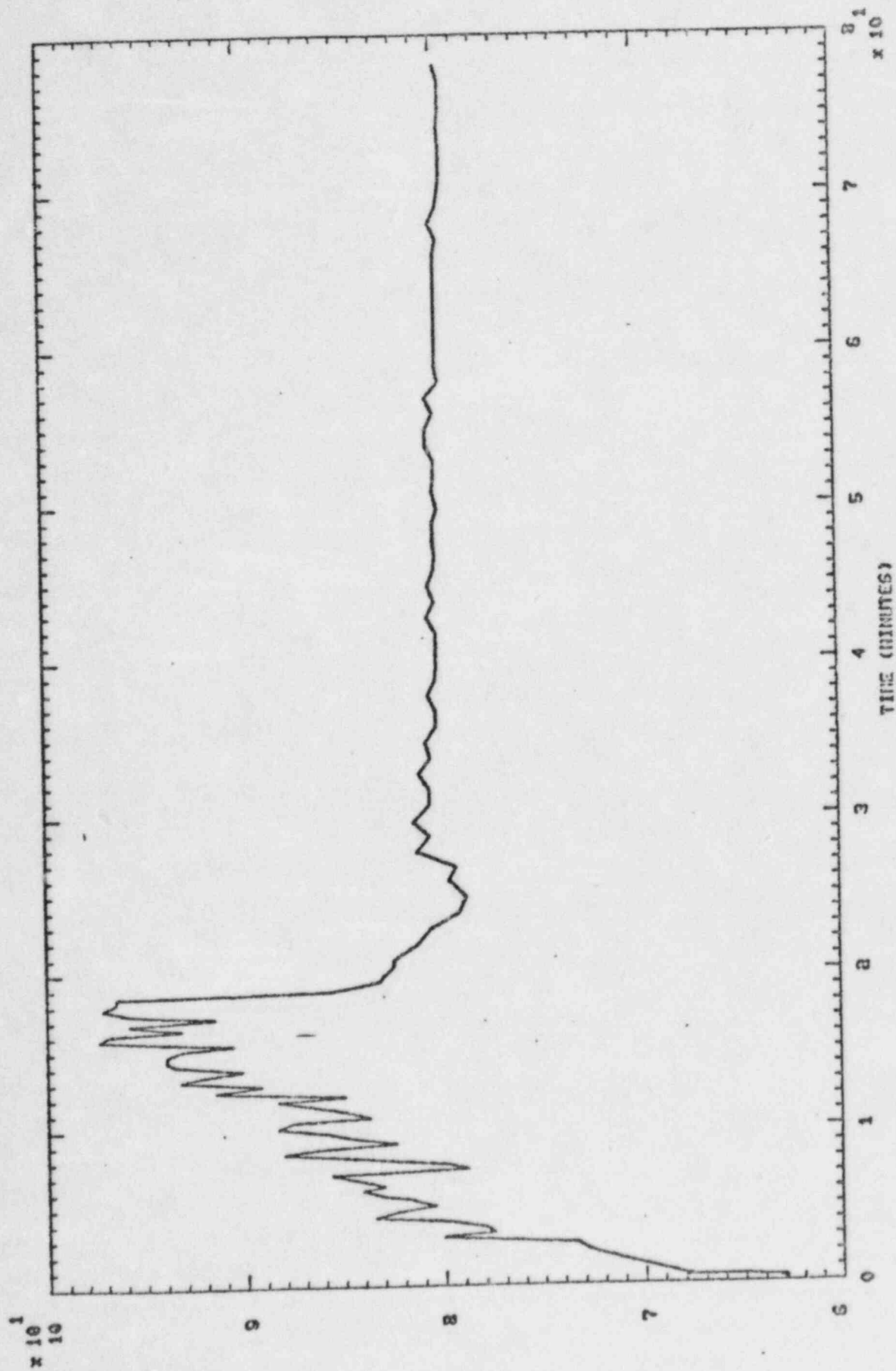
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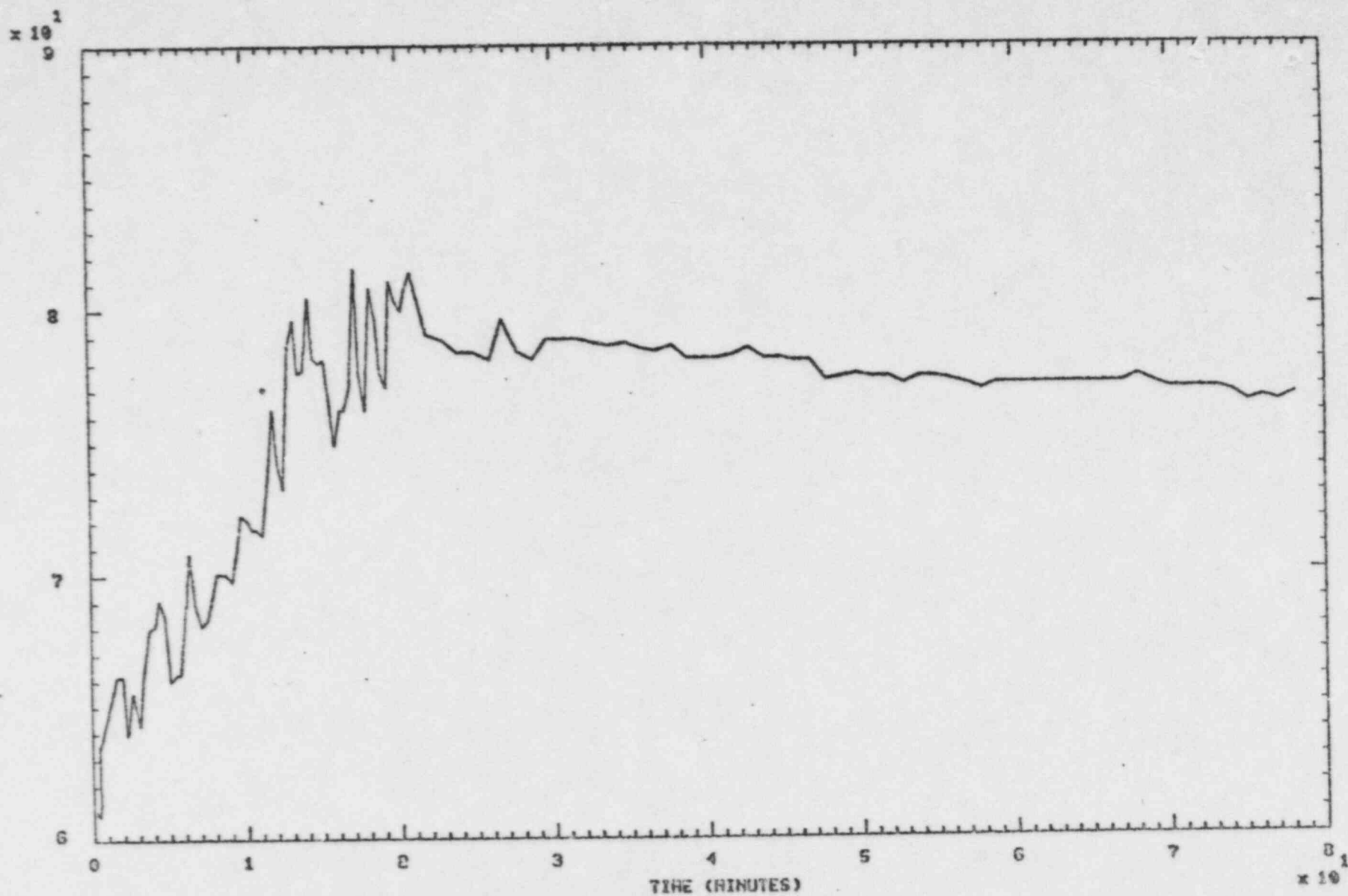


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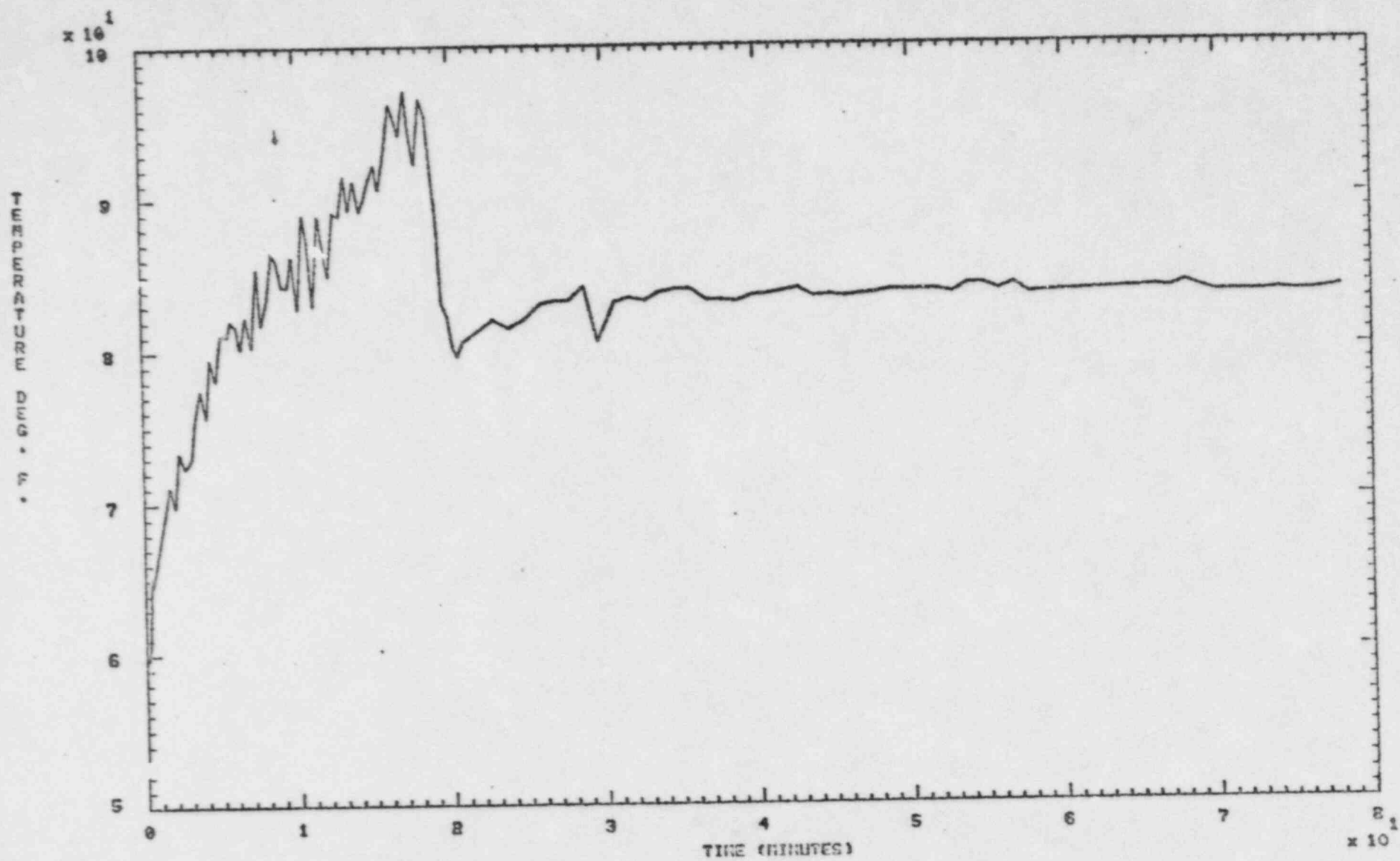


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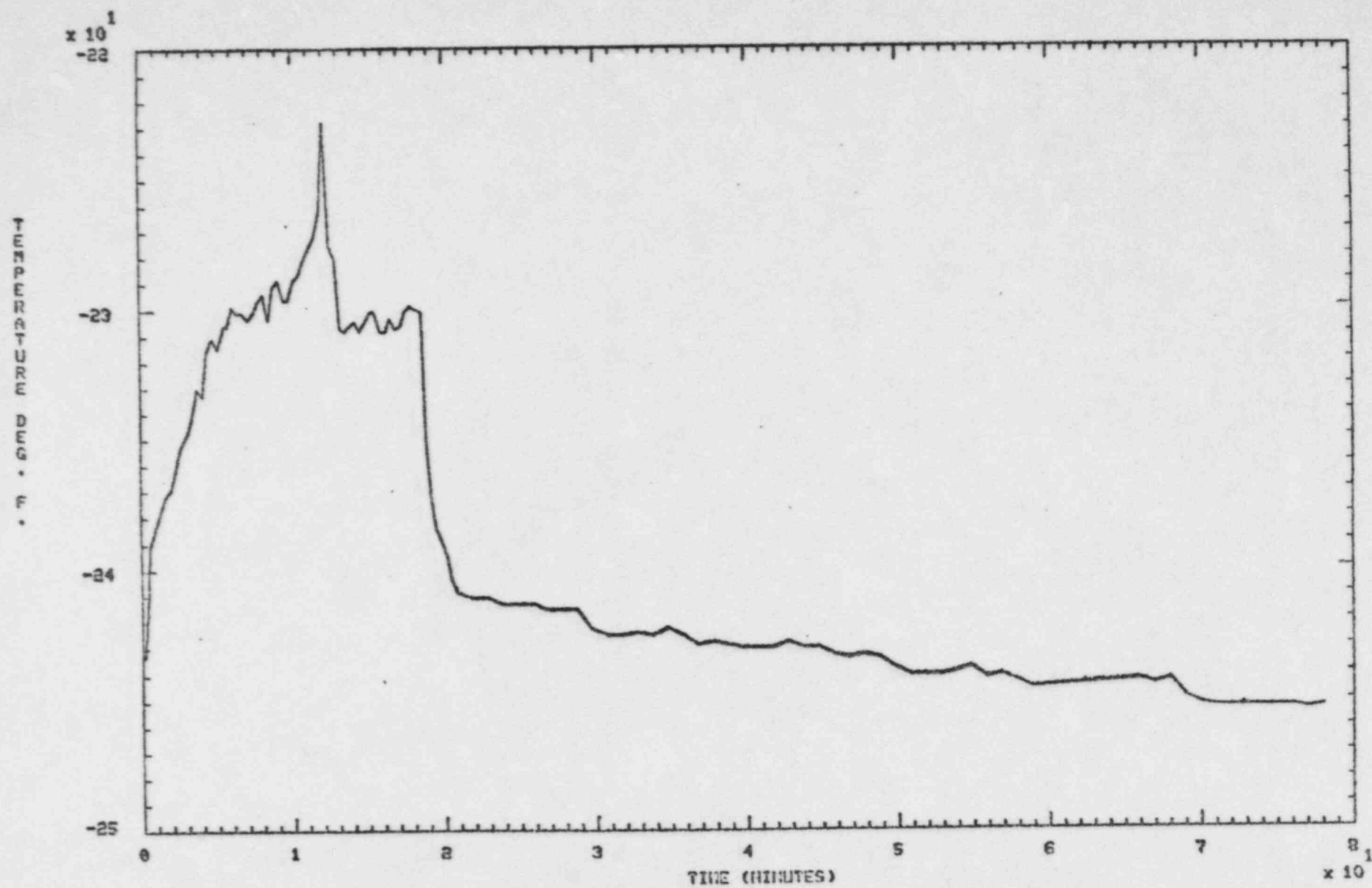
TEMPERATURE DEG. F.



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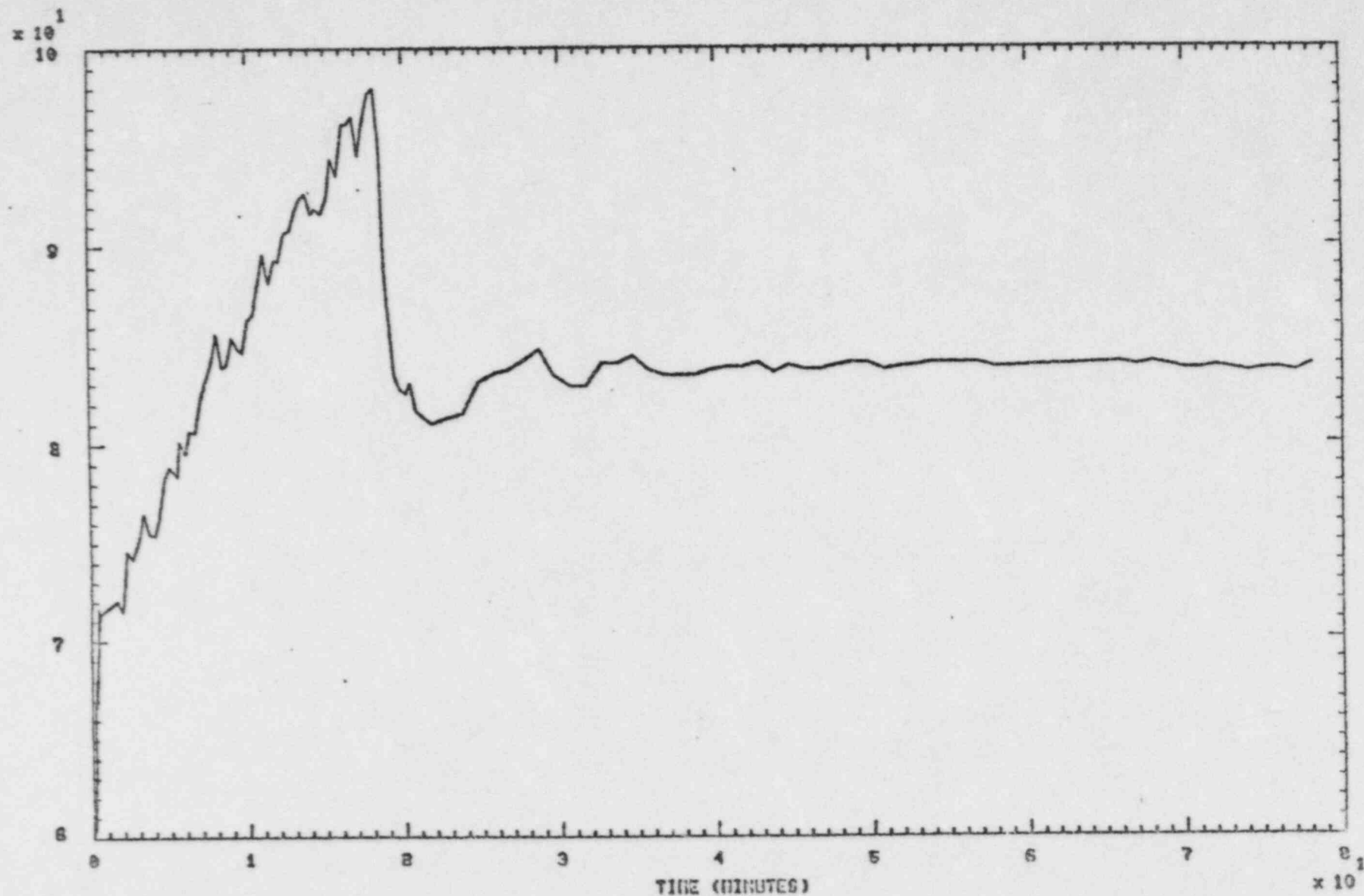


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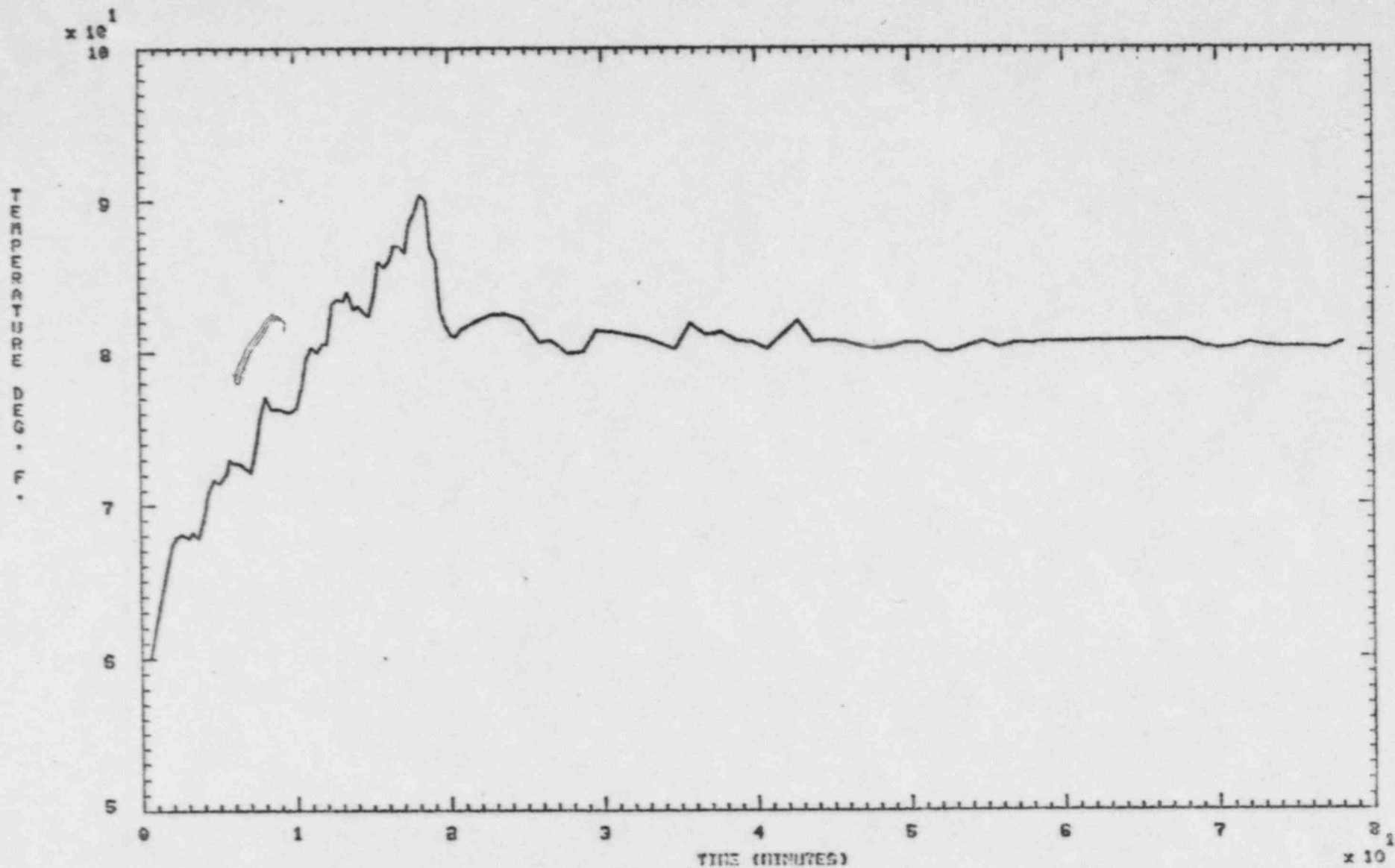


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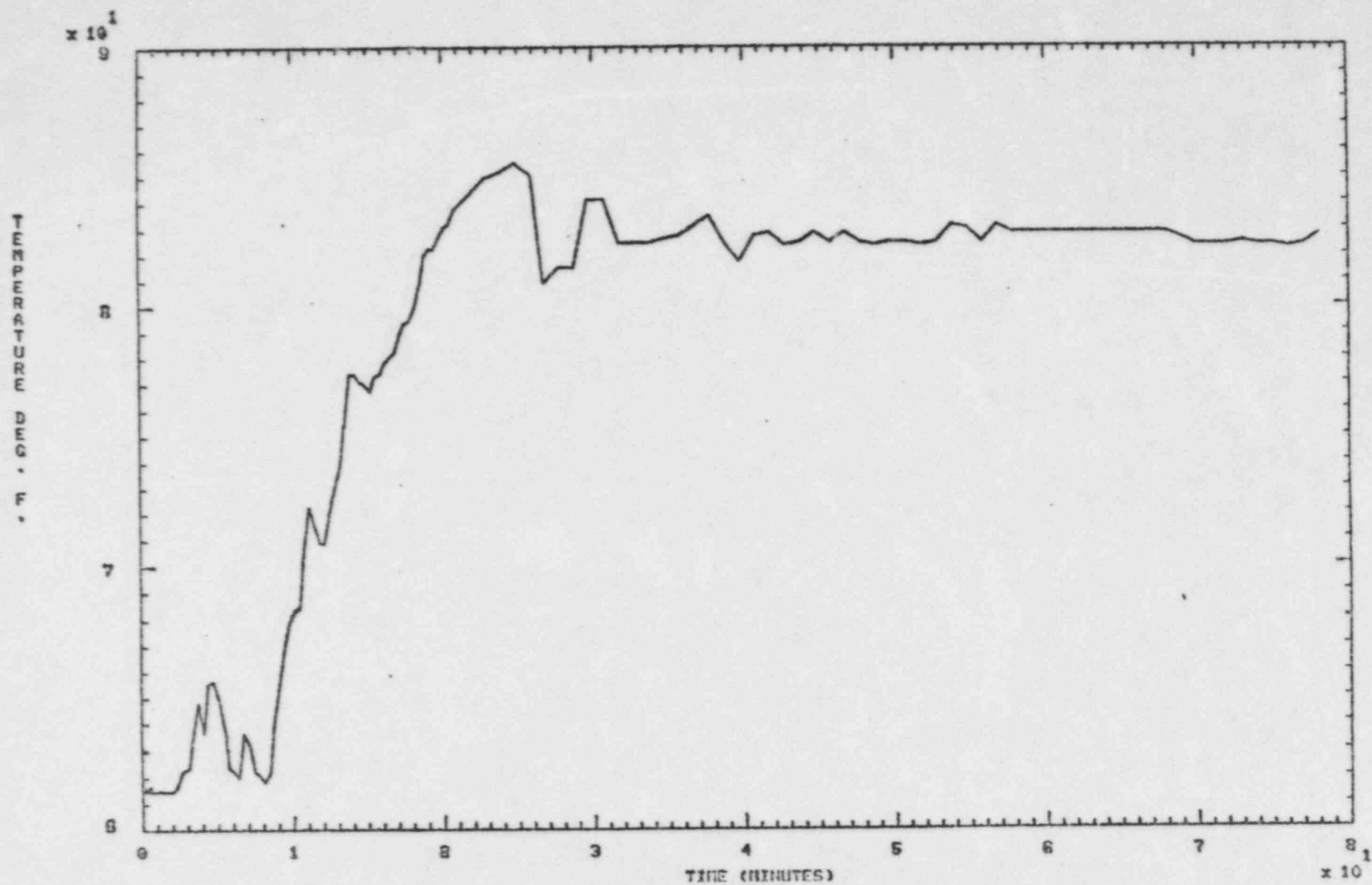
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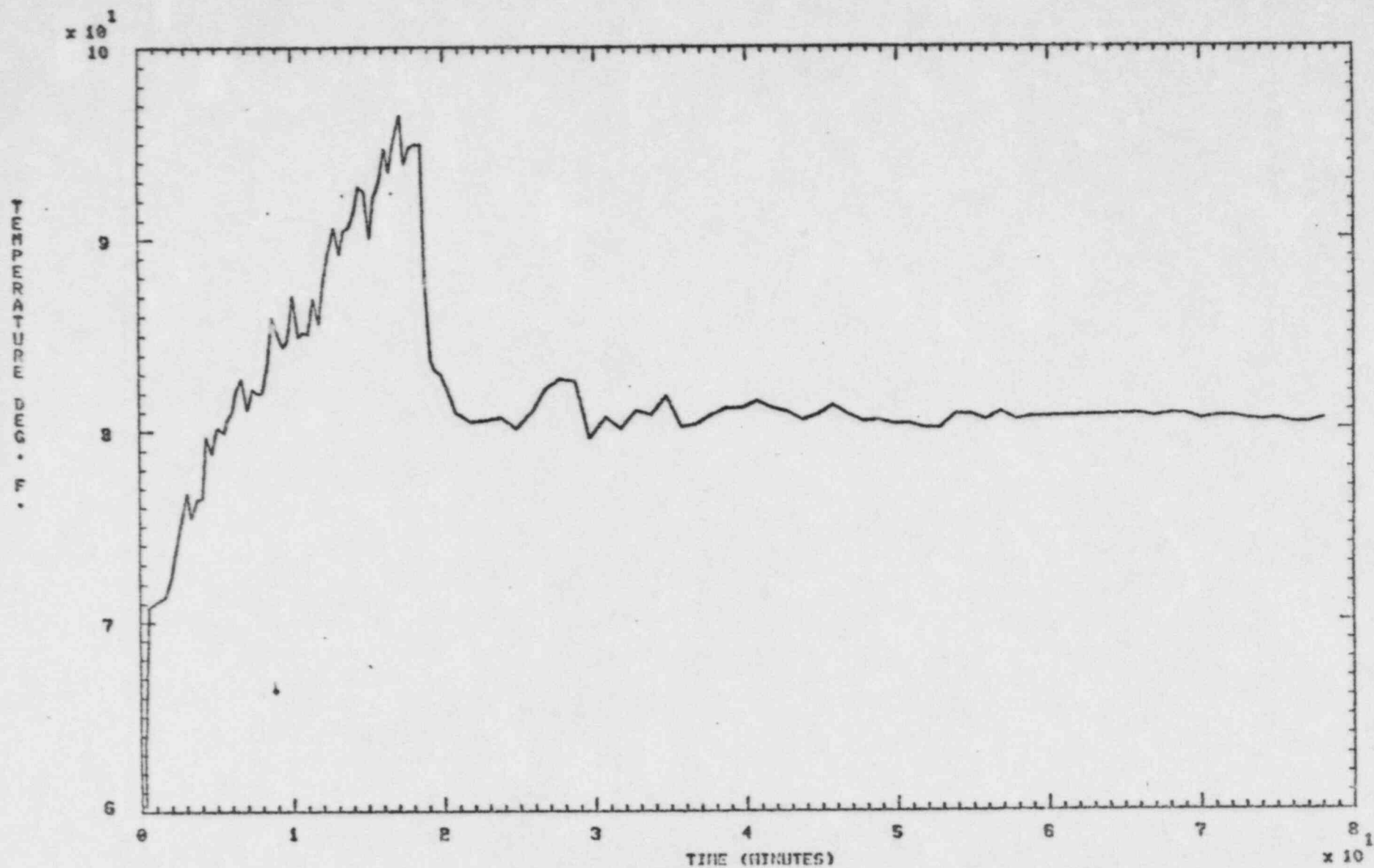
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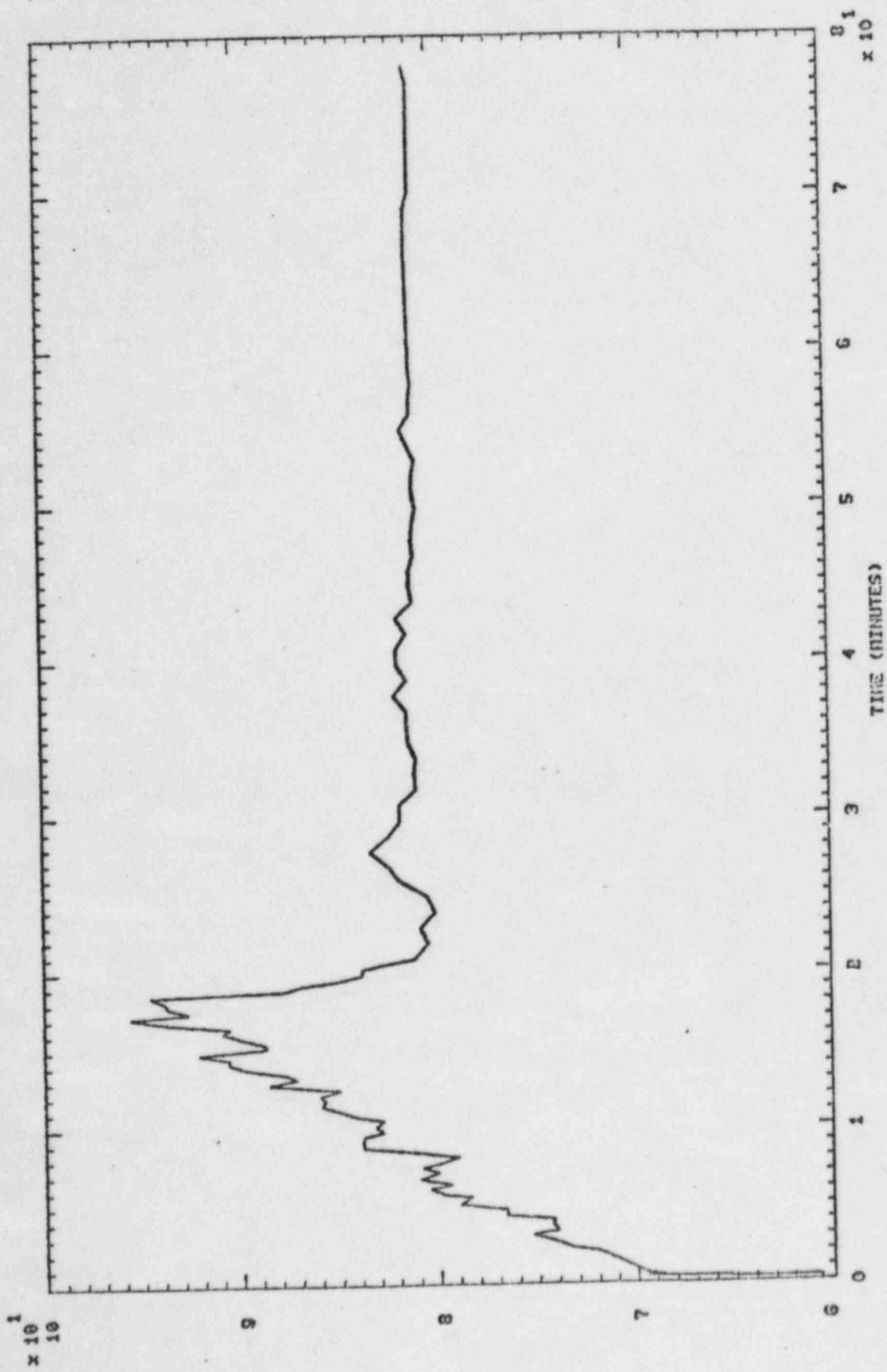
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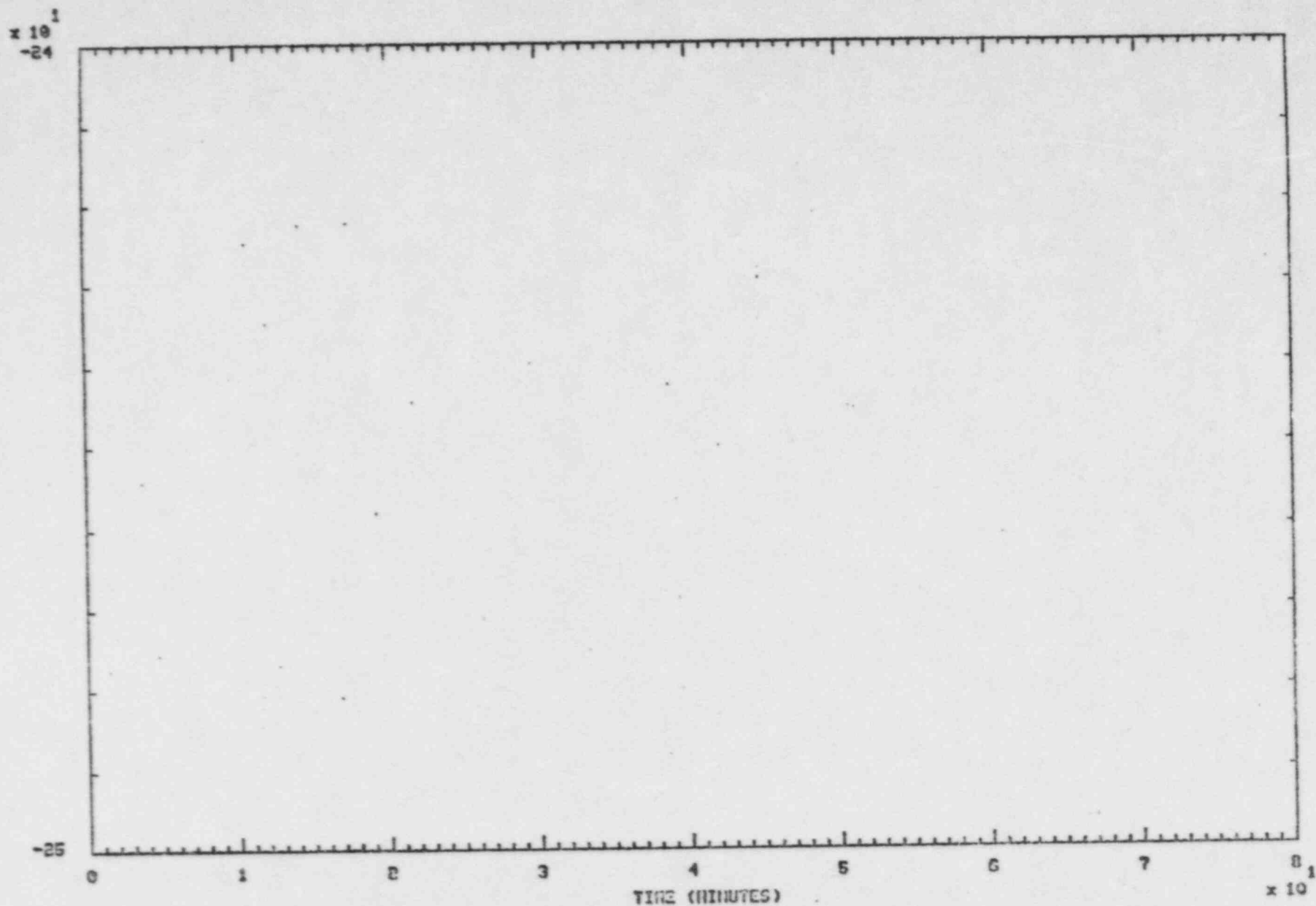


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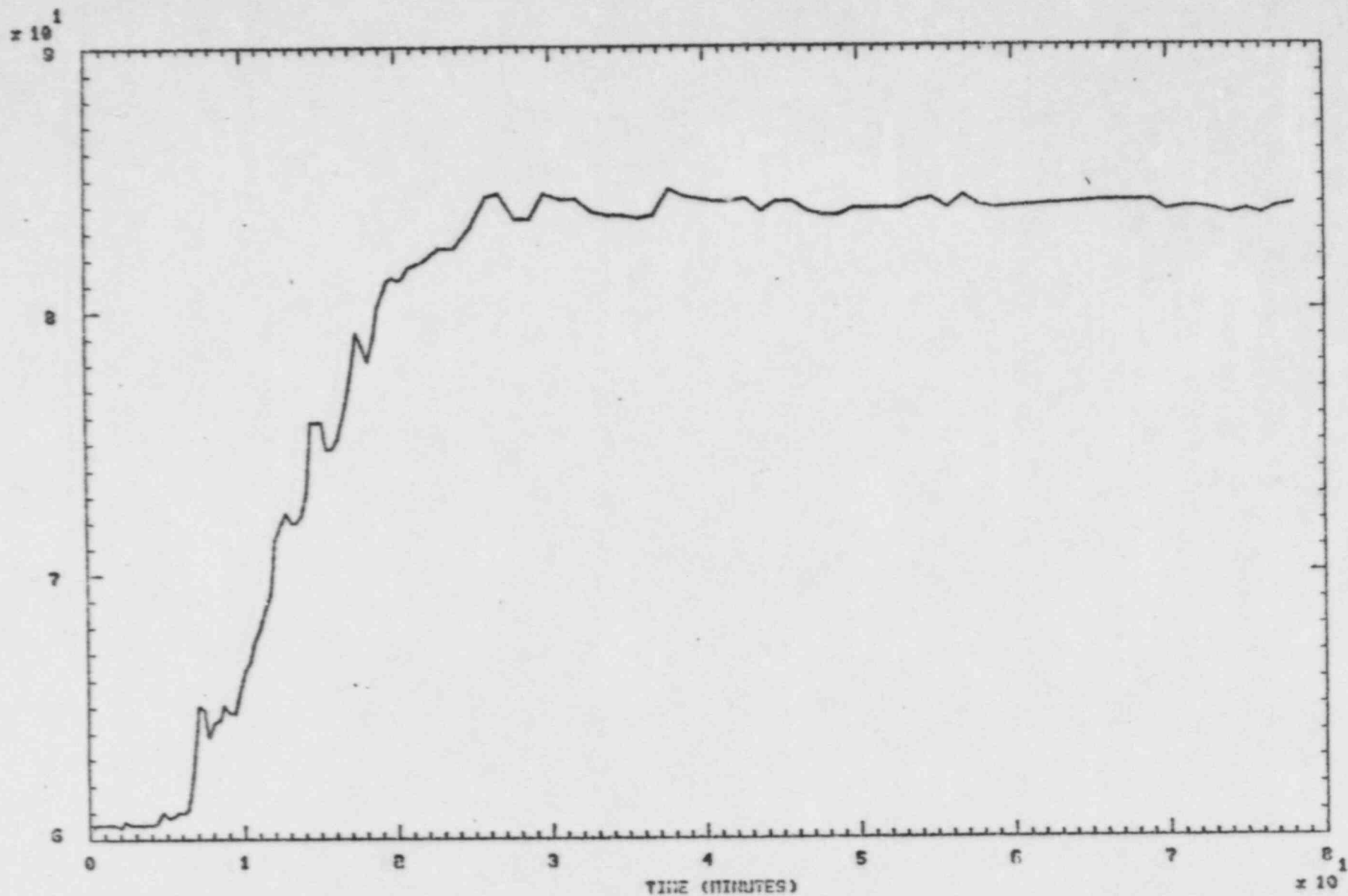
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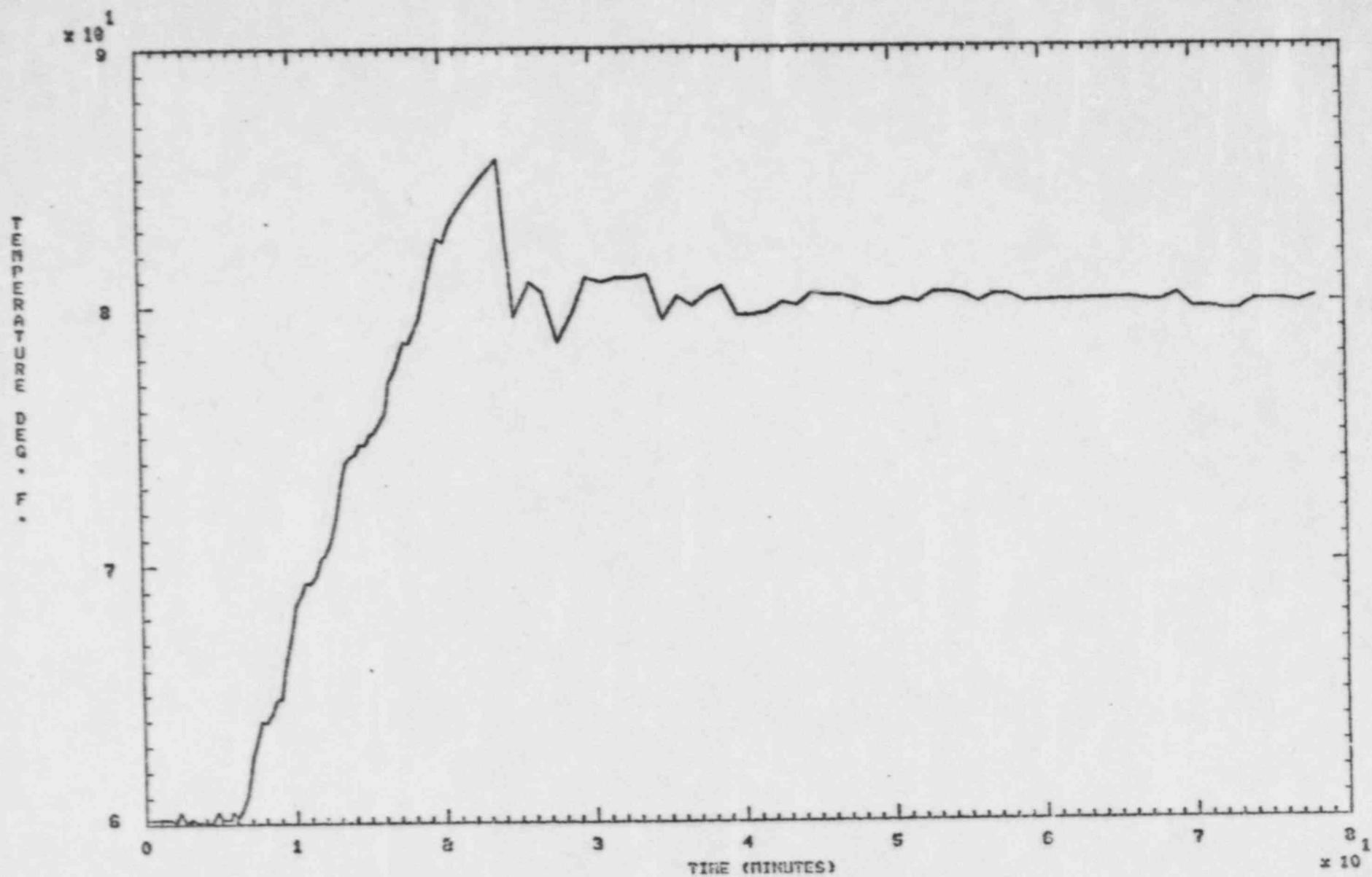


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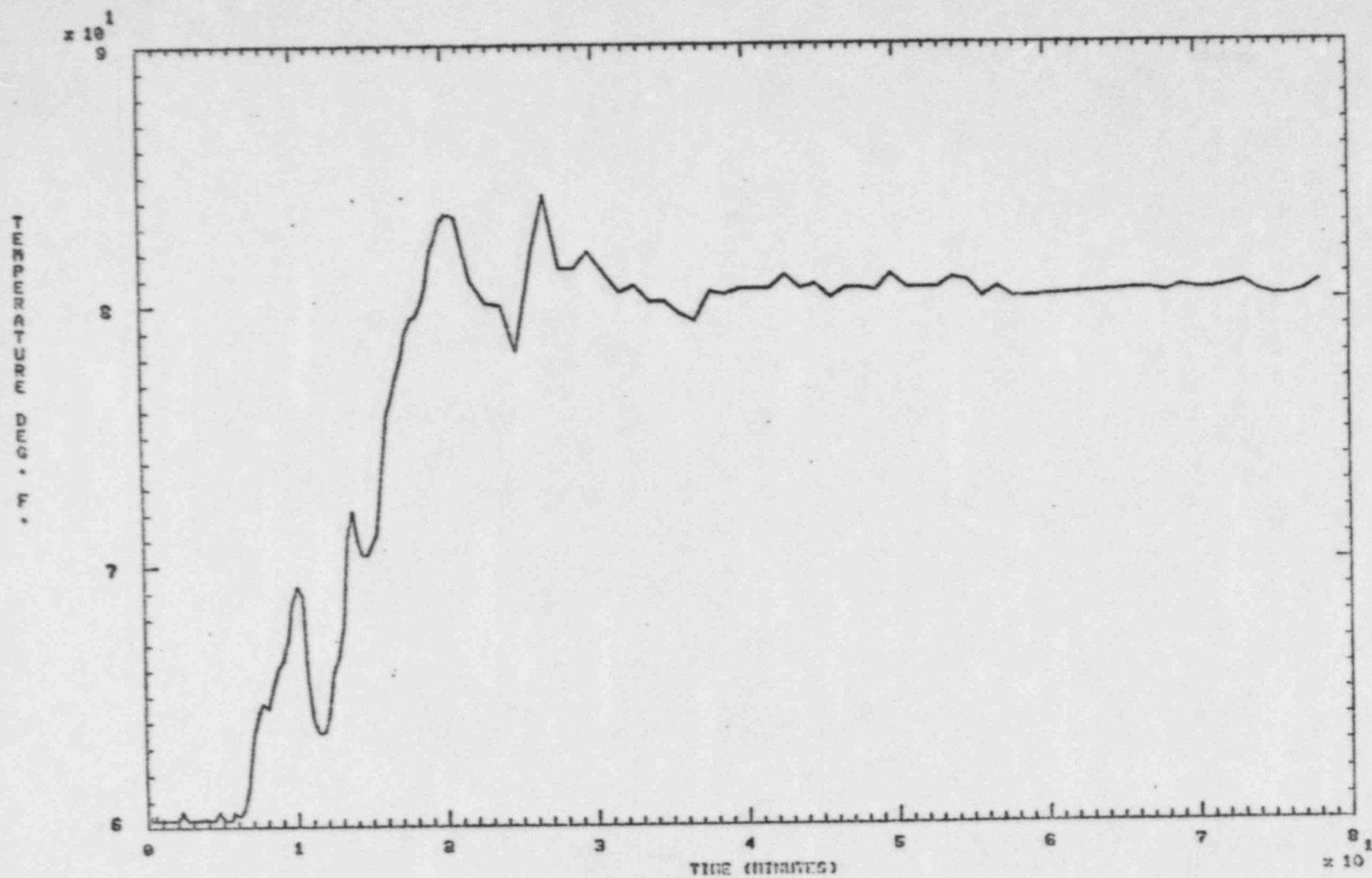
Pressure (PSI) vs. Time (min)



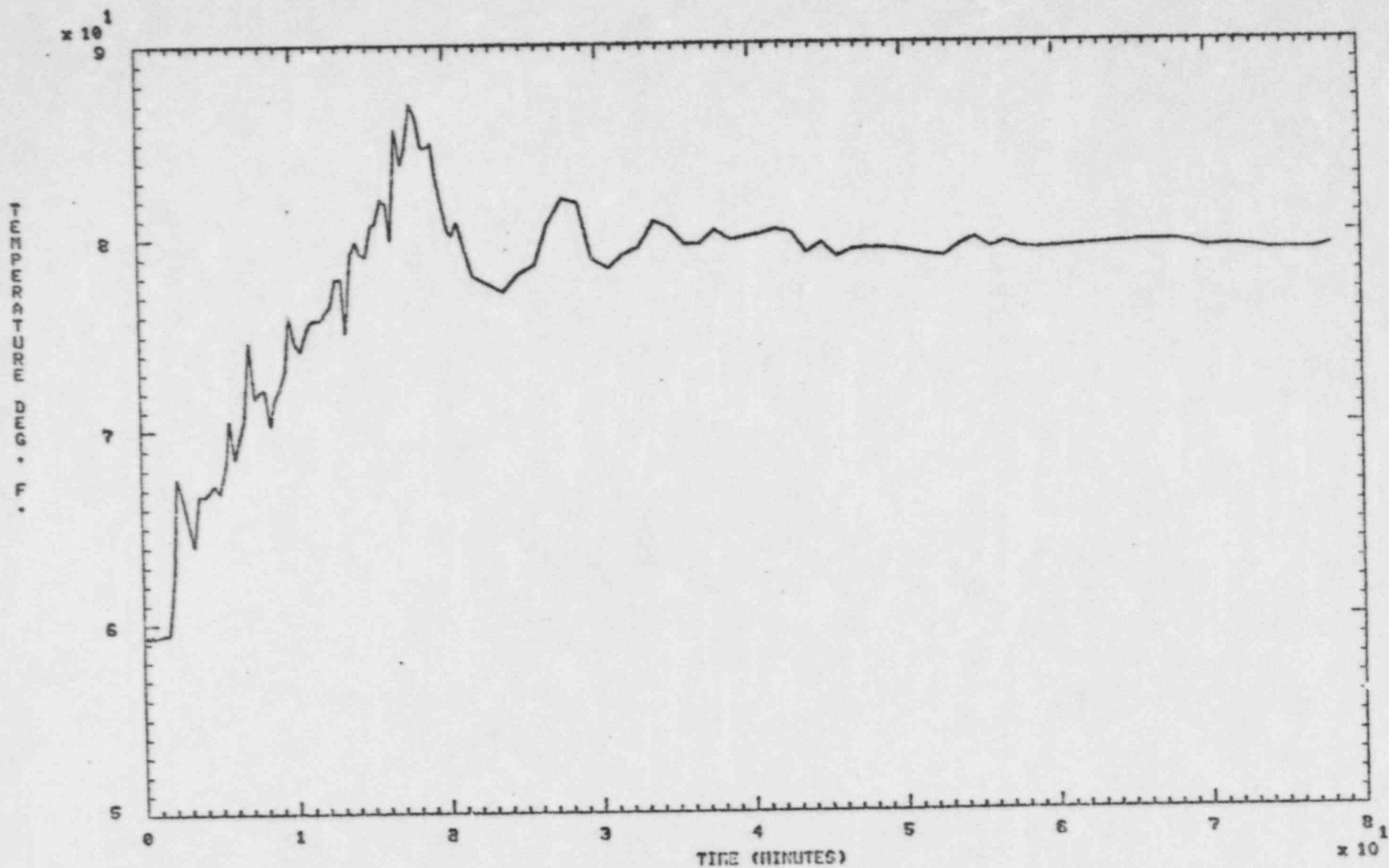
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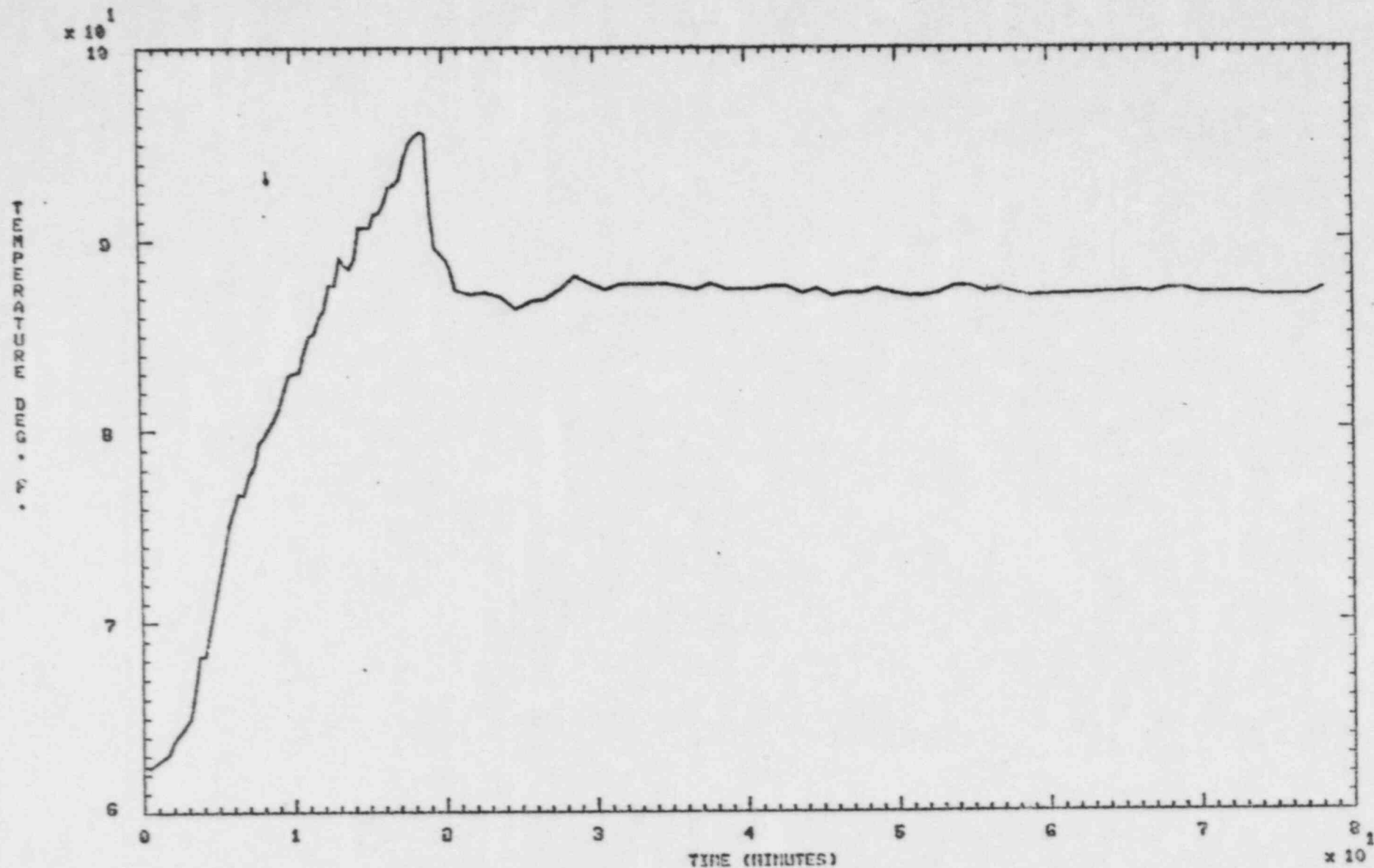
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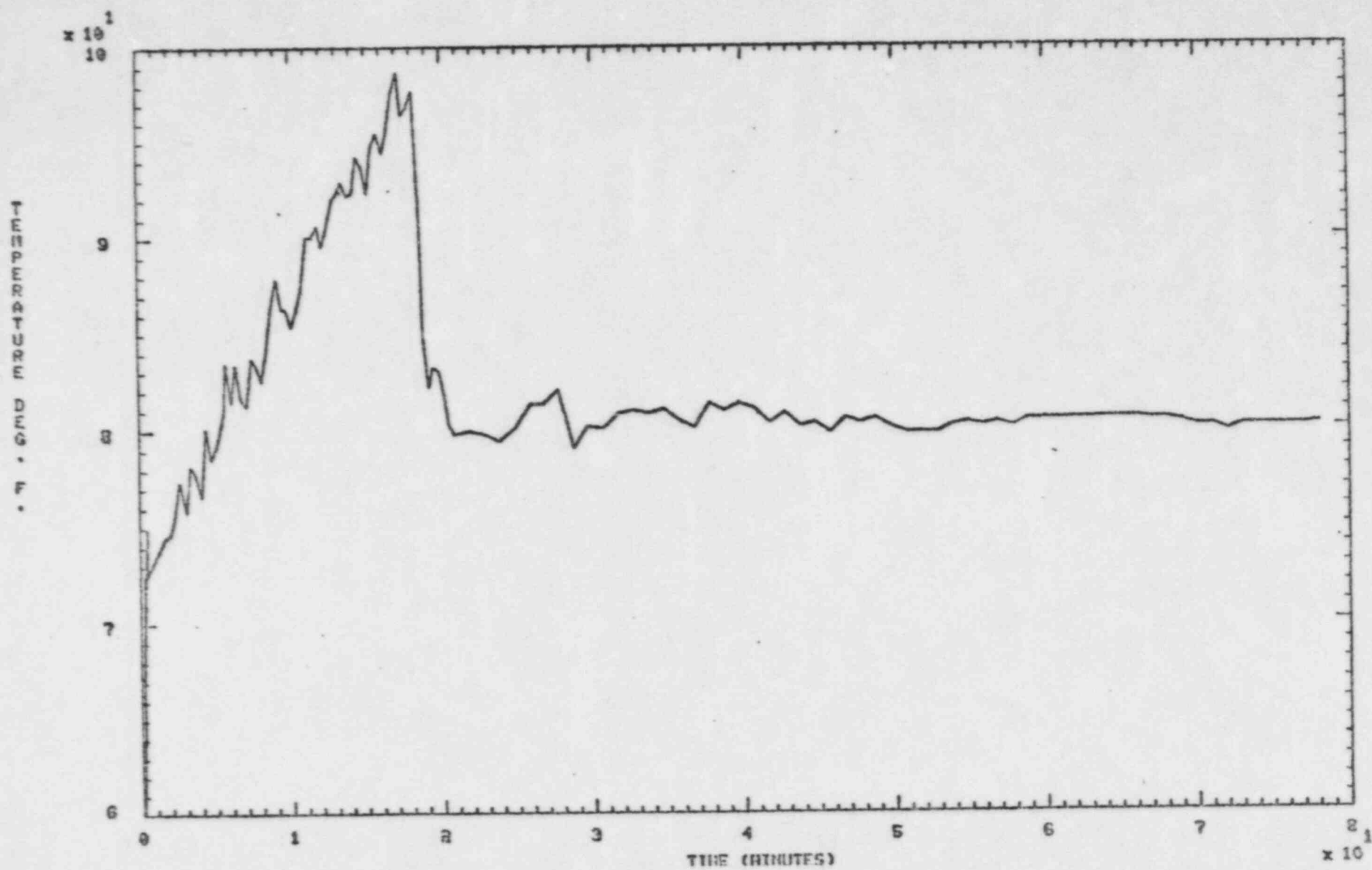
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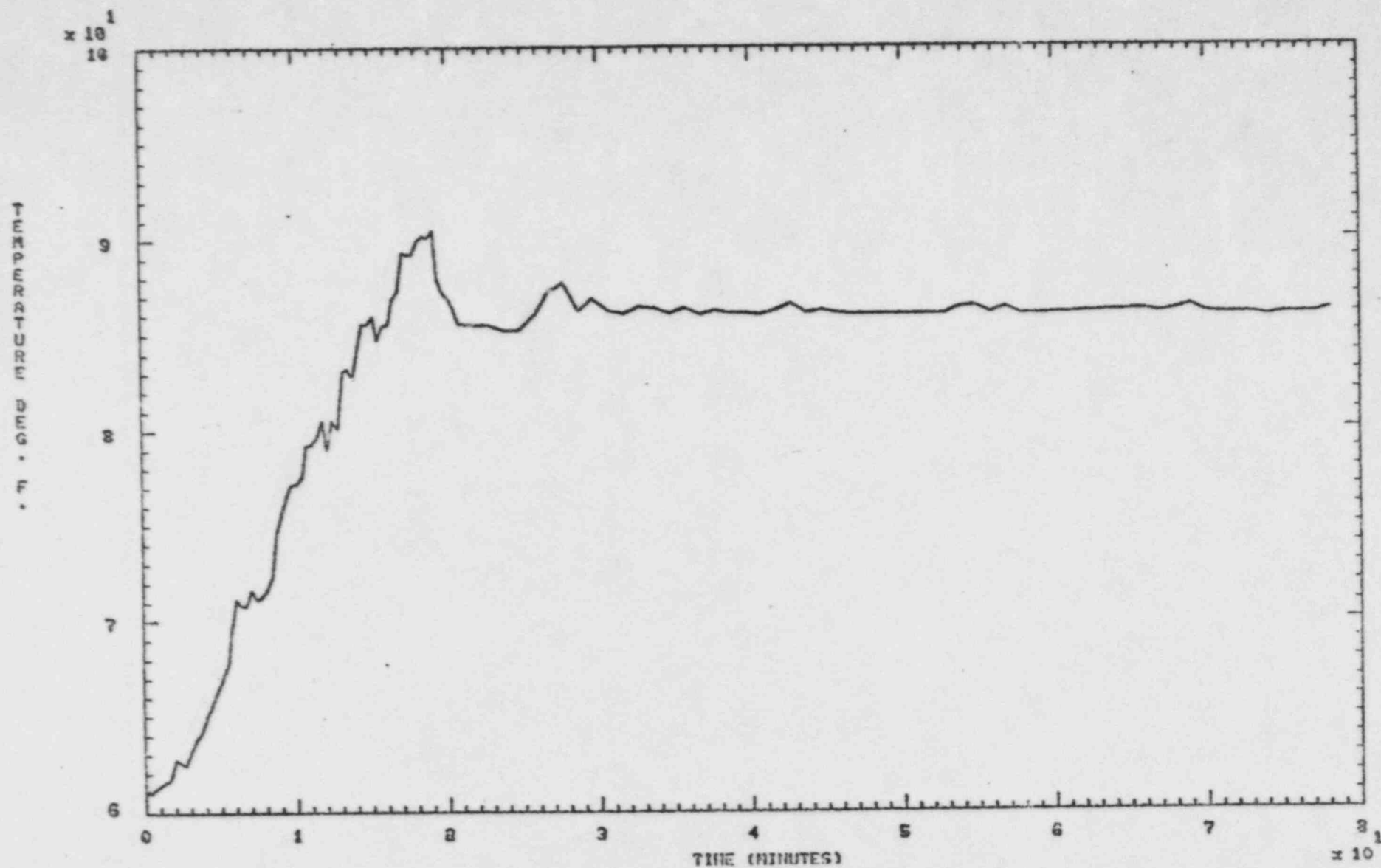
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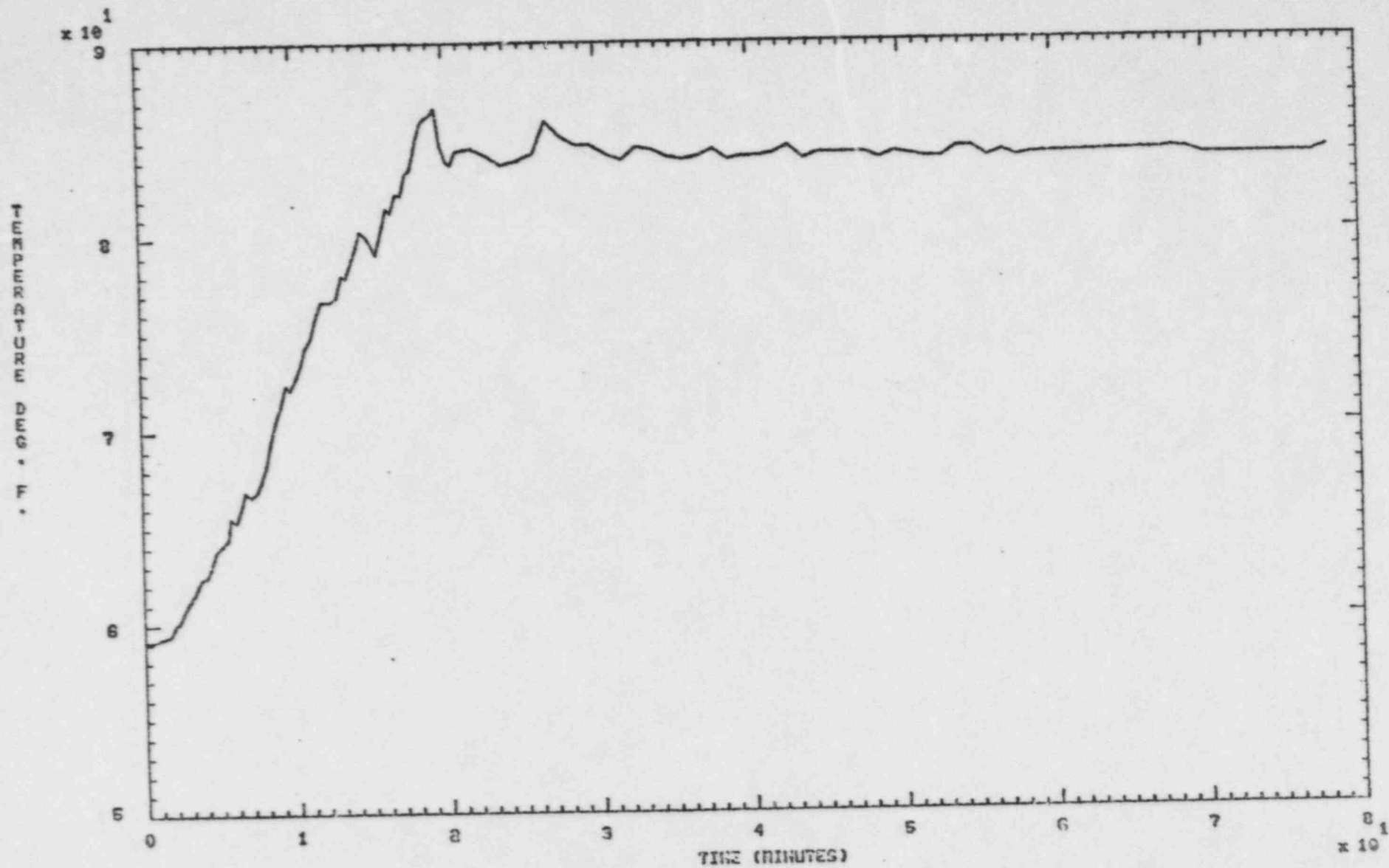
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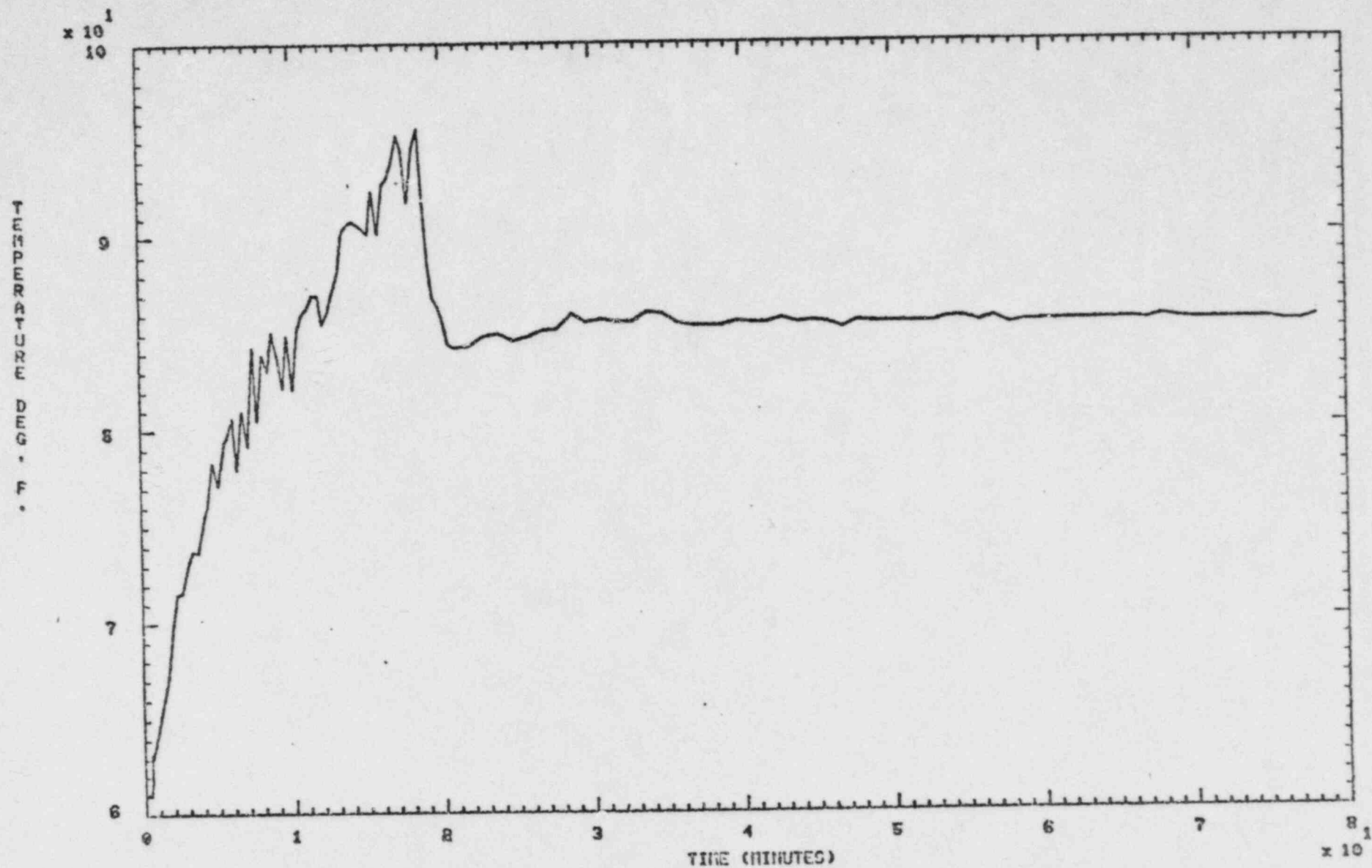
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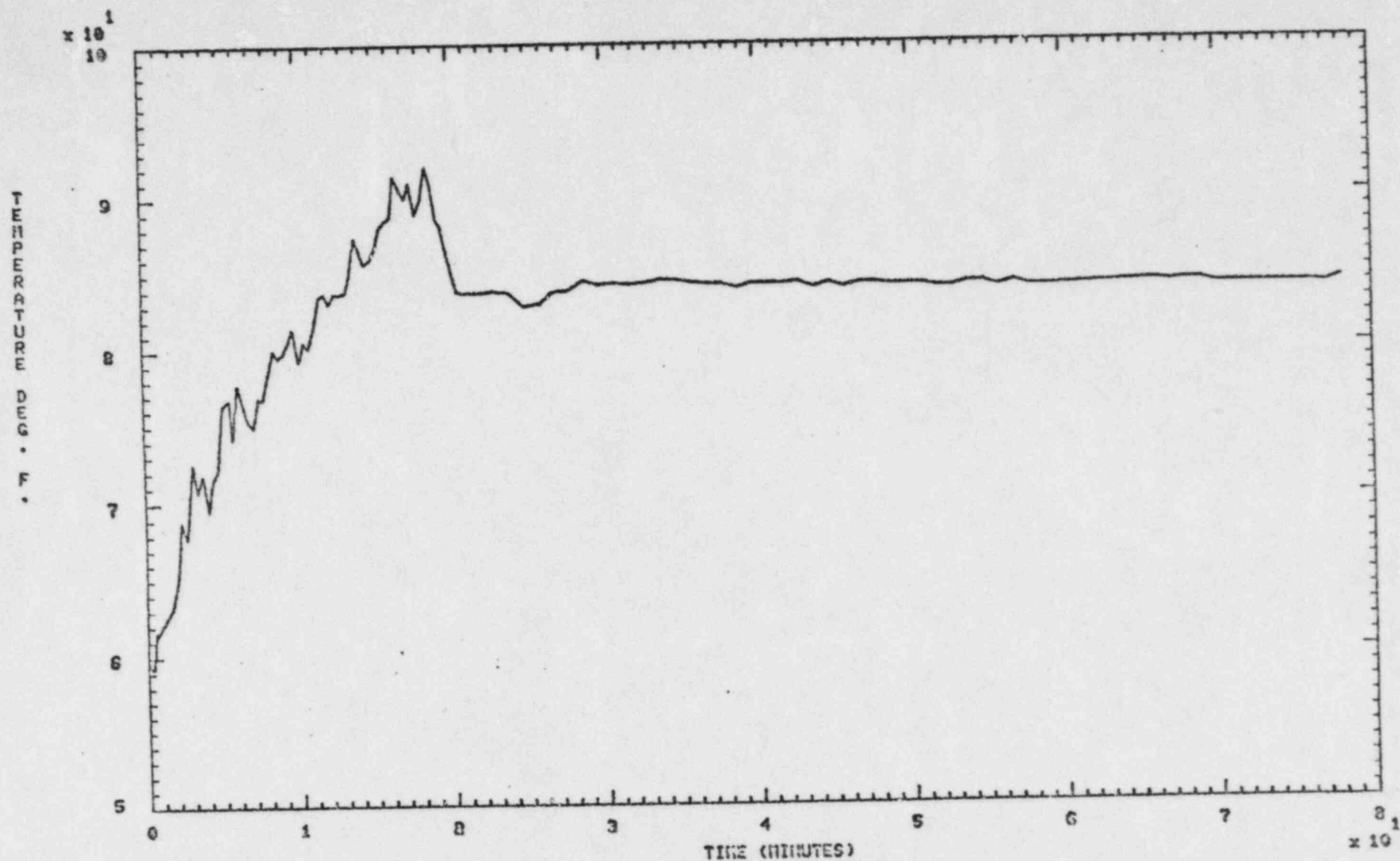
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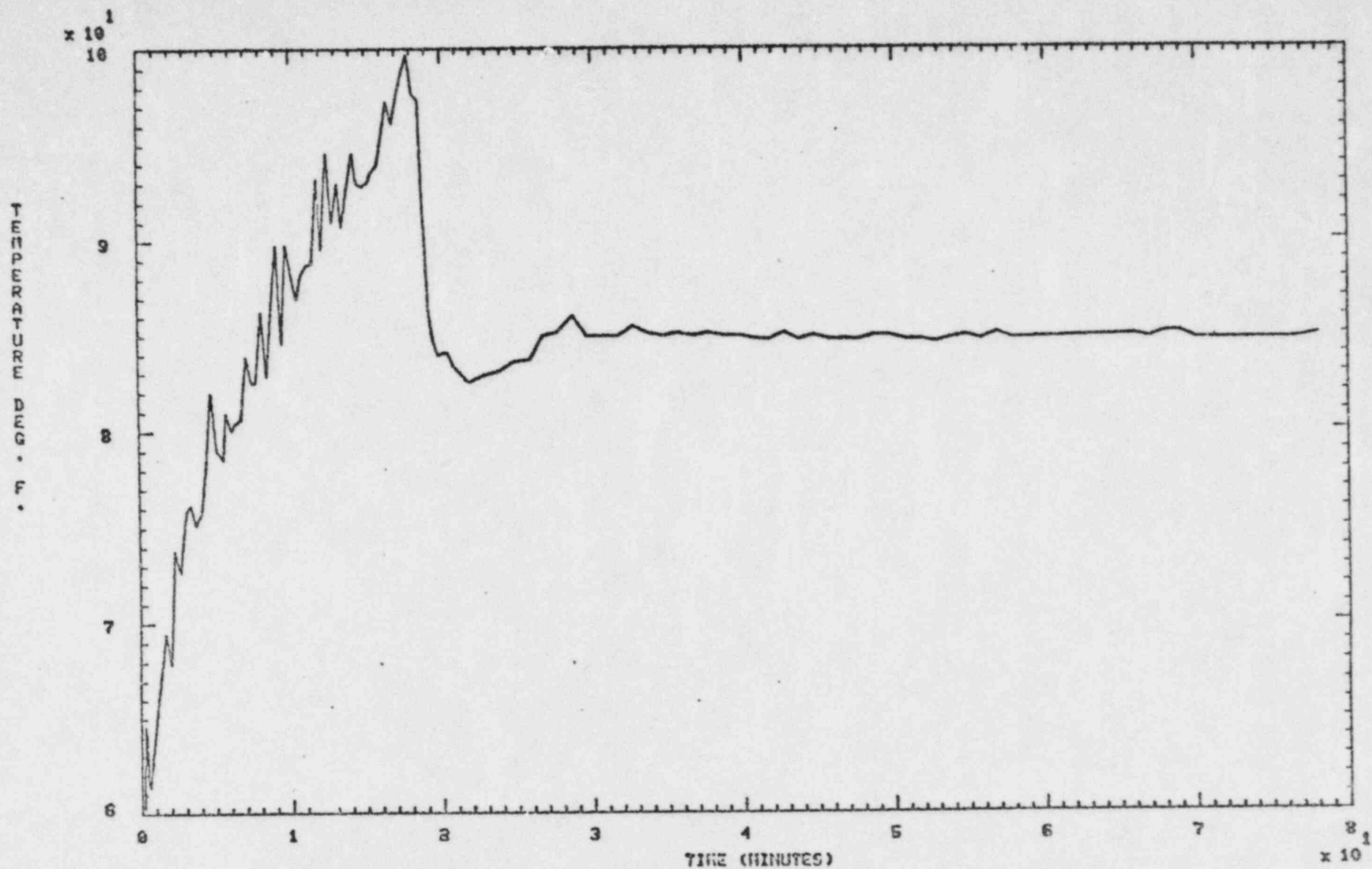
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EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 20



VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 21

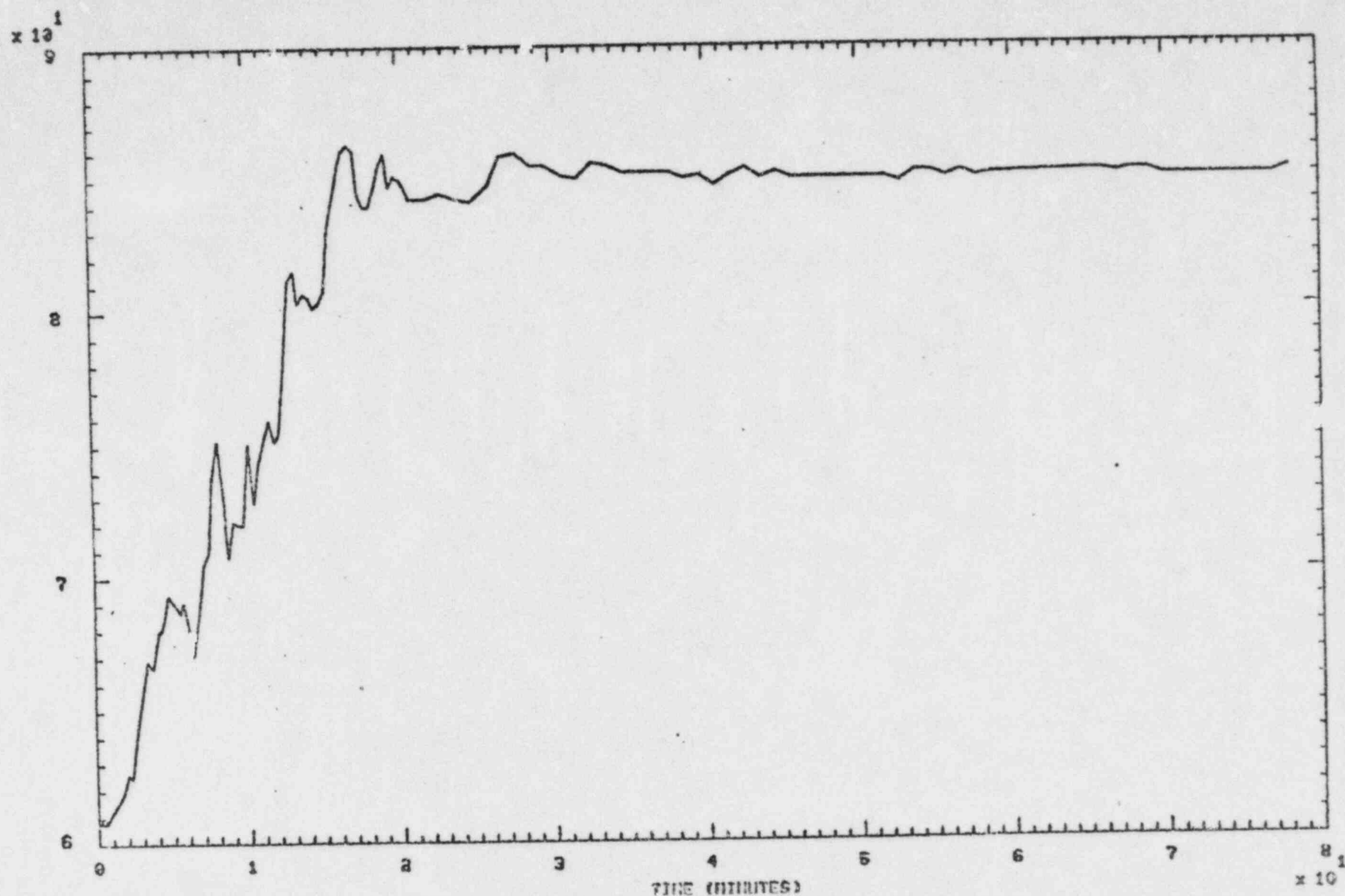


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 22

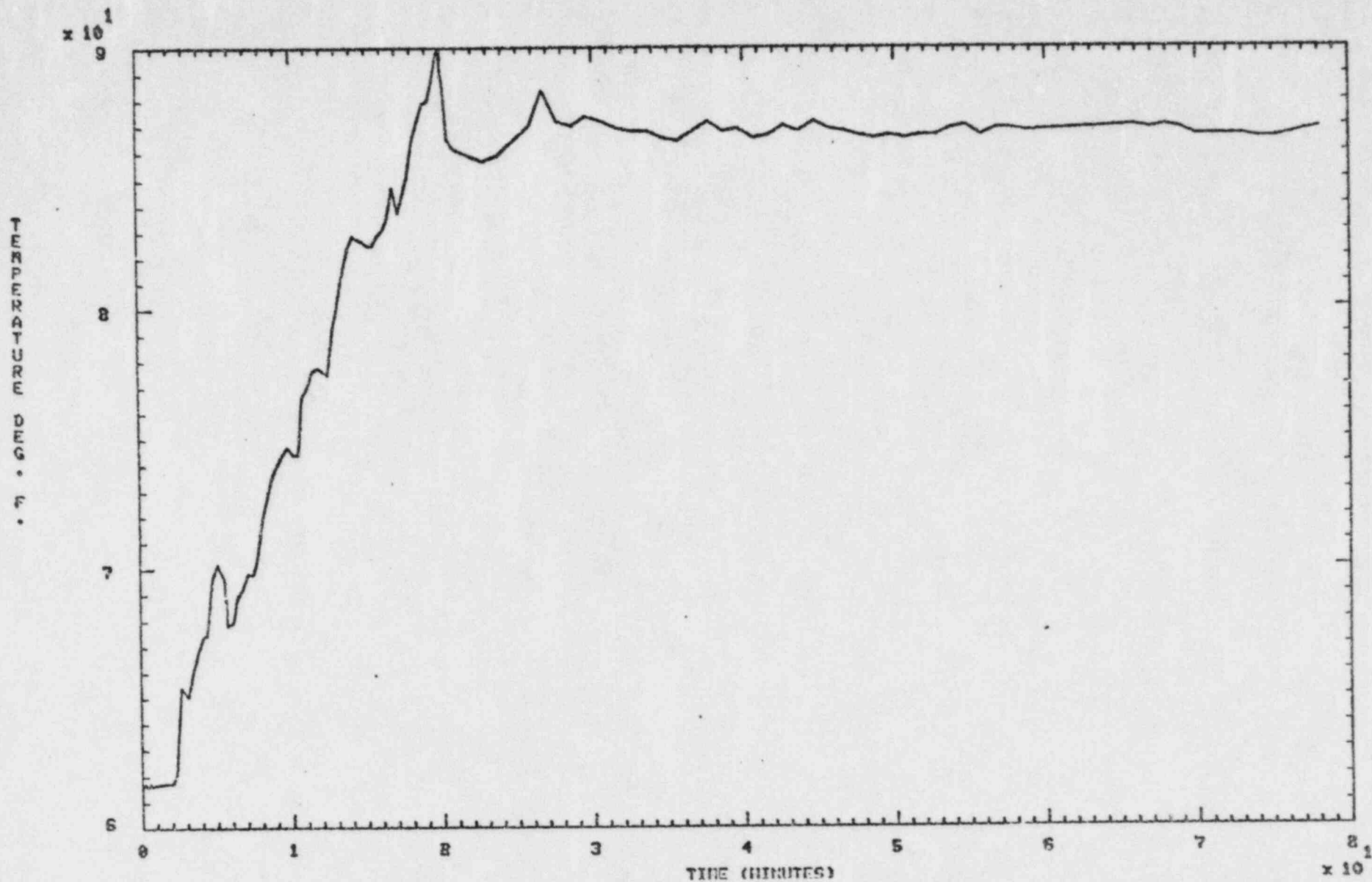


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 23

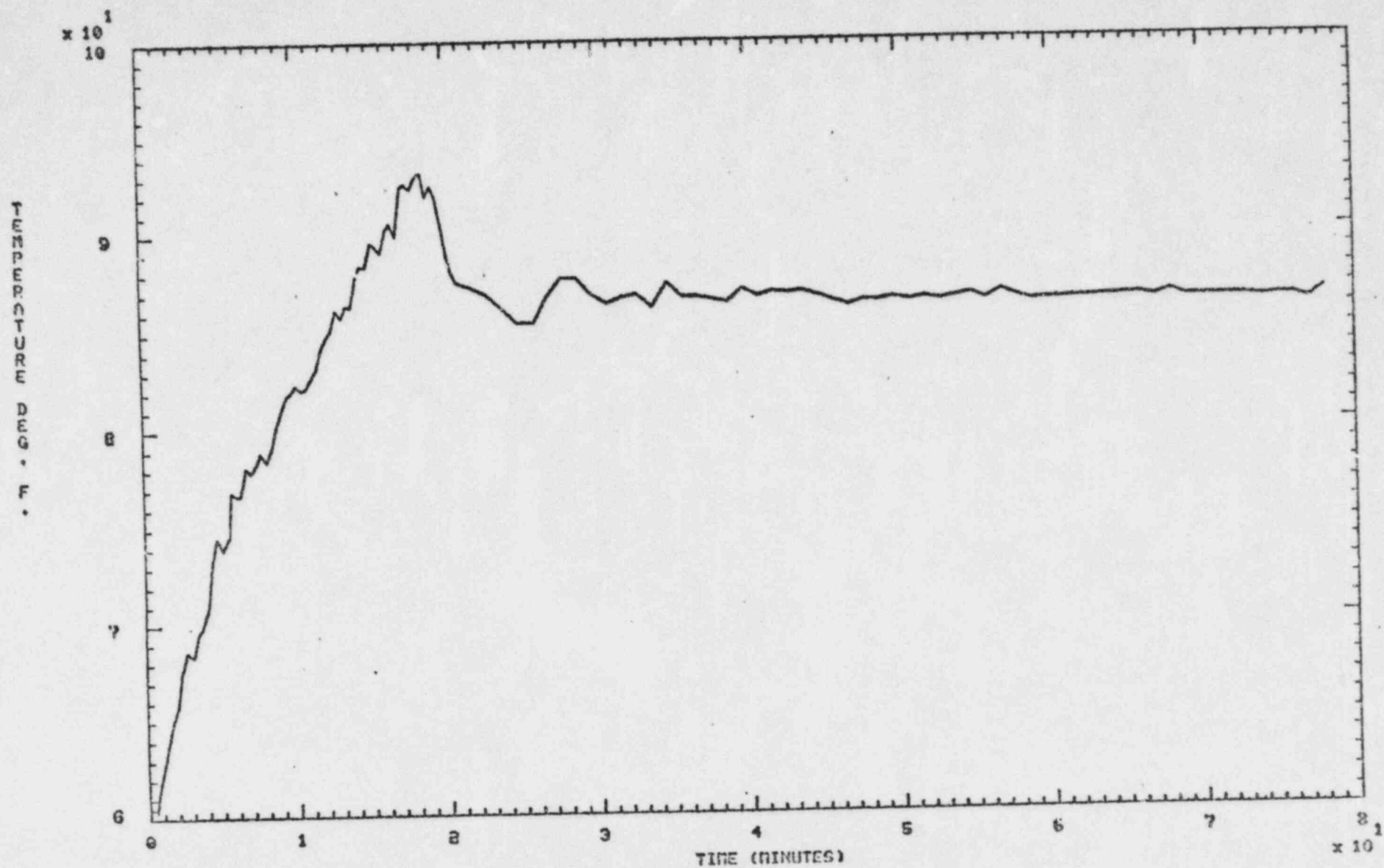
TEMPERATURE



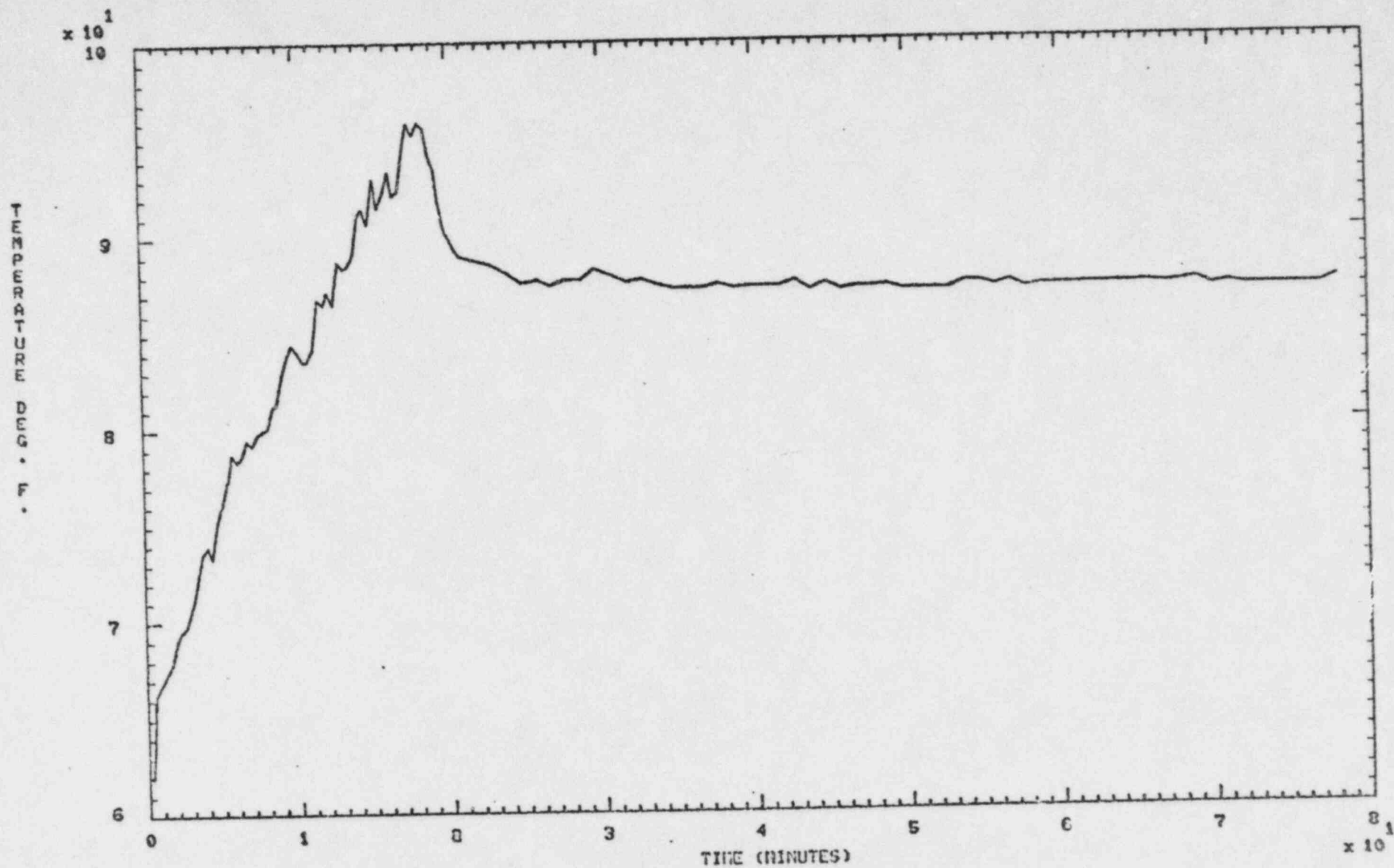
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 24



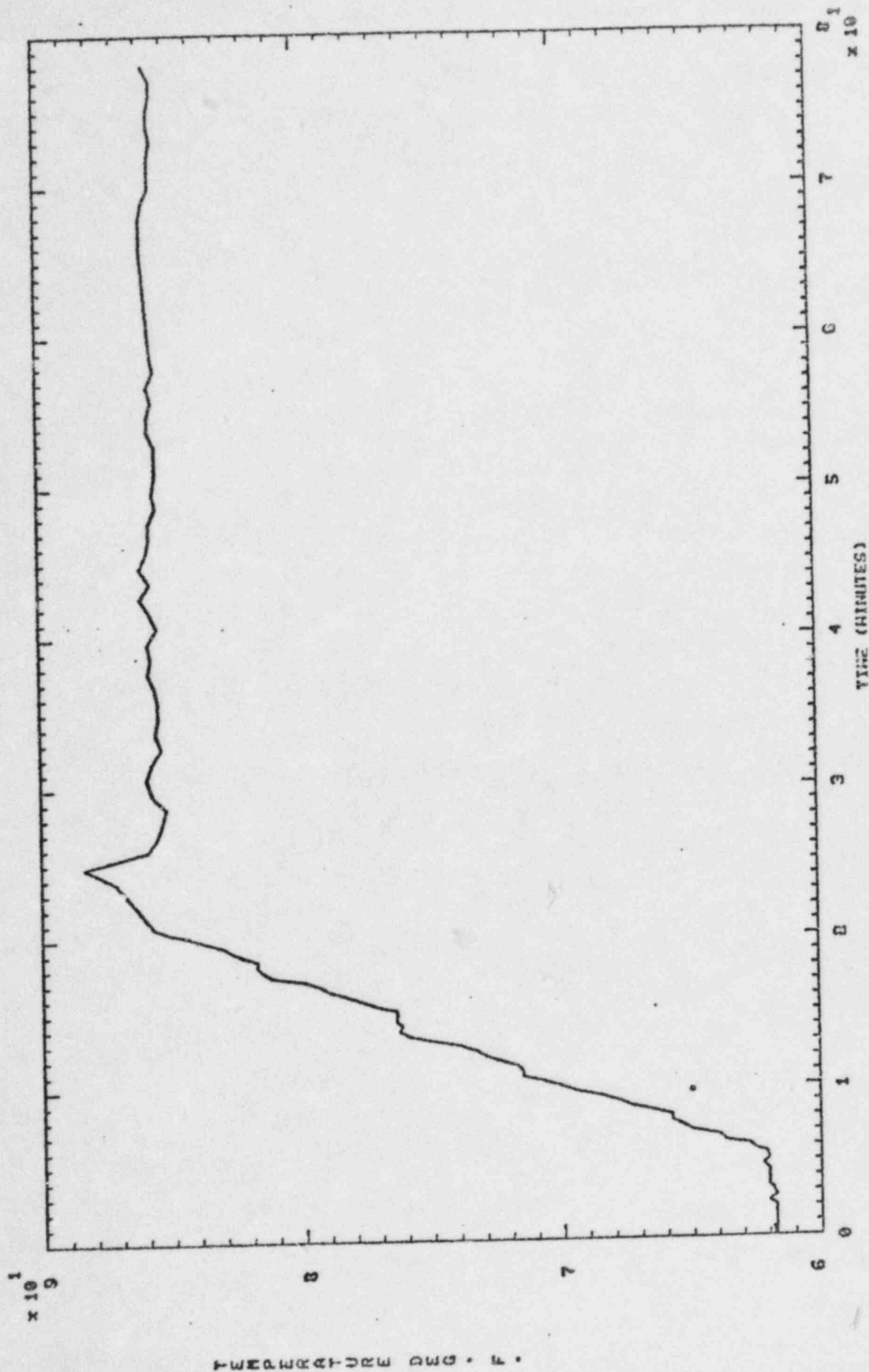
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 25



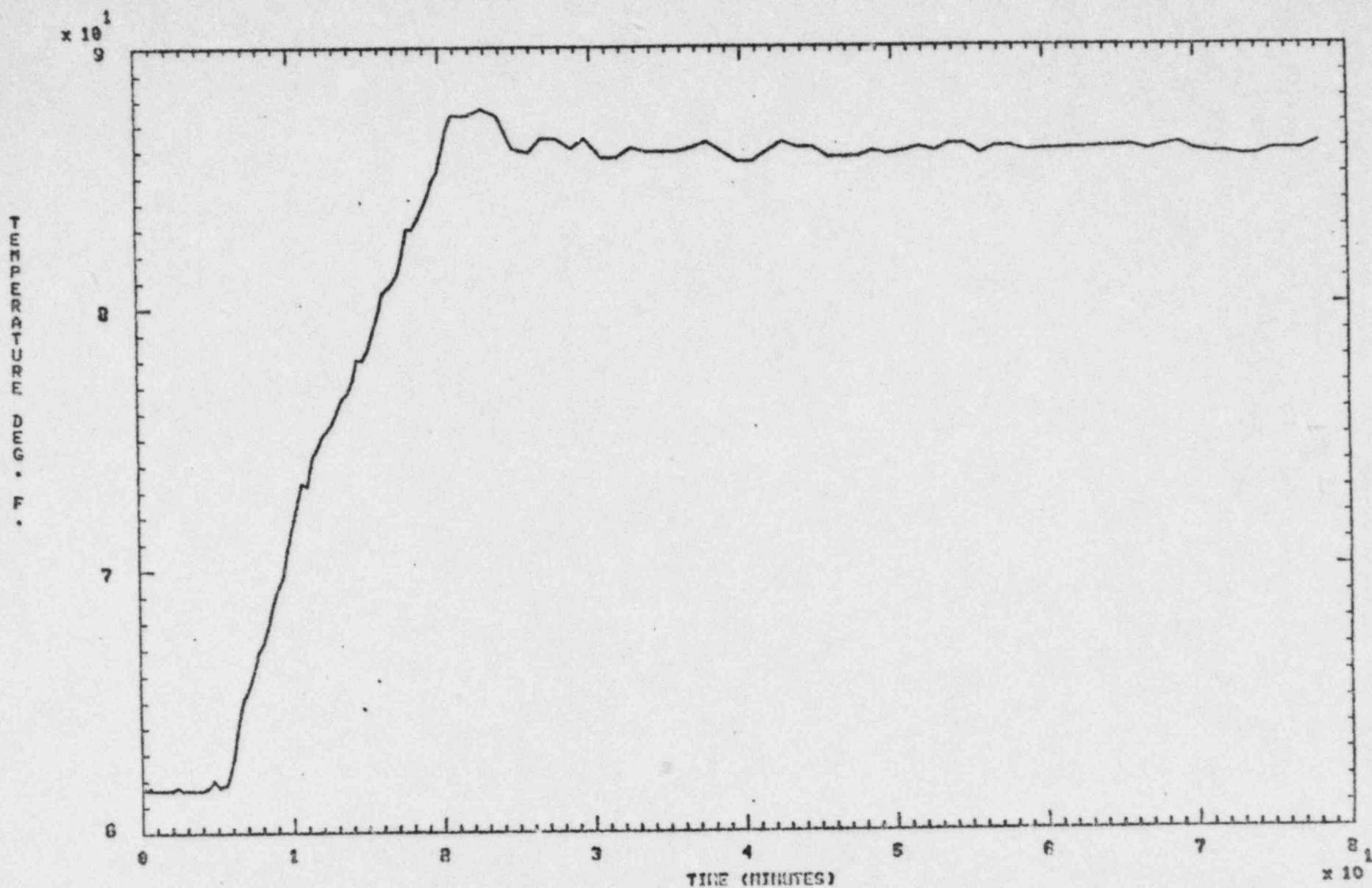
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 26



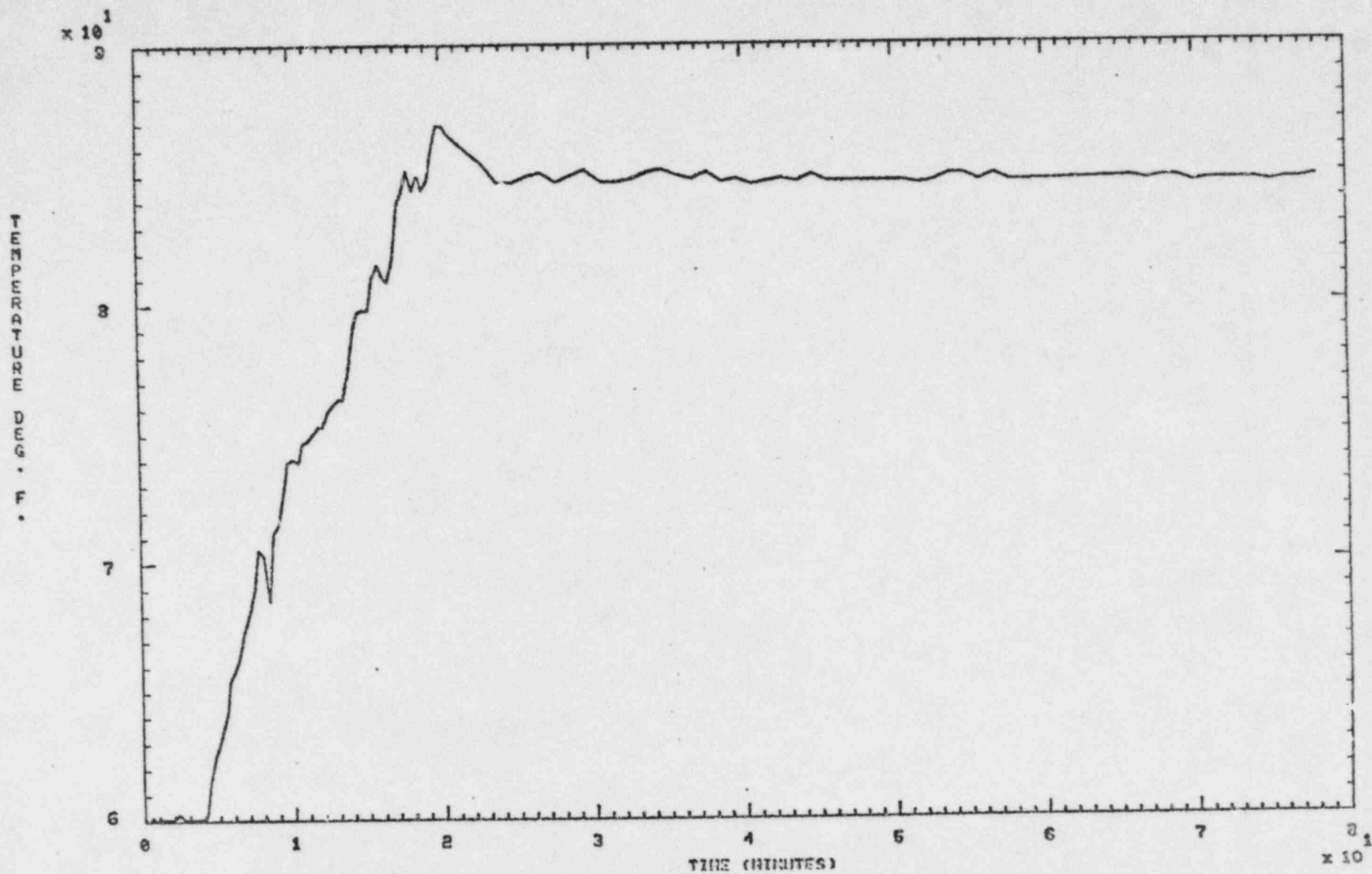
VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 27



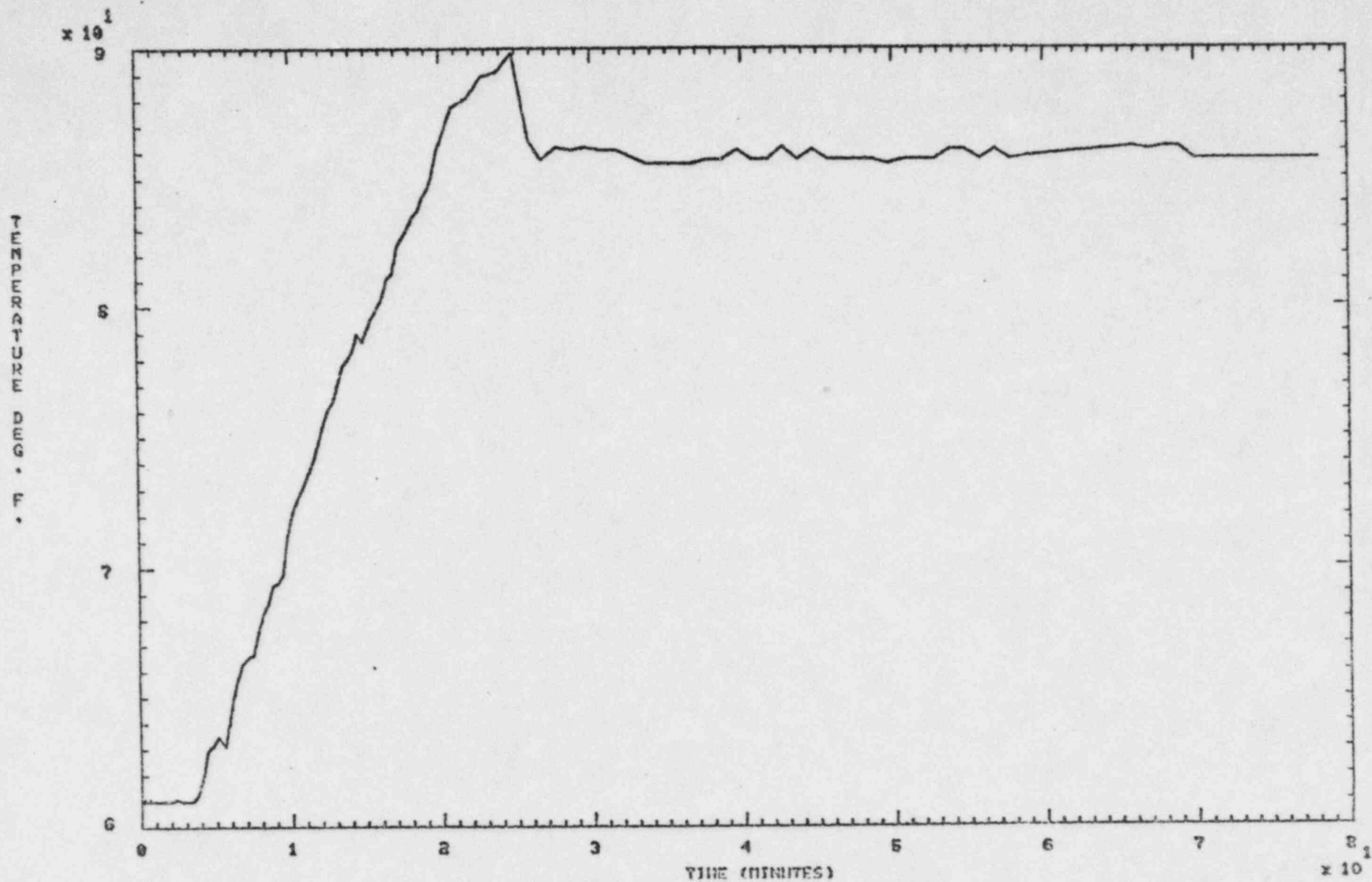
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 28



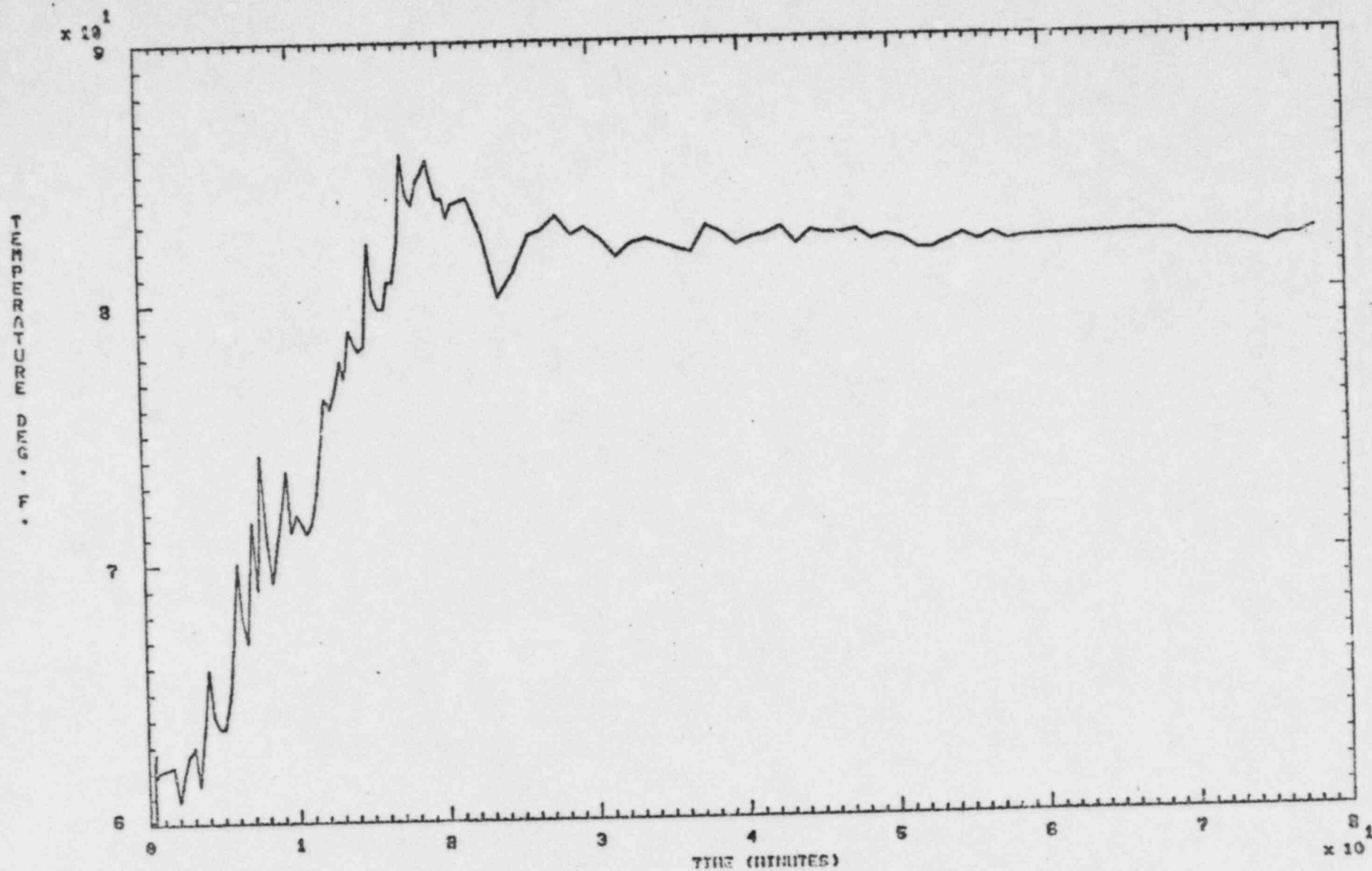
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 29



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT# 30

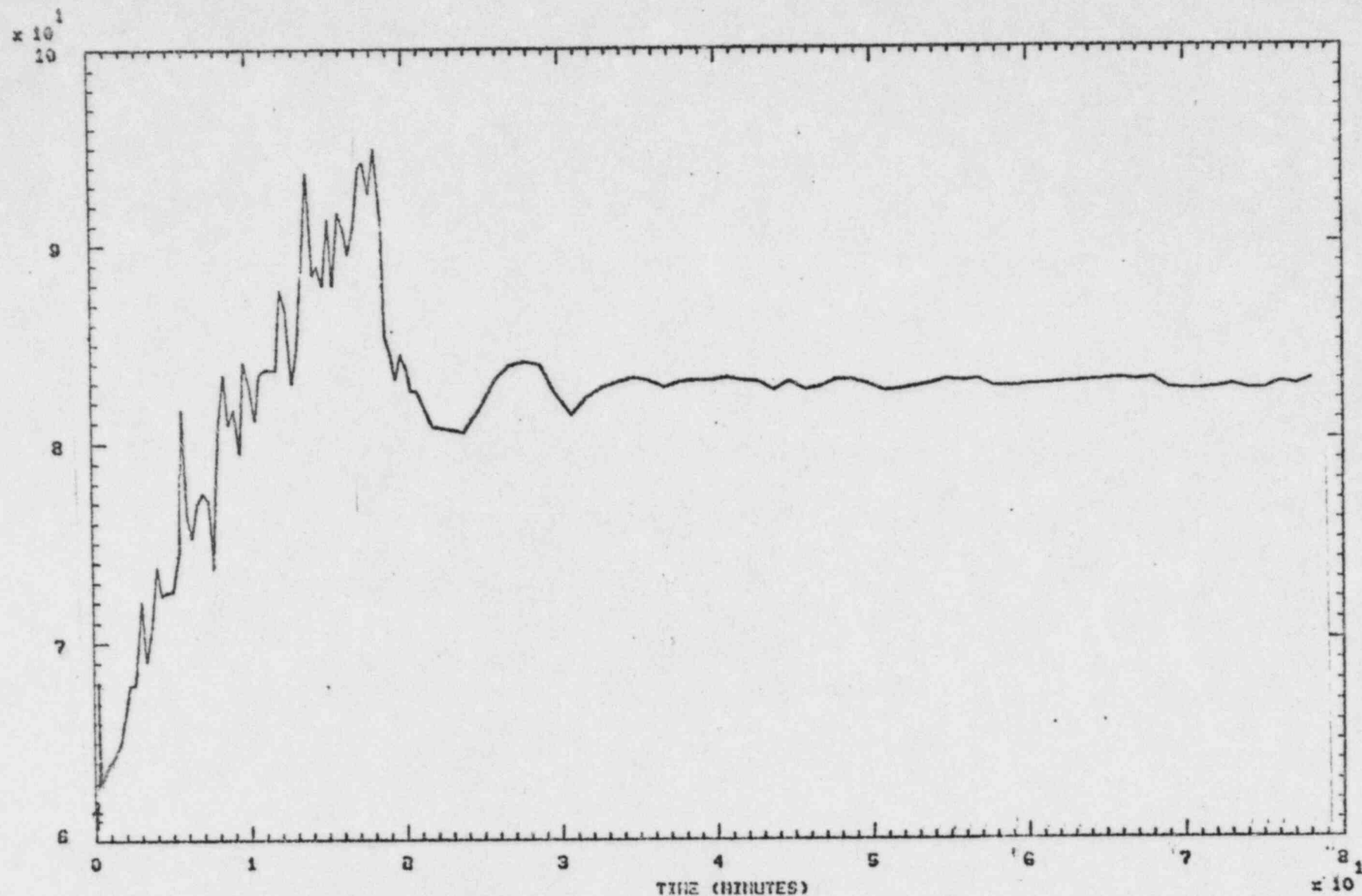


VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 31

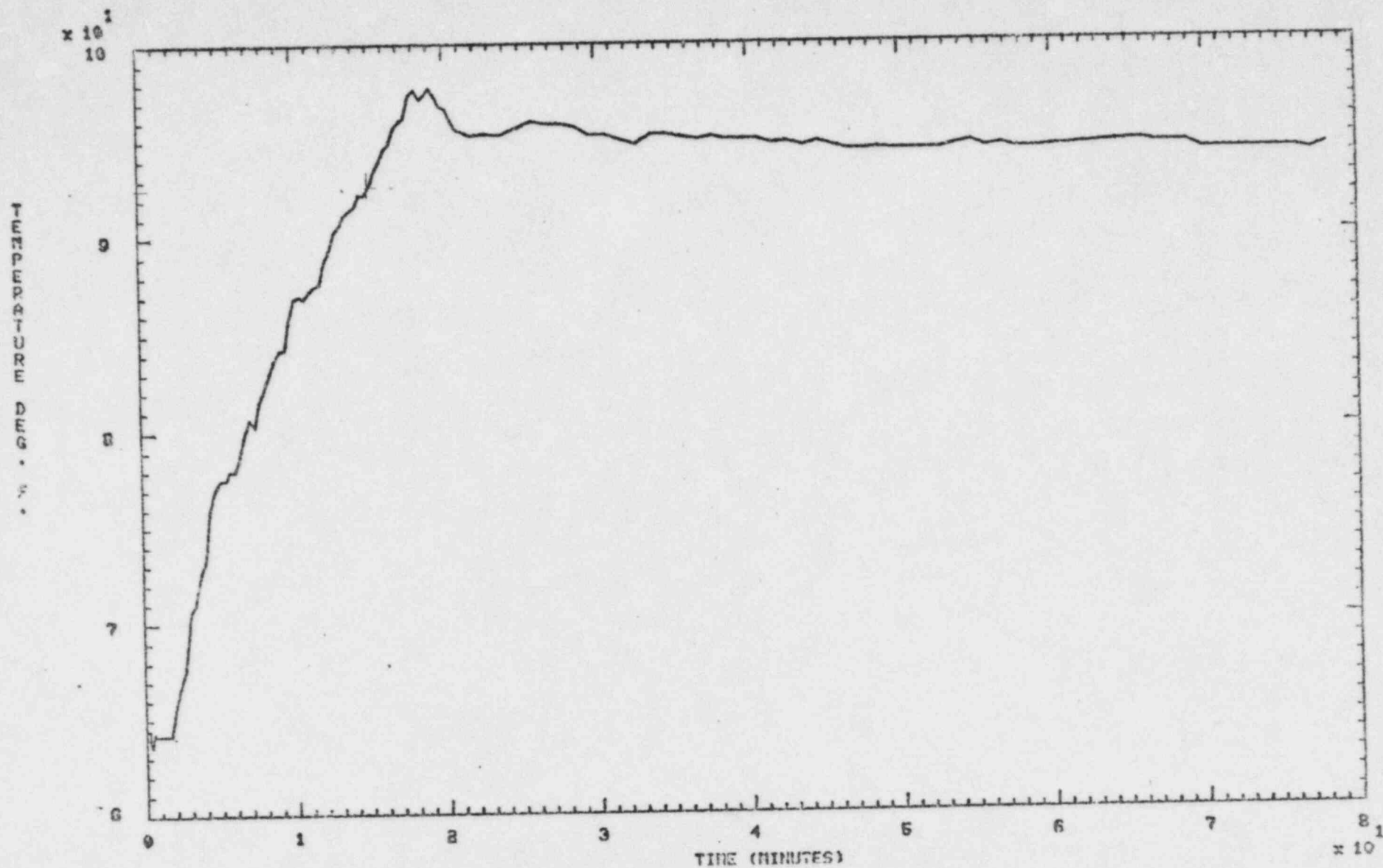


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 32

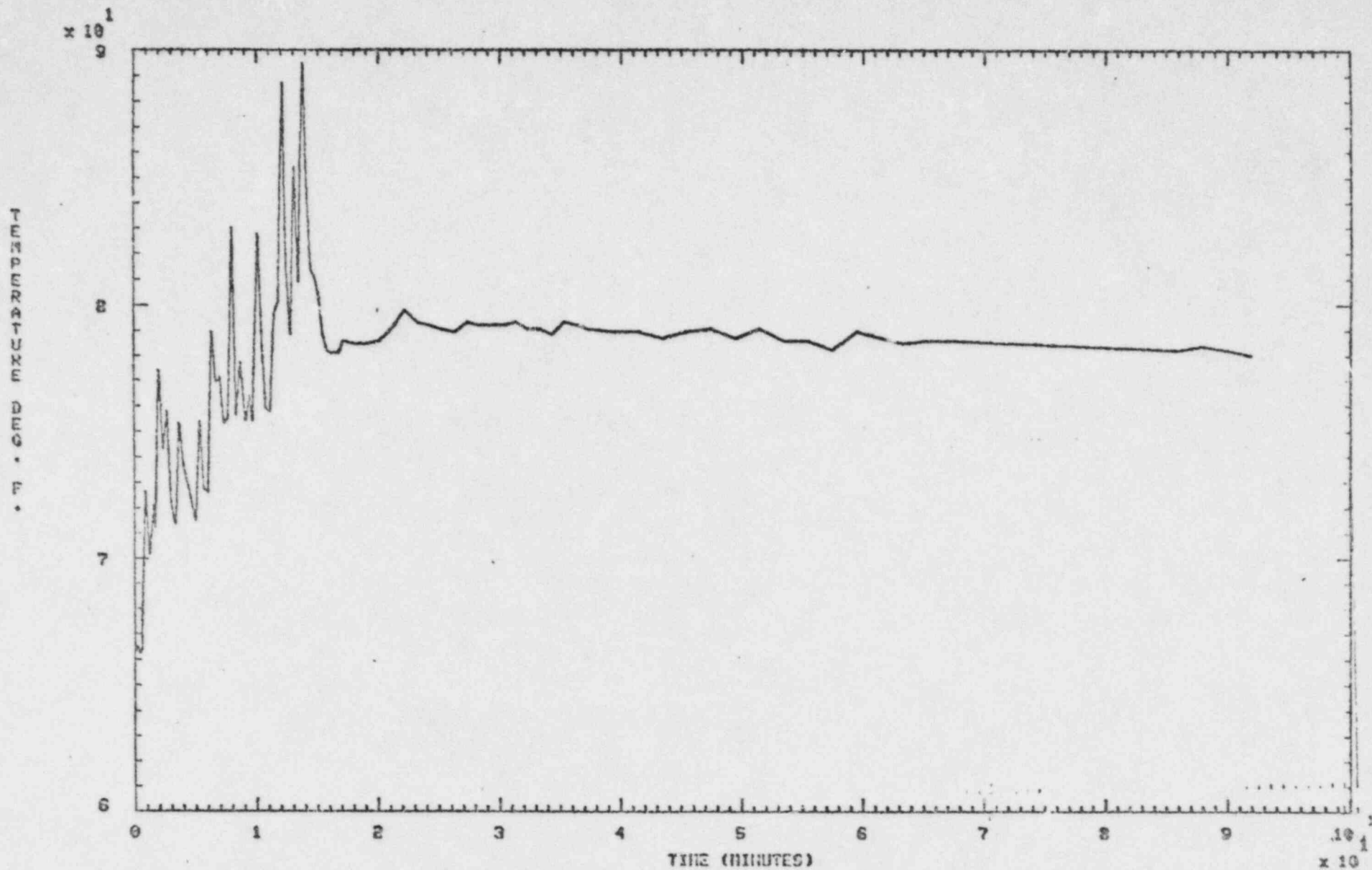
TEMPERATURE (°C)



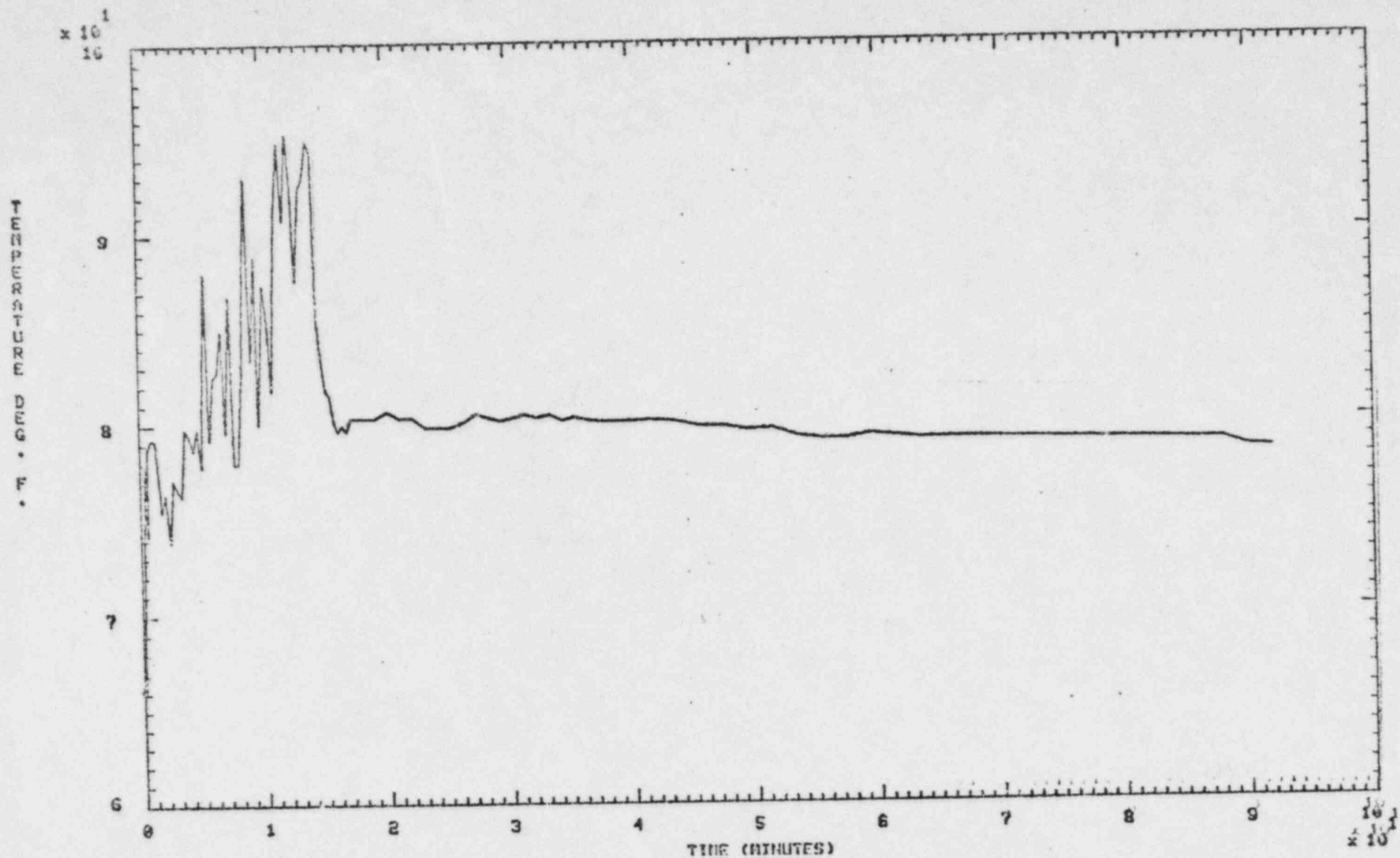
VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 33

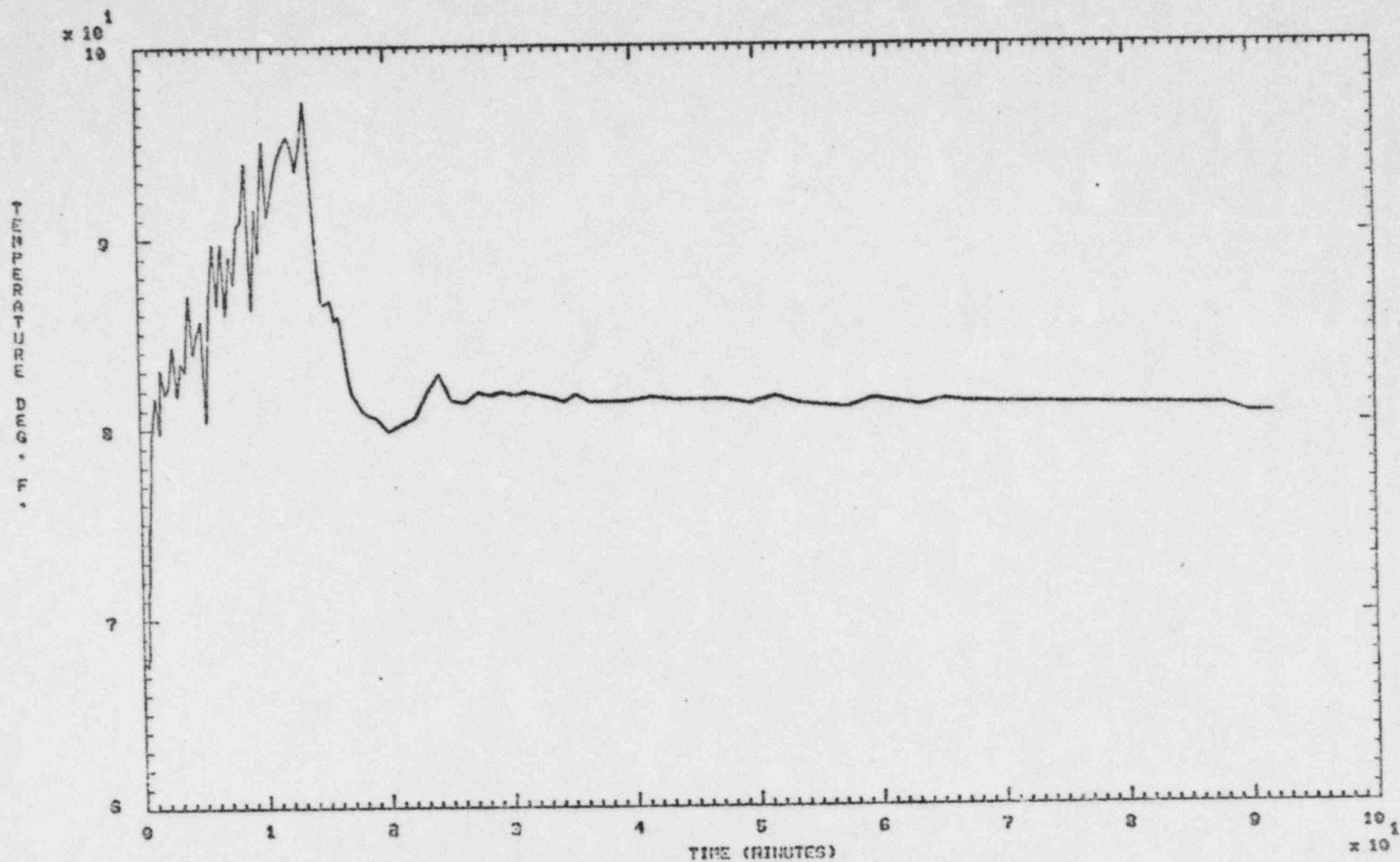


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 070X TT= 48



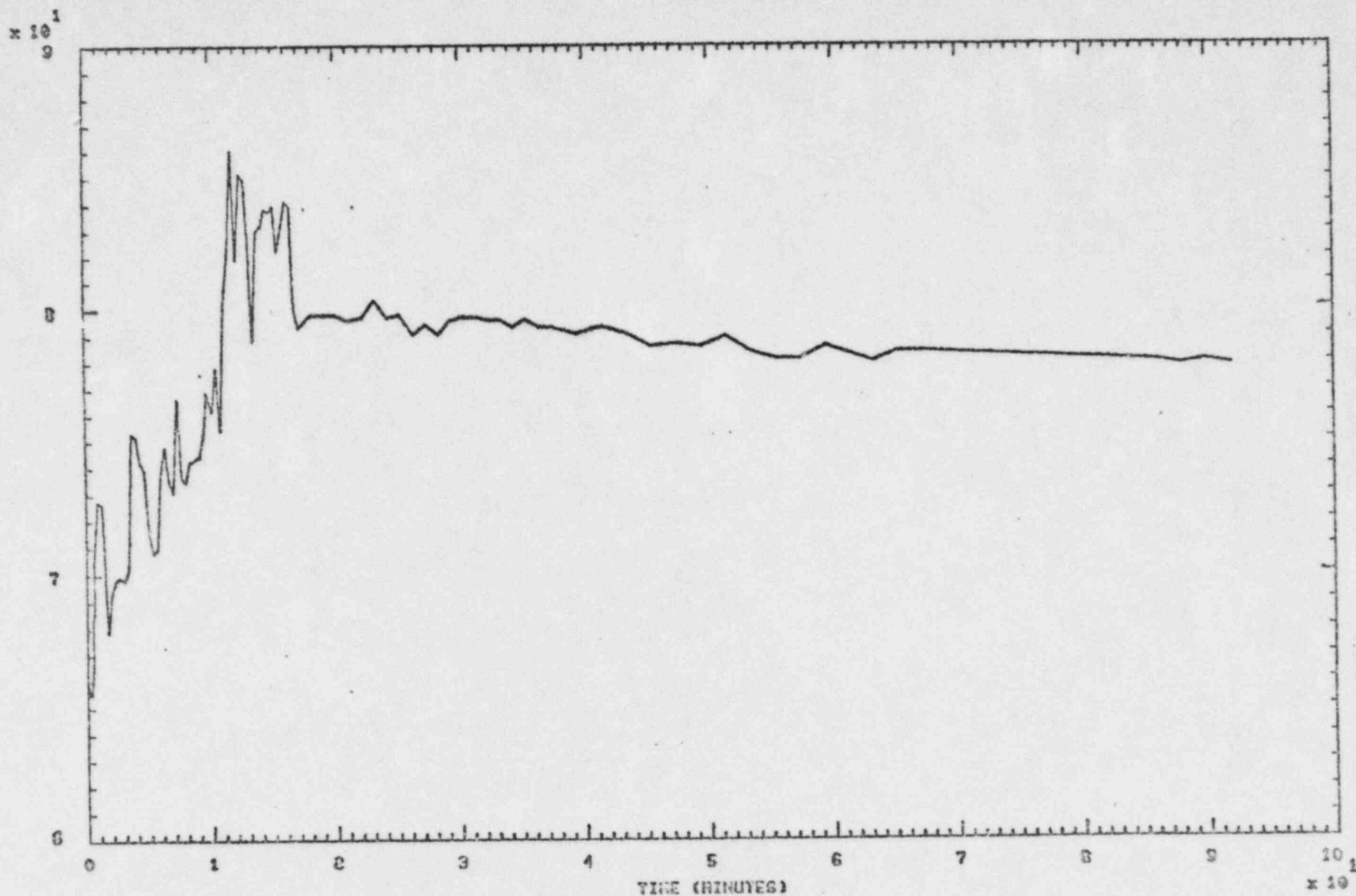
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 1





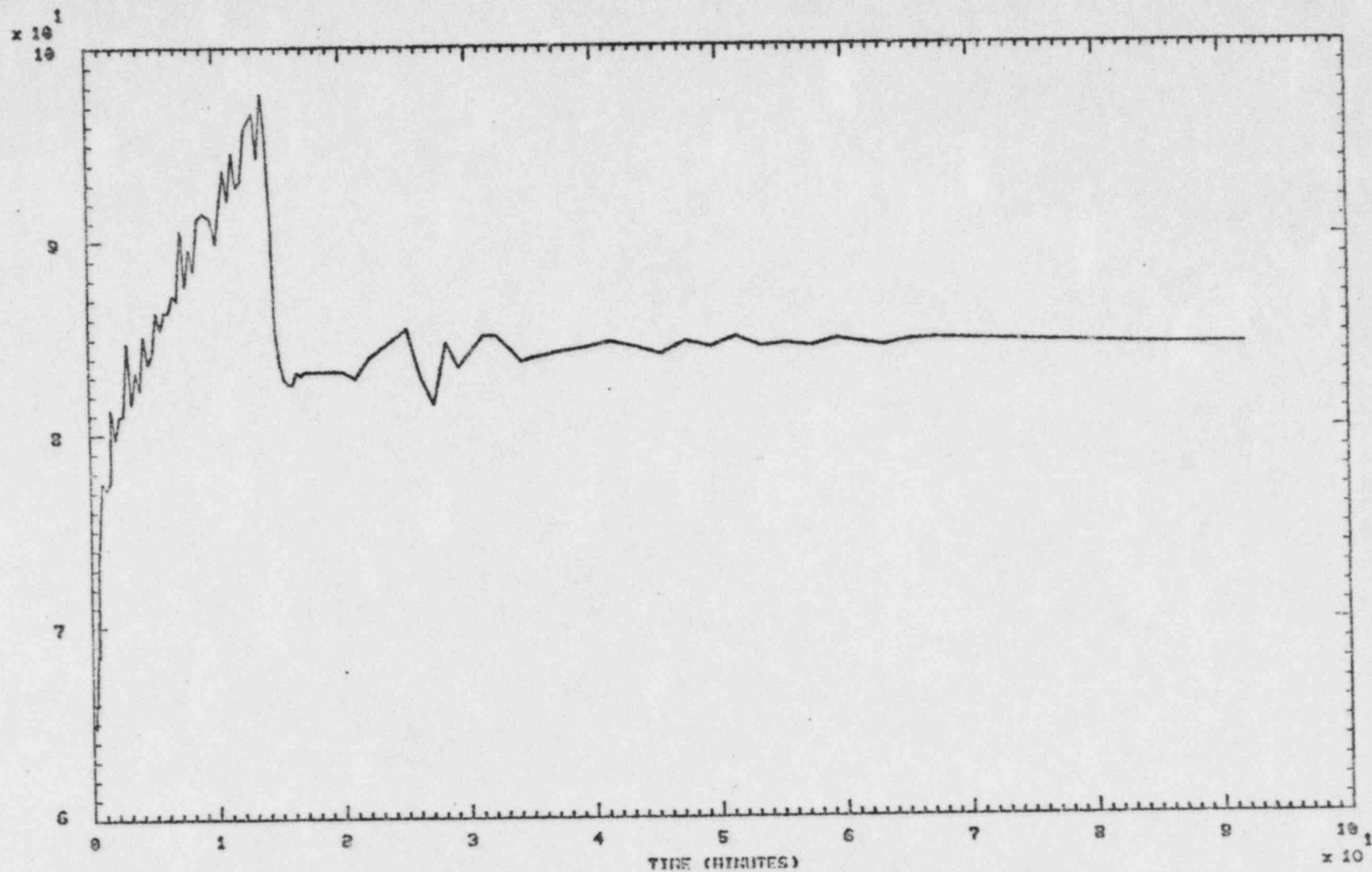
VALVE OPENS AT 10.1 SEC .
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 3

TEMPERATURE

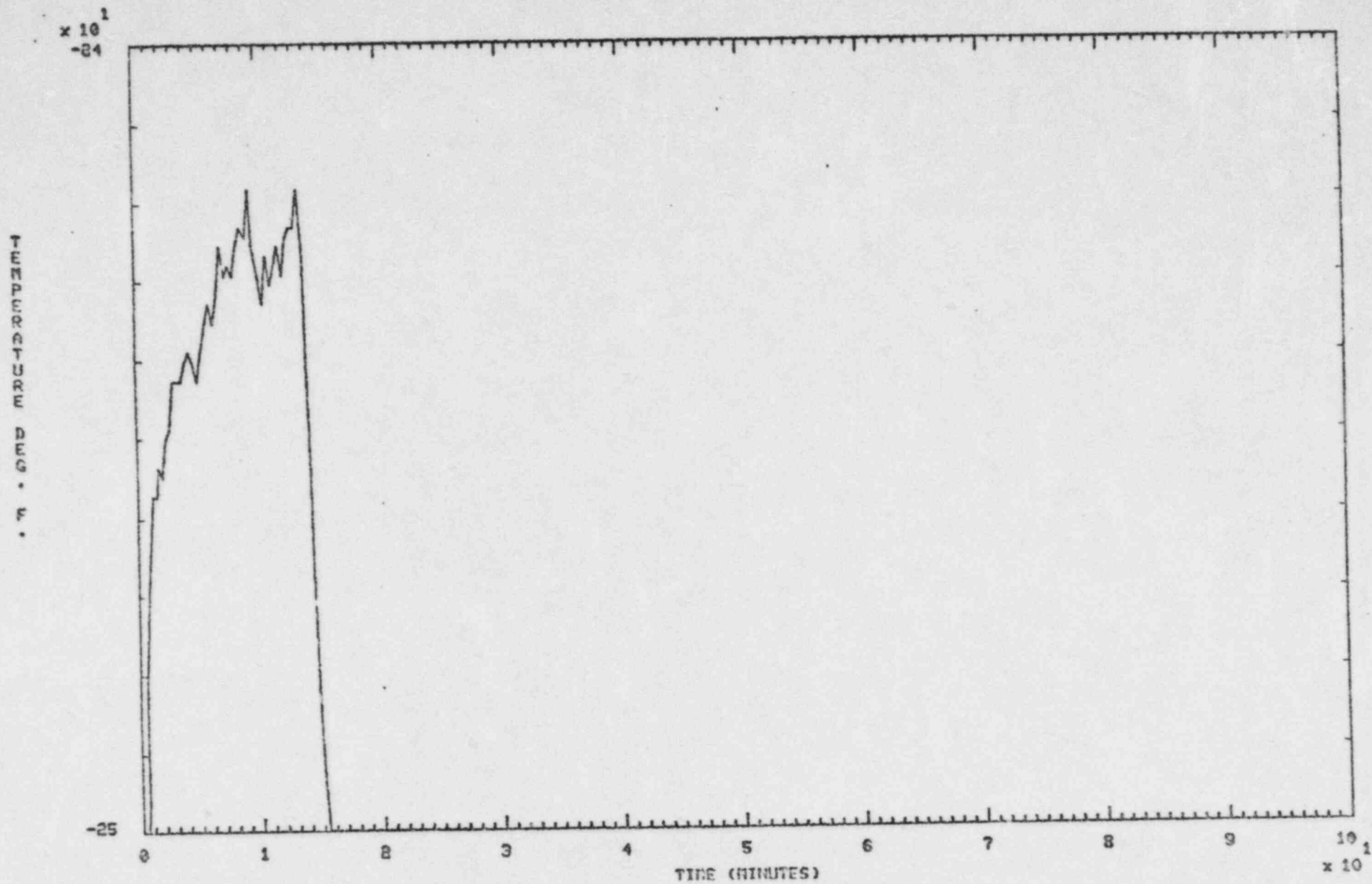


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 4

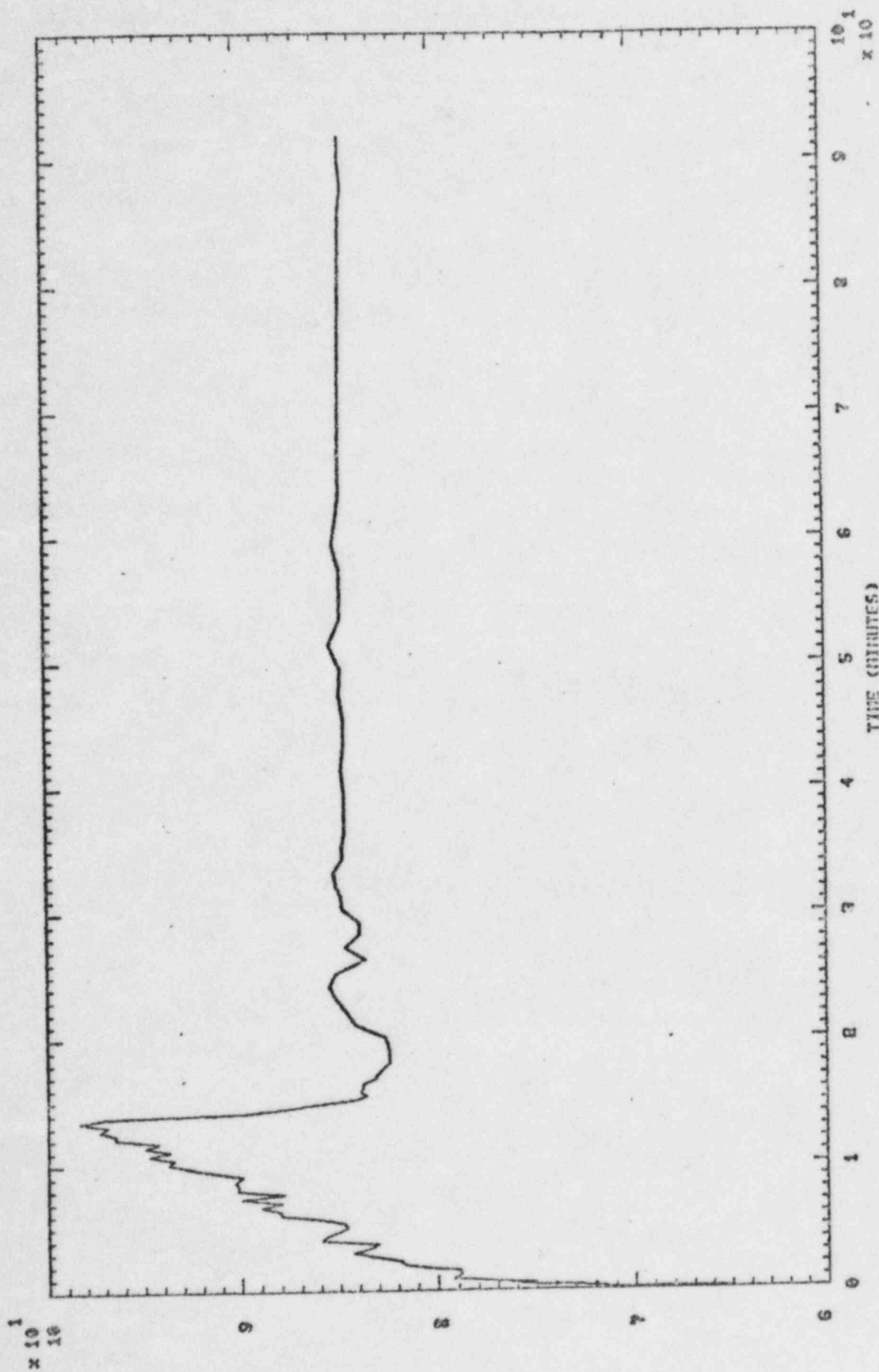
TEMPERATURE - °F



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 5

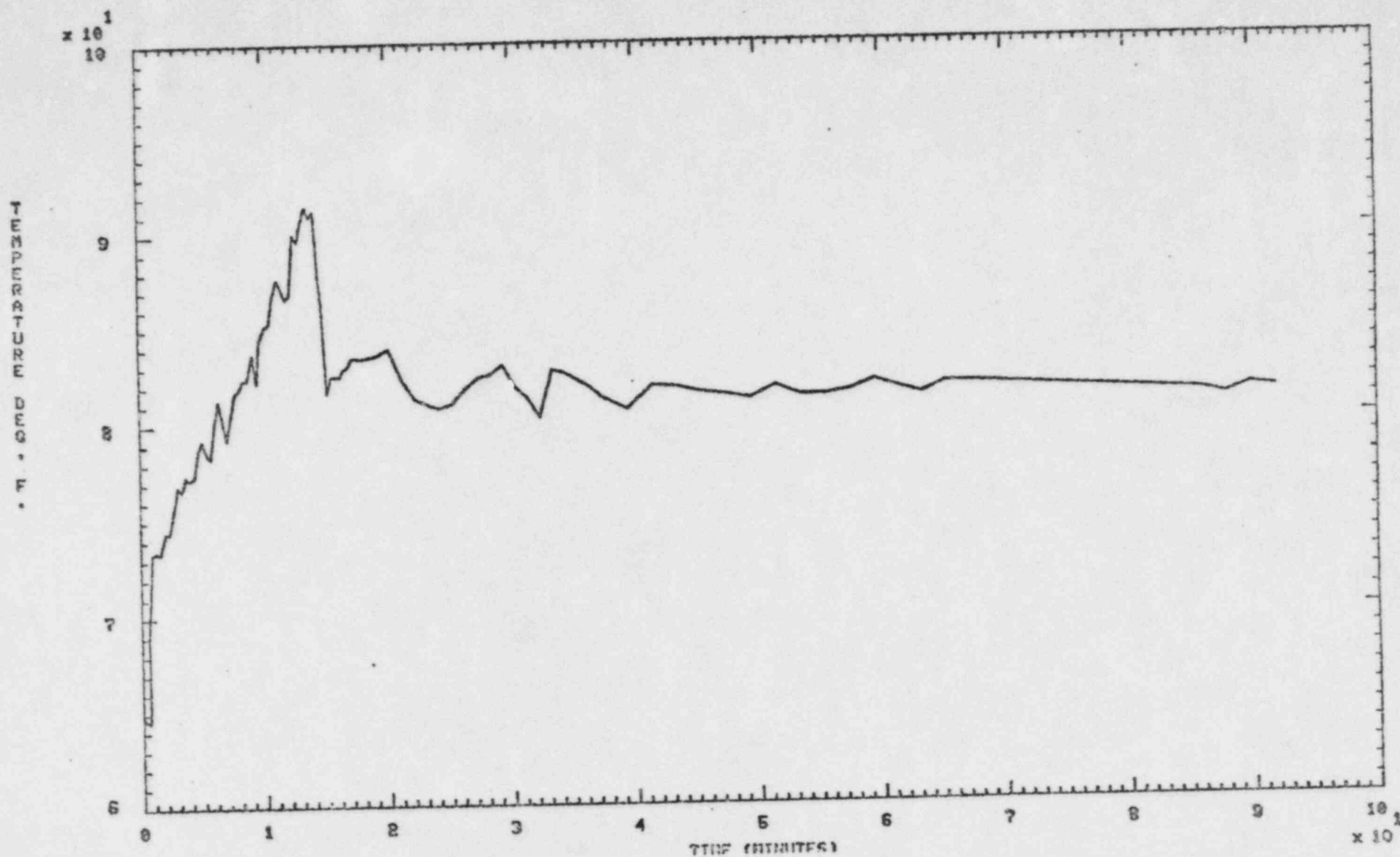


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 6

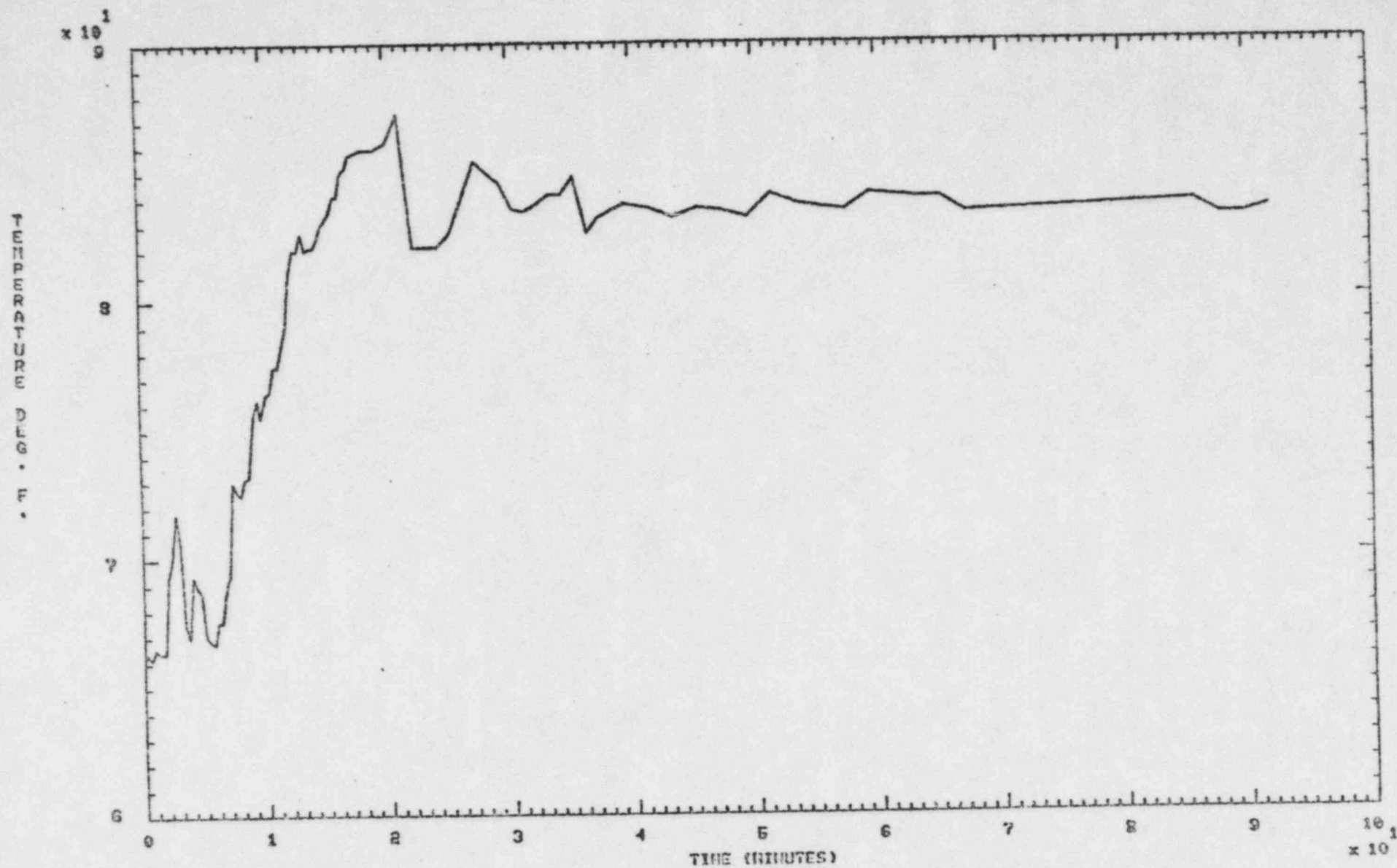


VALVE OPENS AT 10.1 SEC

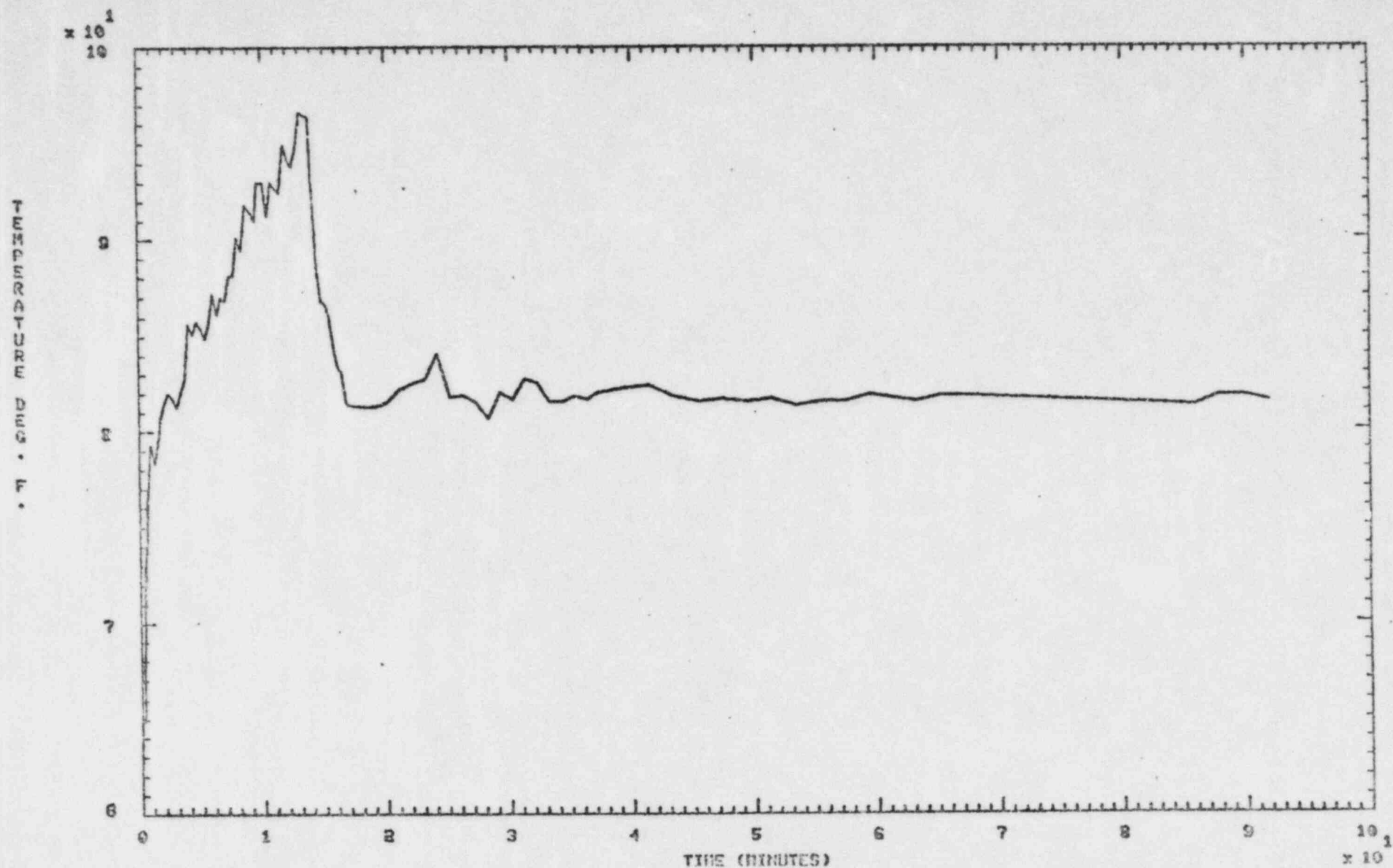
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 7



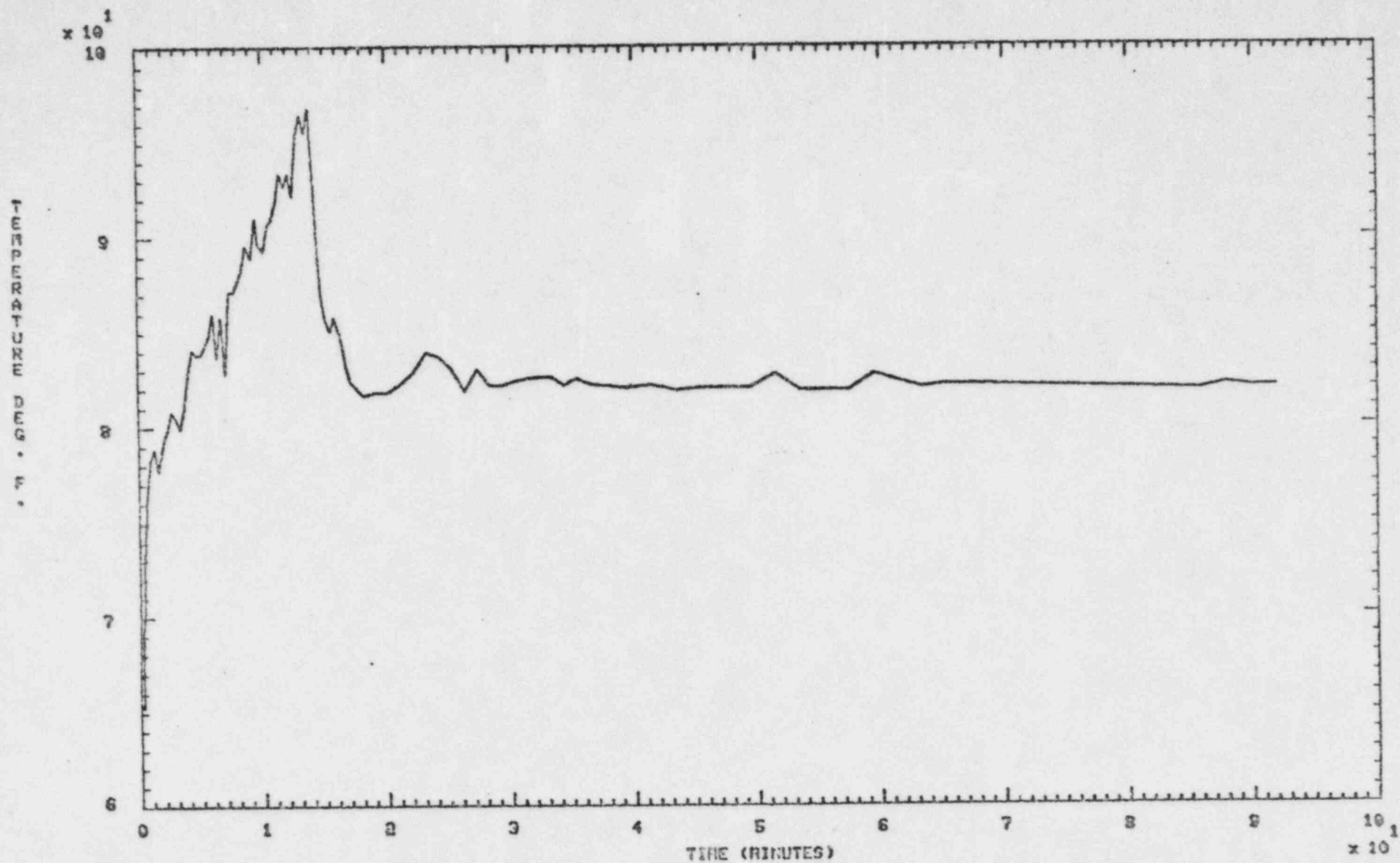
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT# 8



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 9

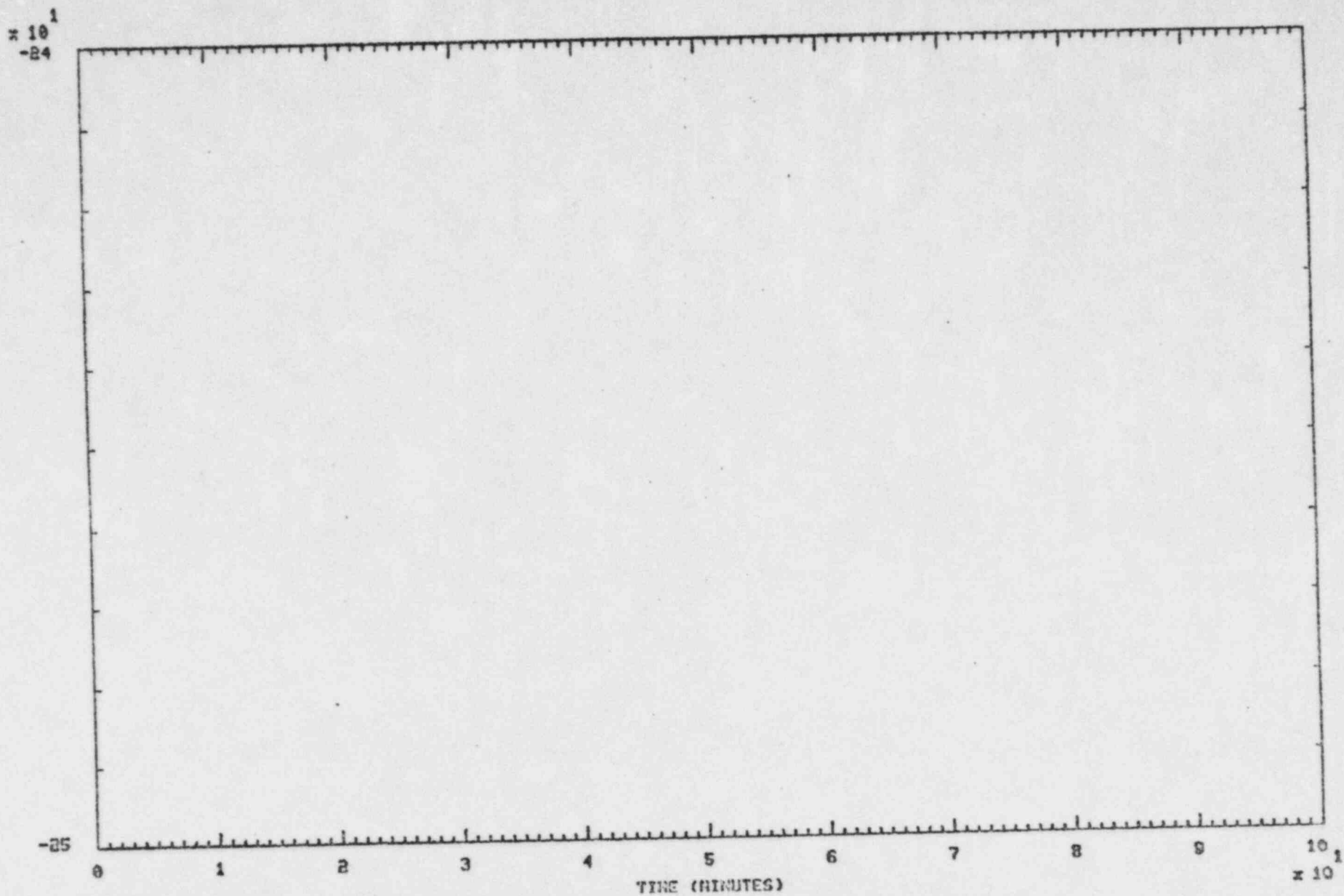


VALVE OPENS AT 10.1 SEC .
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 10

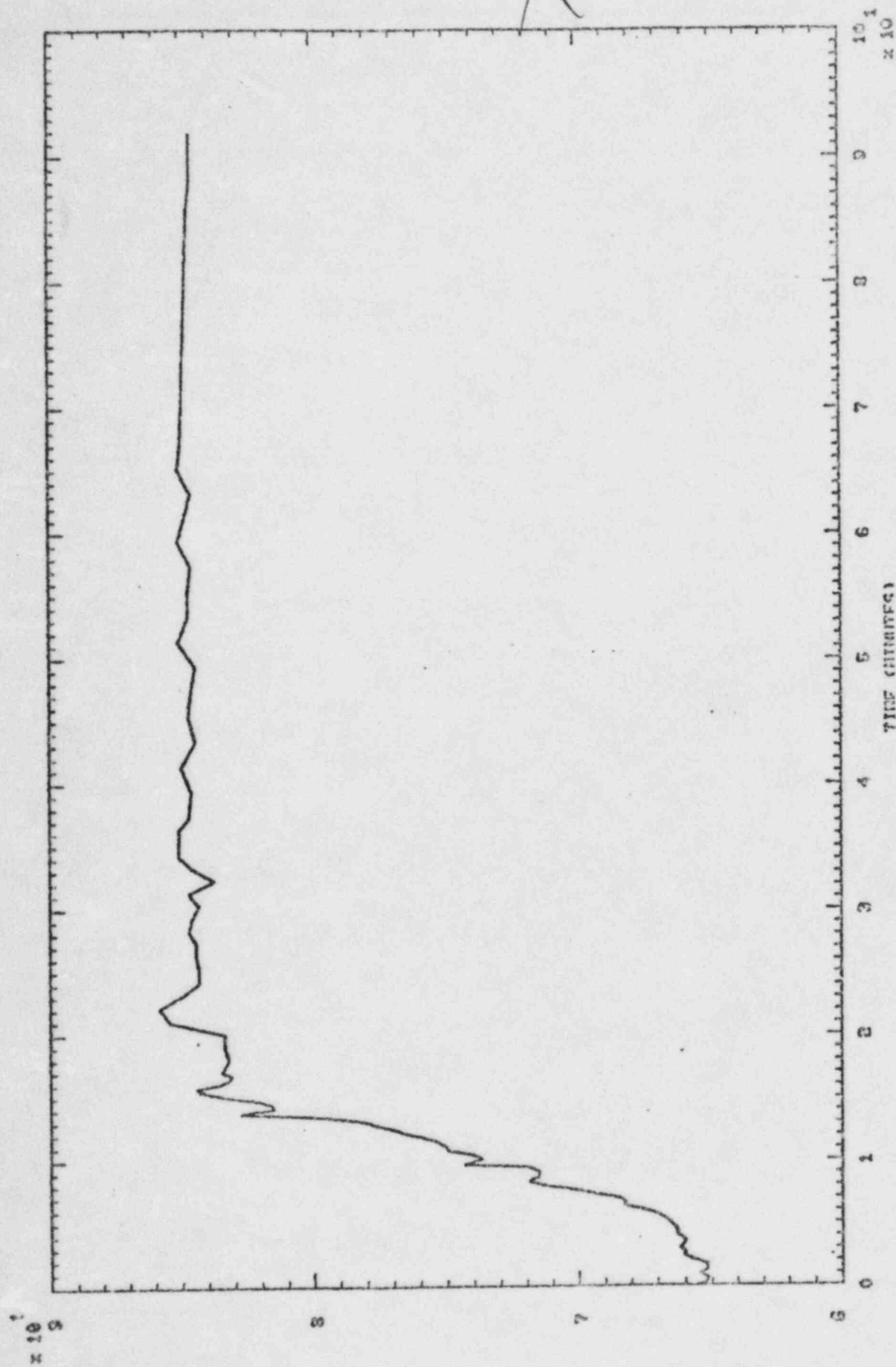


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 11

TEMPERATURE
DEG. F.



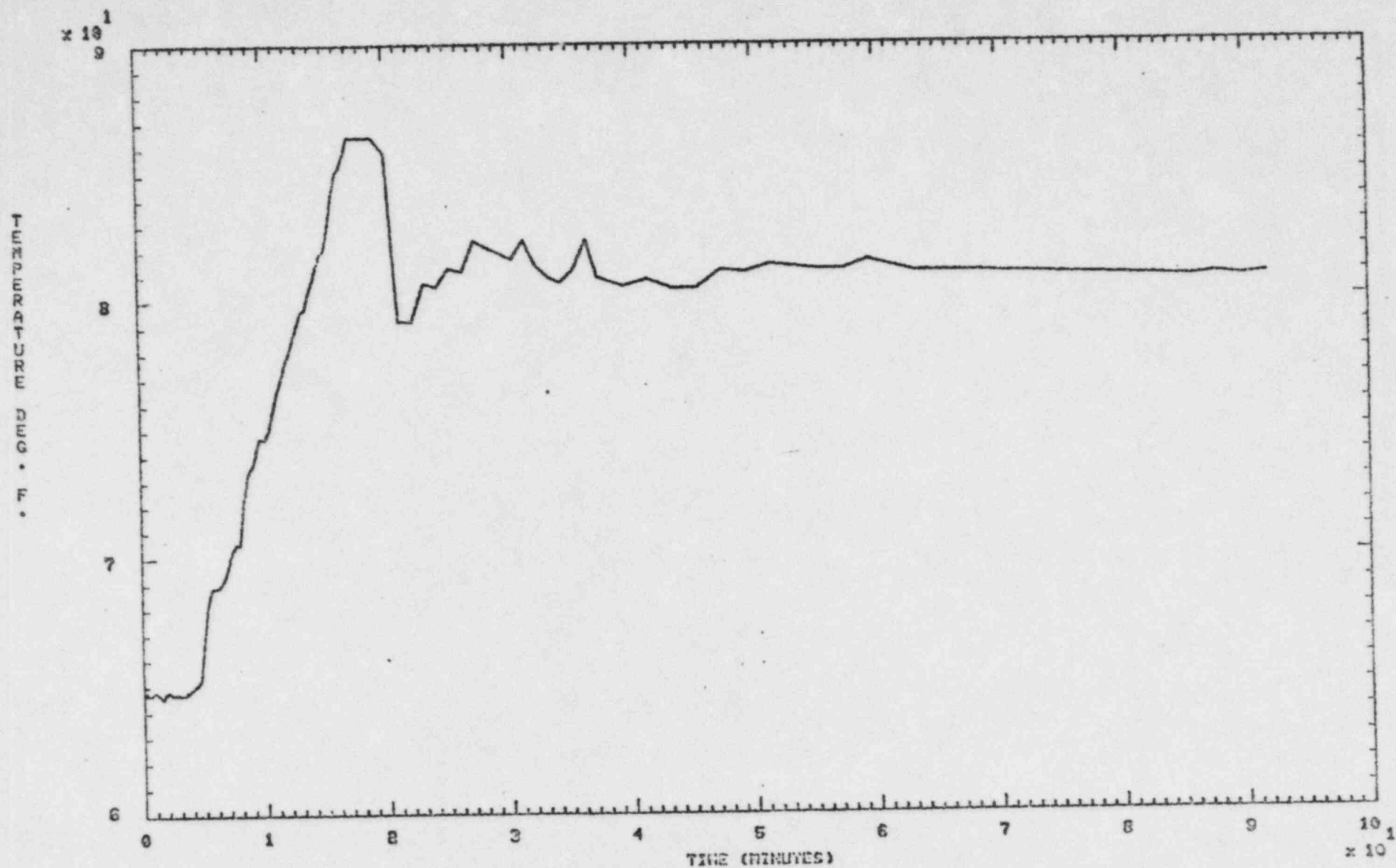
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 12



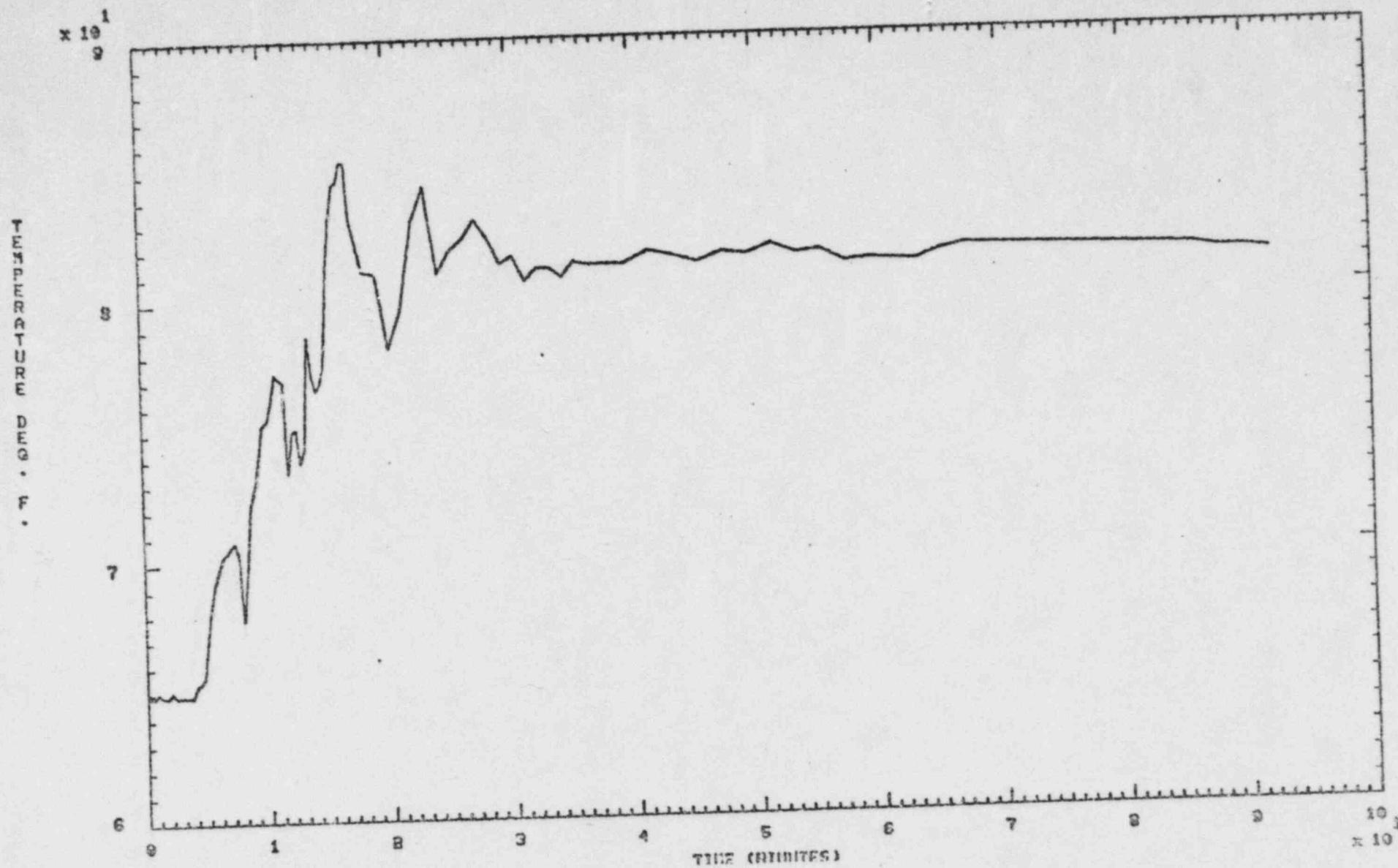
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO. RUN NO. 071X TT= 13

VALVE OPENS AT 10.1 SEC

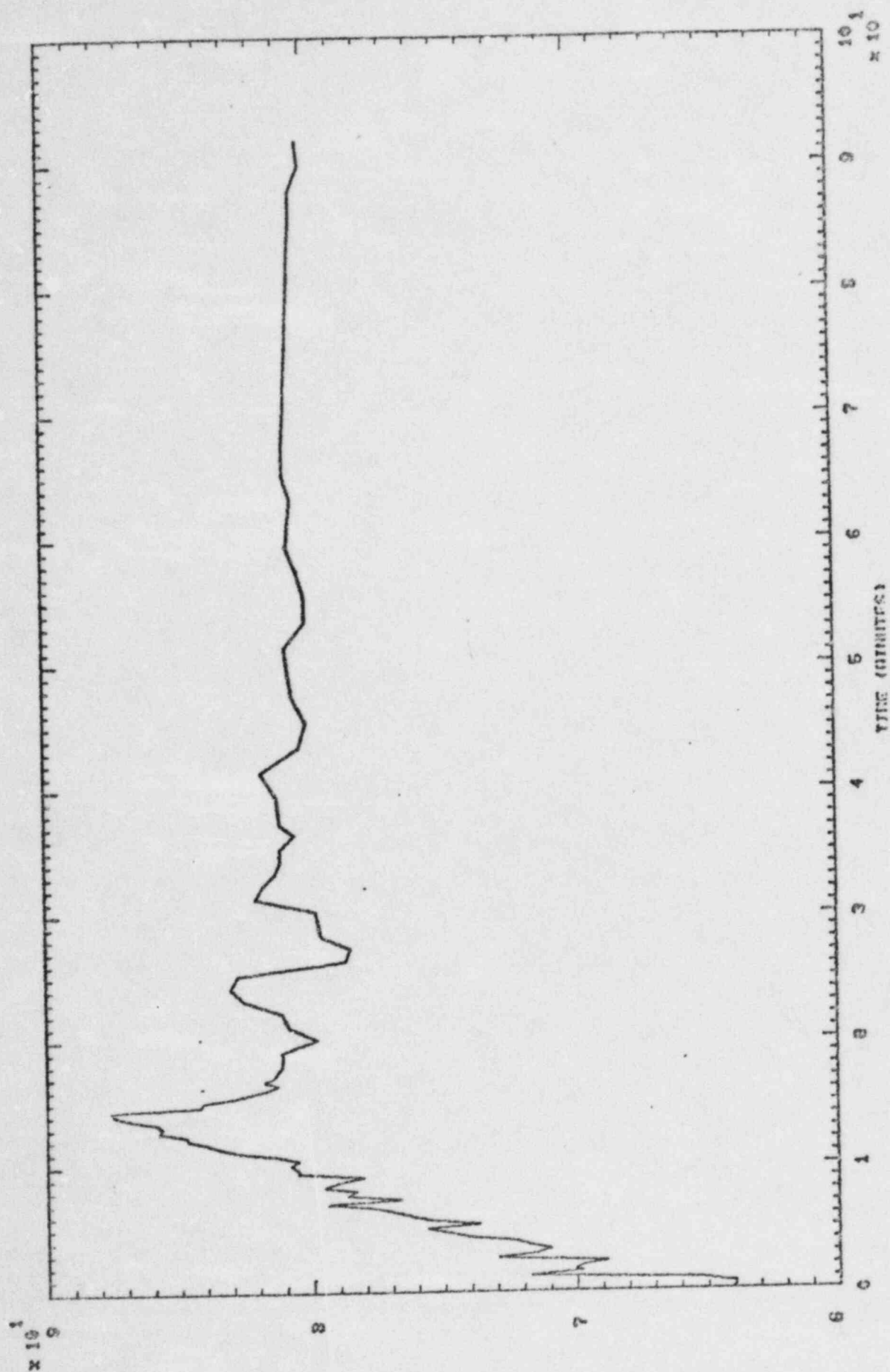
OFFICE (HOURS) 2014



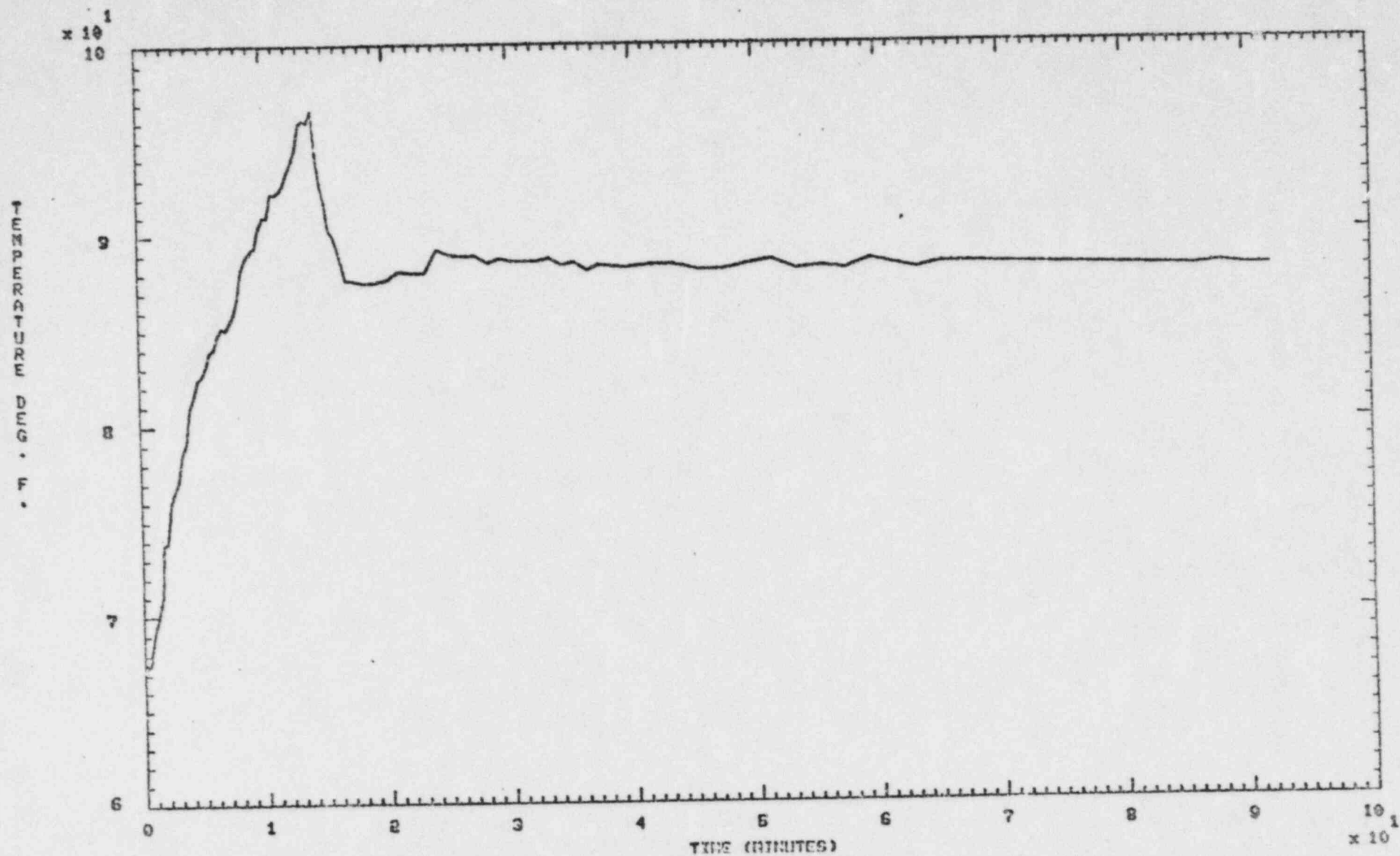
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 14



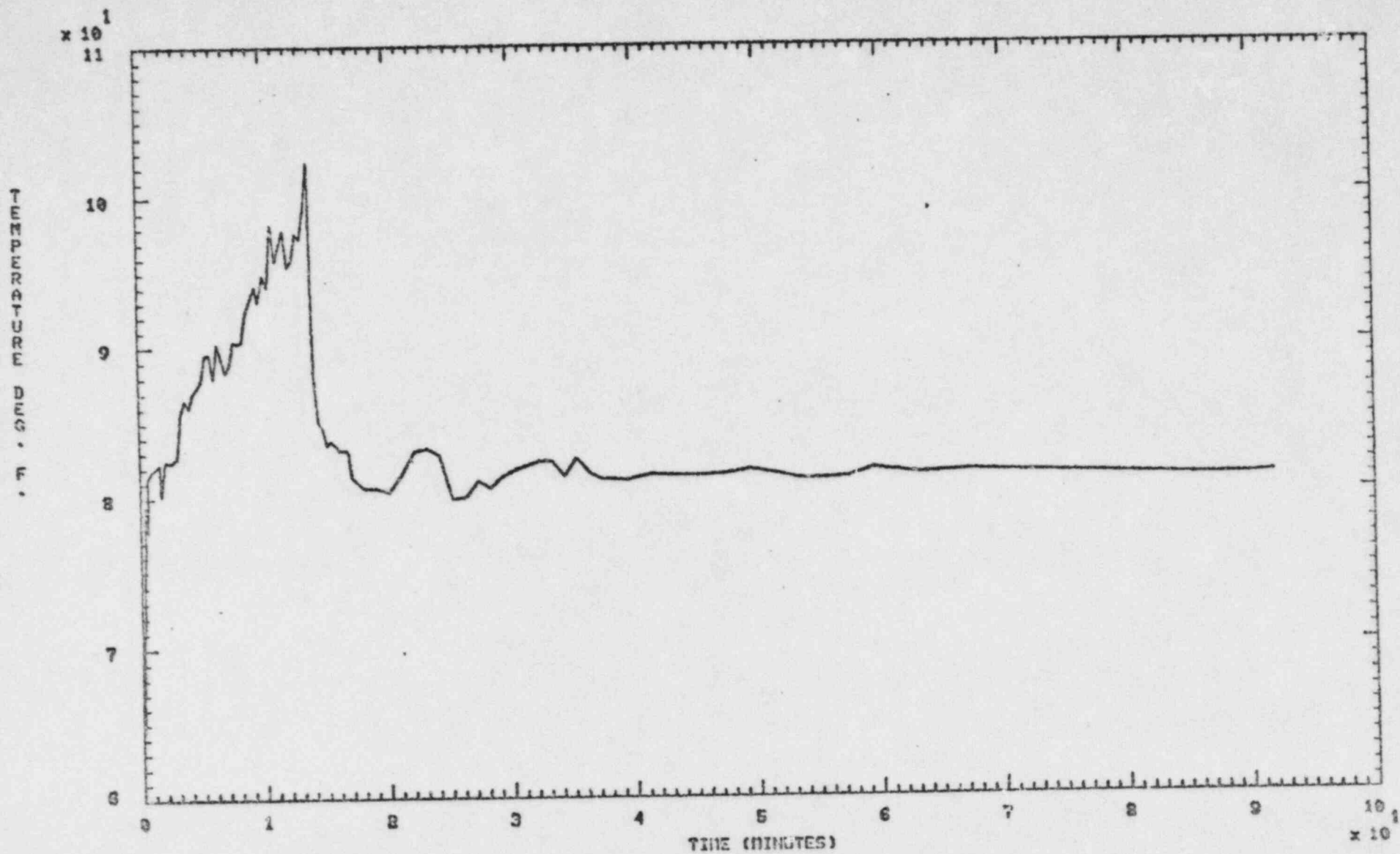
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 15



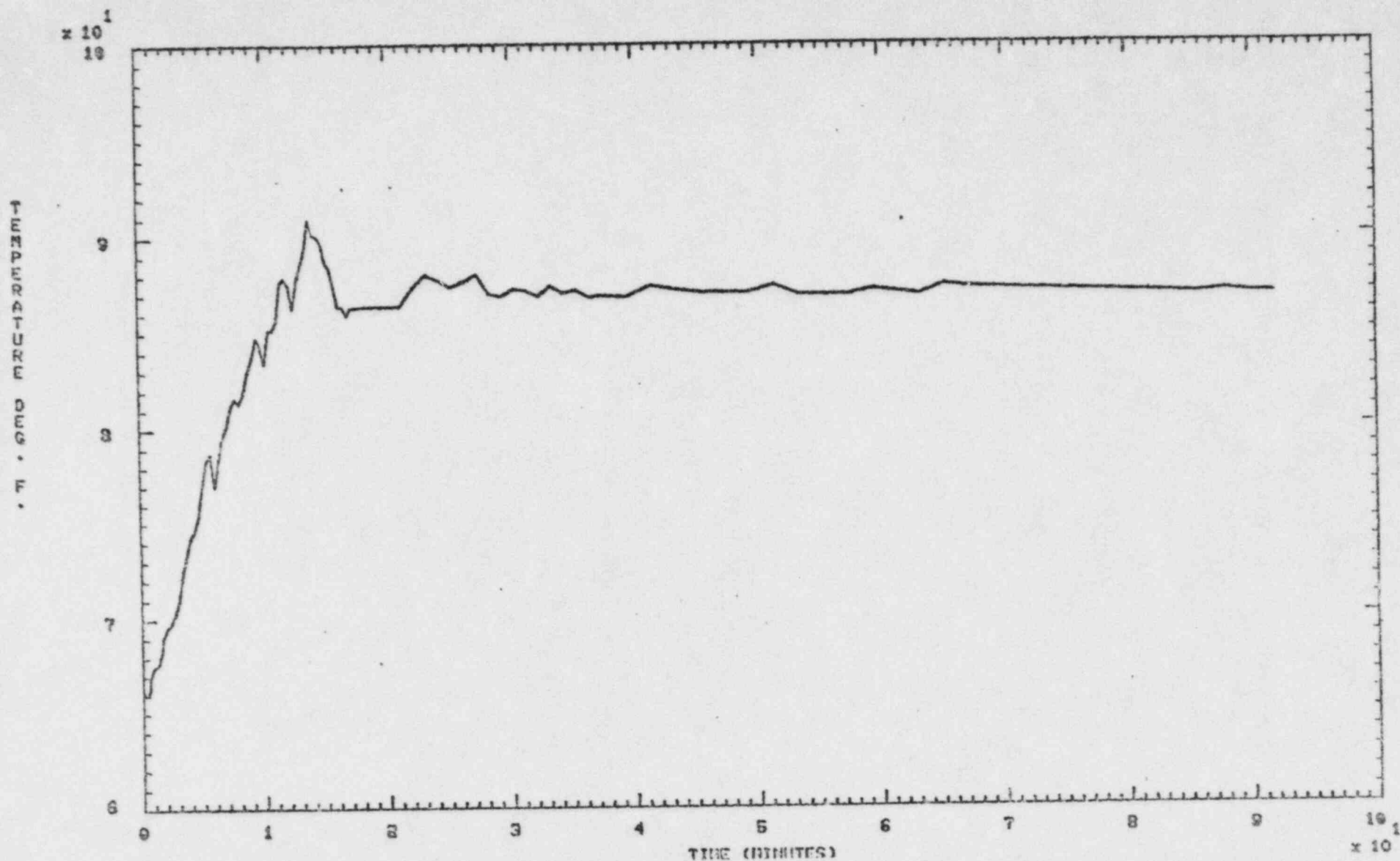
VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 16



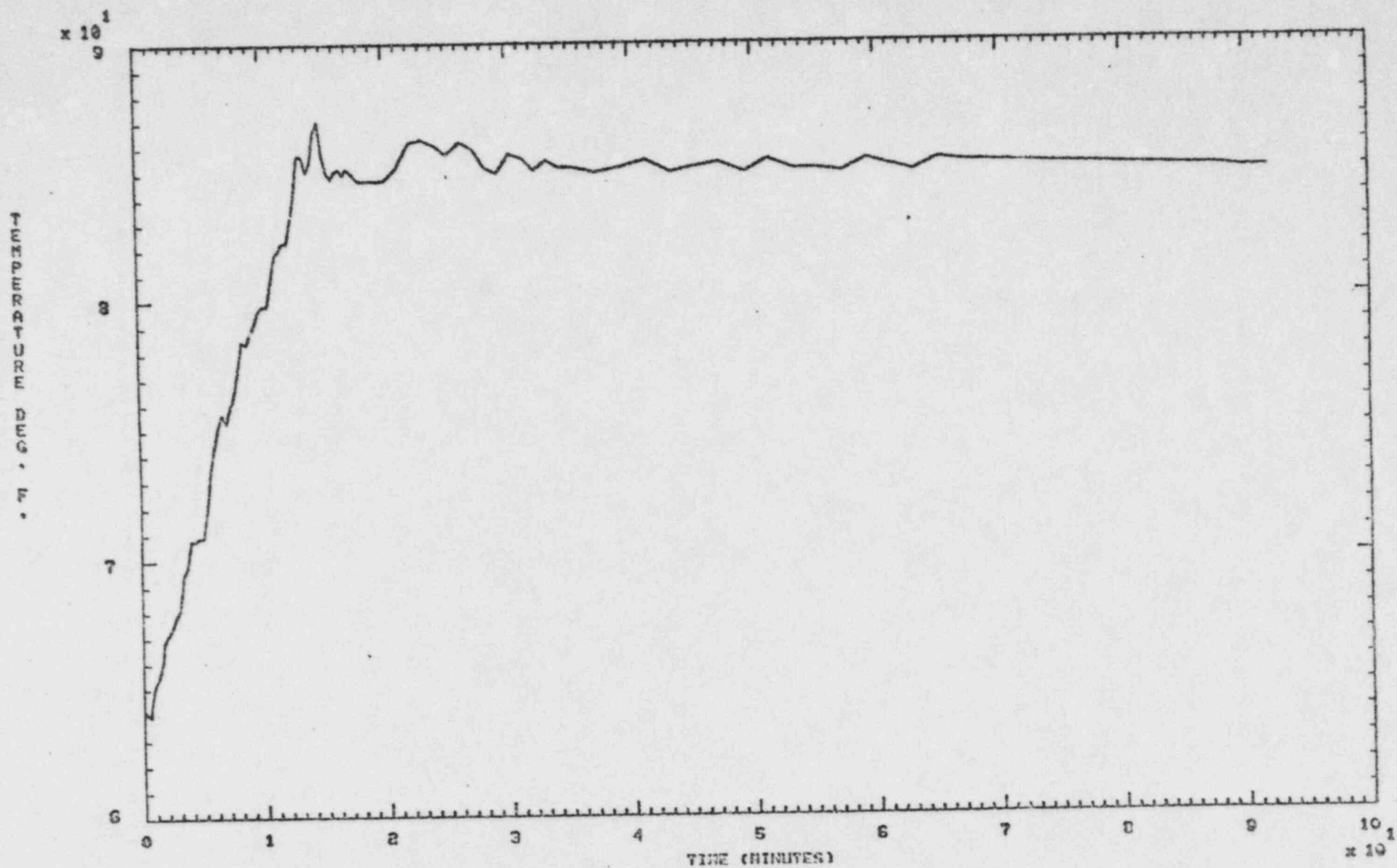
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 17



VALVE OPENS AT 10.1 SEC .
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 18

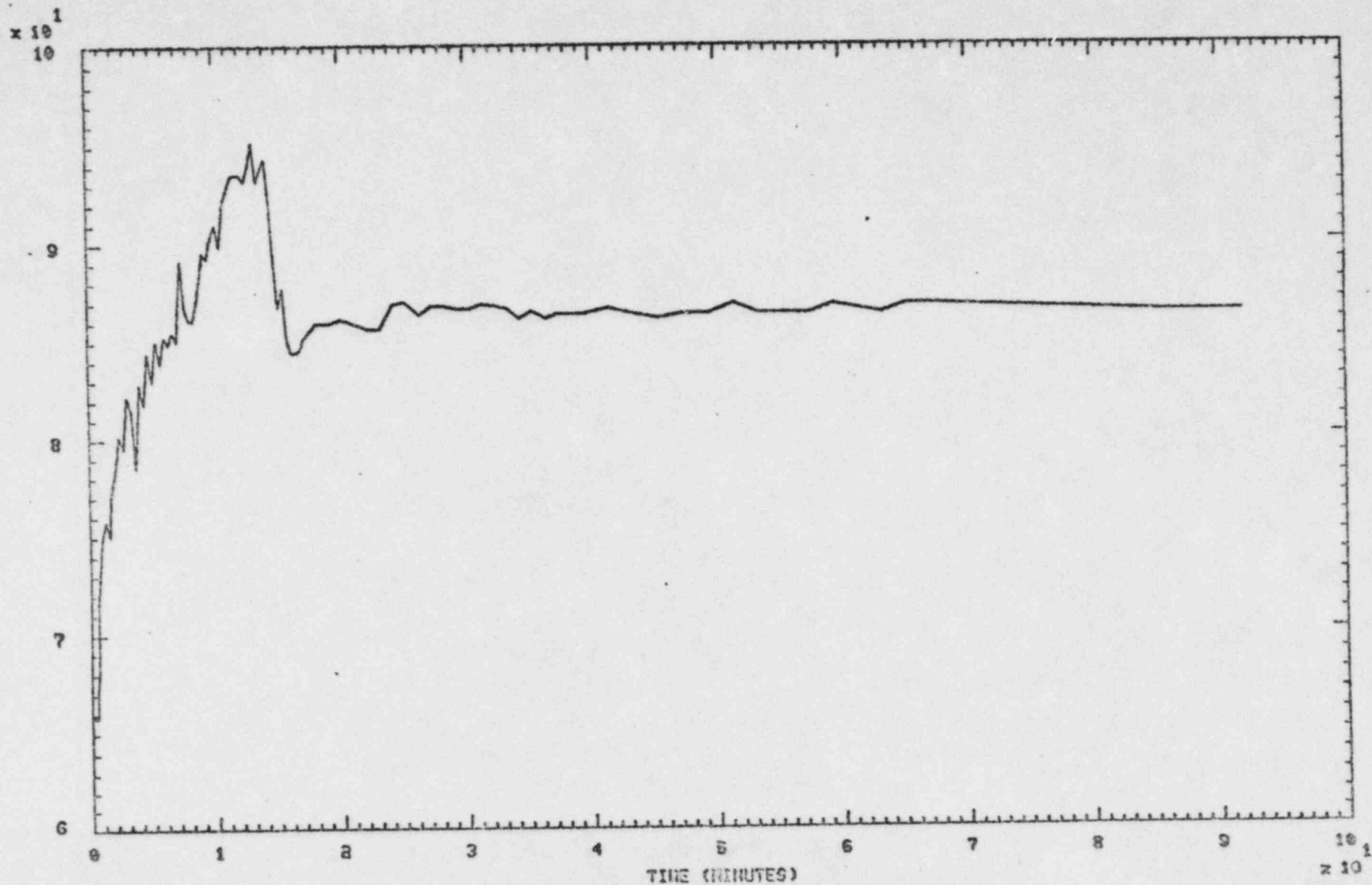


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 19

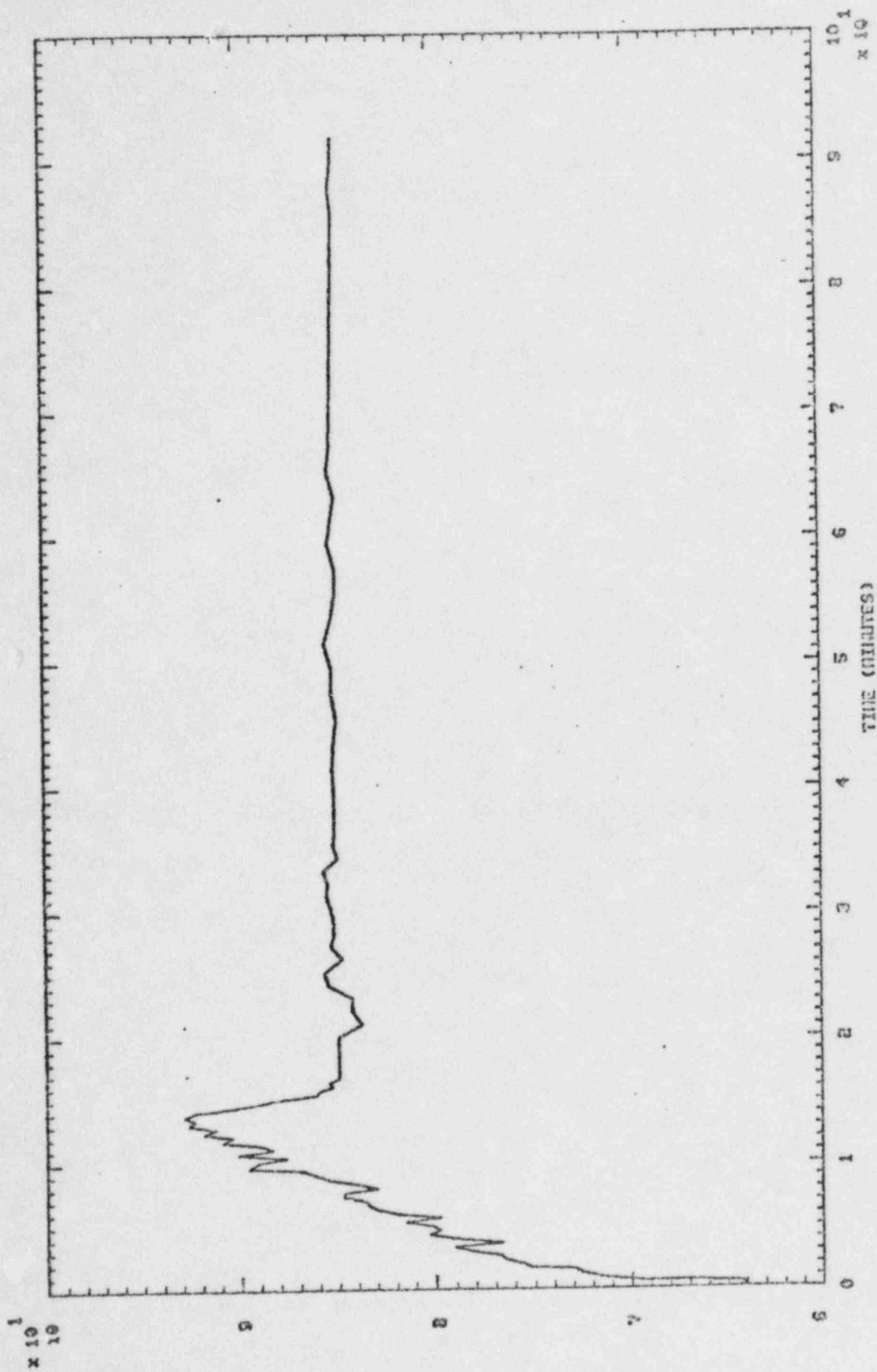


VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 20

TEMPERATURE DEG. F.

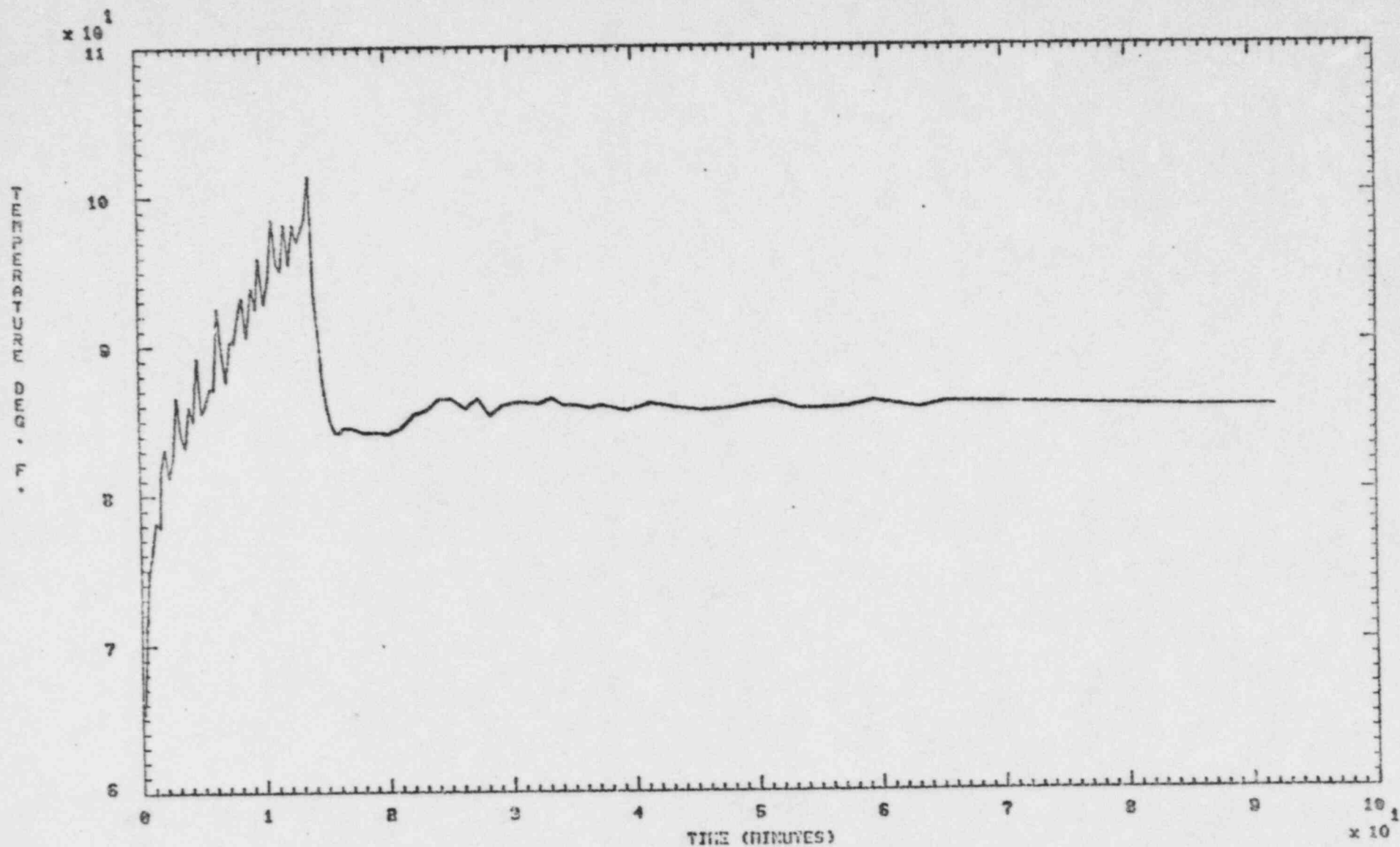


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 21

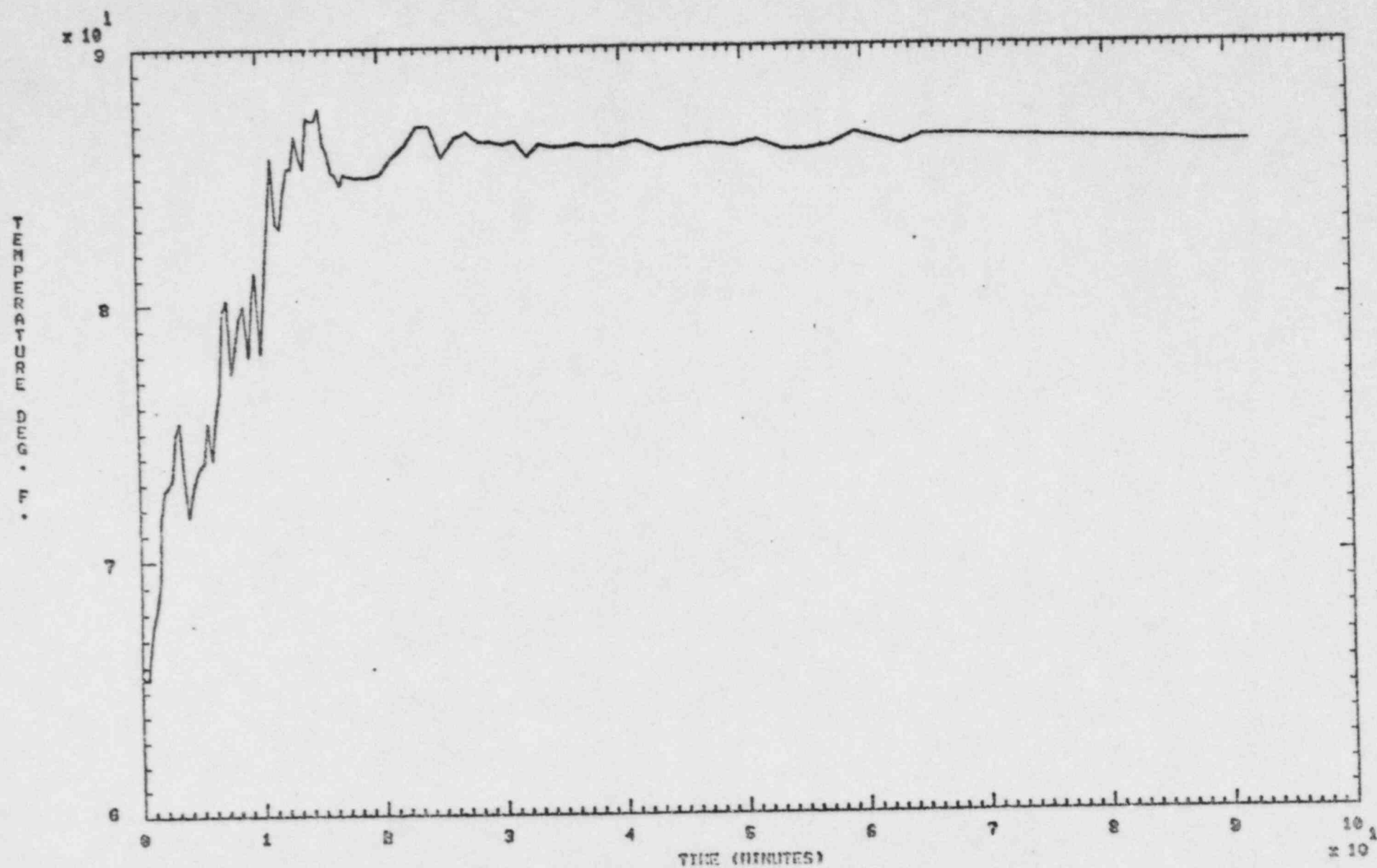


RECEIVED DEC 10 1964

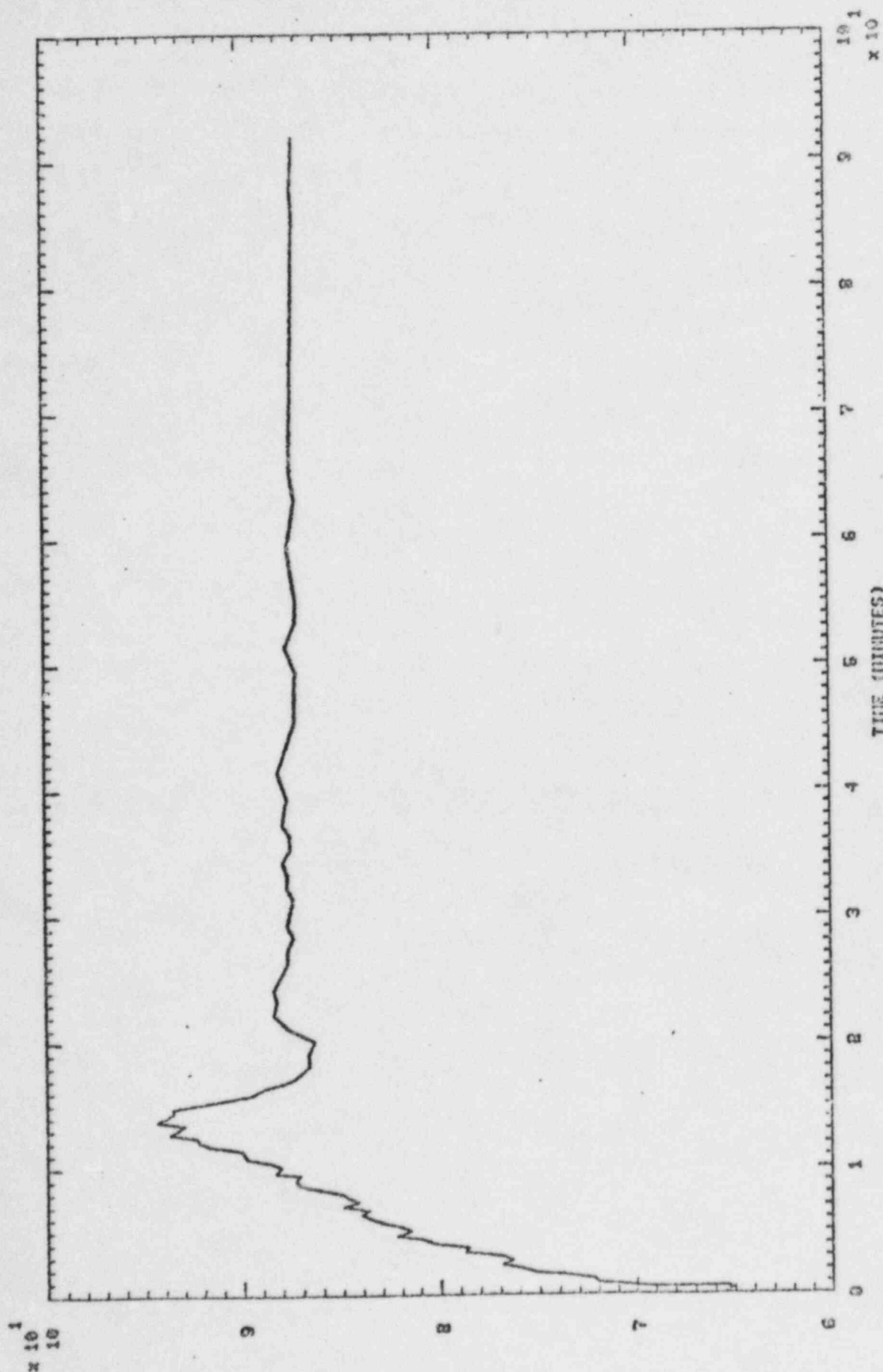
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 22



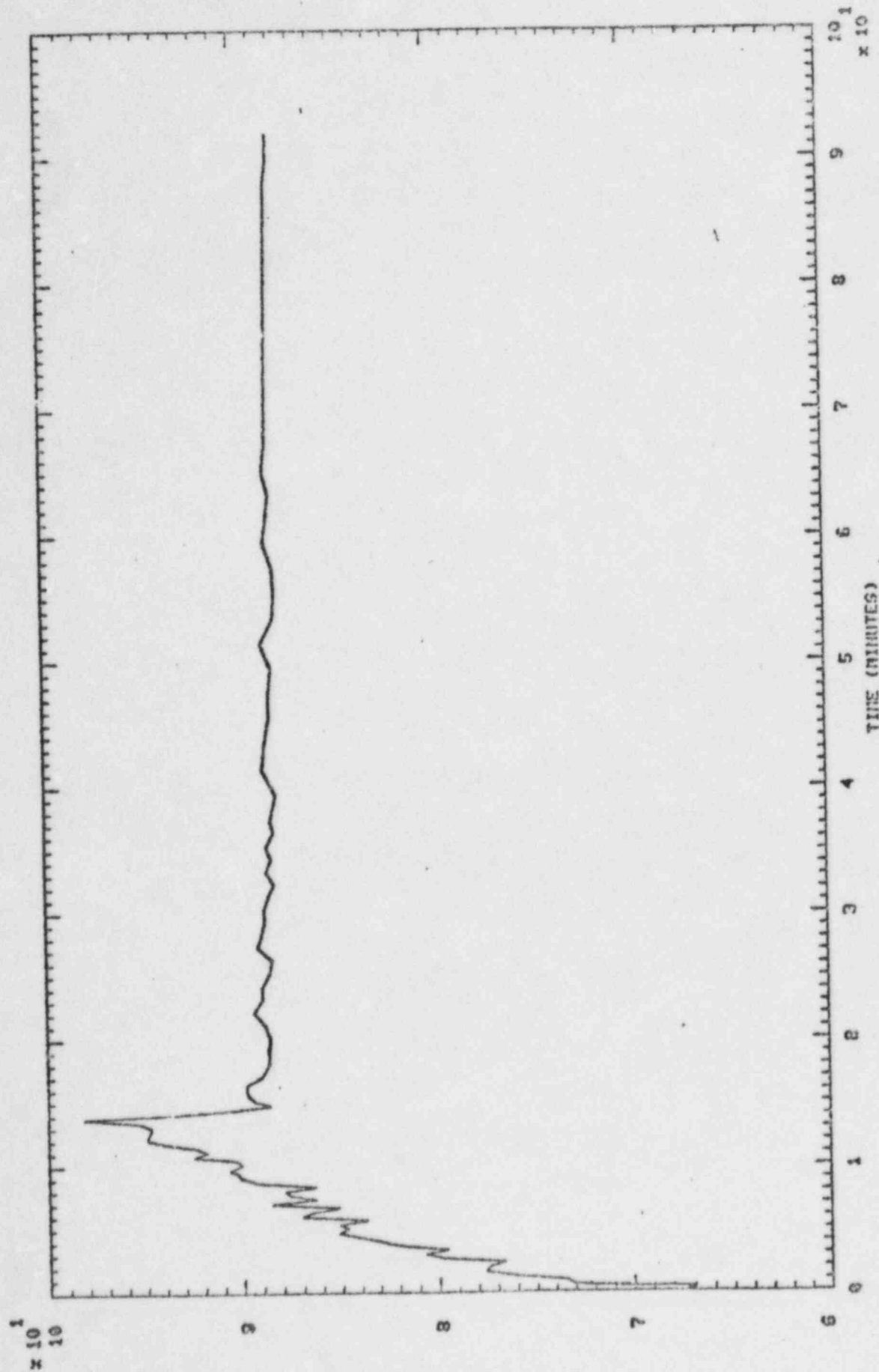
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 23



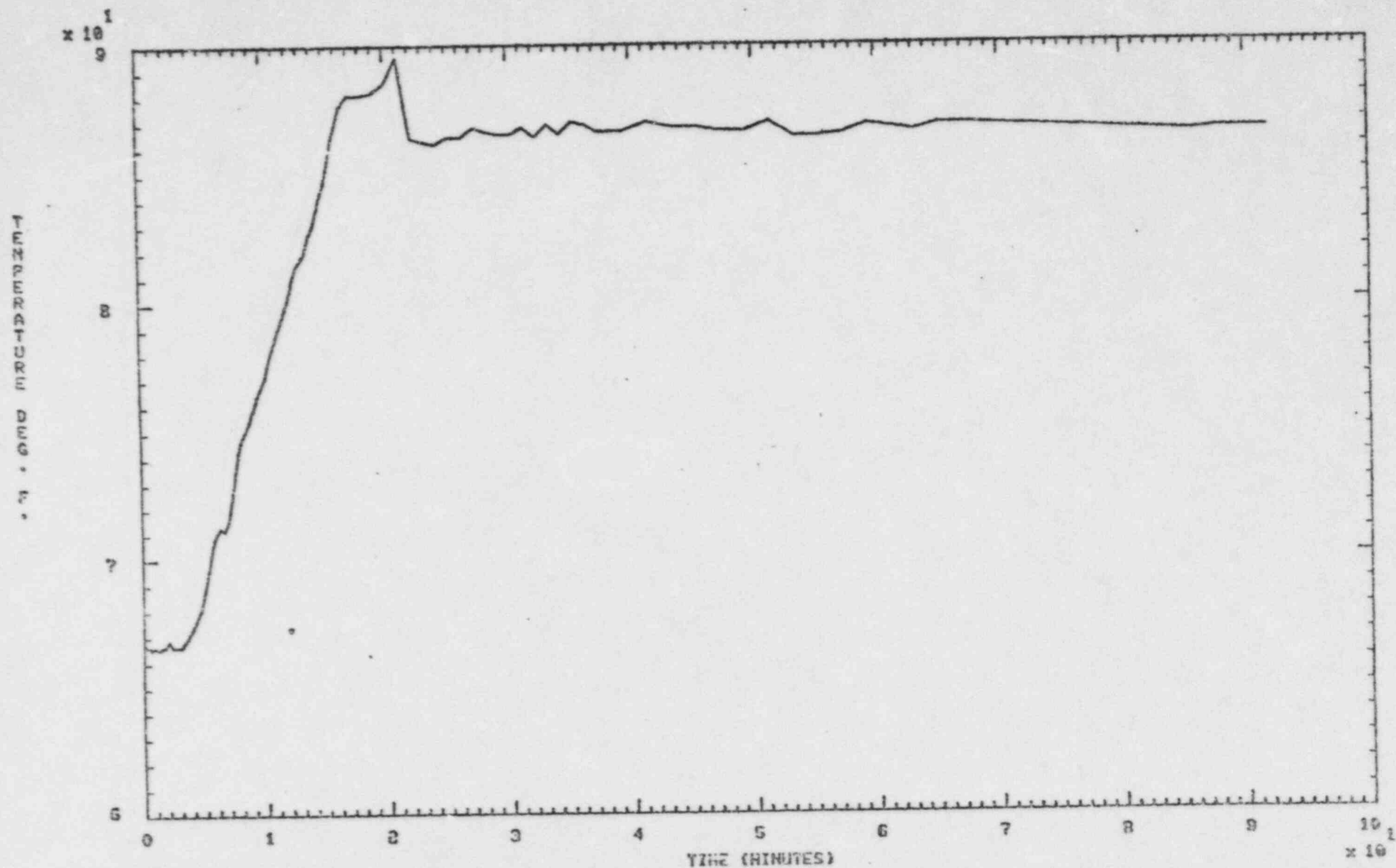
VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 24



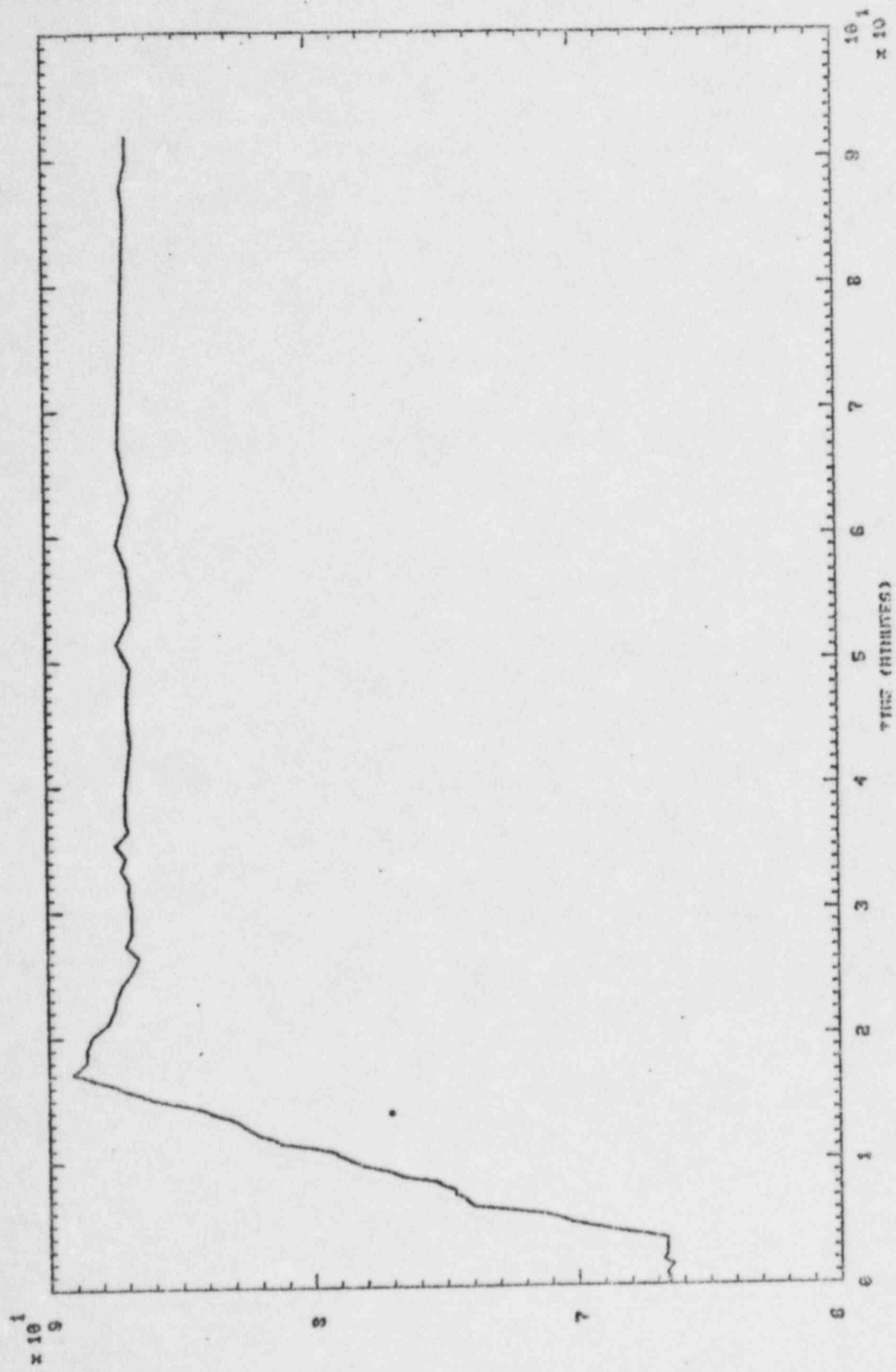
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 25



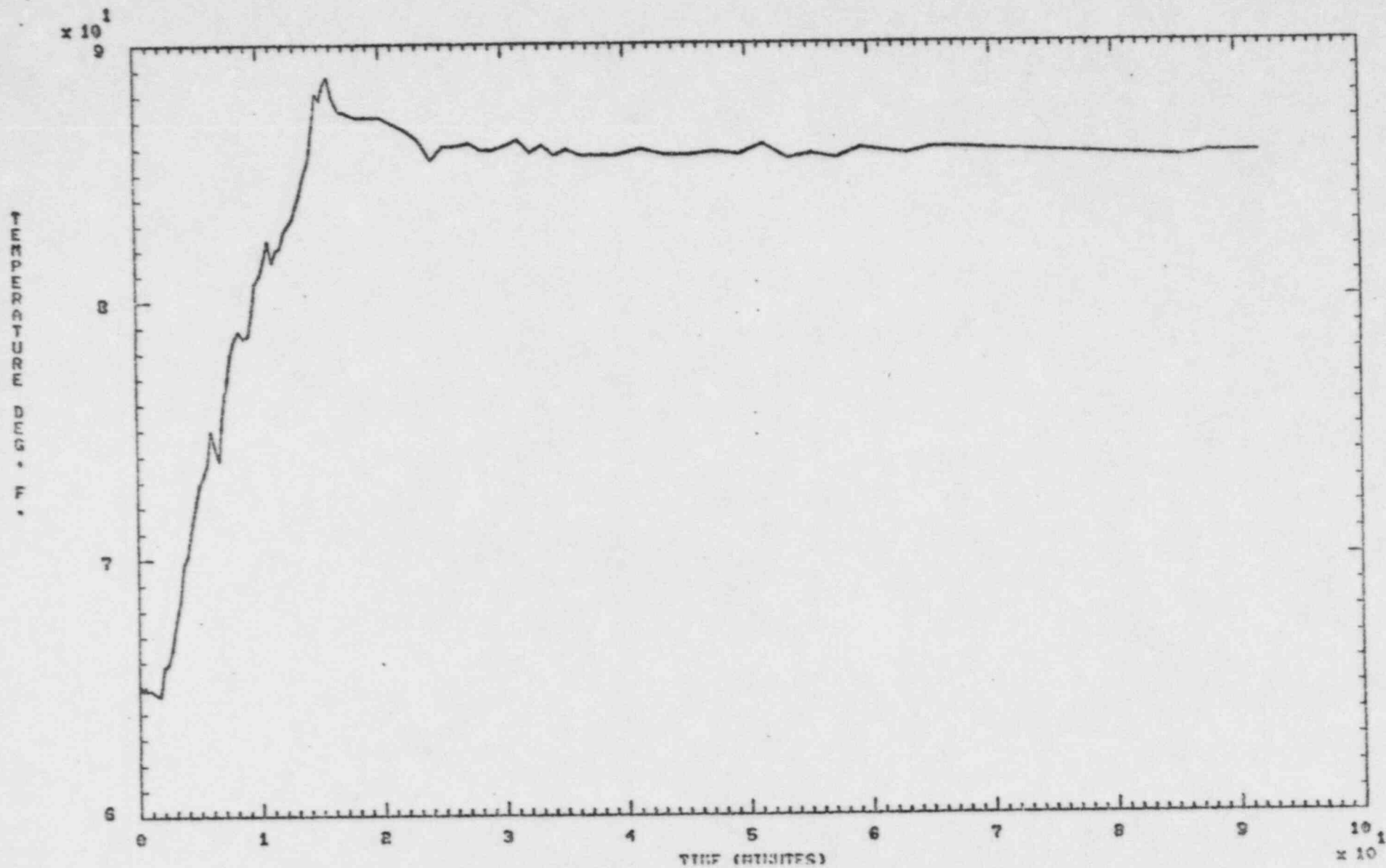
VALUE OPENS AT 10/1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 27



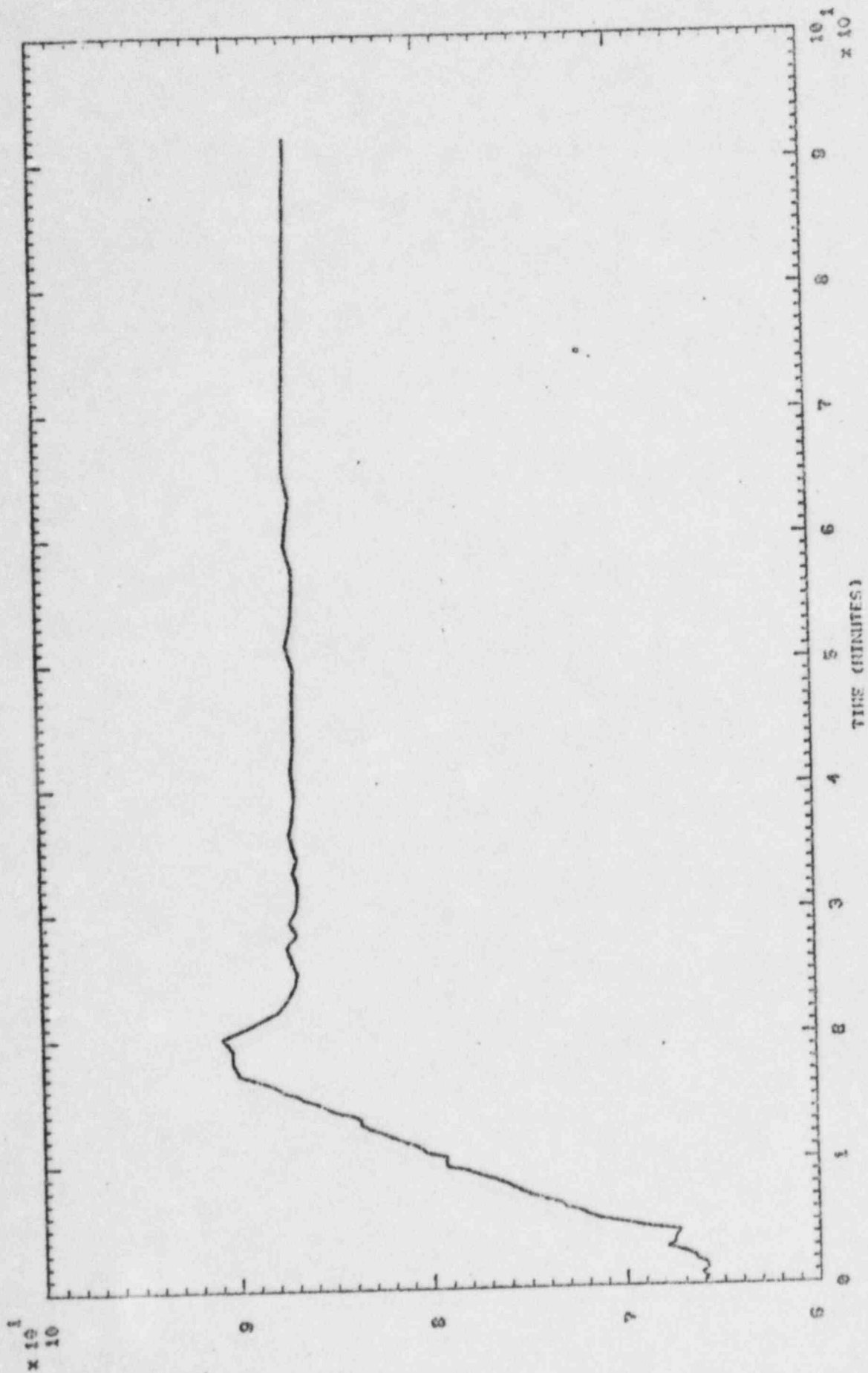
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 28



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO. RUN NO. 071X TT= 29

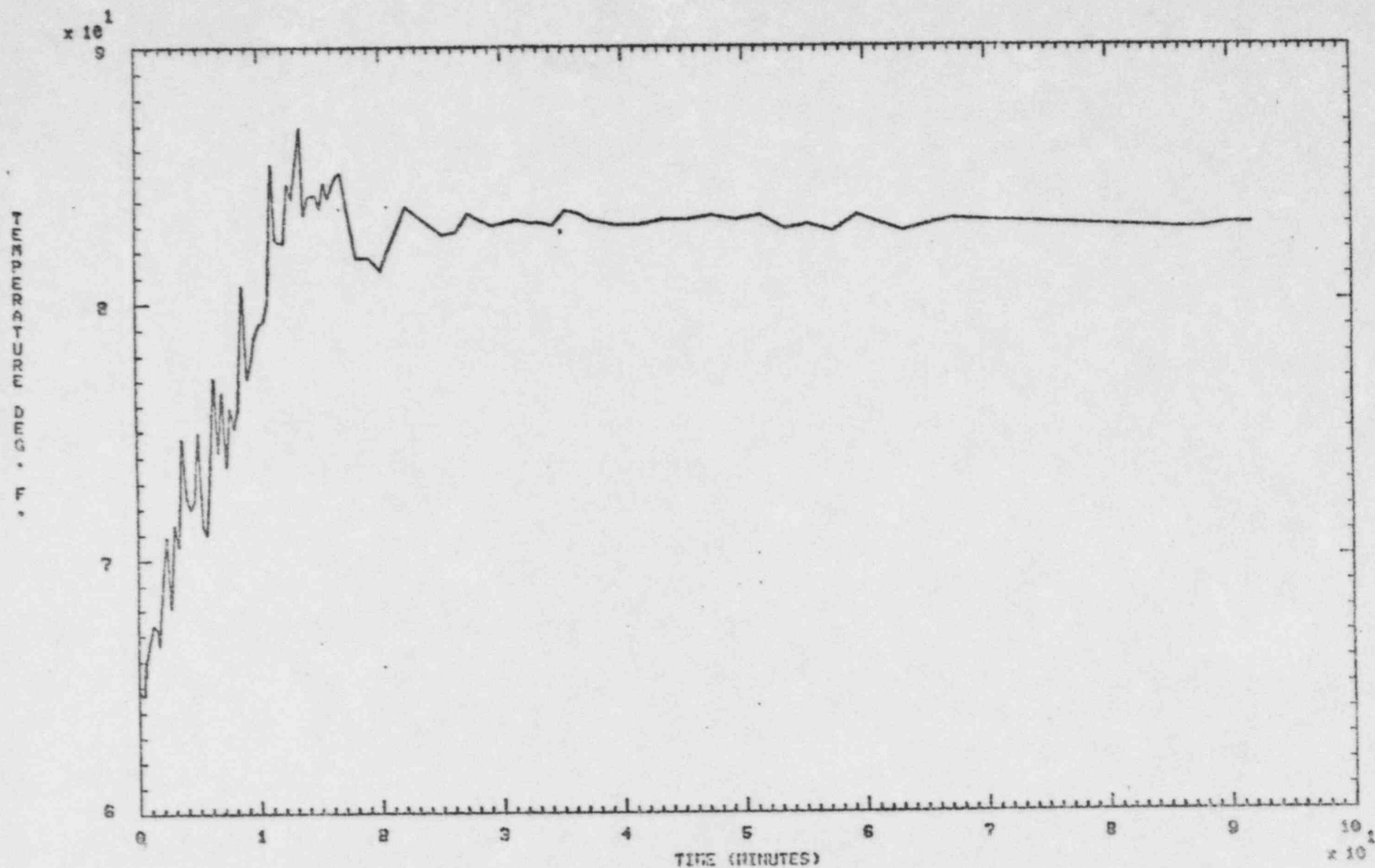


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 30 .

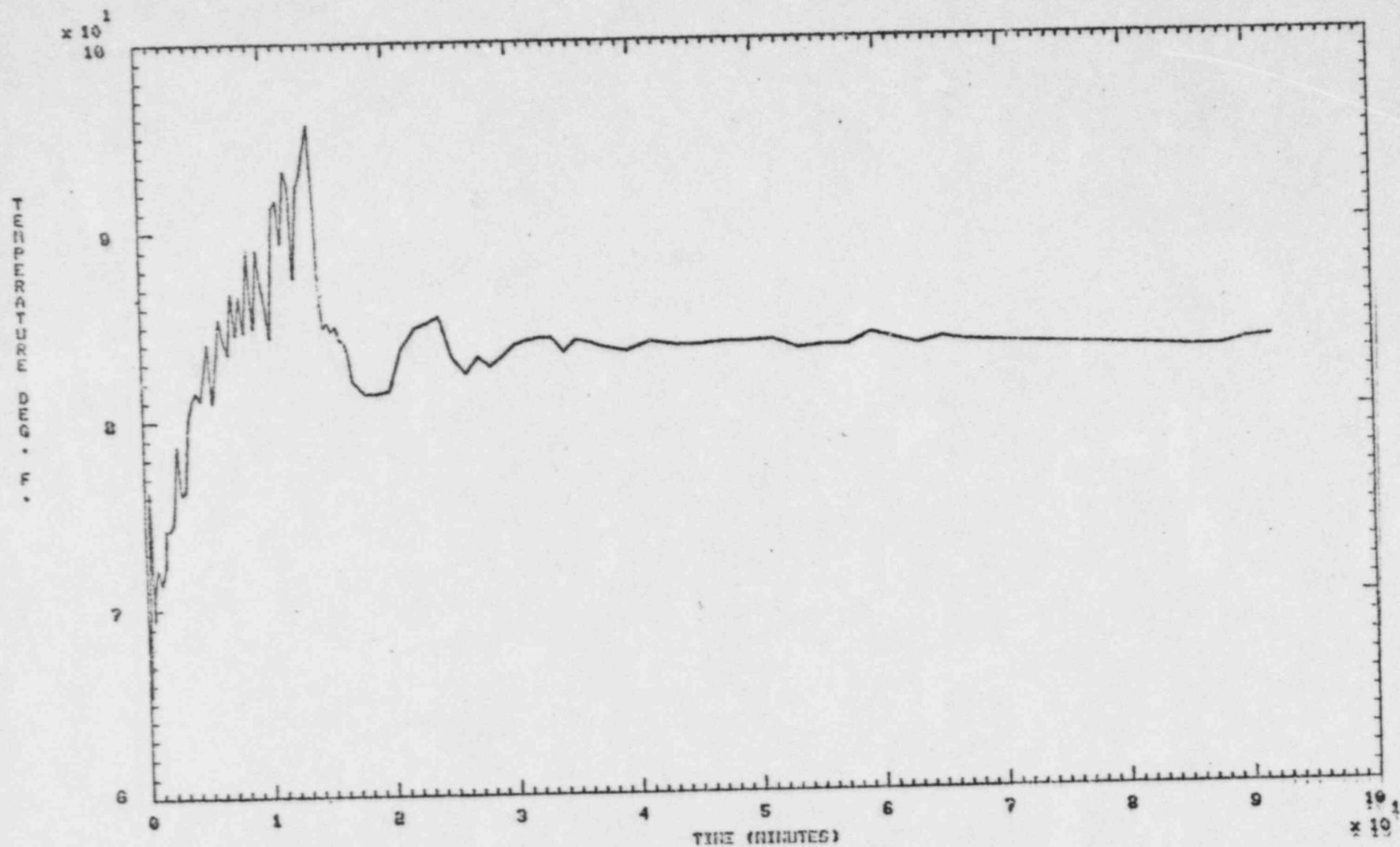


EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 31

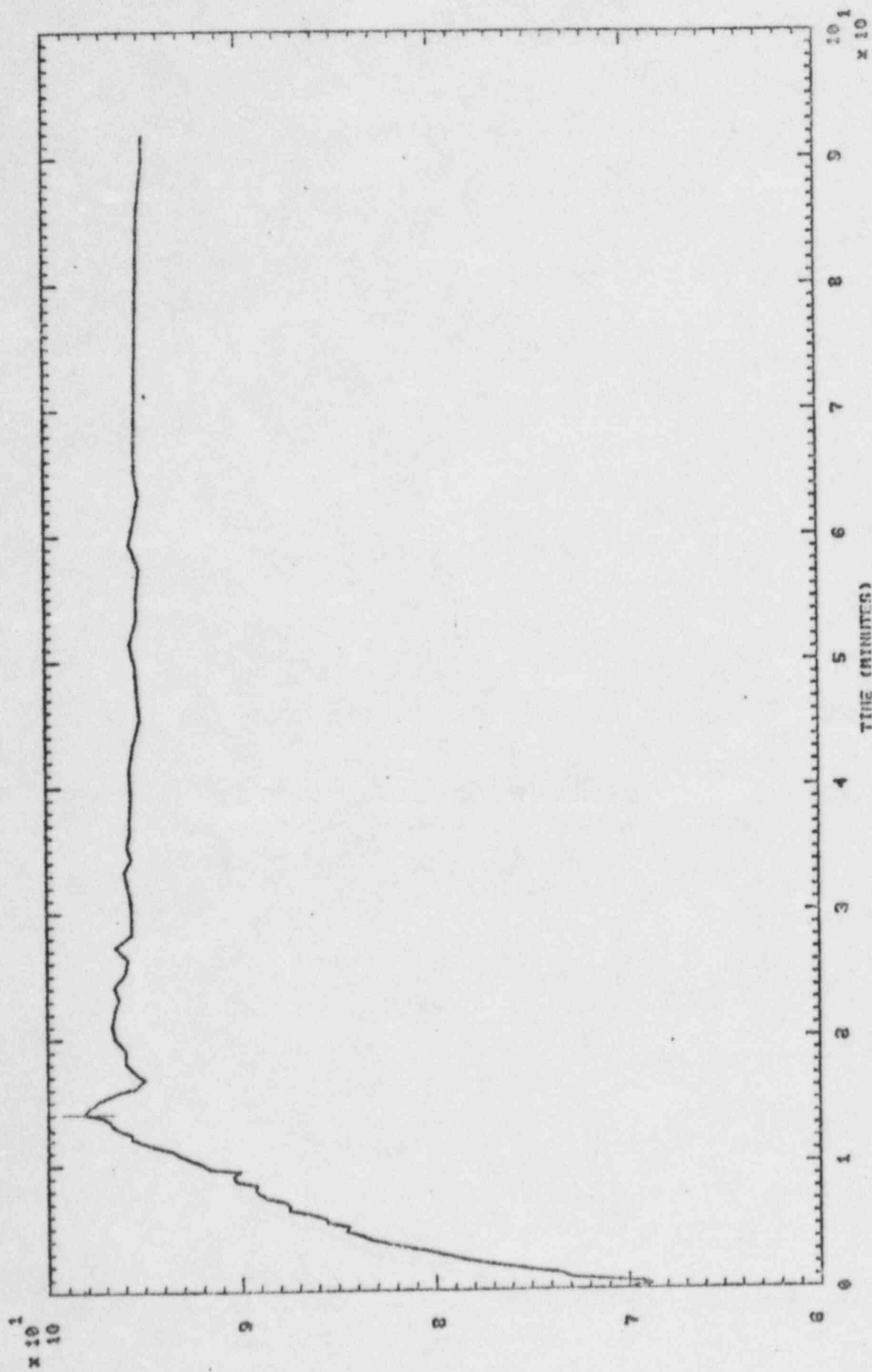
VALVE OPENS AT 10.1 SEC



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 32

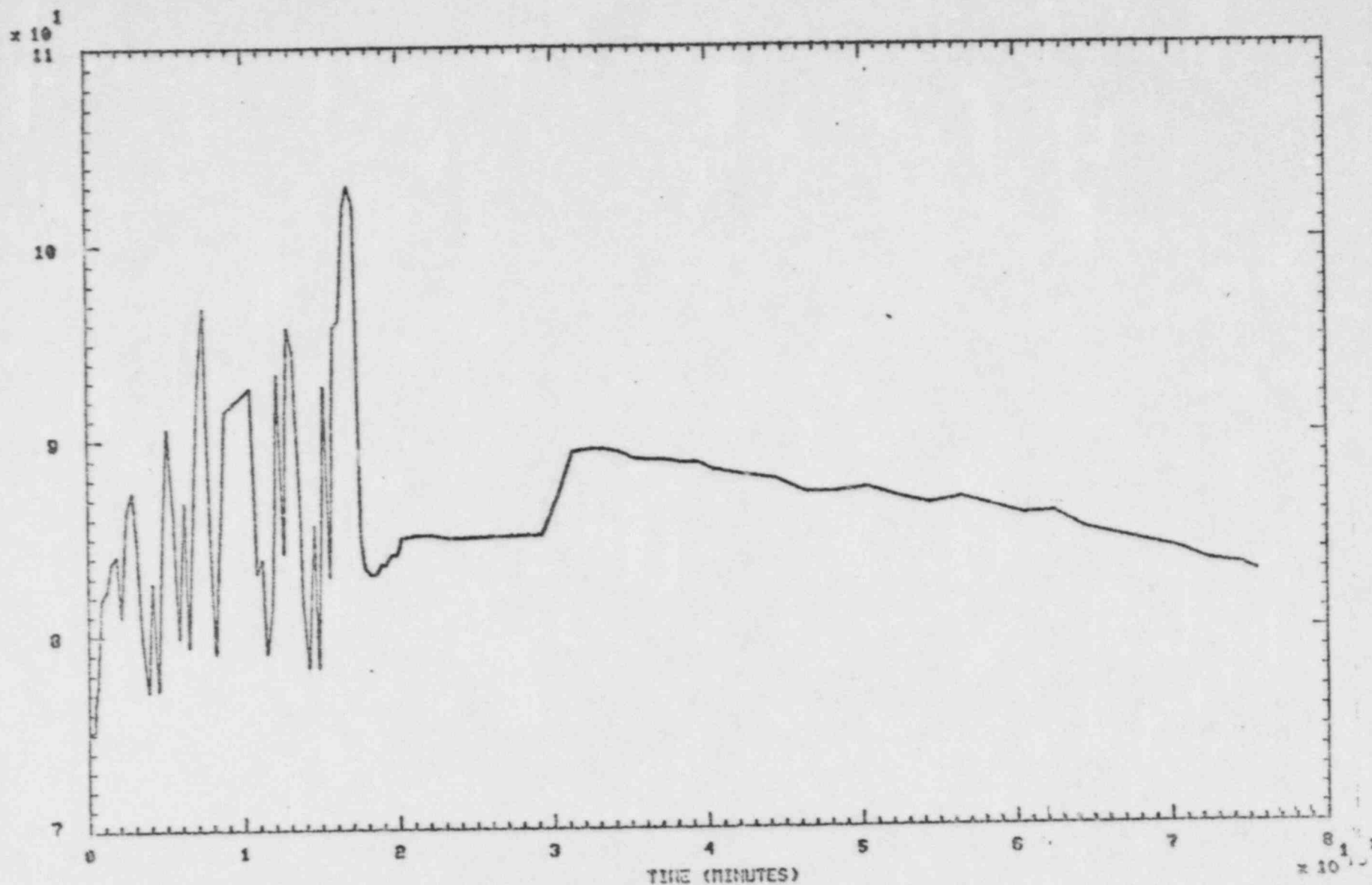


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 33

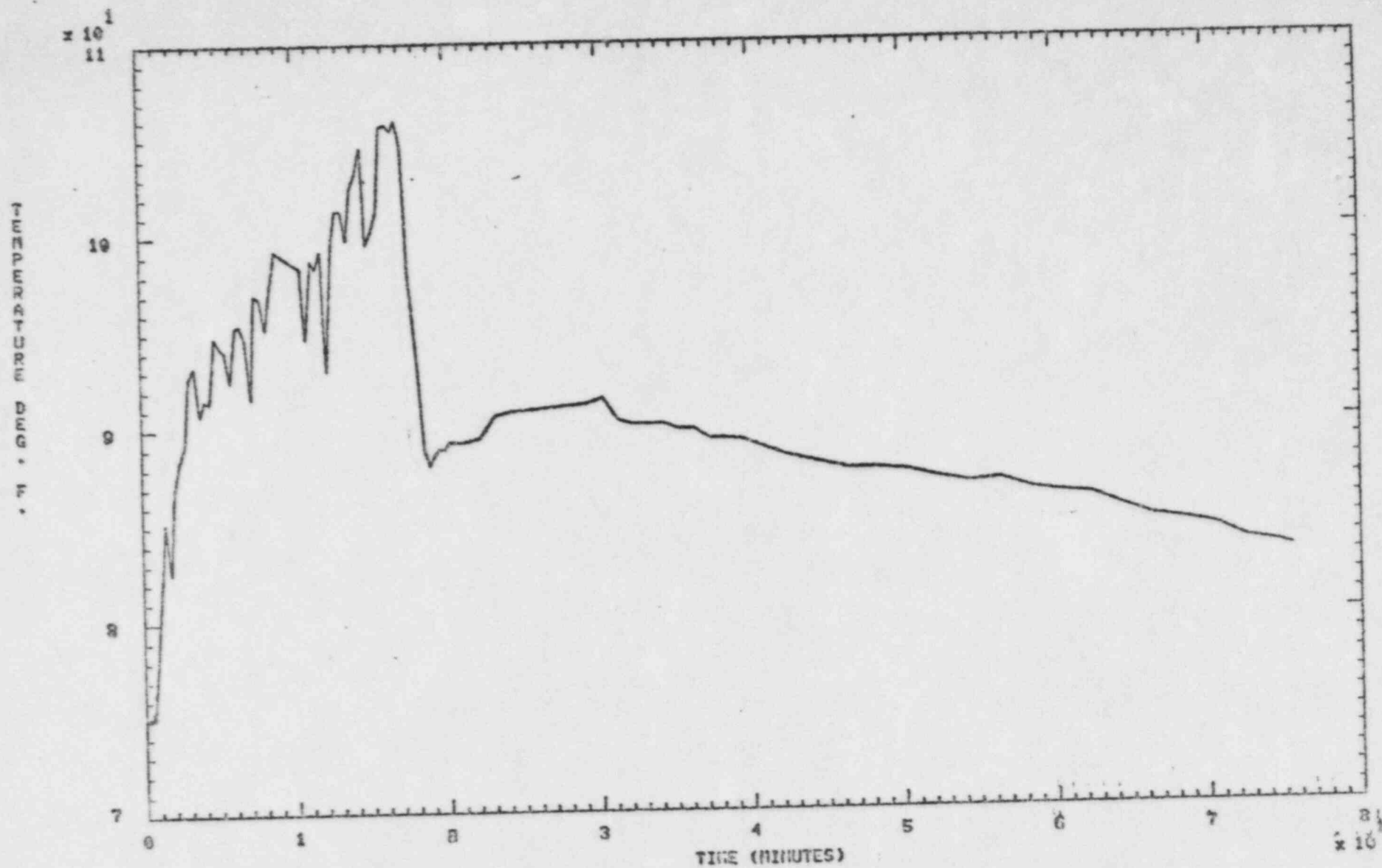


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 071X TT= 48

TEMPERATURE (°C)

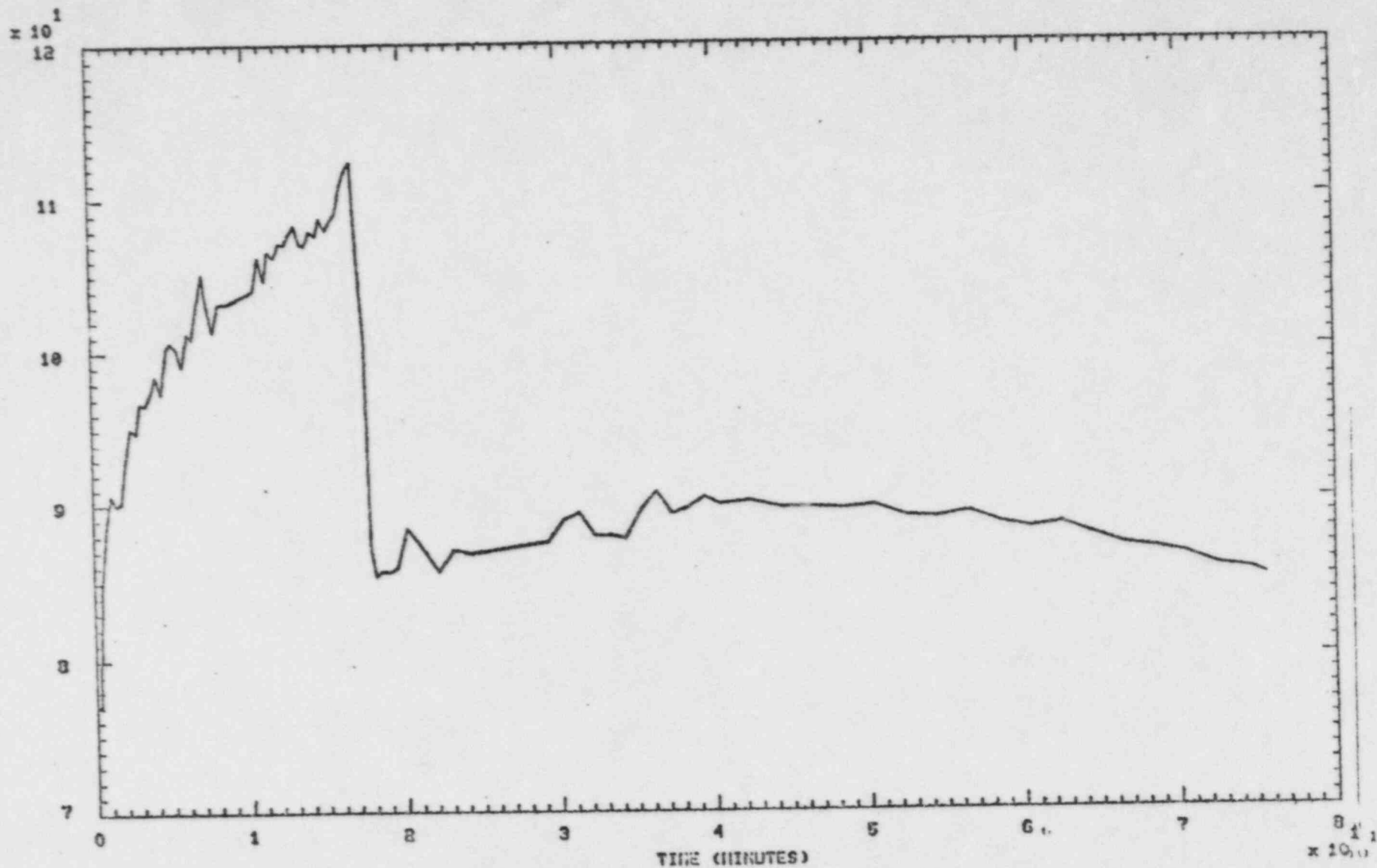


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X:K TTWT 1

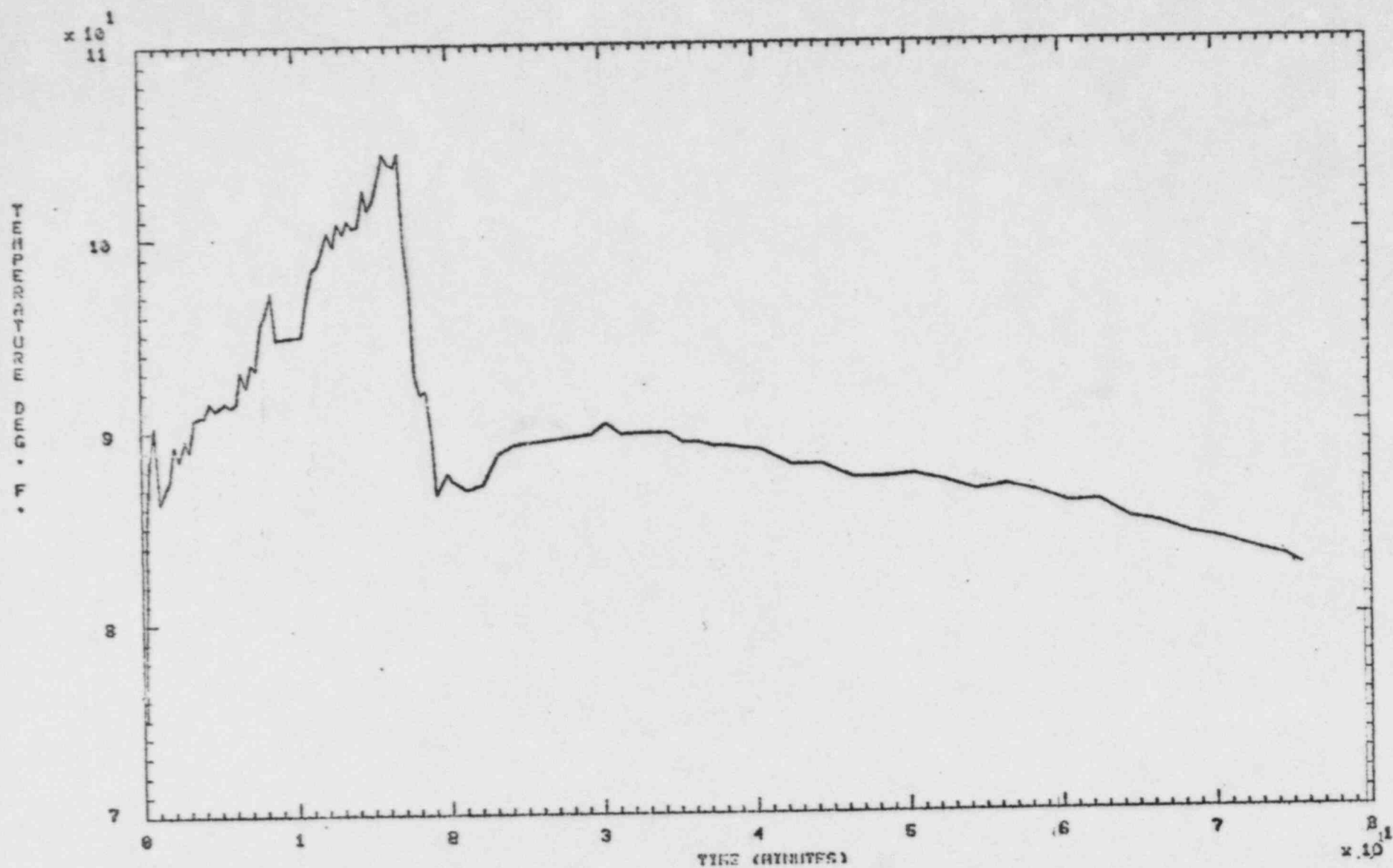


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO: RUN NO. 072X TT= 2

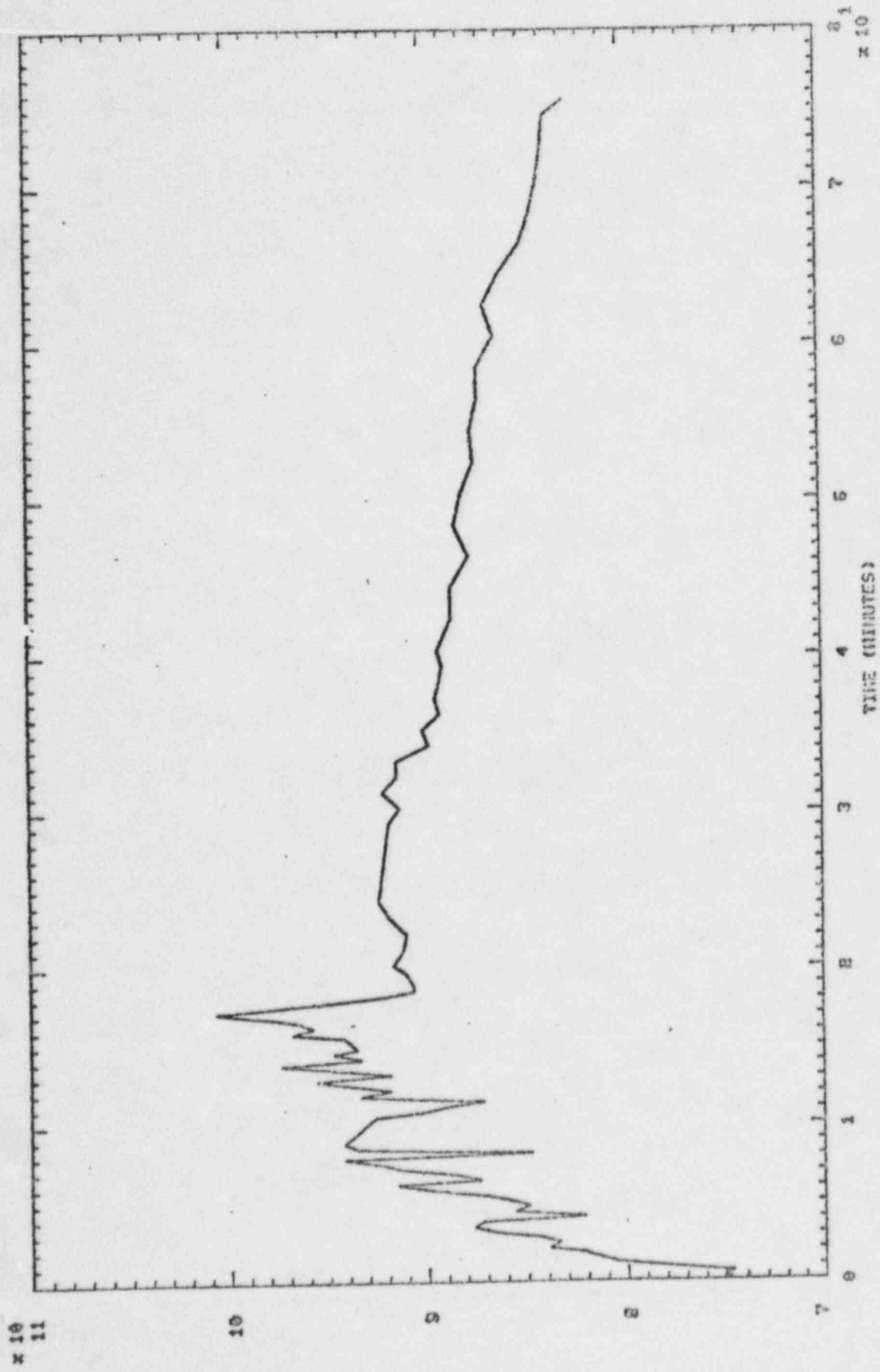
TEMPERATURE (°C) x 10¹



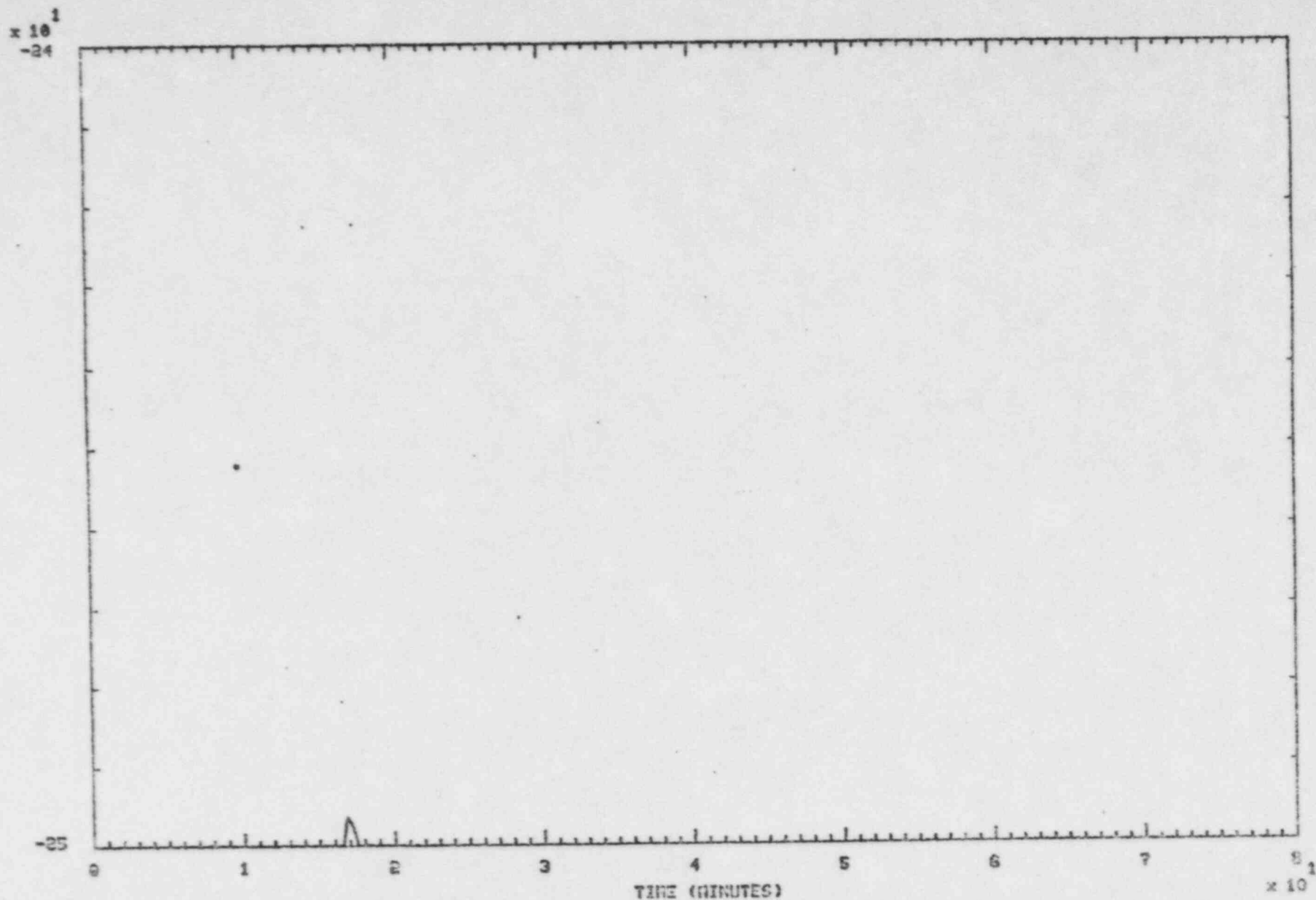
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072XX TT# 3.



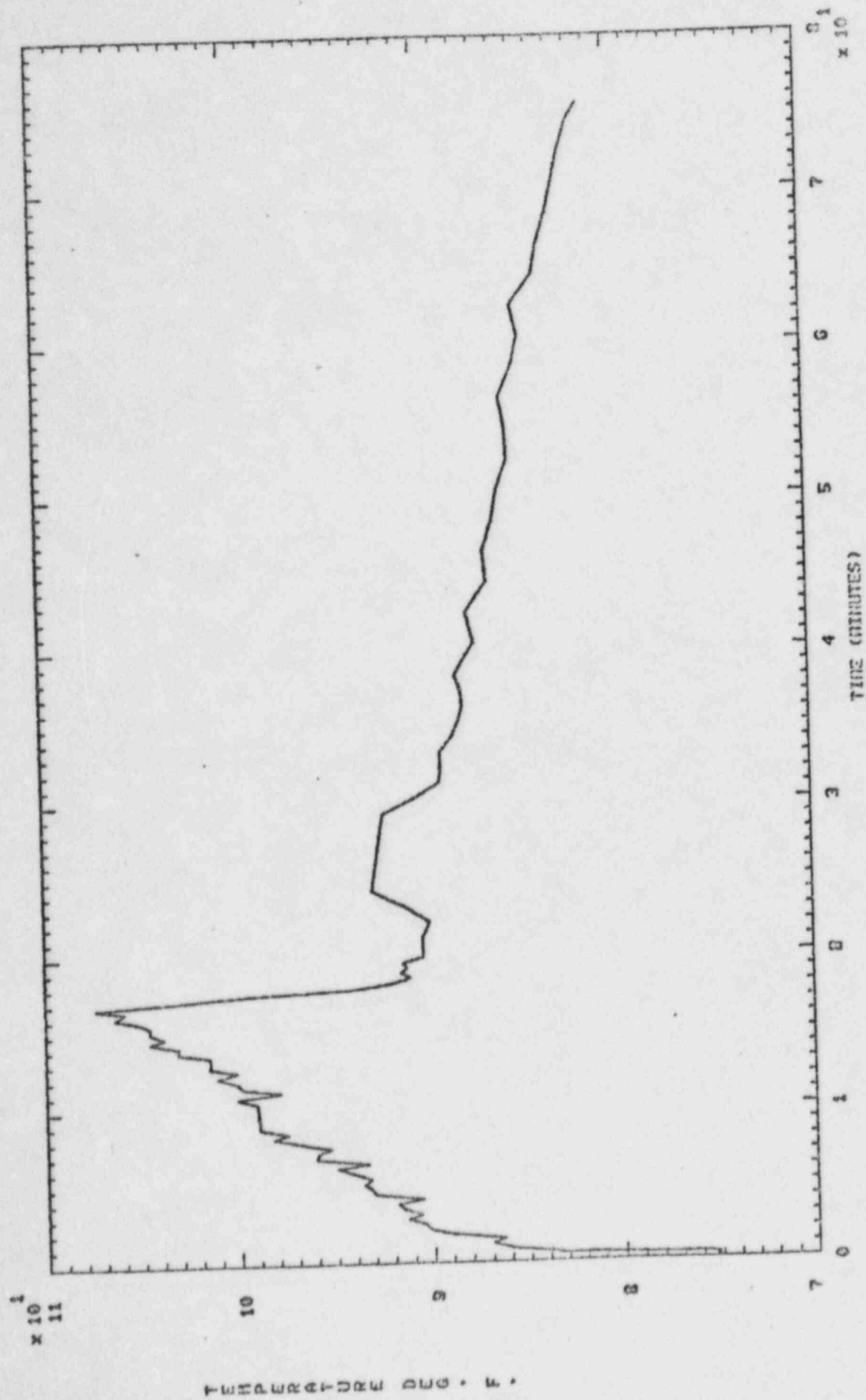
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT# 4



TEMPERATURE DEG. F.



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 6



EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 7

VALVE OPENS AT 10.1 SEC

$\times 10^1$
11

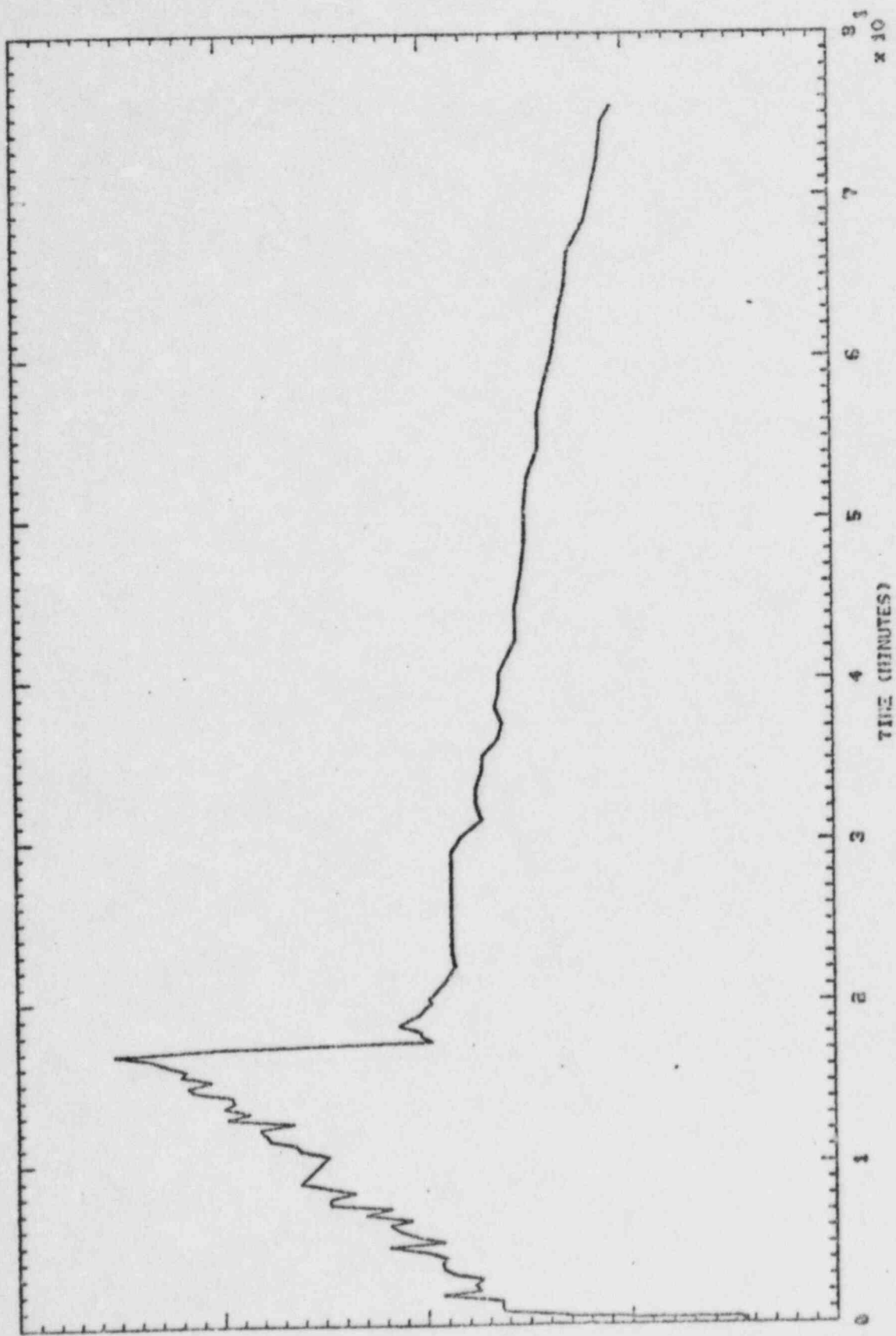
10

9

8

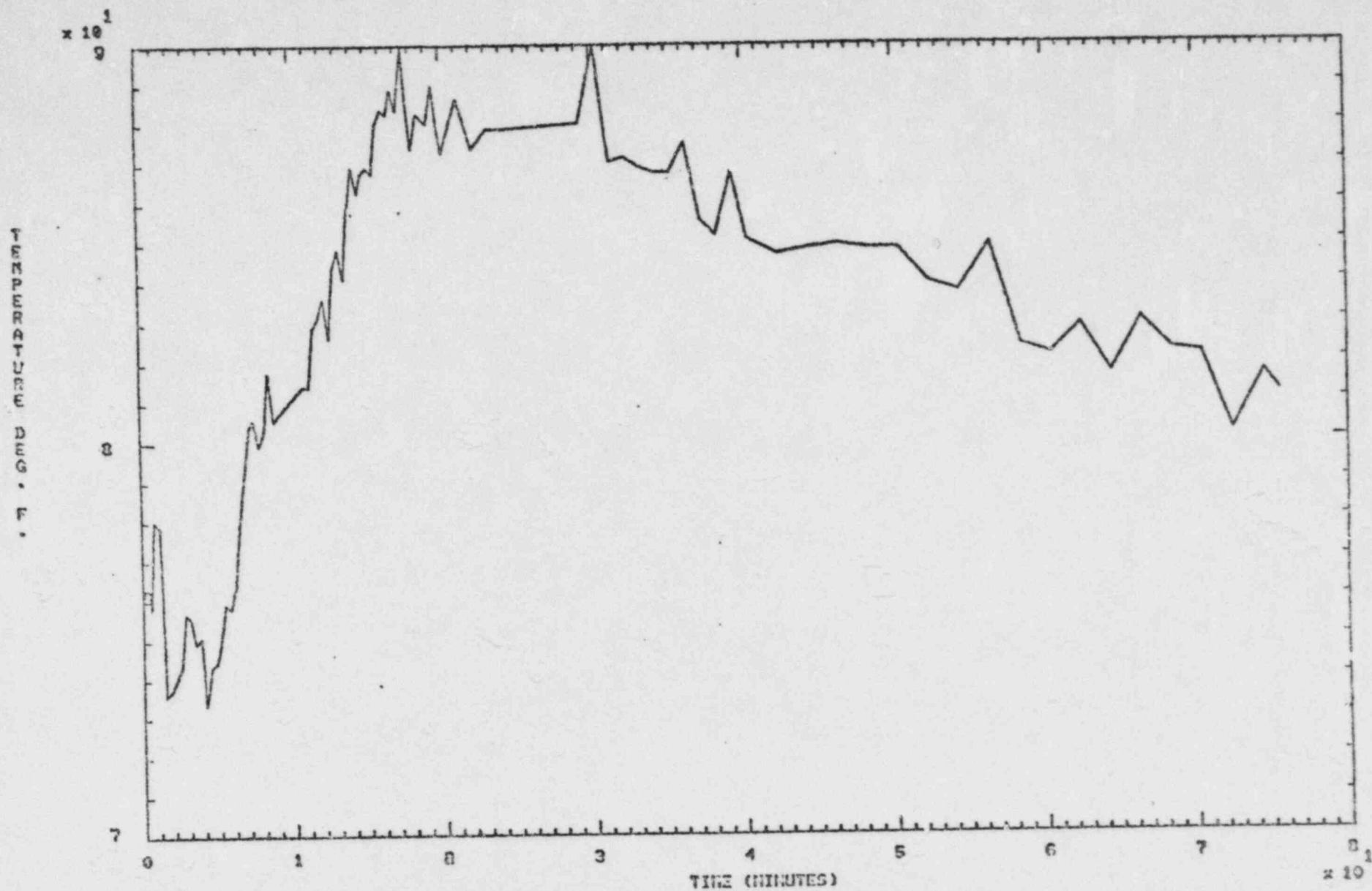
7

TEMPERATURE DEG. F.

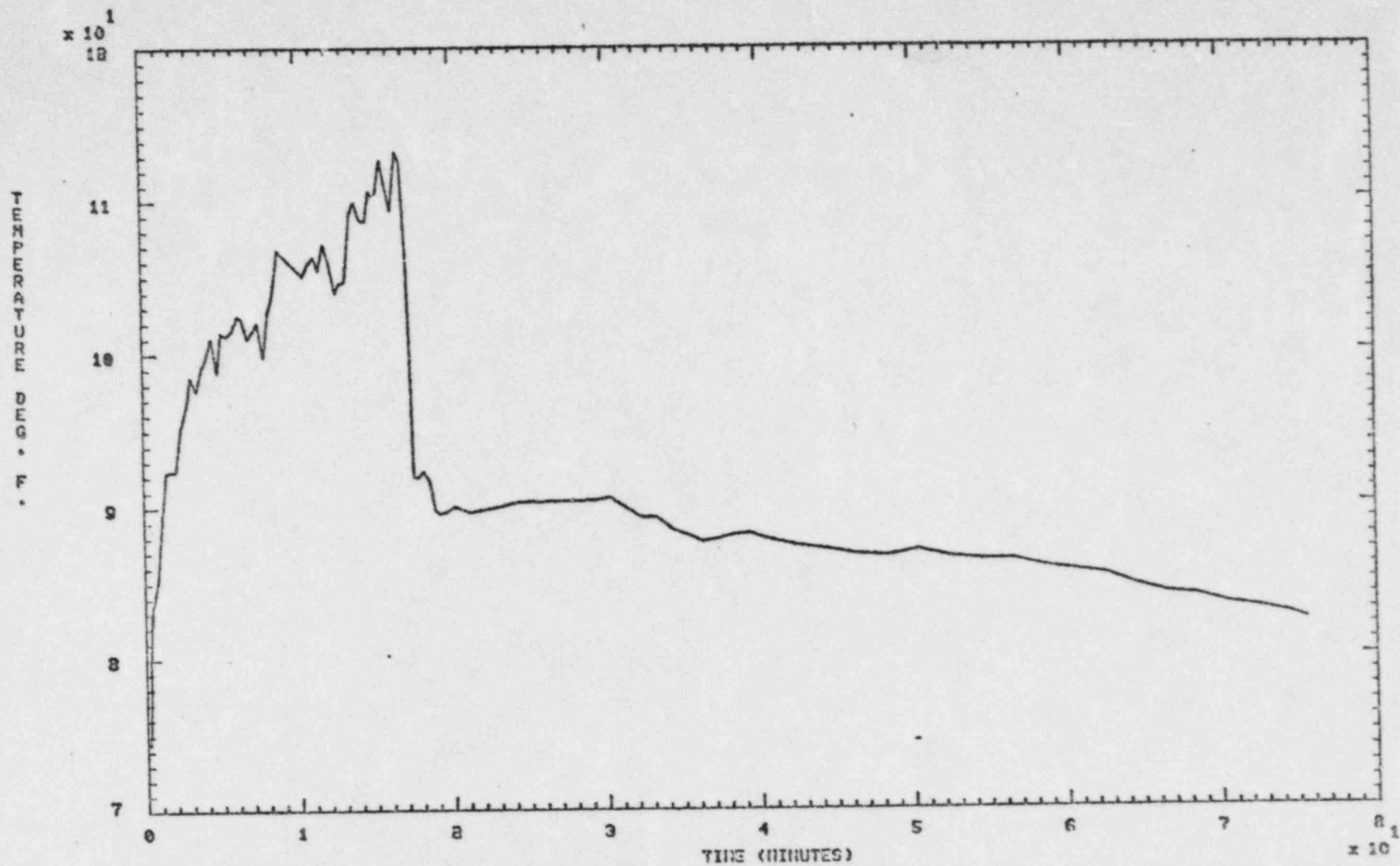


EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 8

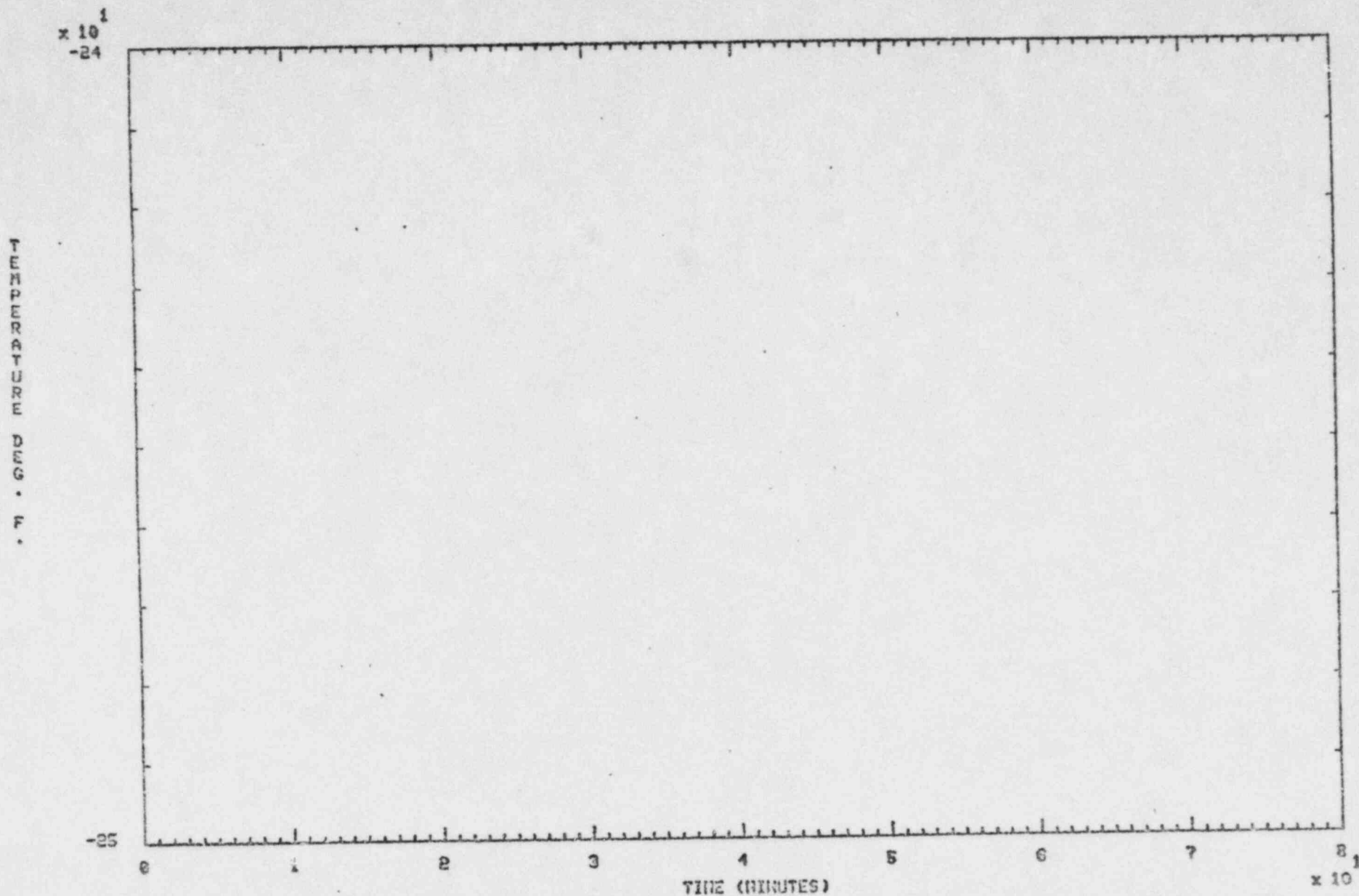
VALVE OPENS AT 10.1 SEC



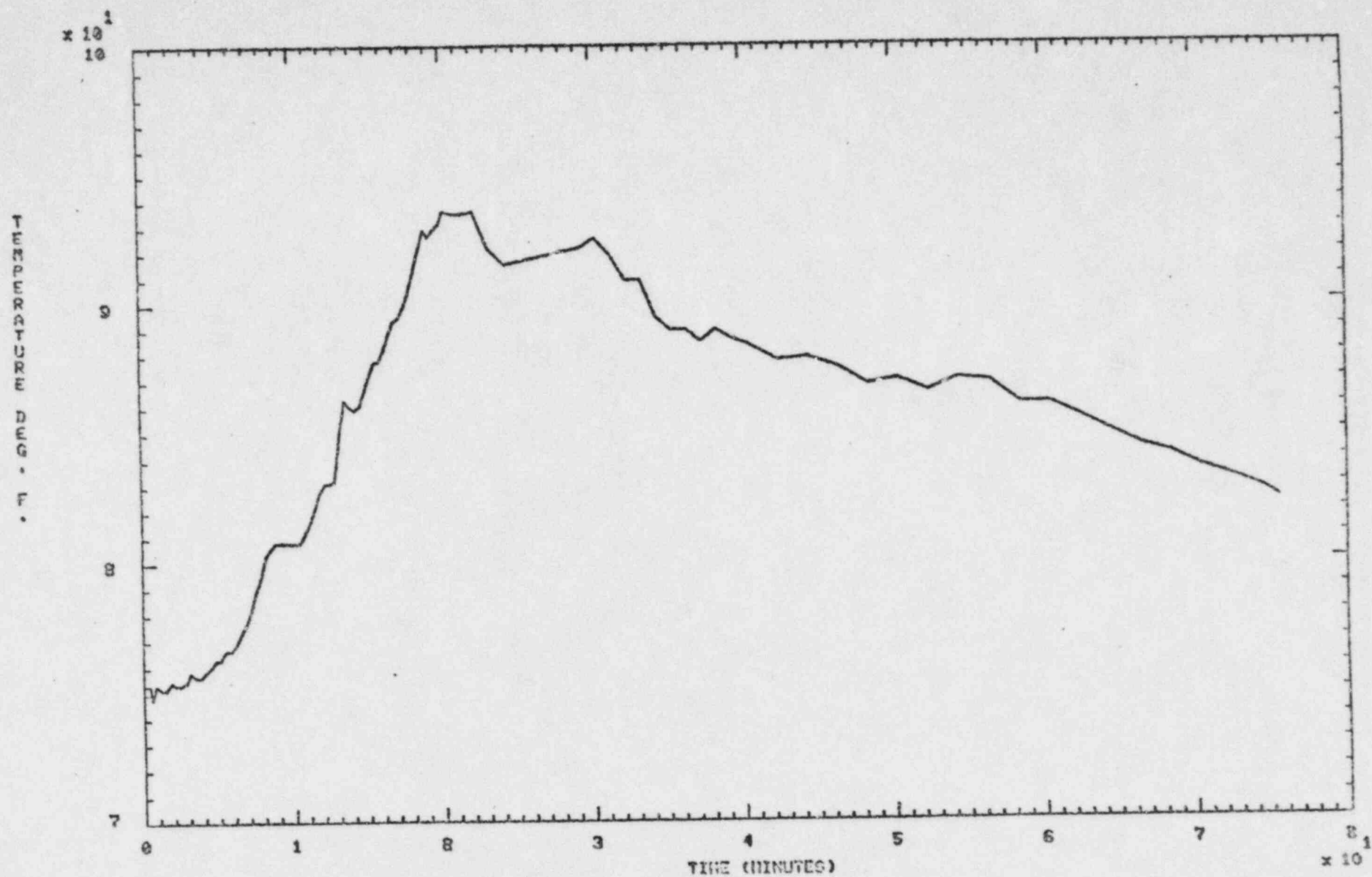
VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 9



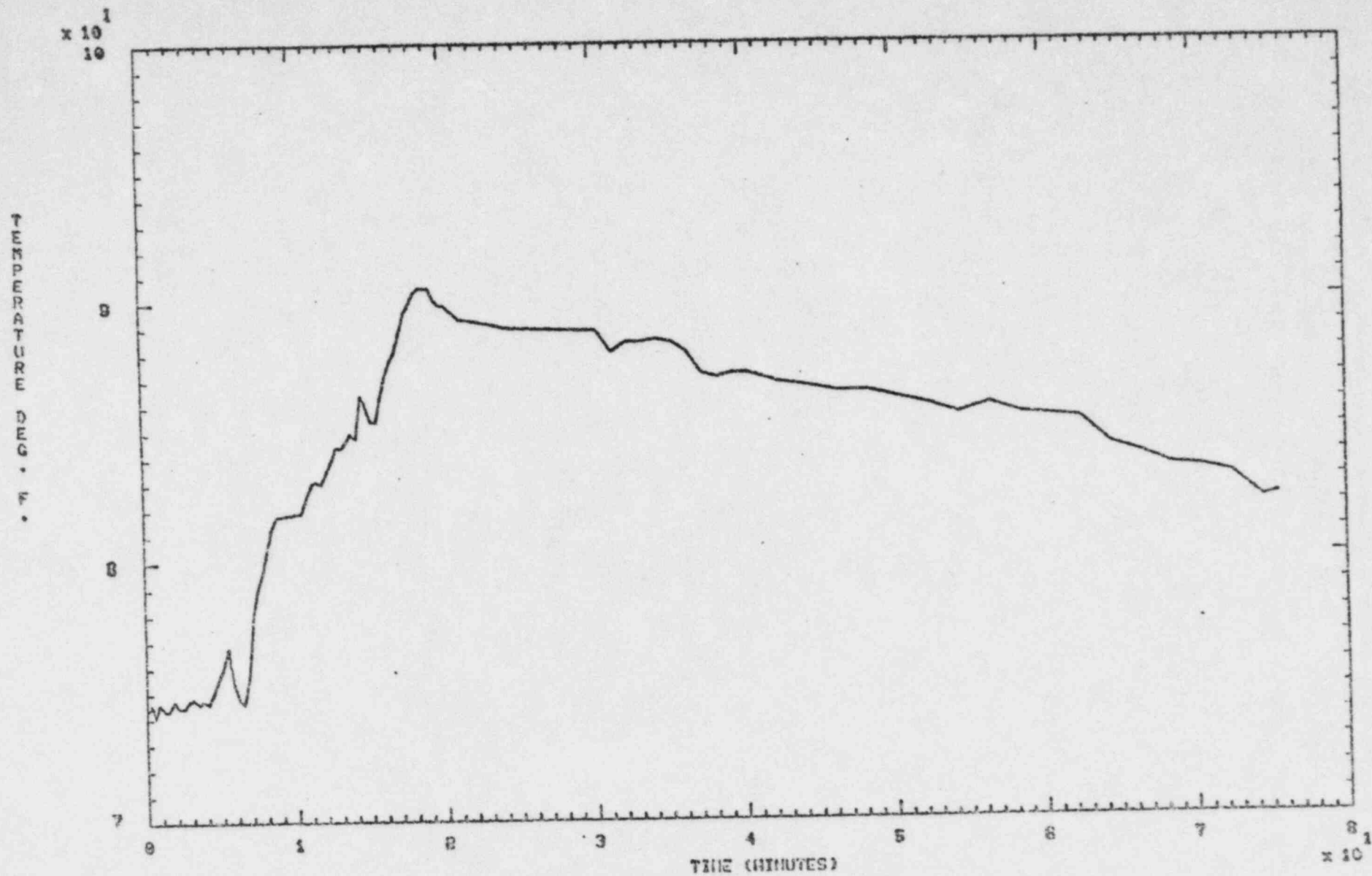
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO: RUN NO. 072X TT= 10



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 12

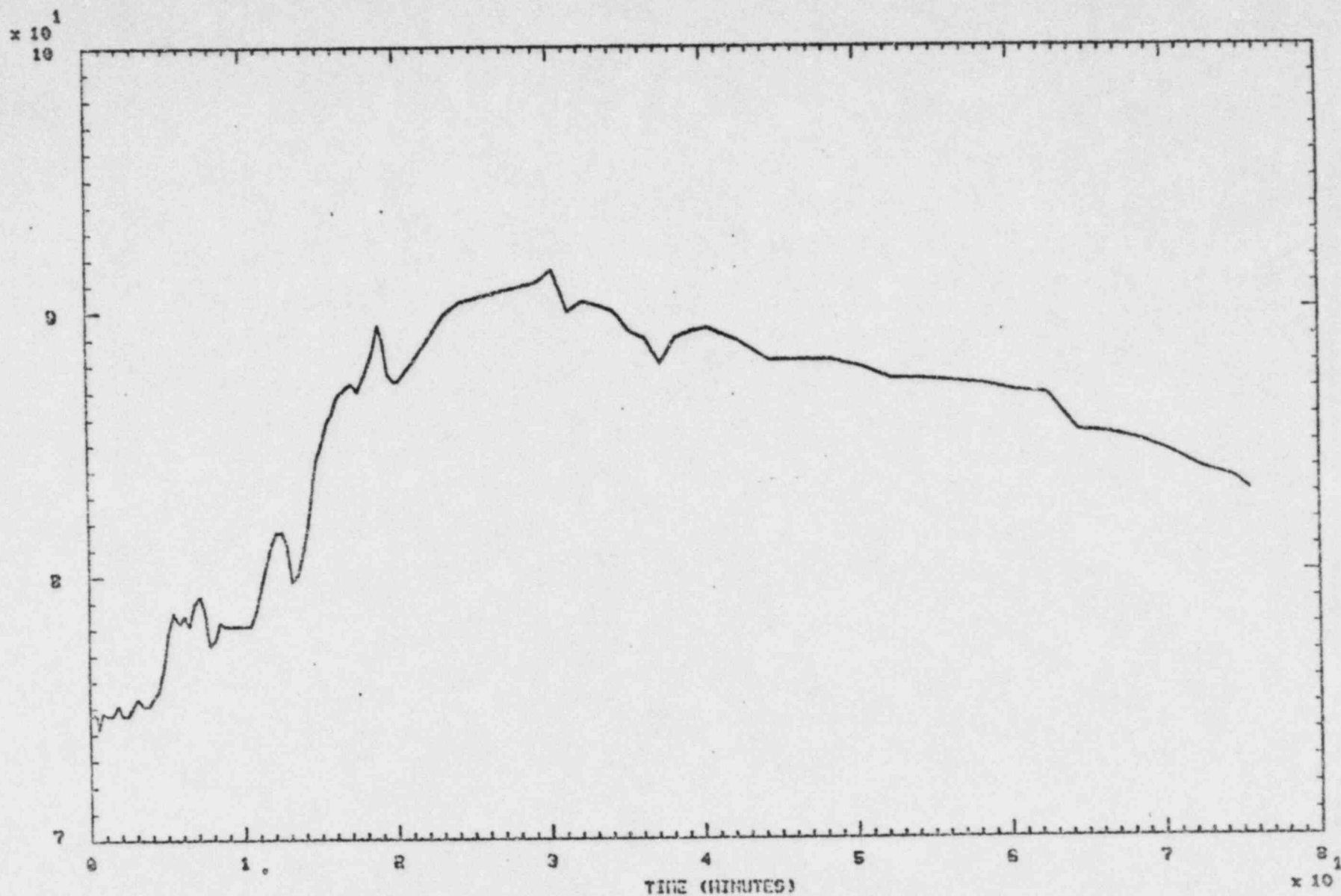


VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 13

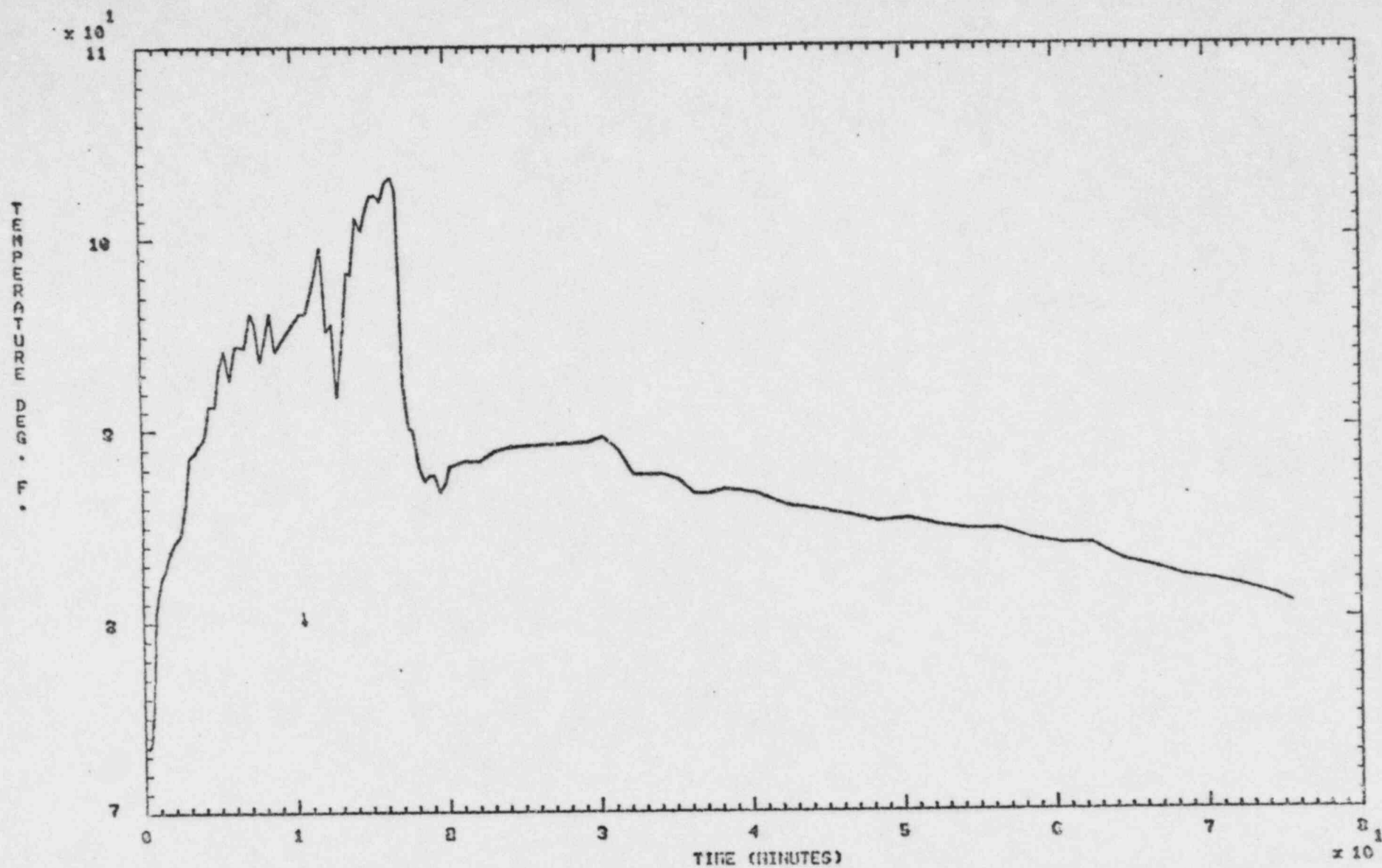


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 14

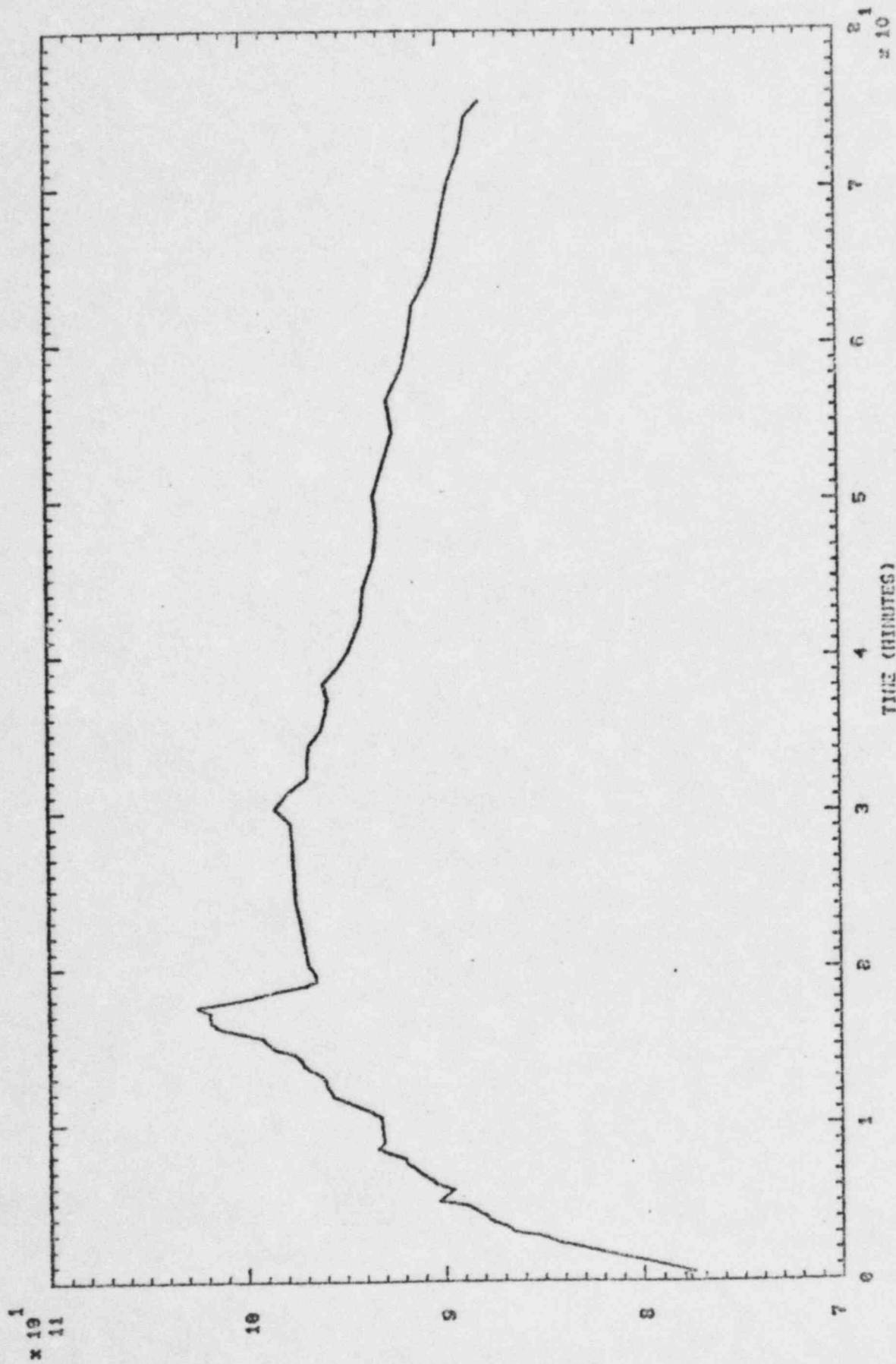
TEMPERATURE DEG. F.



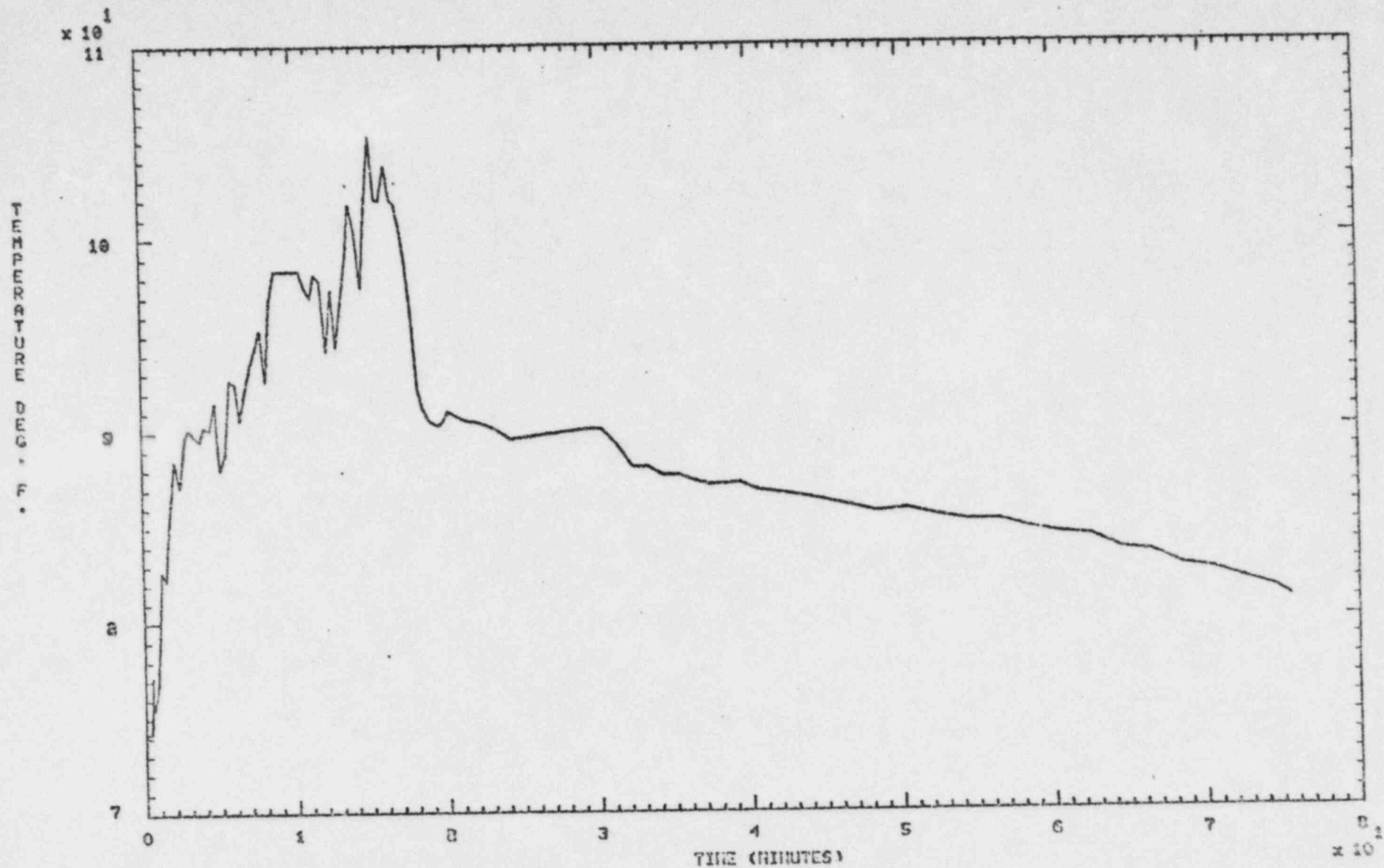
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 15



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 16



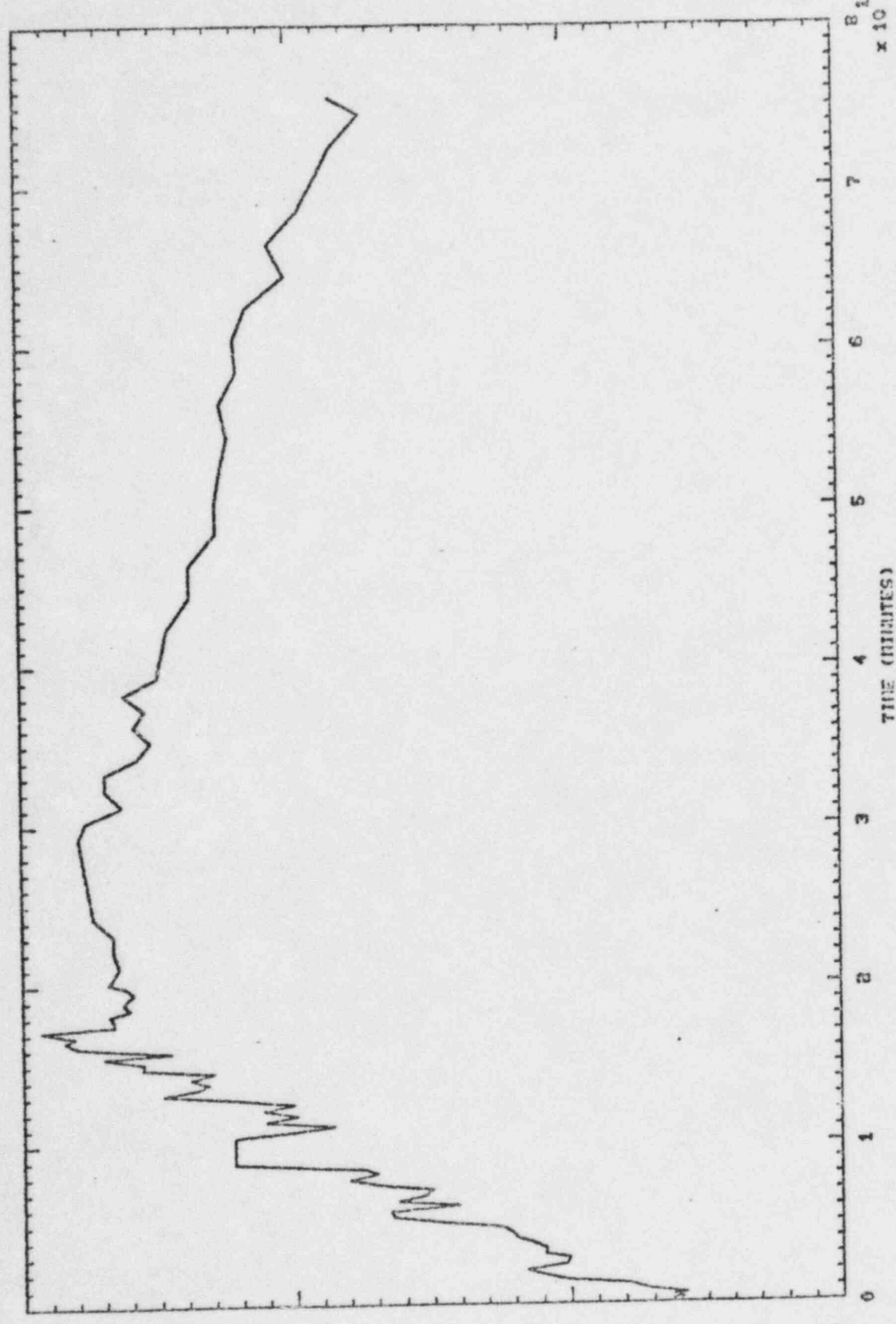
VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 17



EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 18

$\times 10^4$

TEMPERATURE DEG. F.

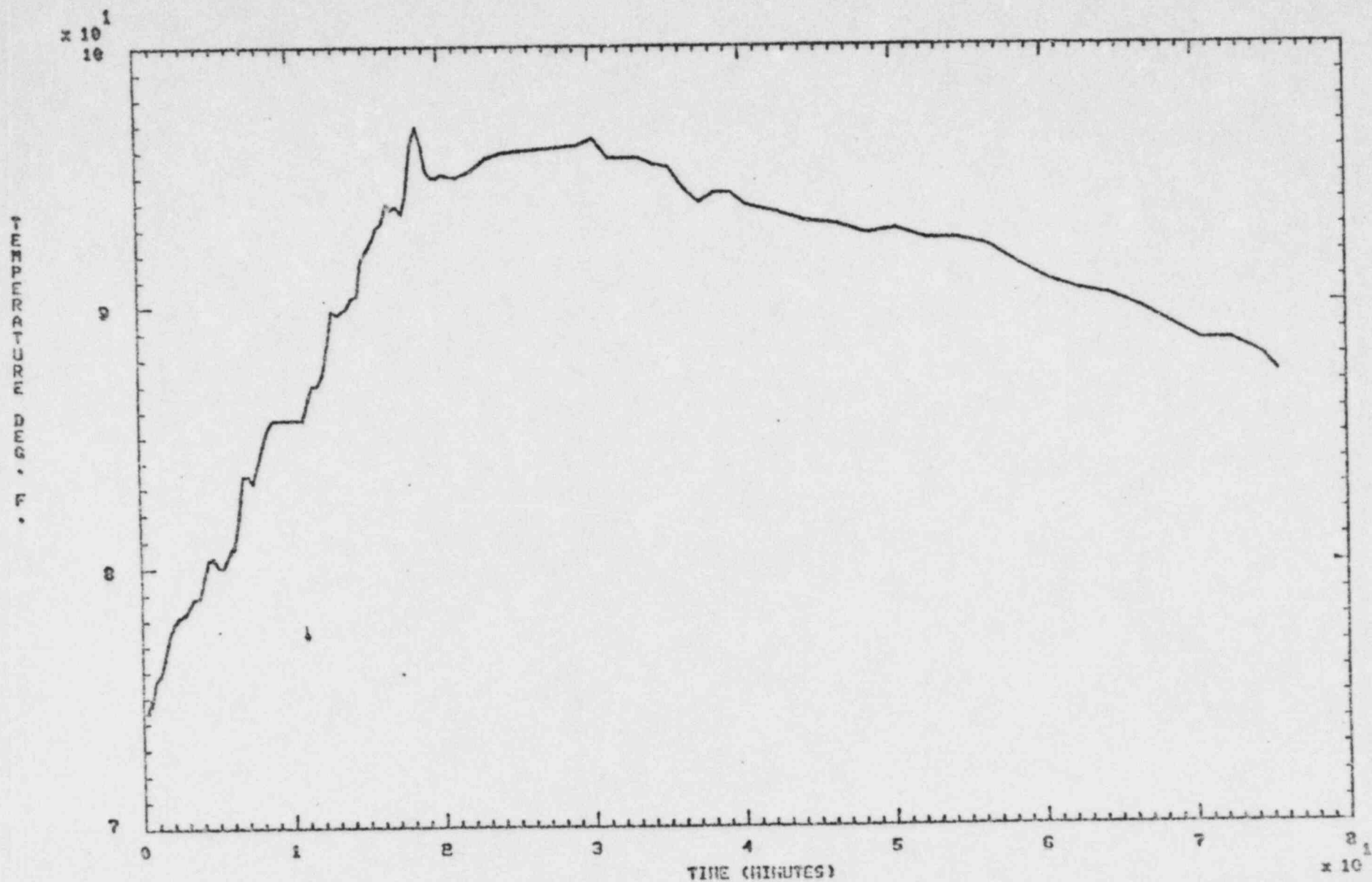


VALVE OPENS AT 10.1 SEC

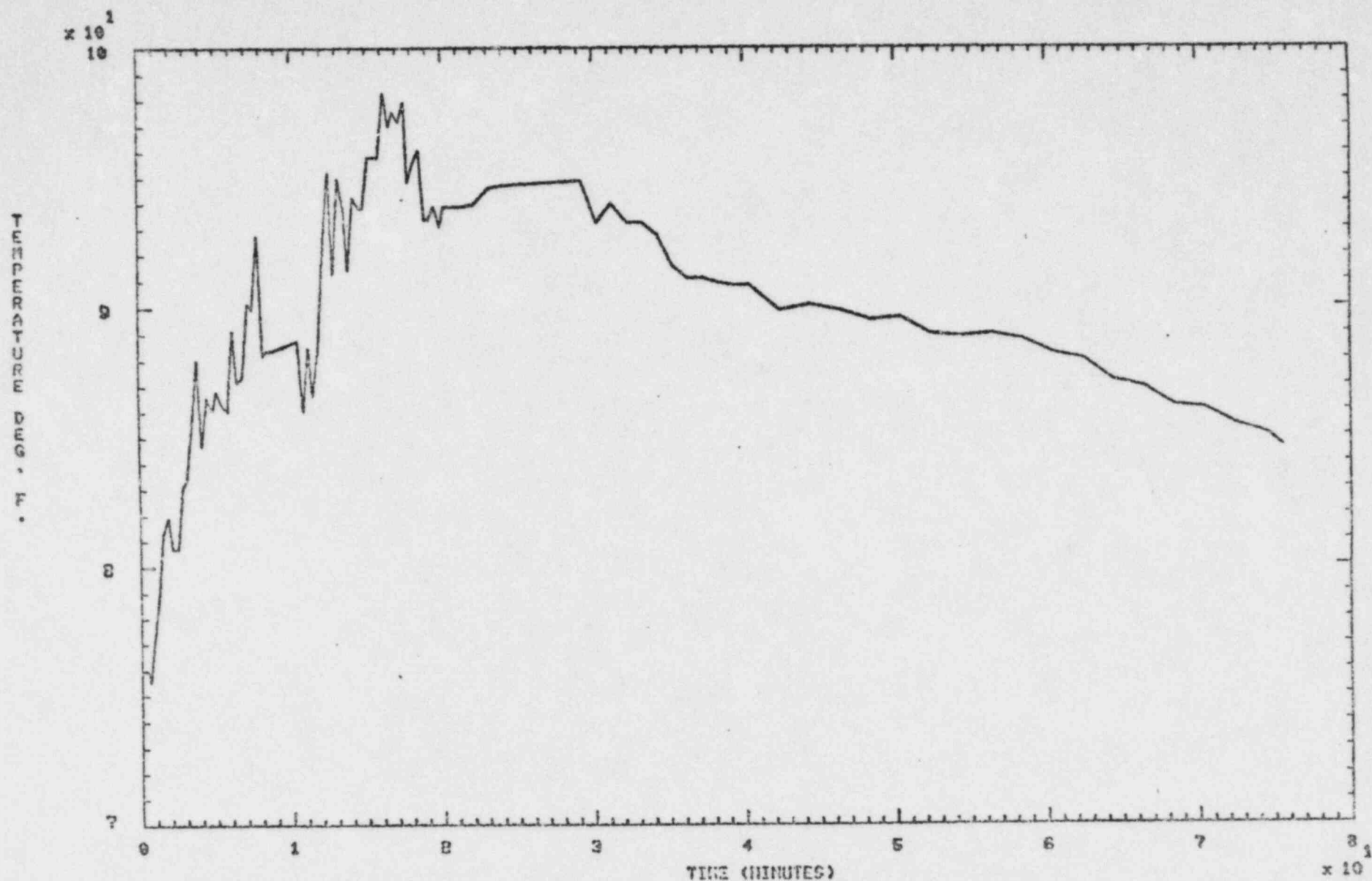
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 19

$\times 10^4$

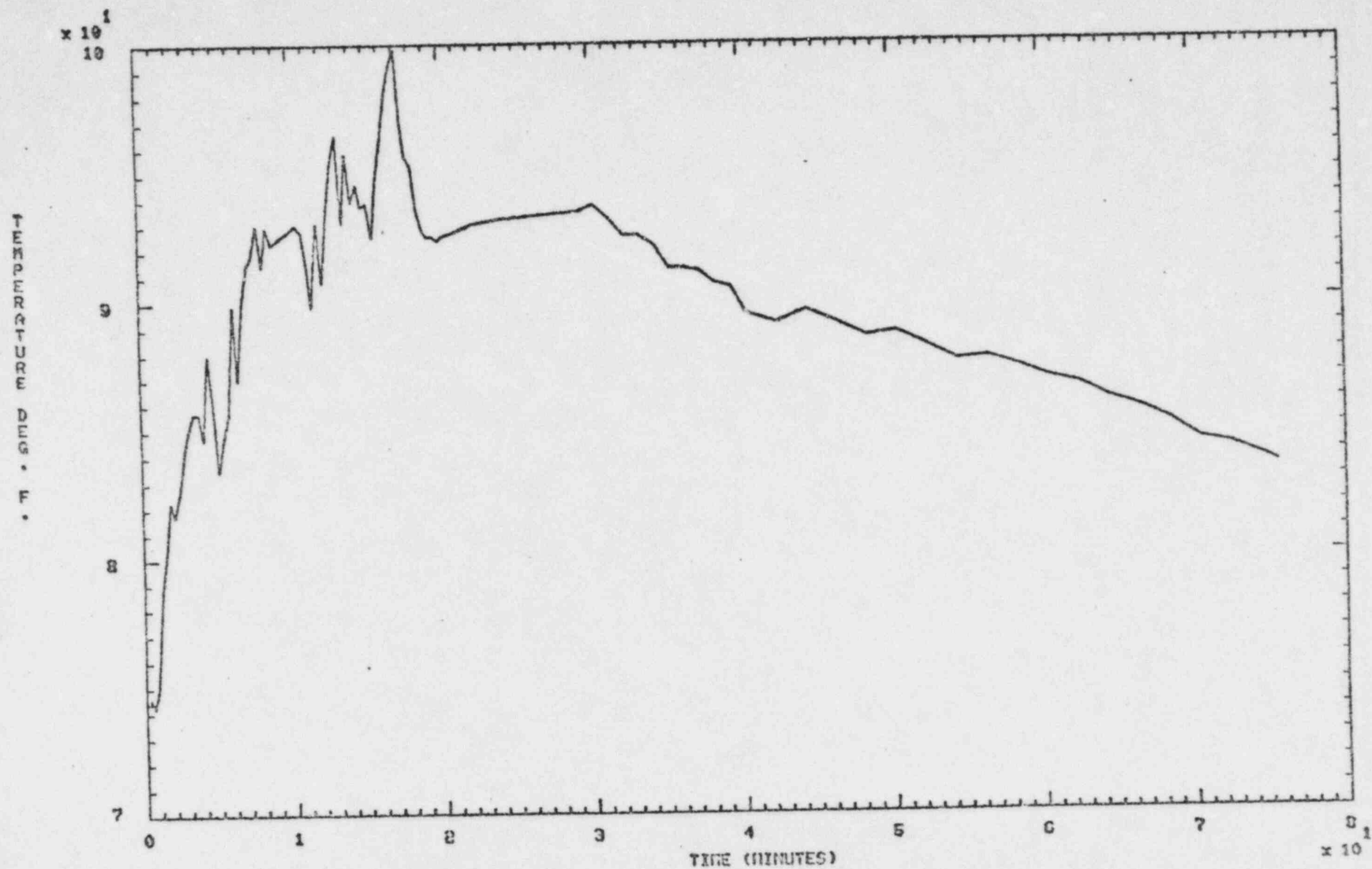
TIME (MINUTES)



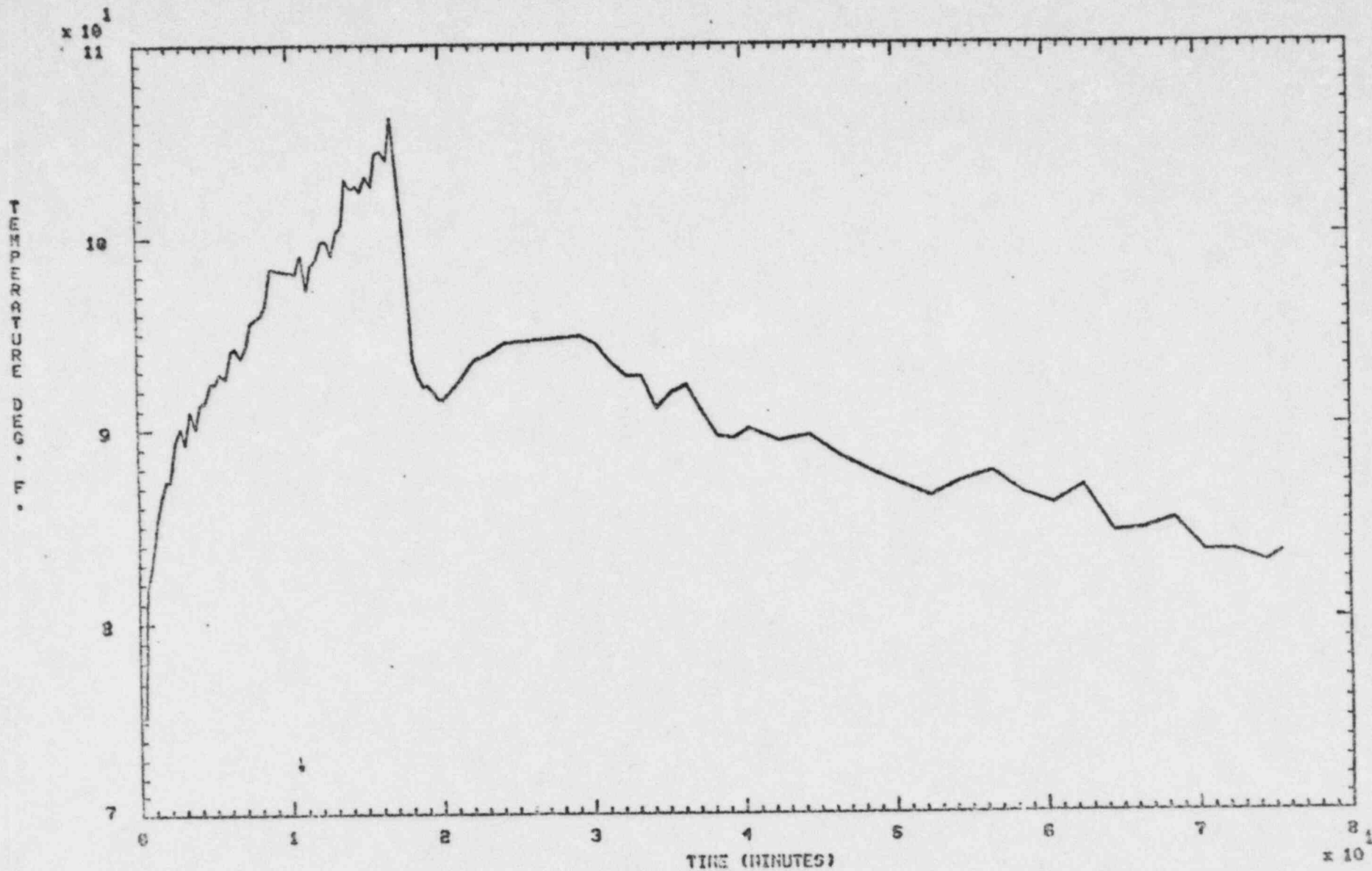
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 20



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 21

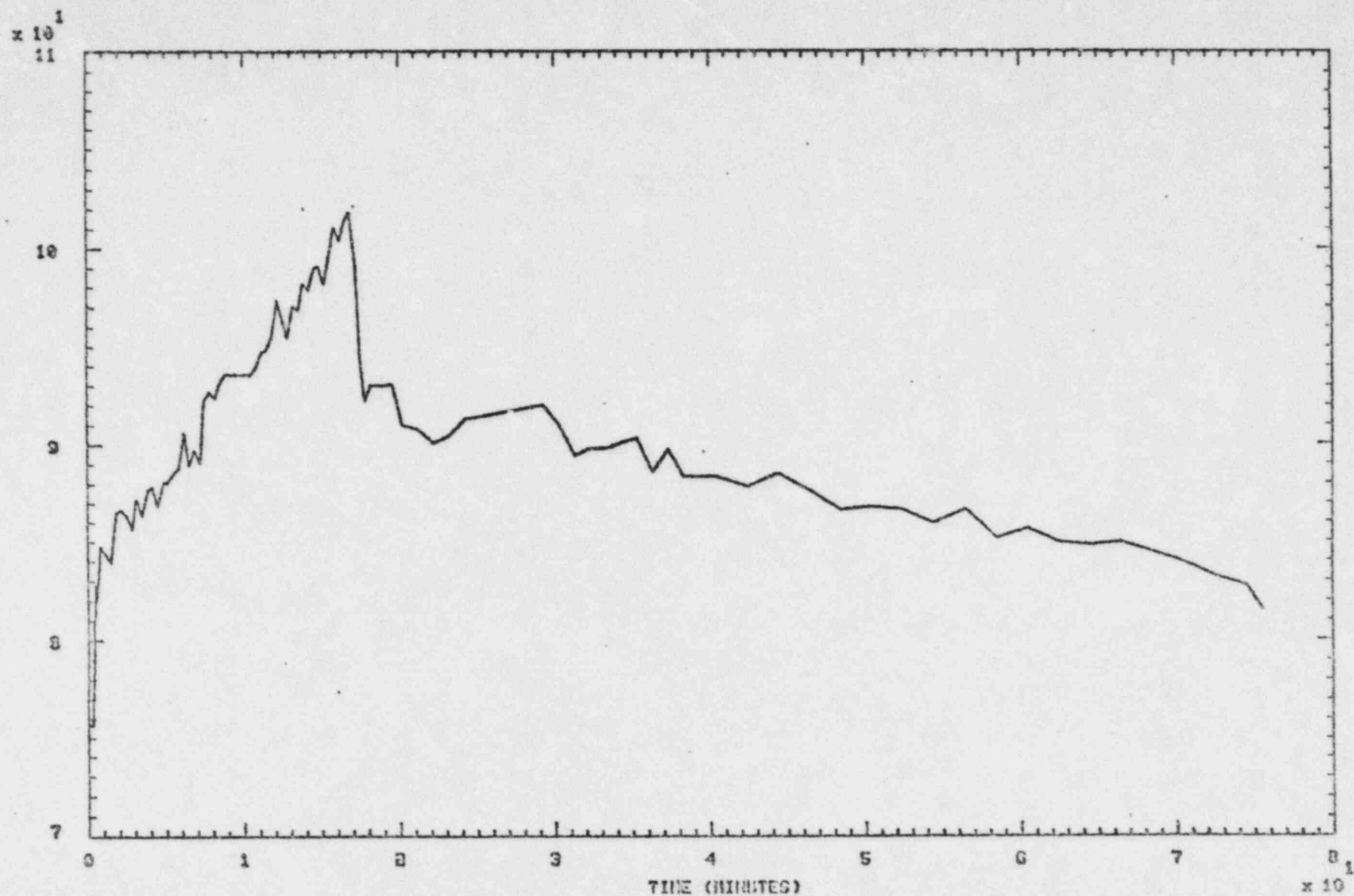


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 22

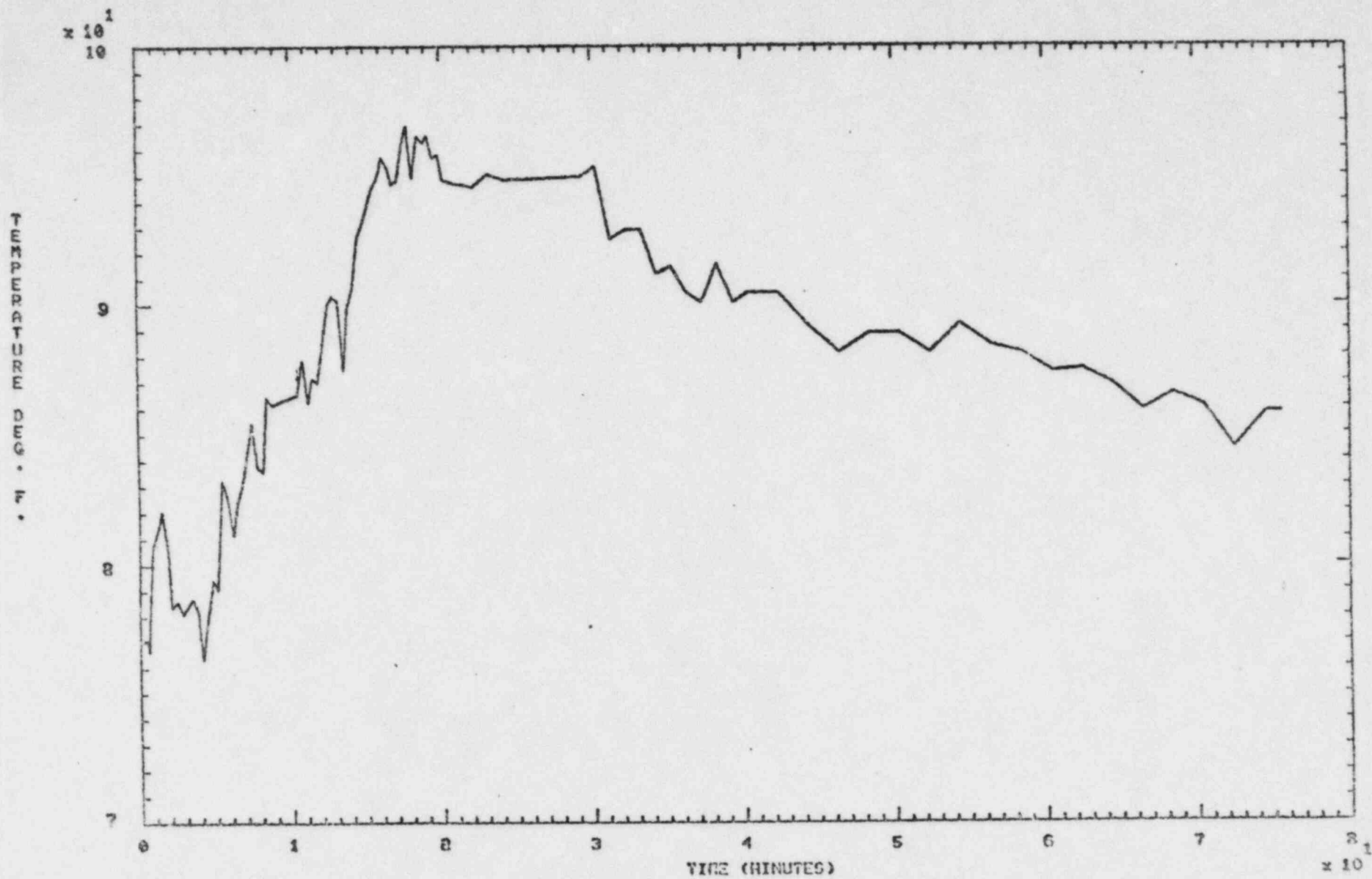


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 23

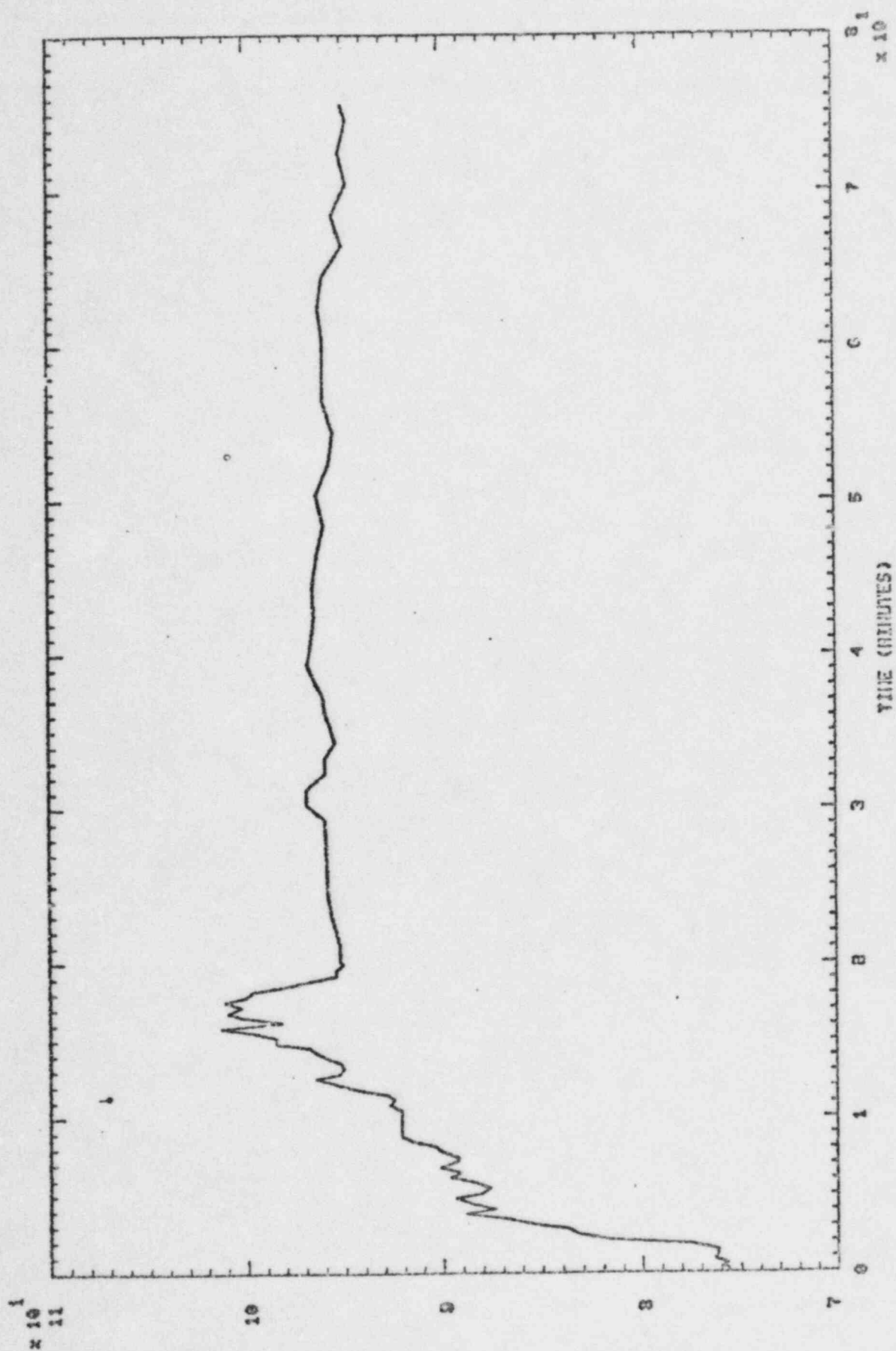
TEMPERATURE (°C)



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 24

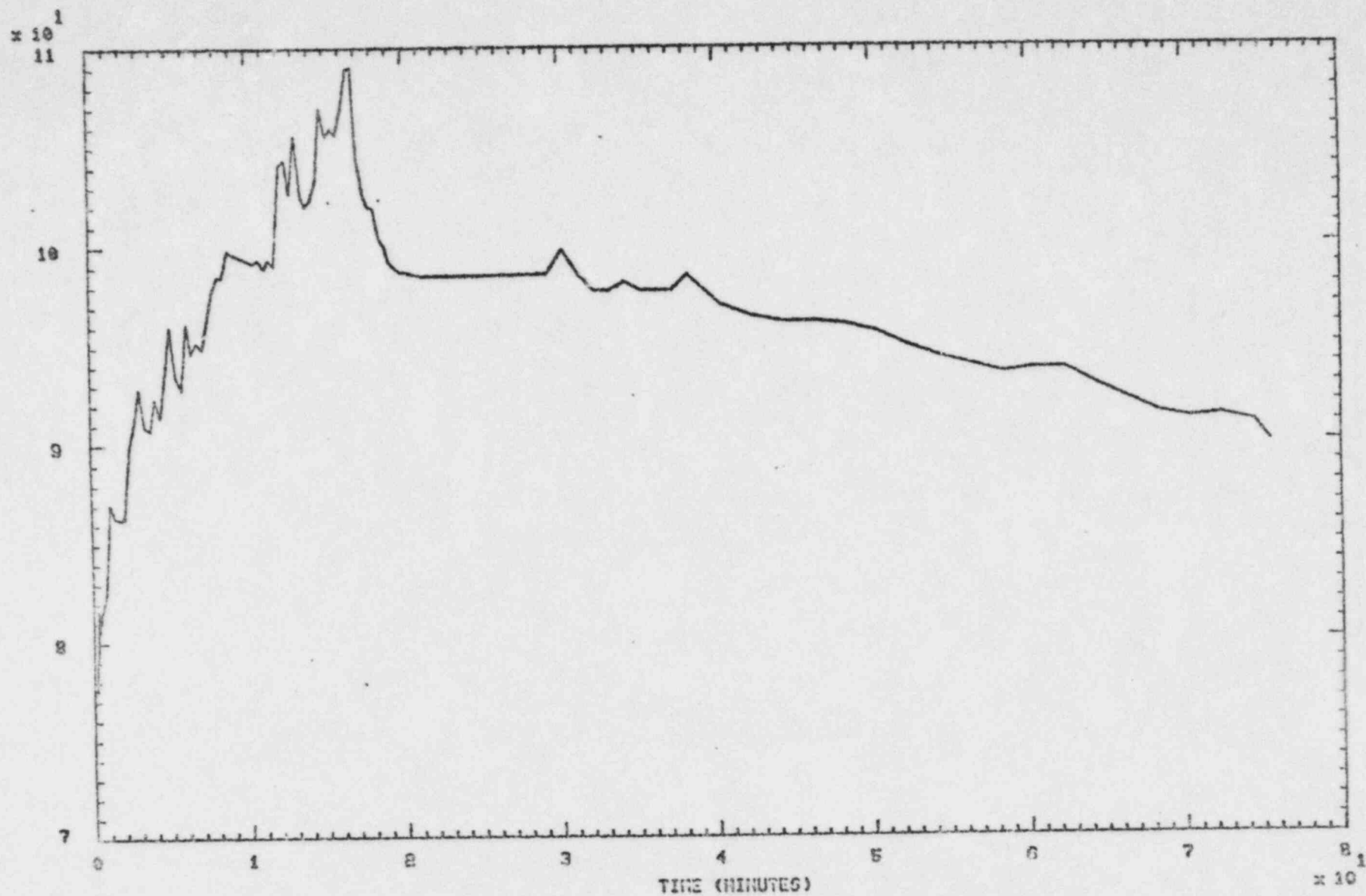


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 25

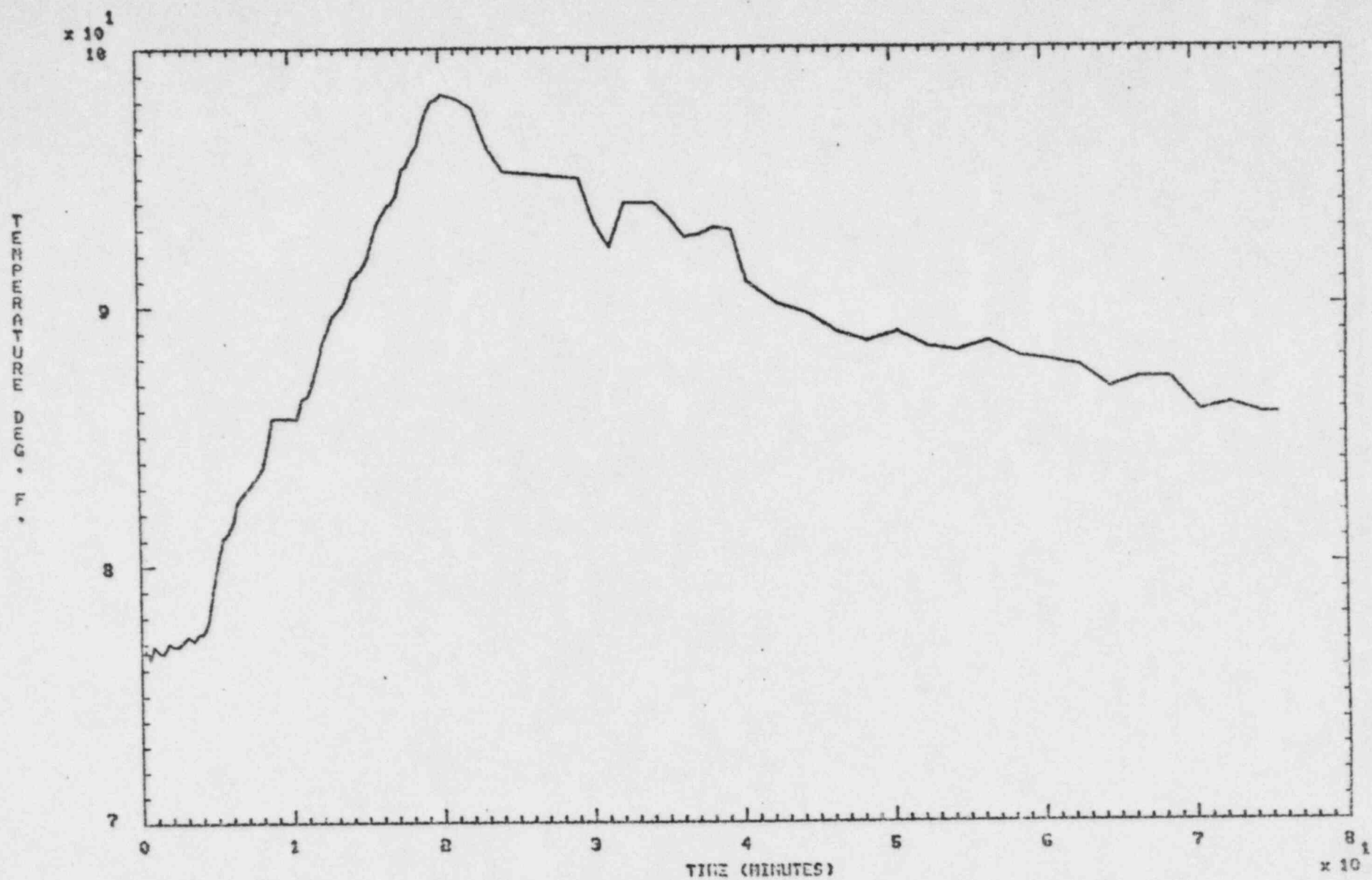


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT# 26

TEMPERATURE (°C)

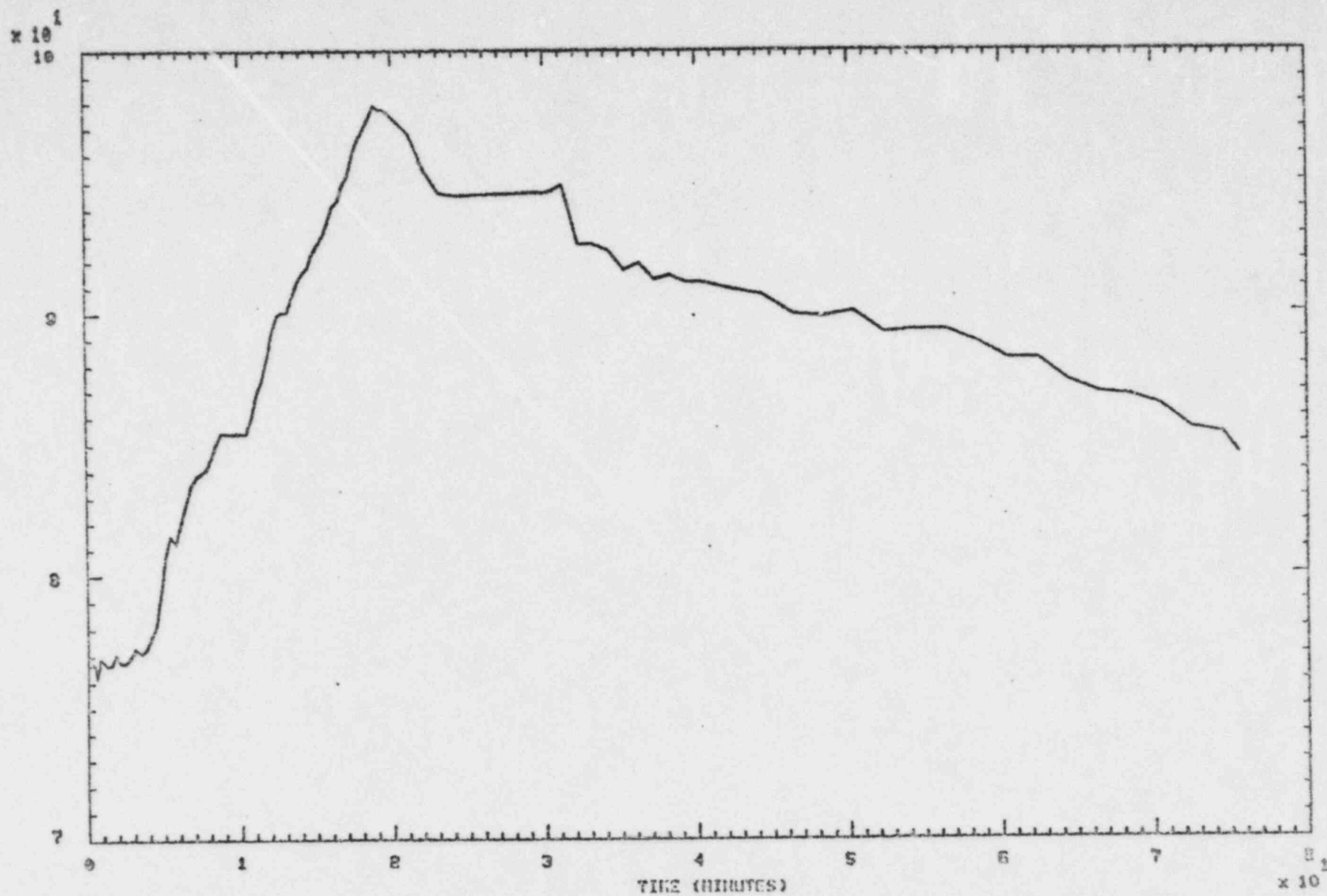


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 27

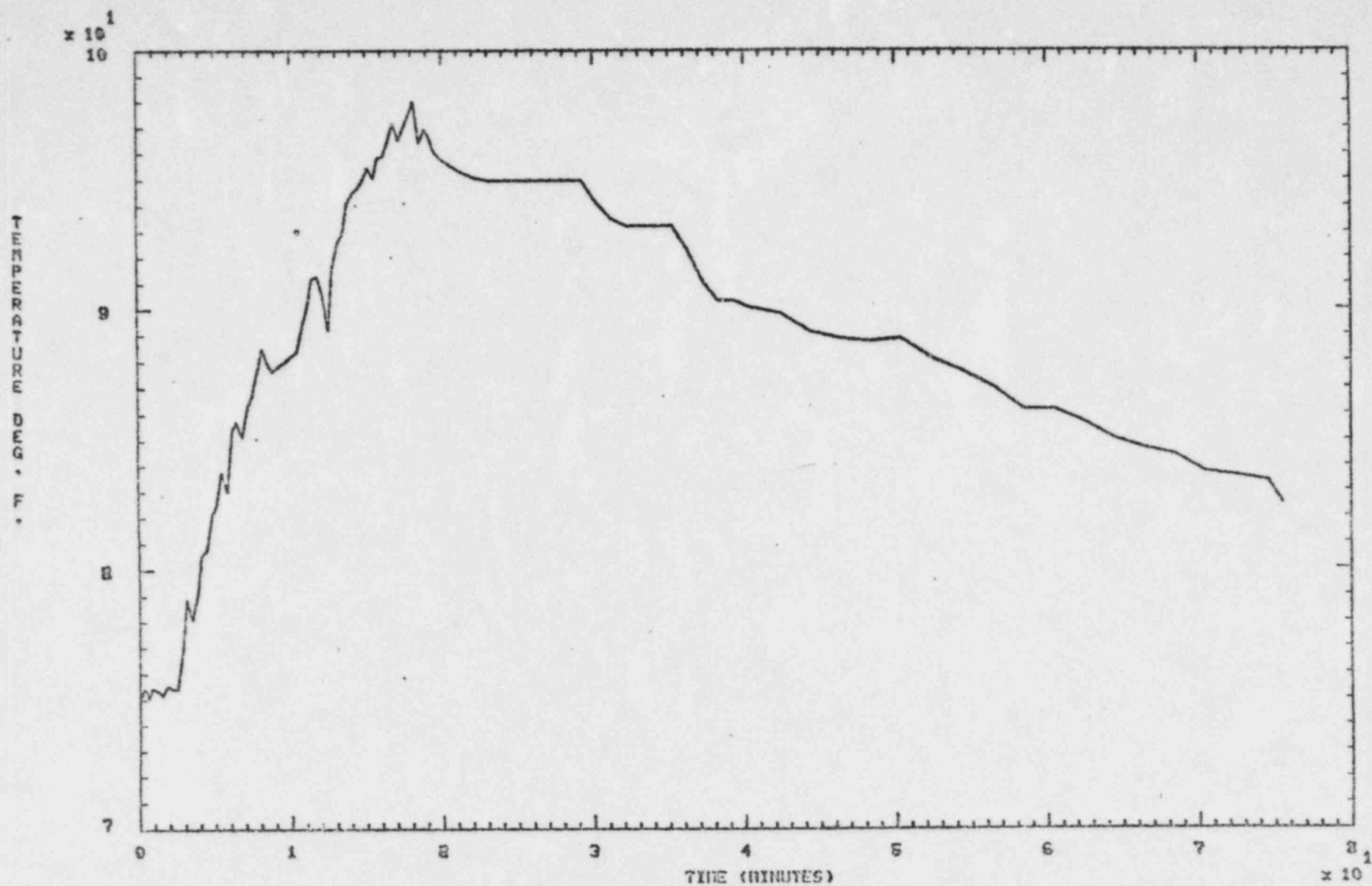


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT# 28

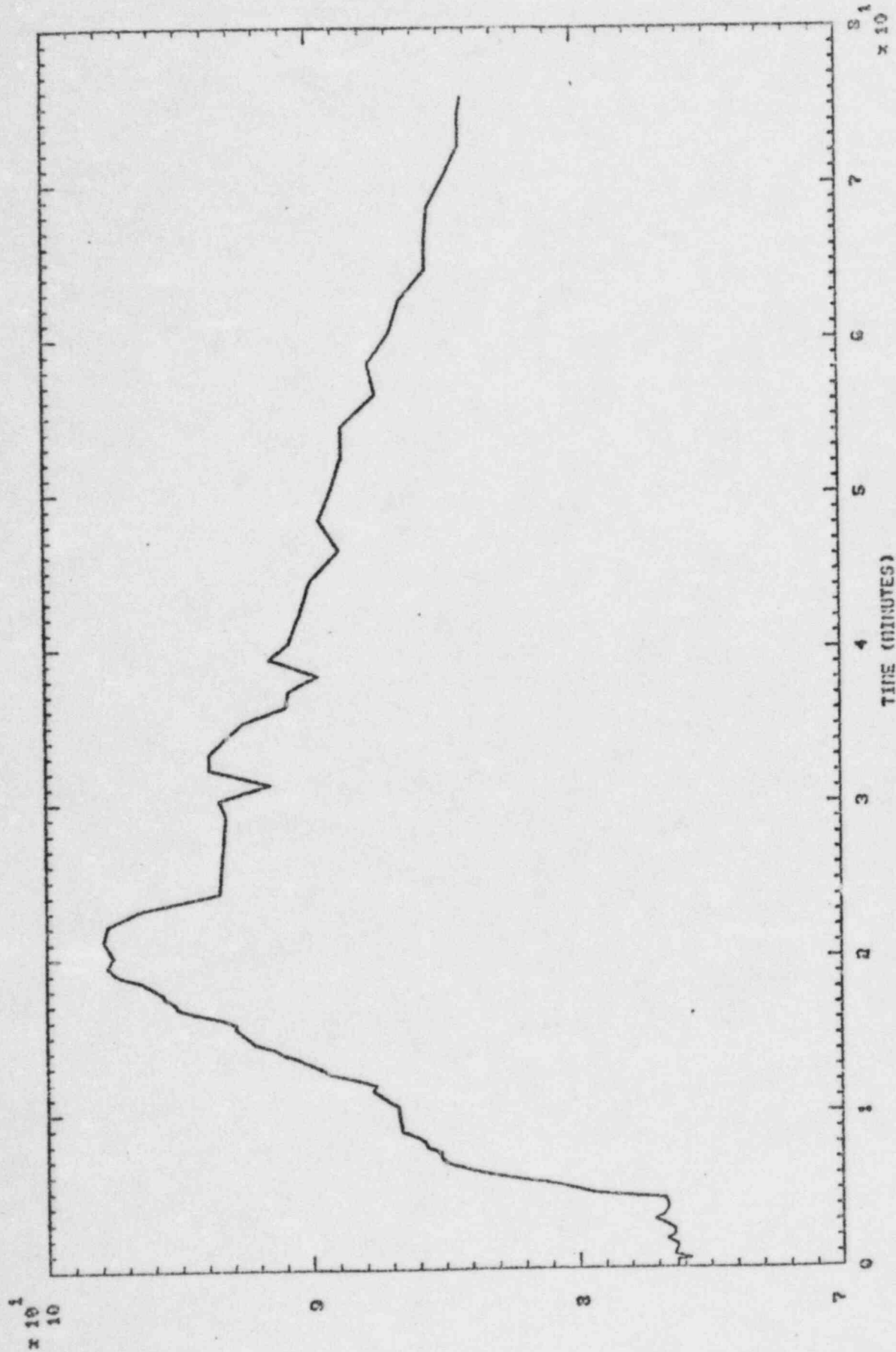
TEMPERATURE (°C)



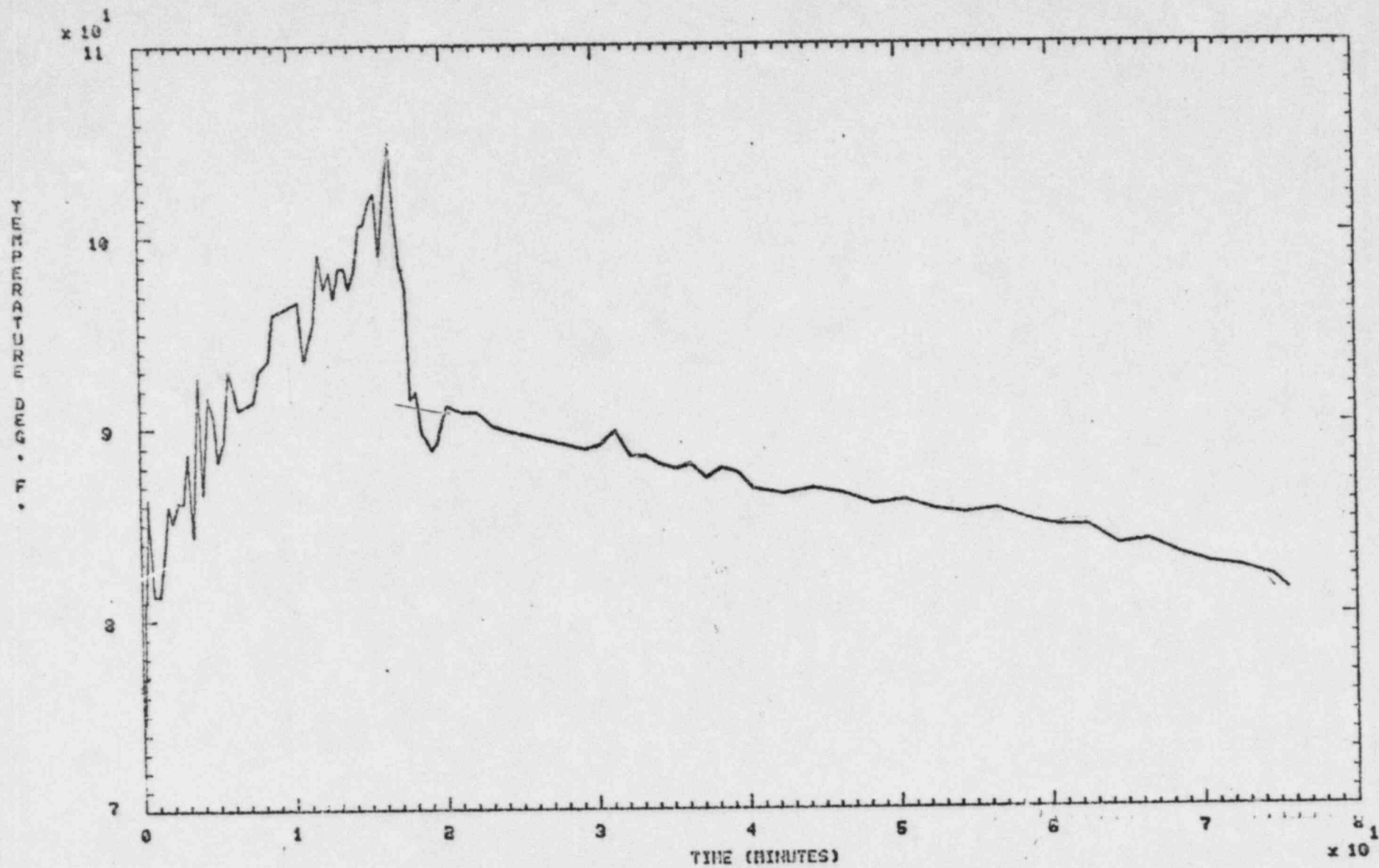
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 29



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 30

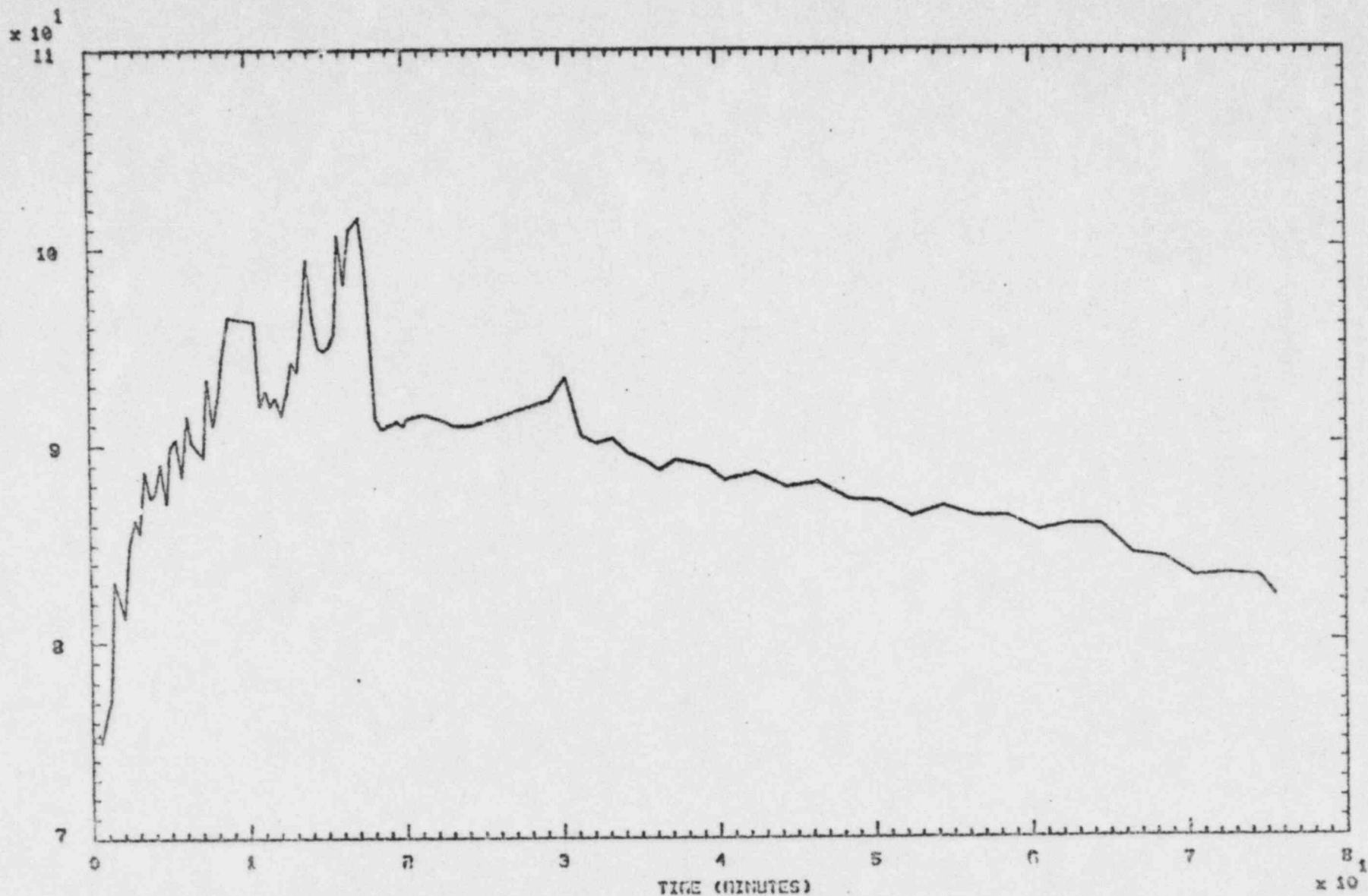


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 31



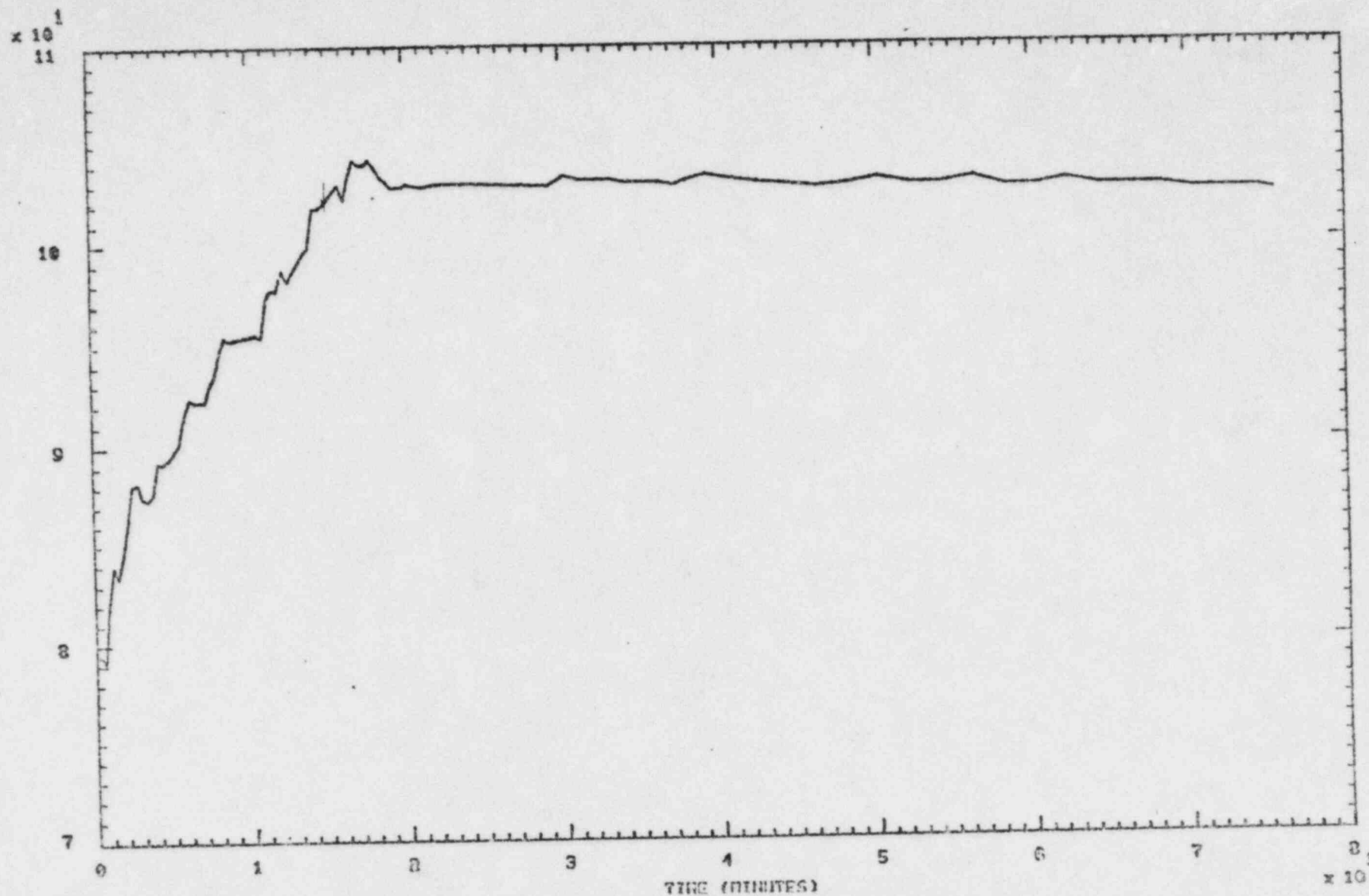
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 32

TEMPERATURE (°C) . 11

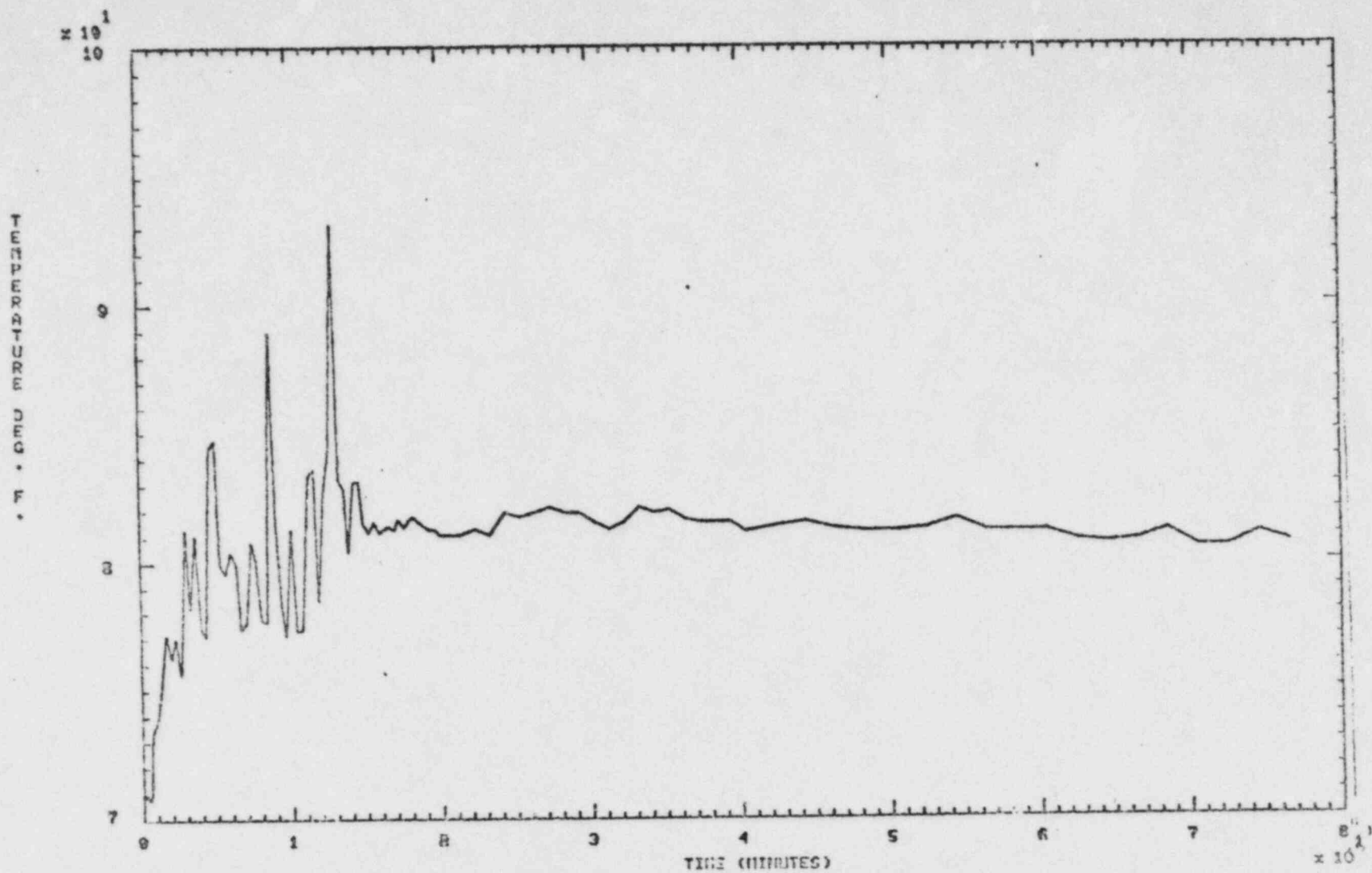


VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 33

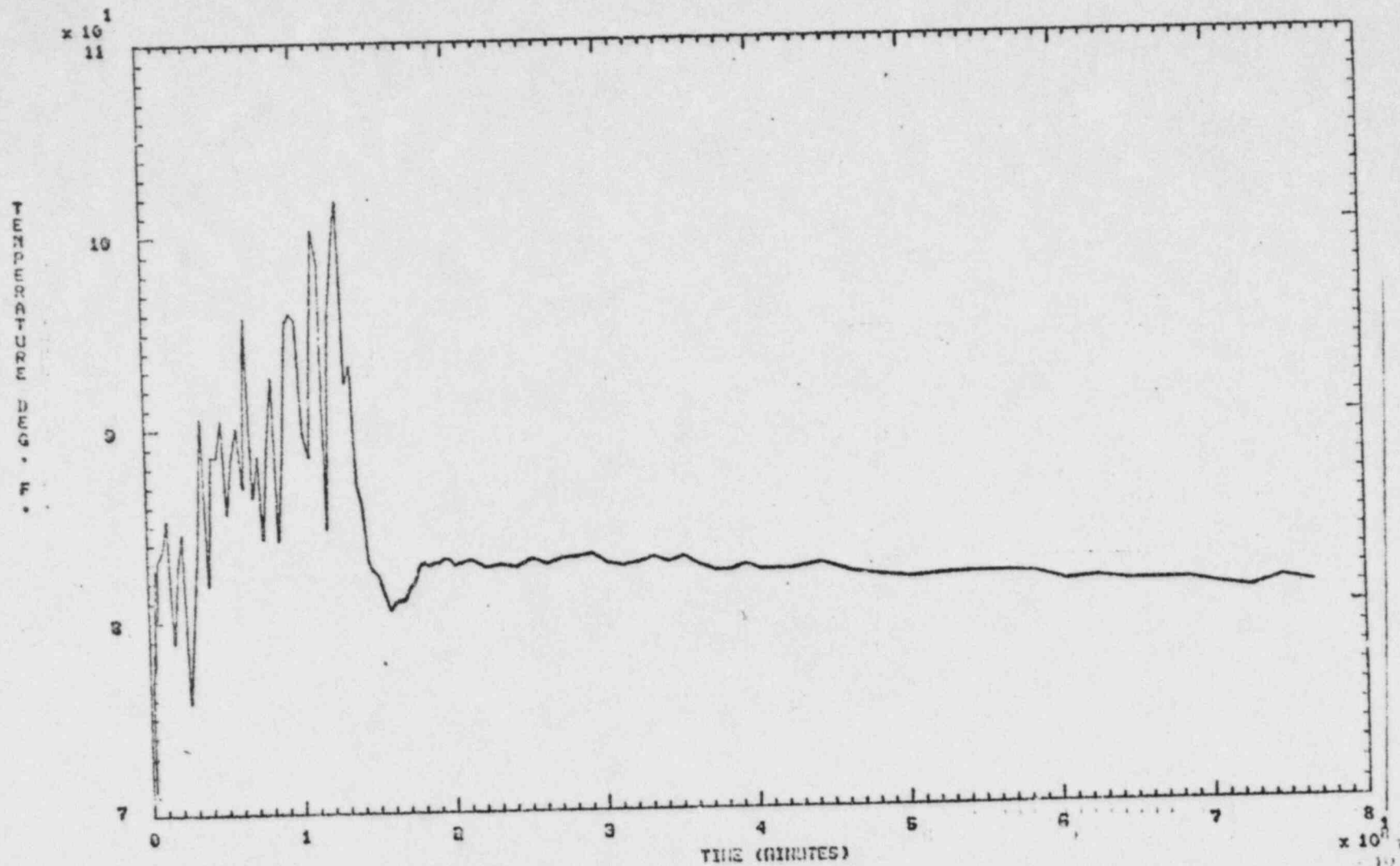
Pressure (PSI) x 10¹



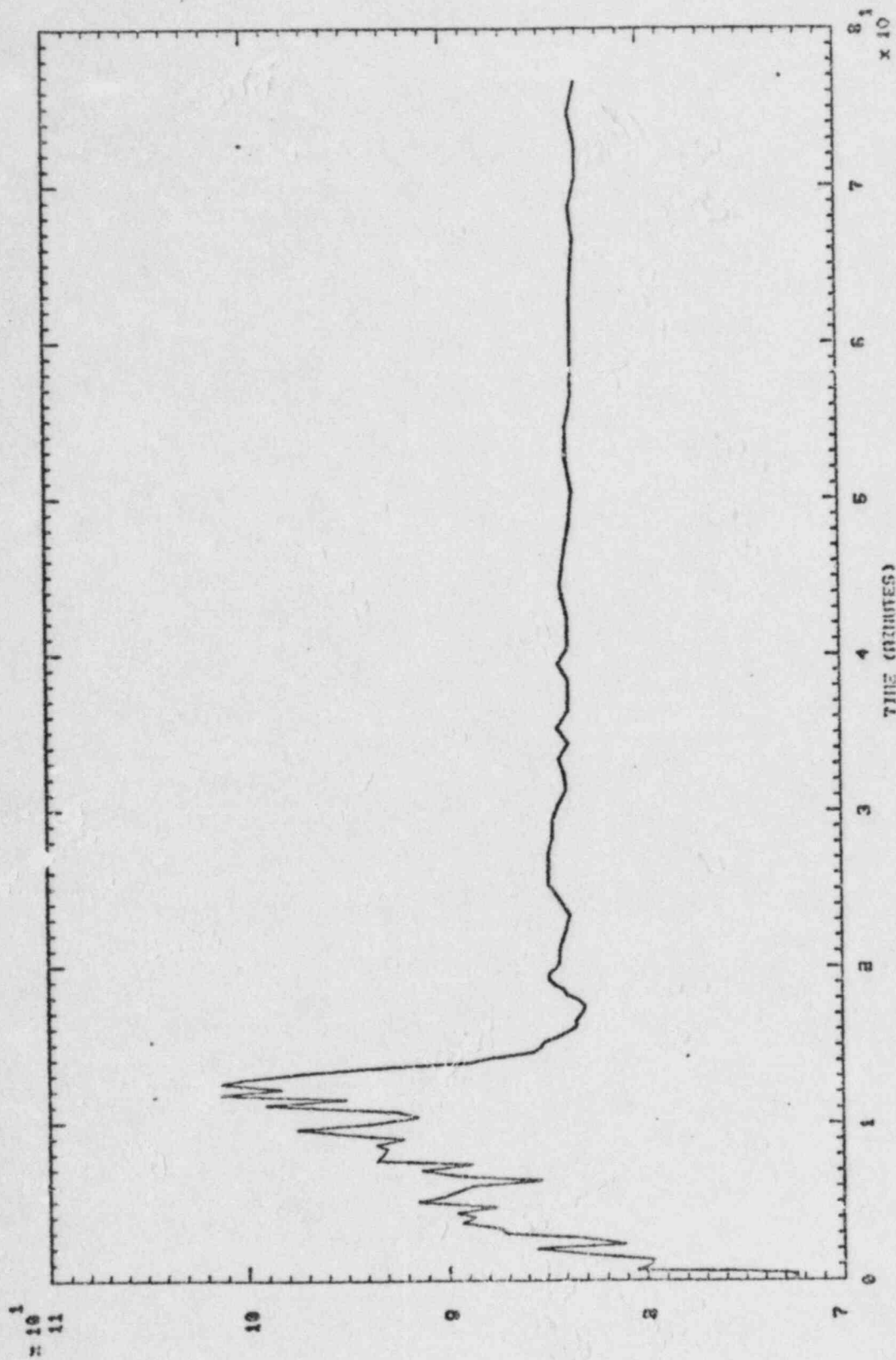
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 072X TT= 48



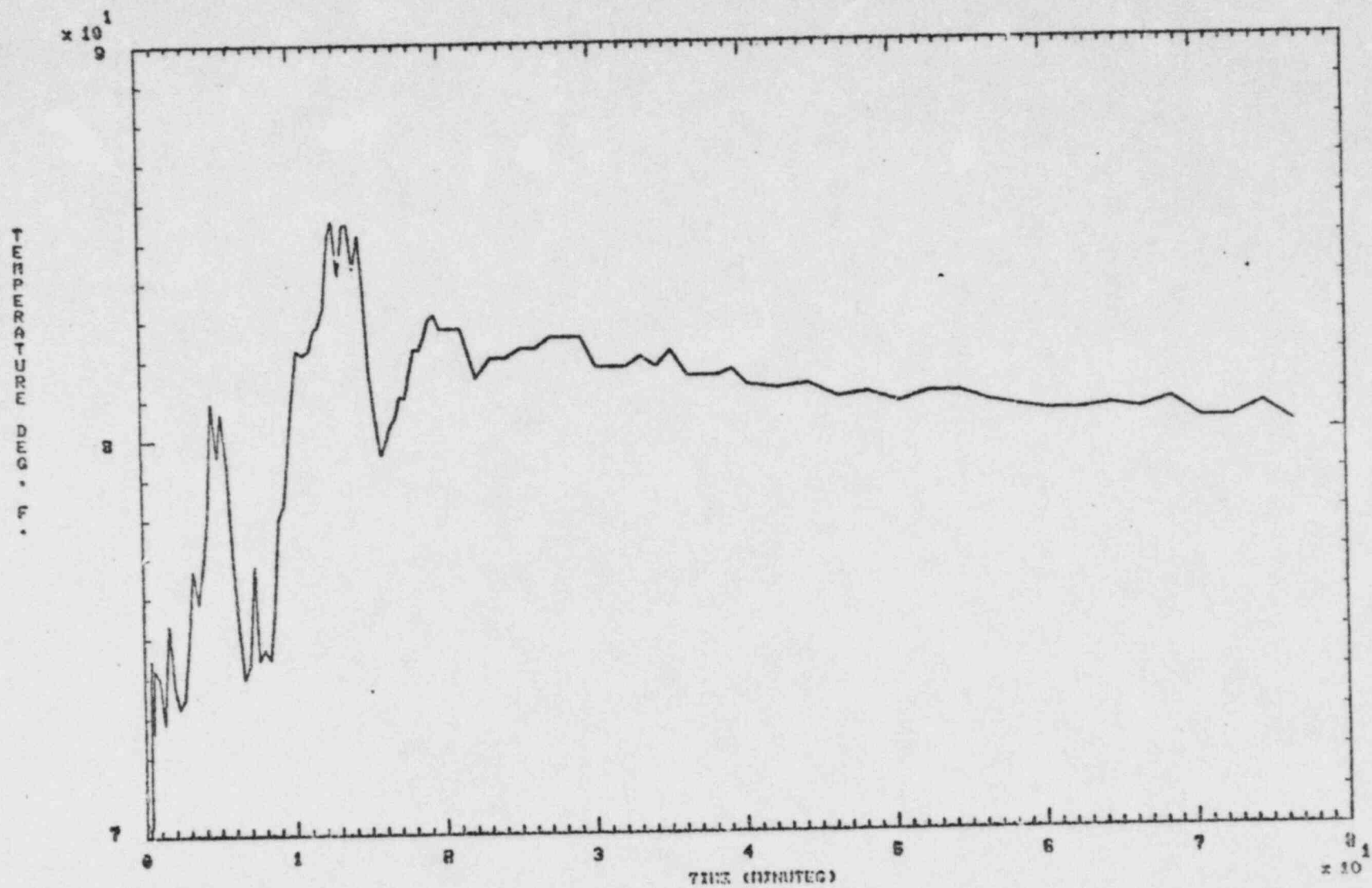
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT¹ 1'



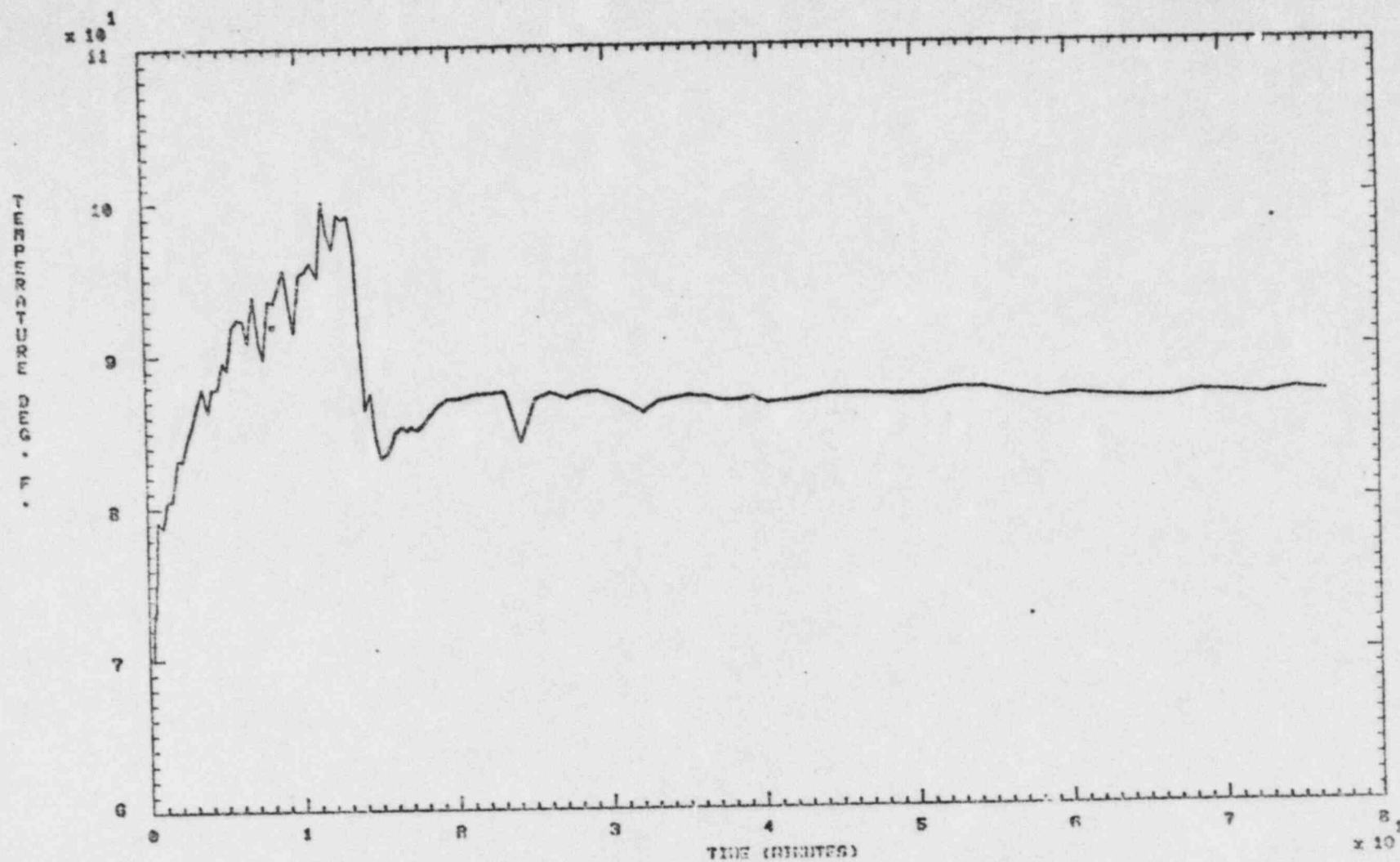
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X $TT_F = 2$



VALVE OPENS AT 10.1 SEC
 EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 3

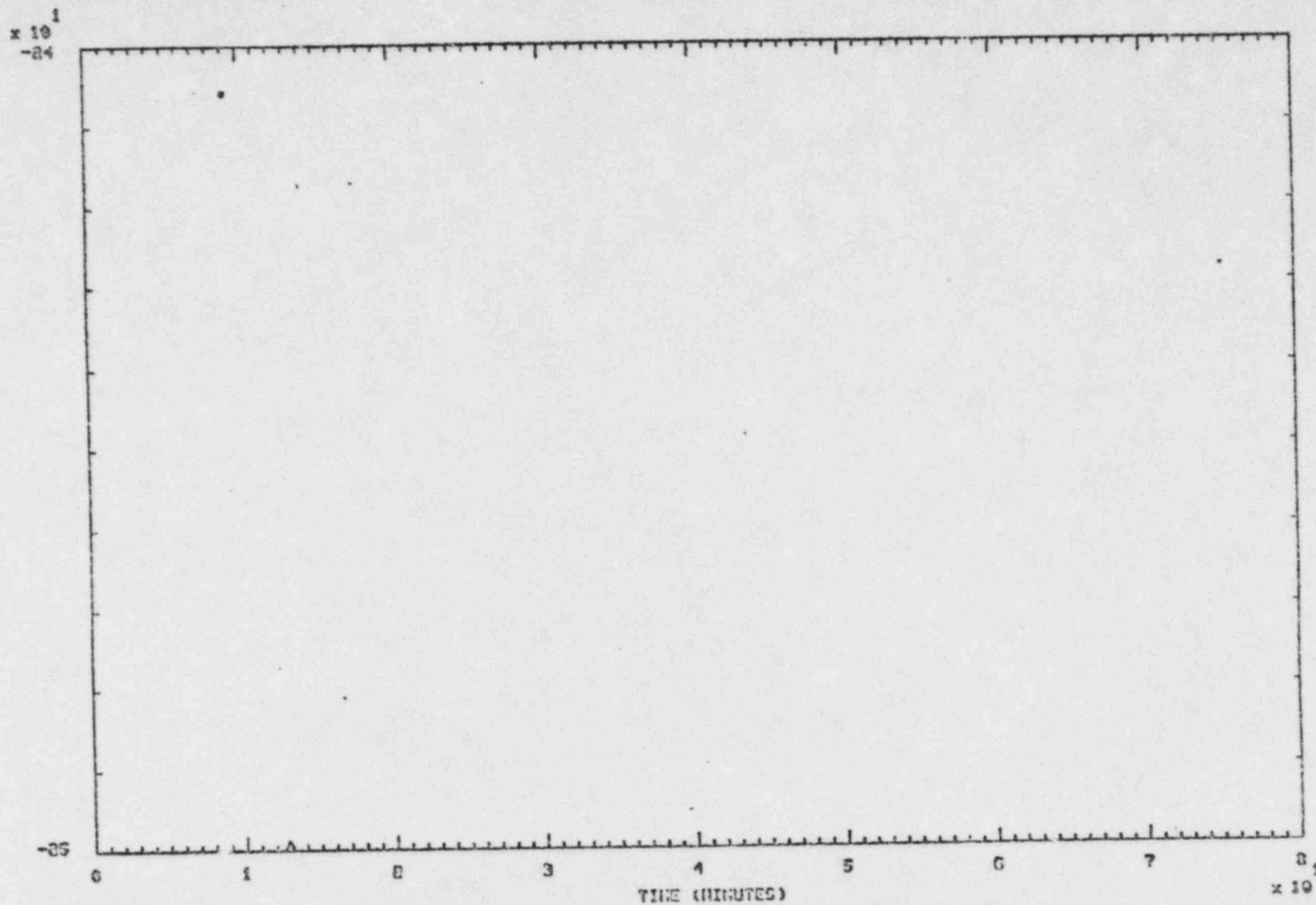


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 4

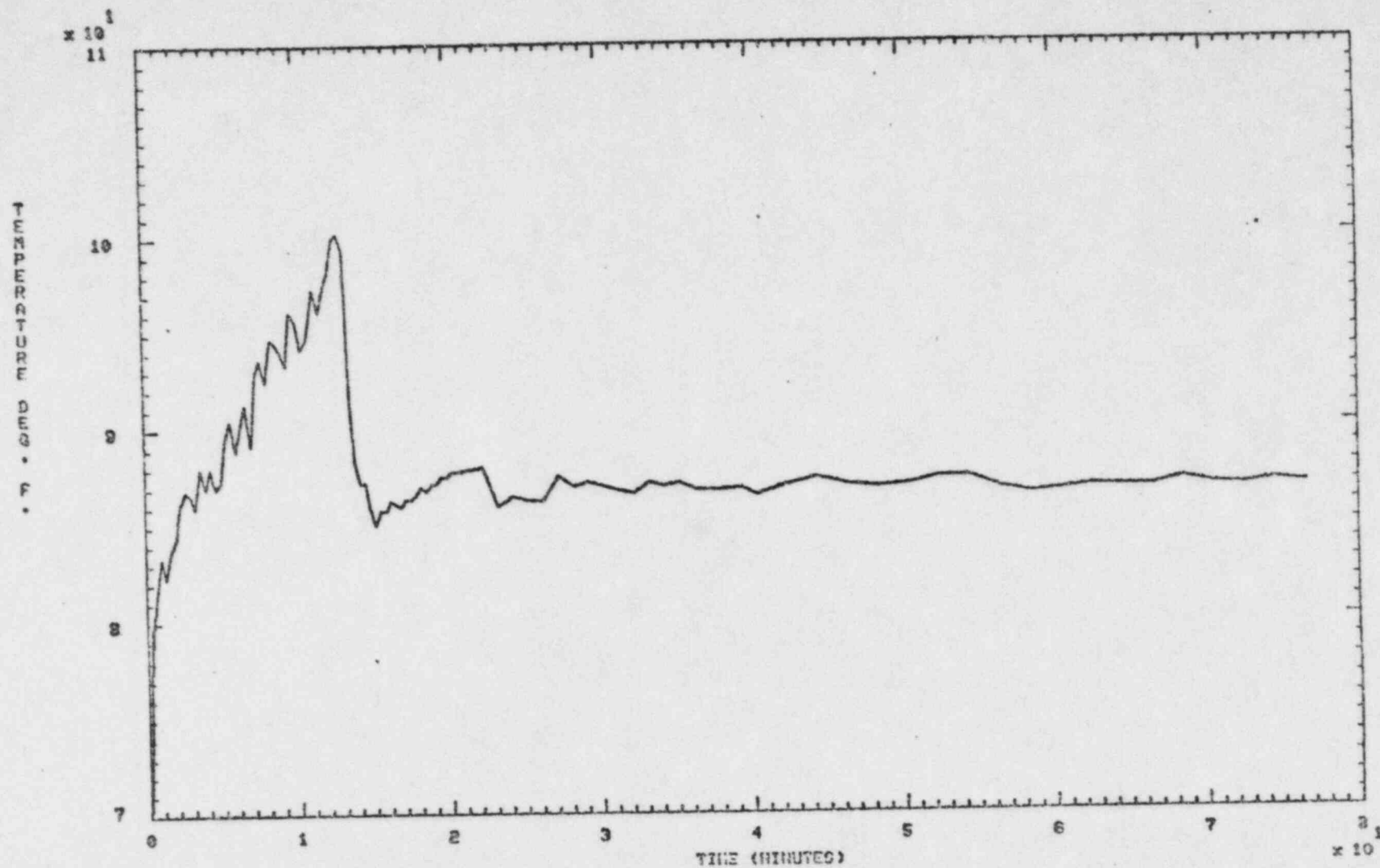


VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 5

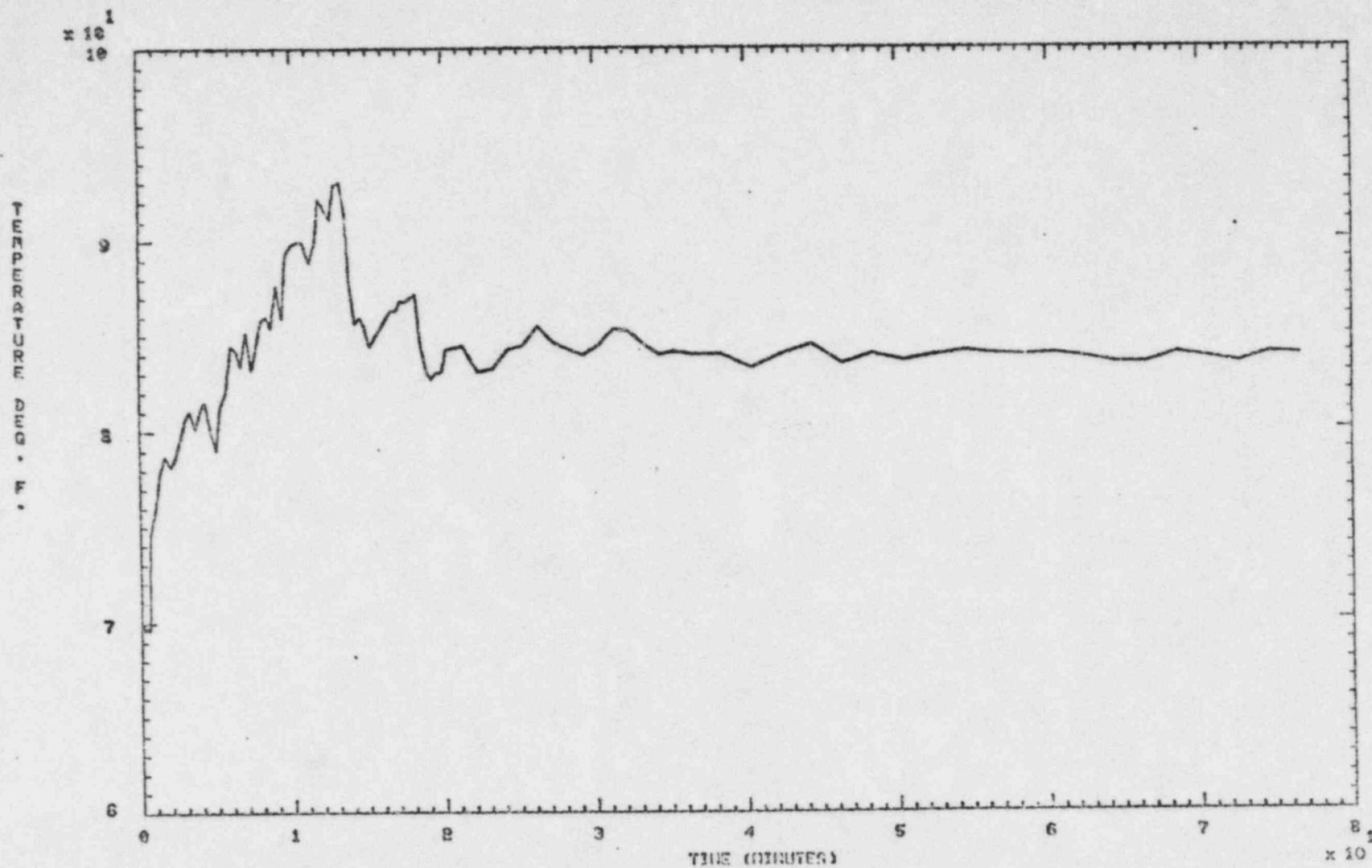
TEMPERATURE



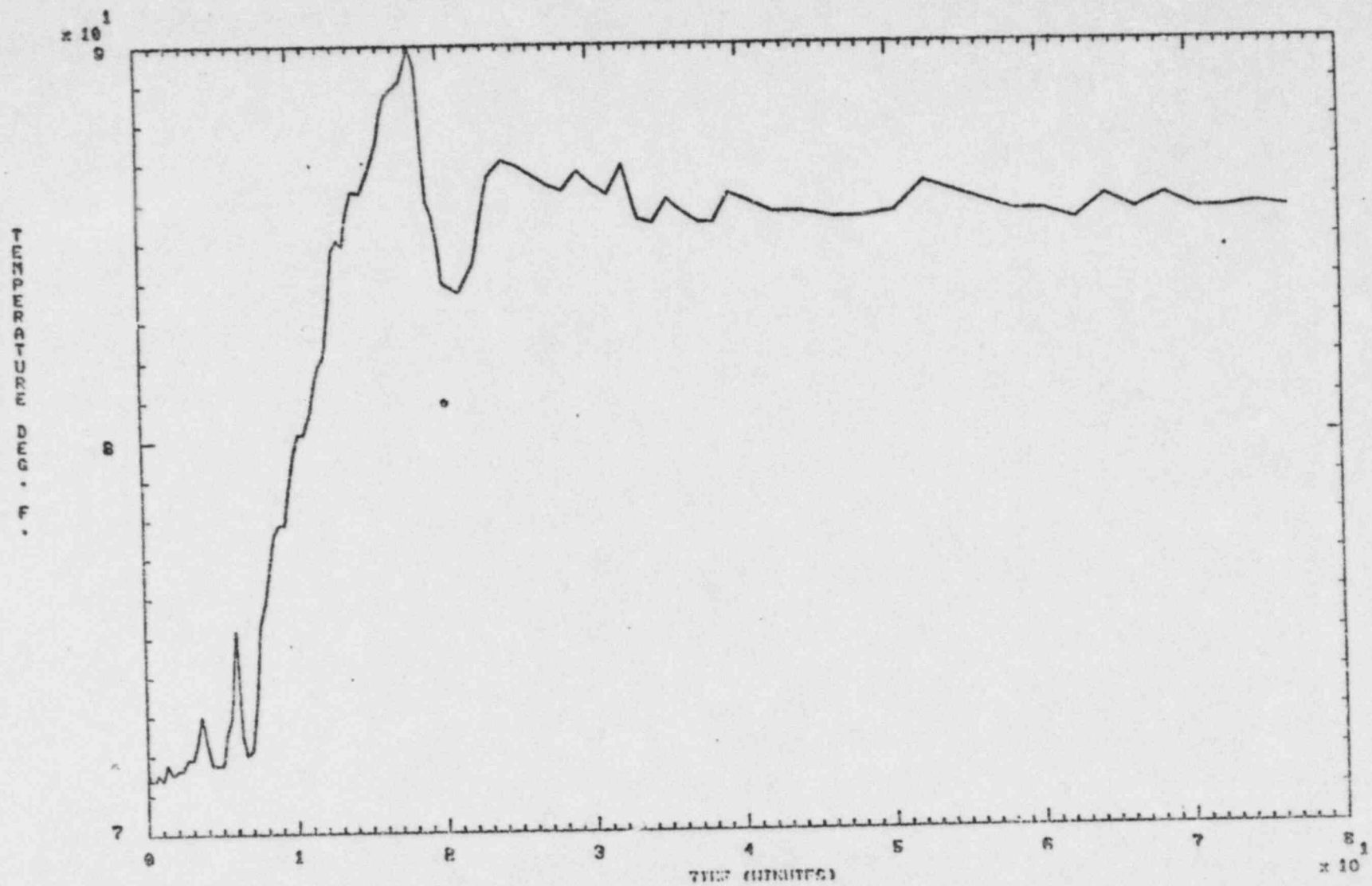
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 6



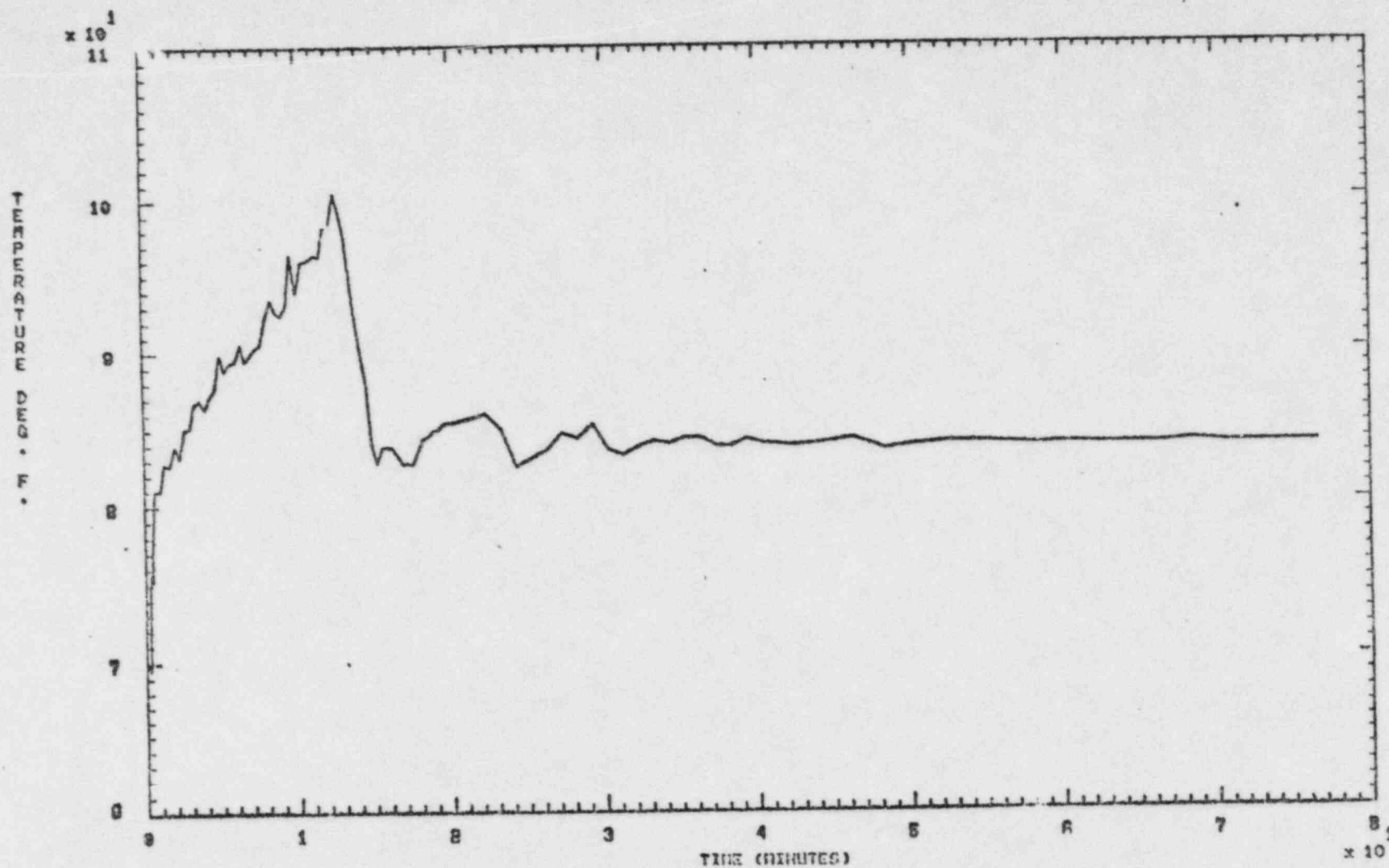
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 7



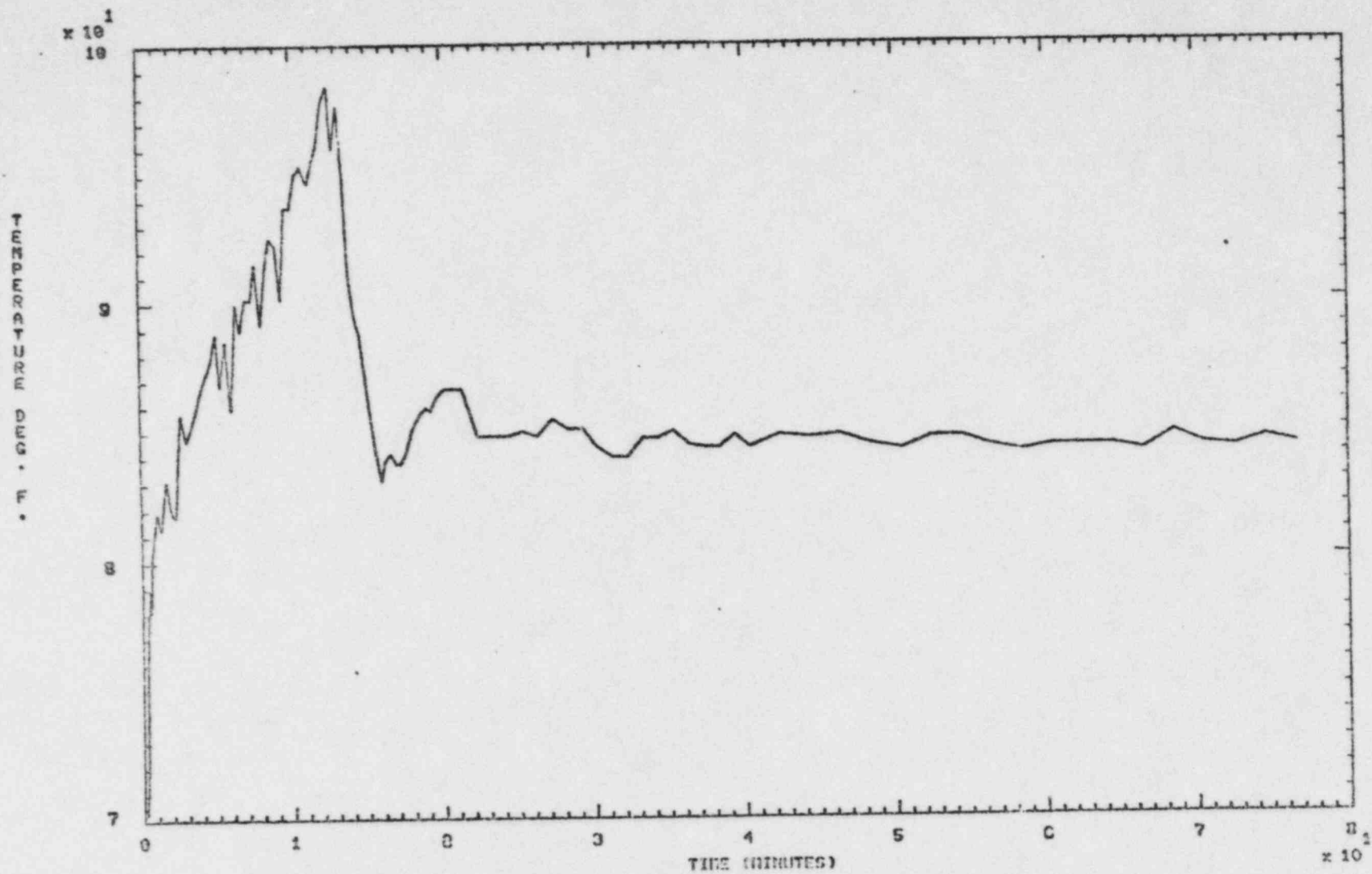
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 8



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 9

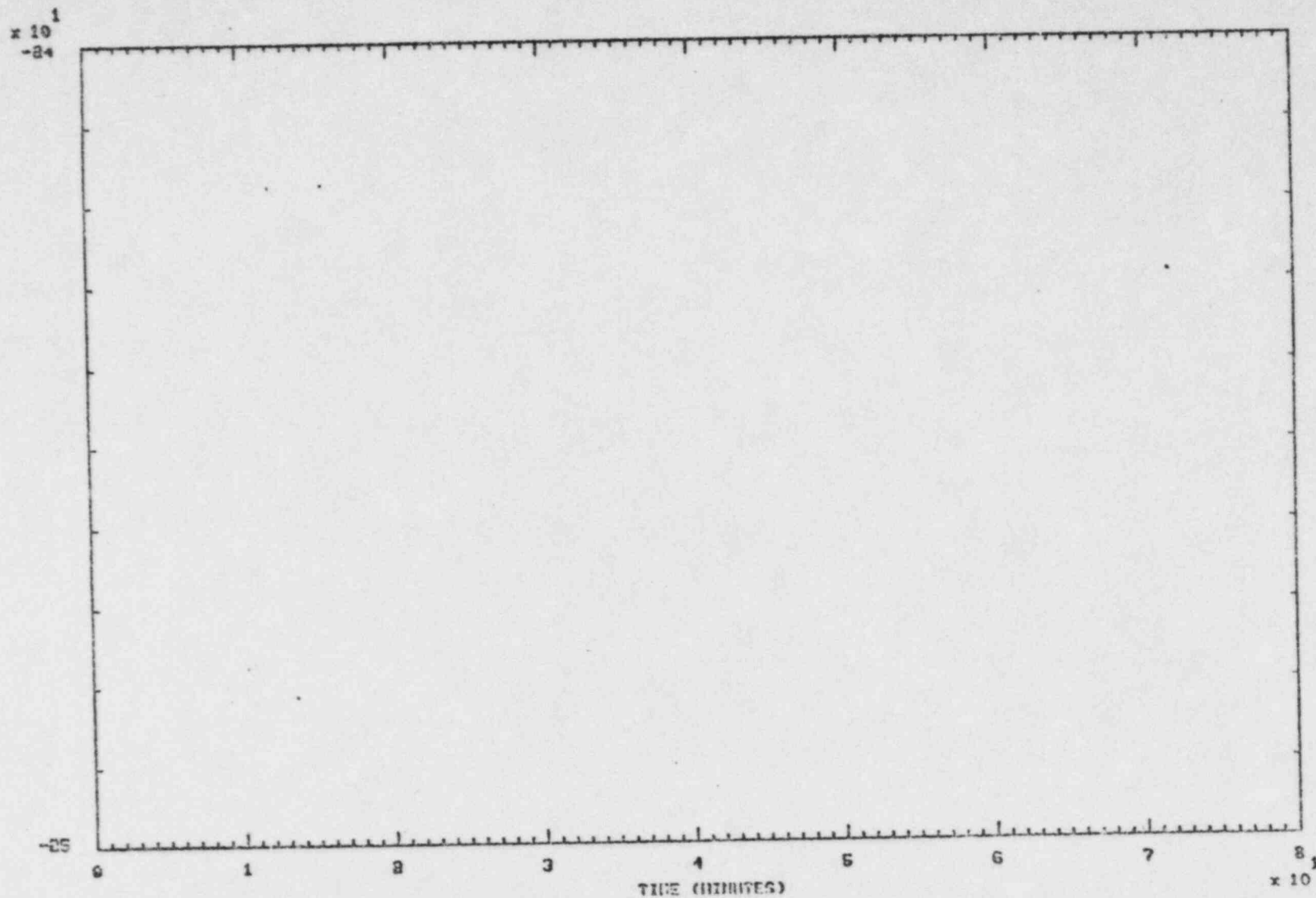


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 10

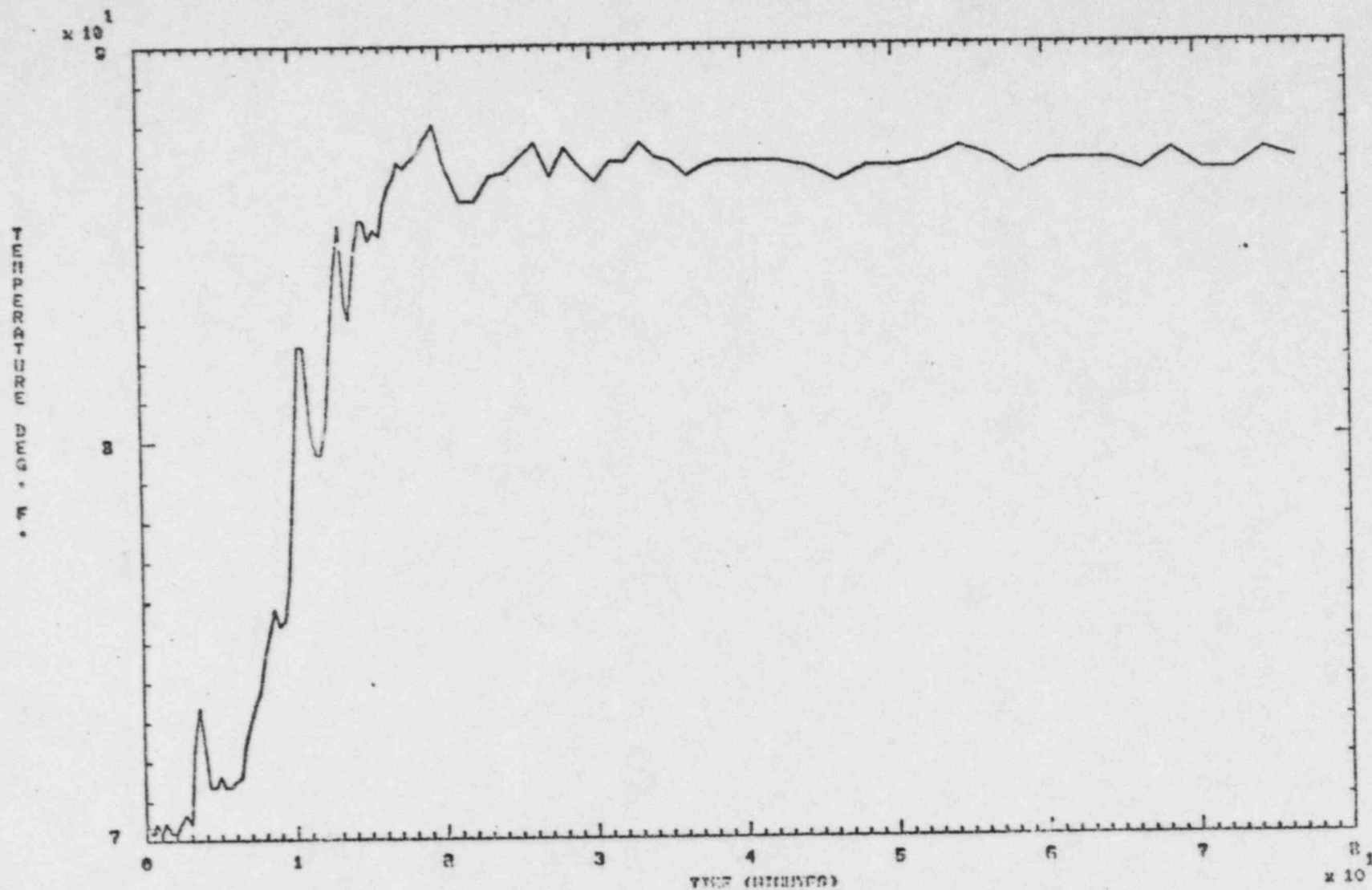


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 11

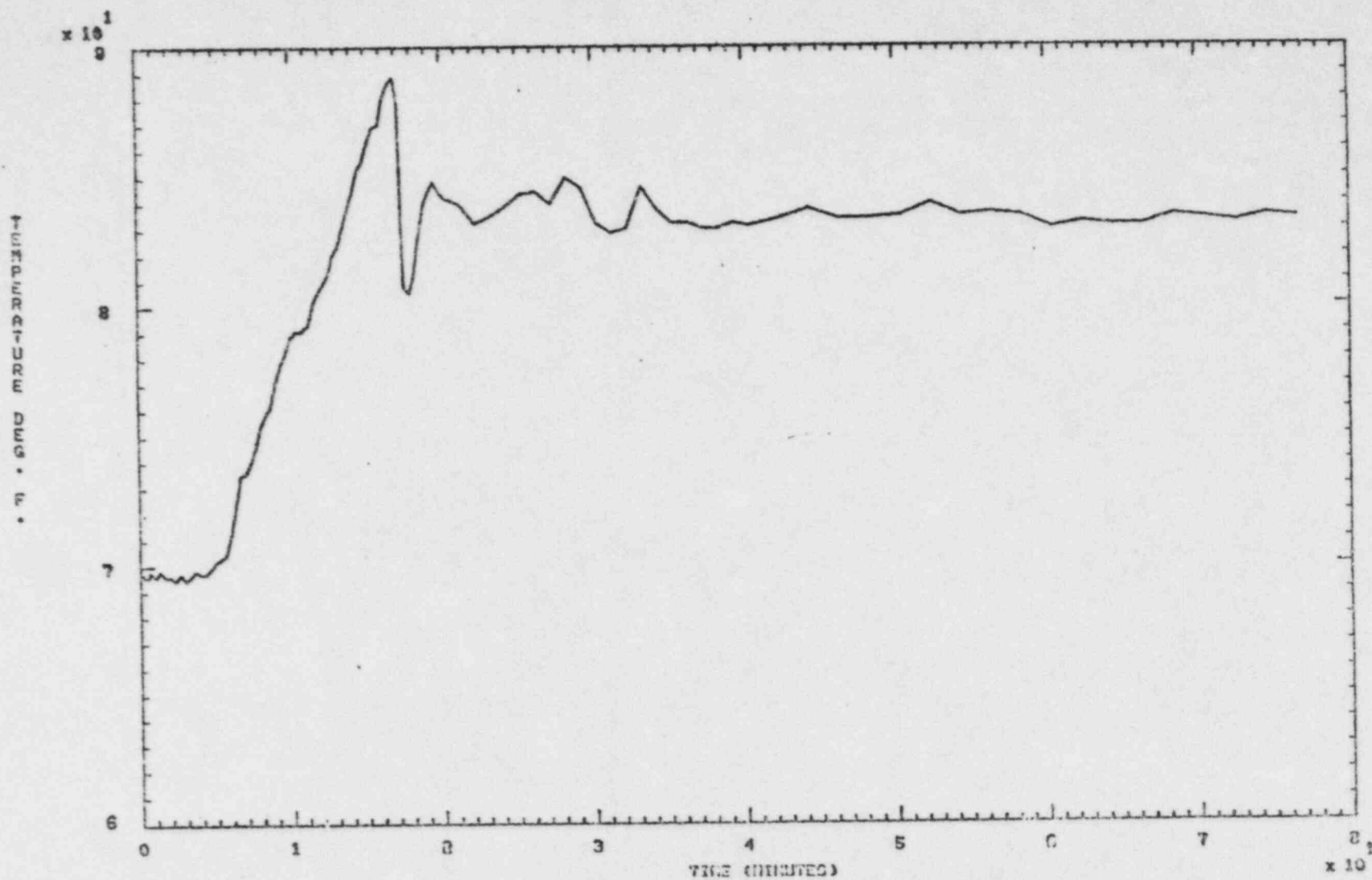
TEMPERATURE



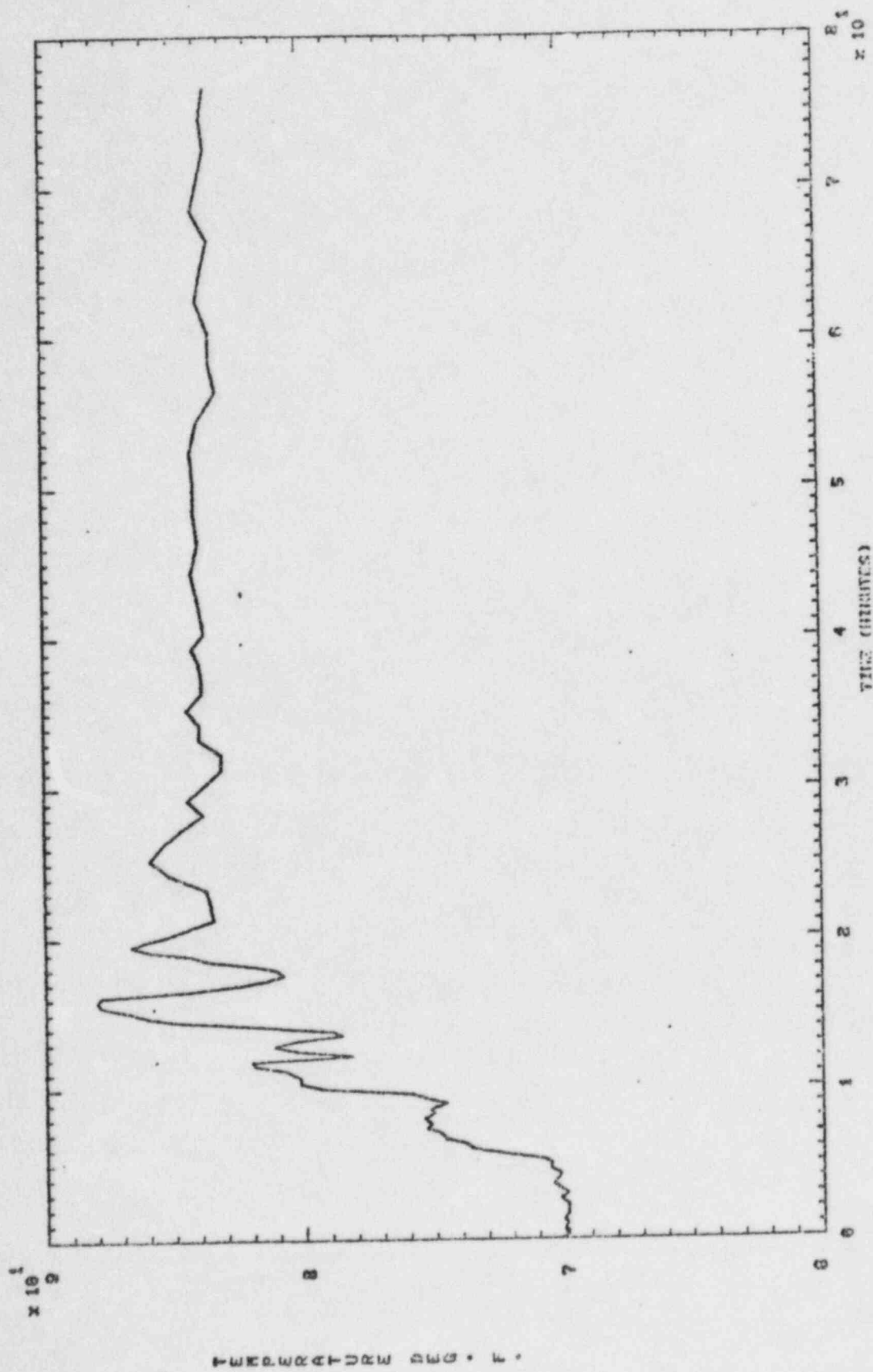
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 12



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 13

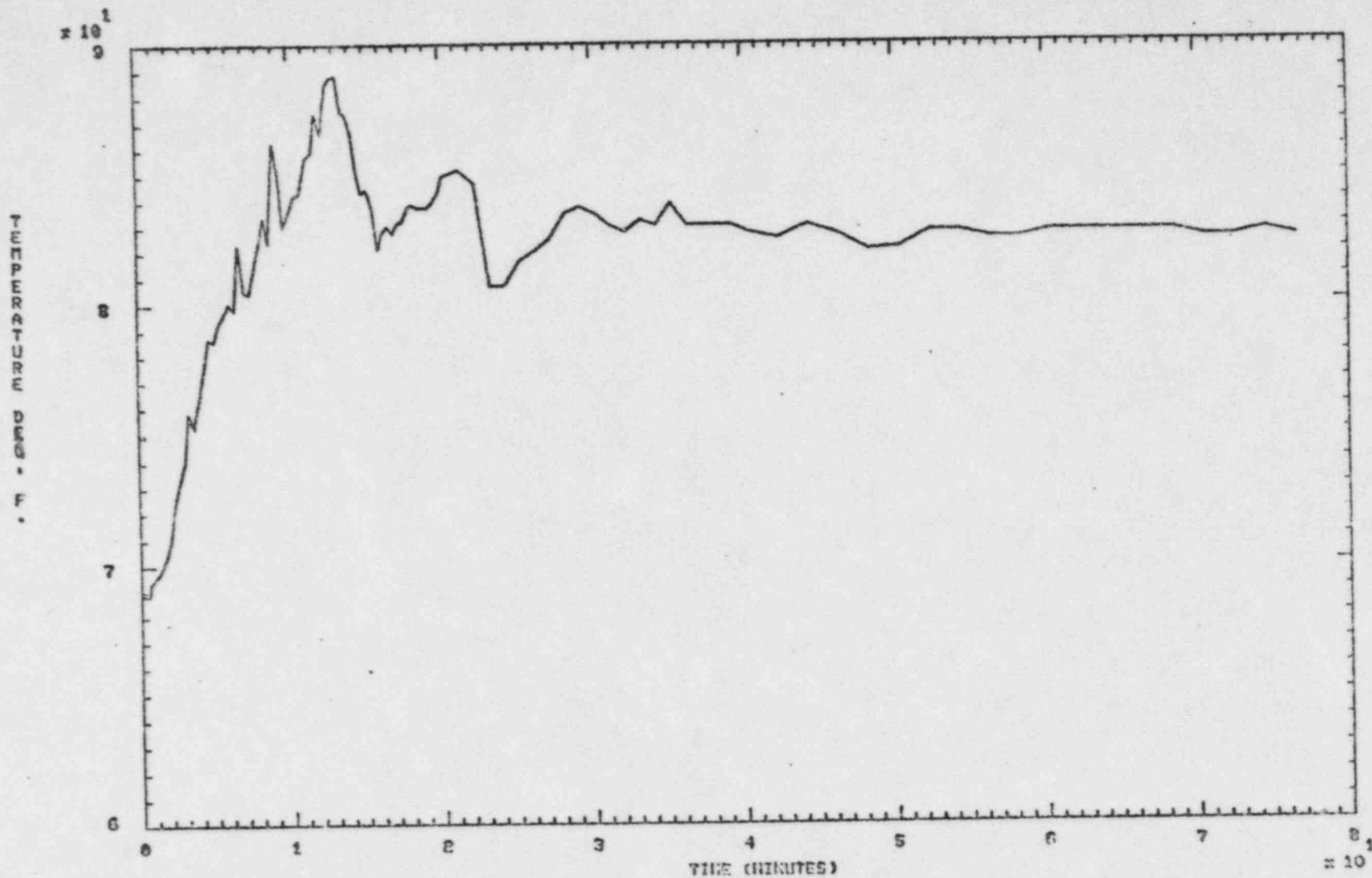


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 14

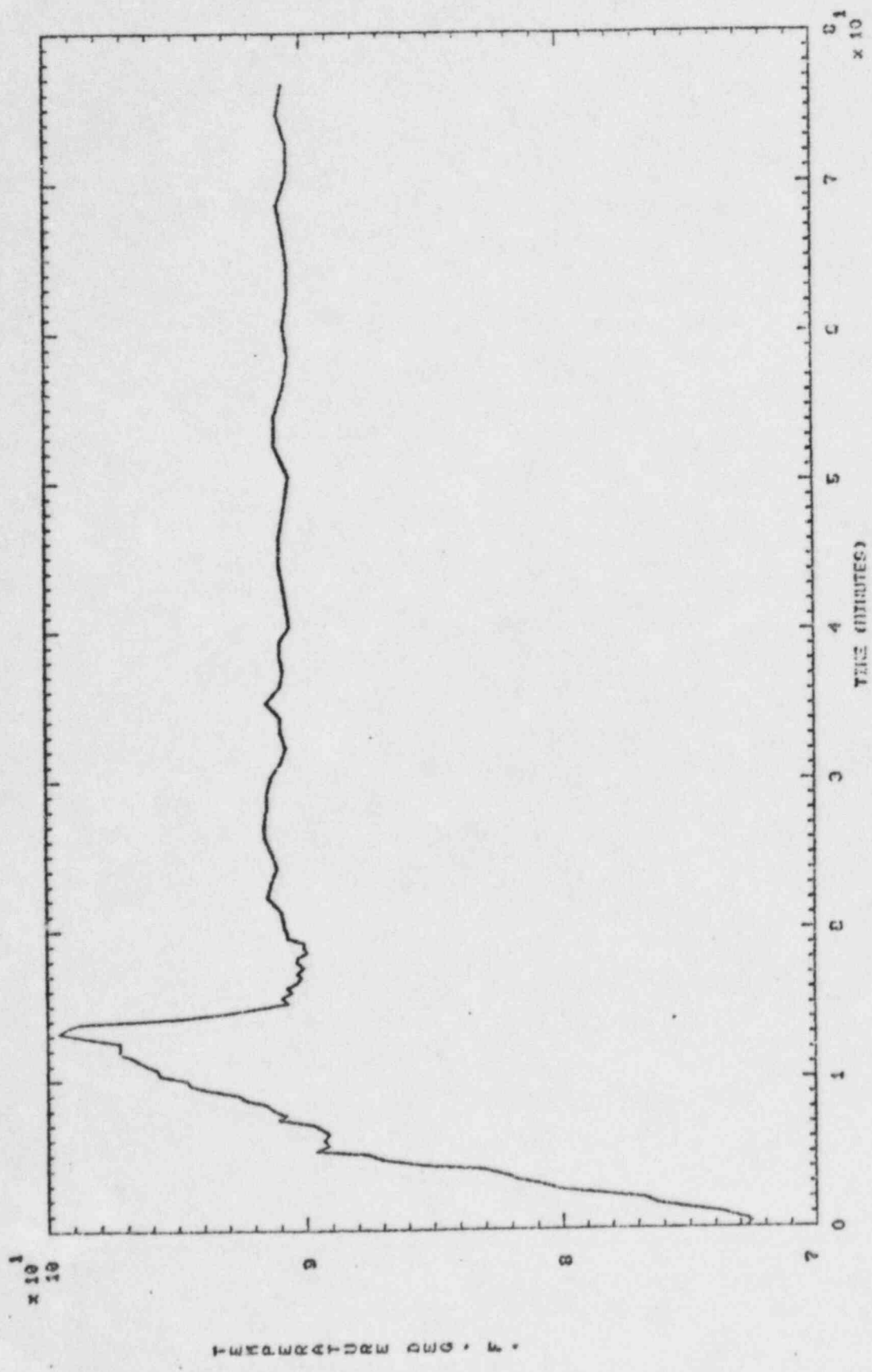


EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 15

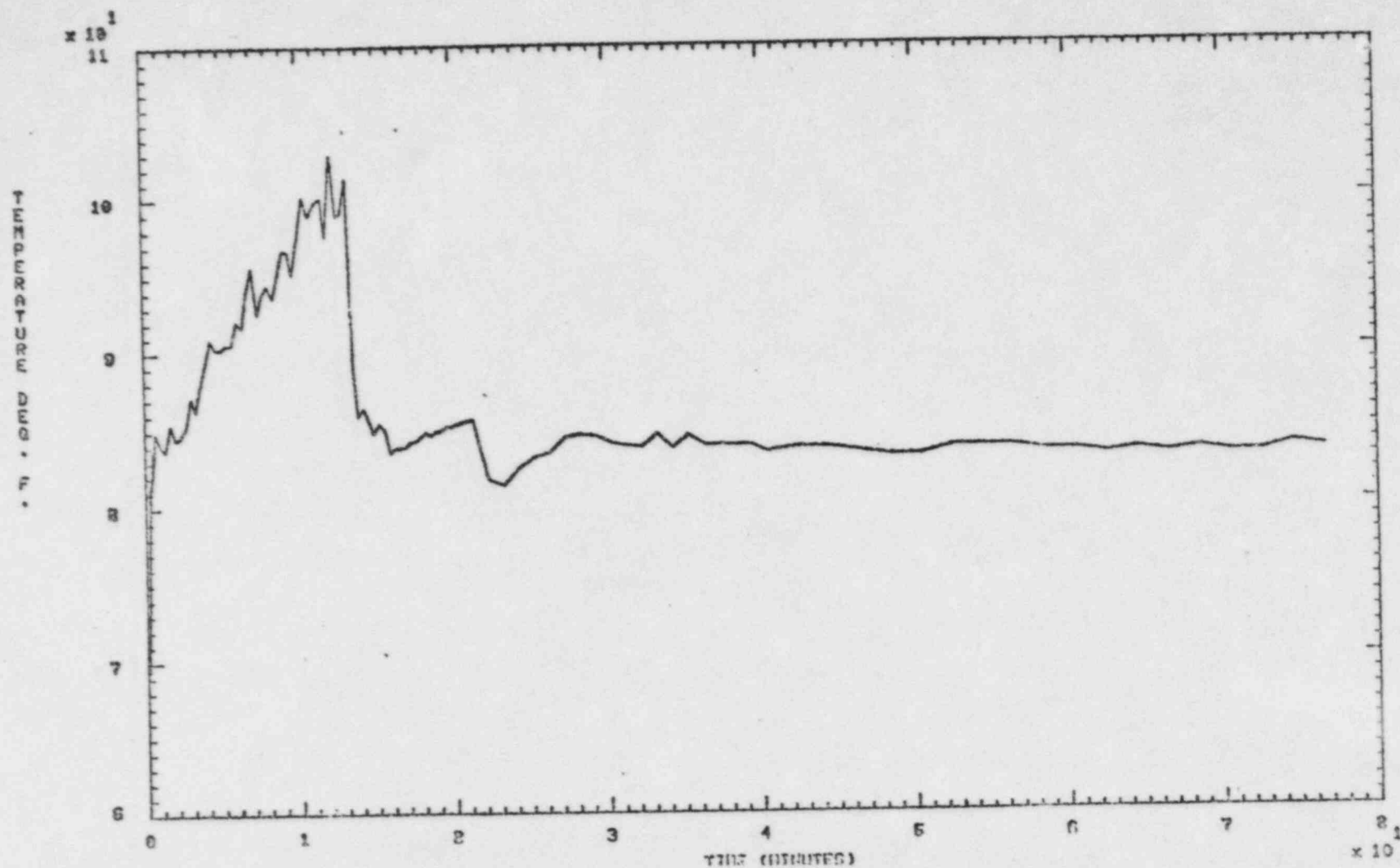
VALVE OPENS AT 10.1 SEC



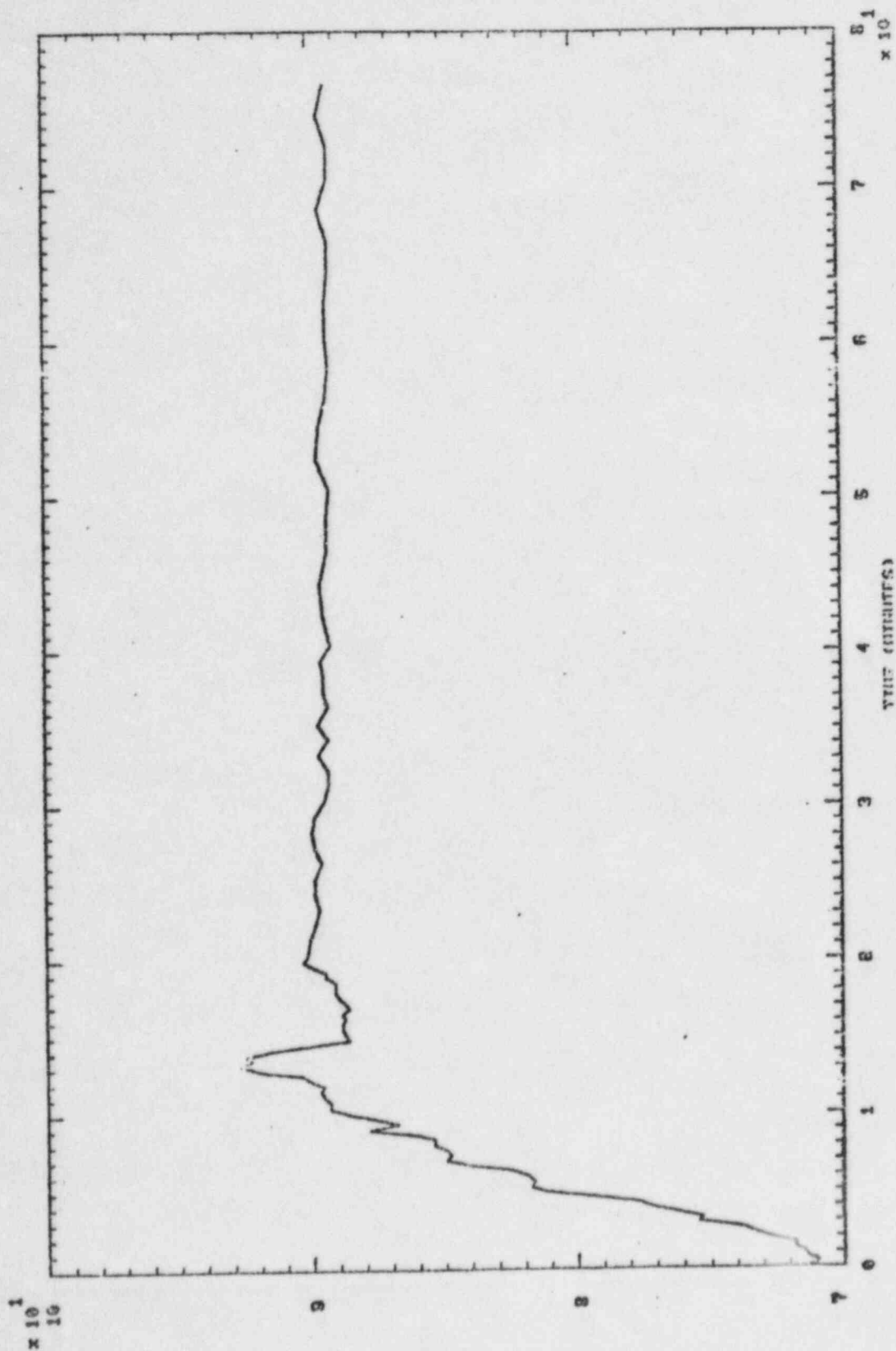
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 16



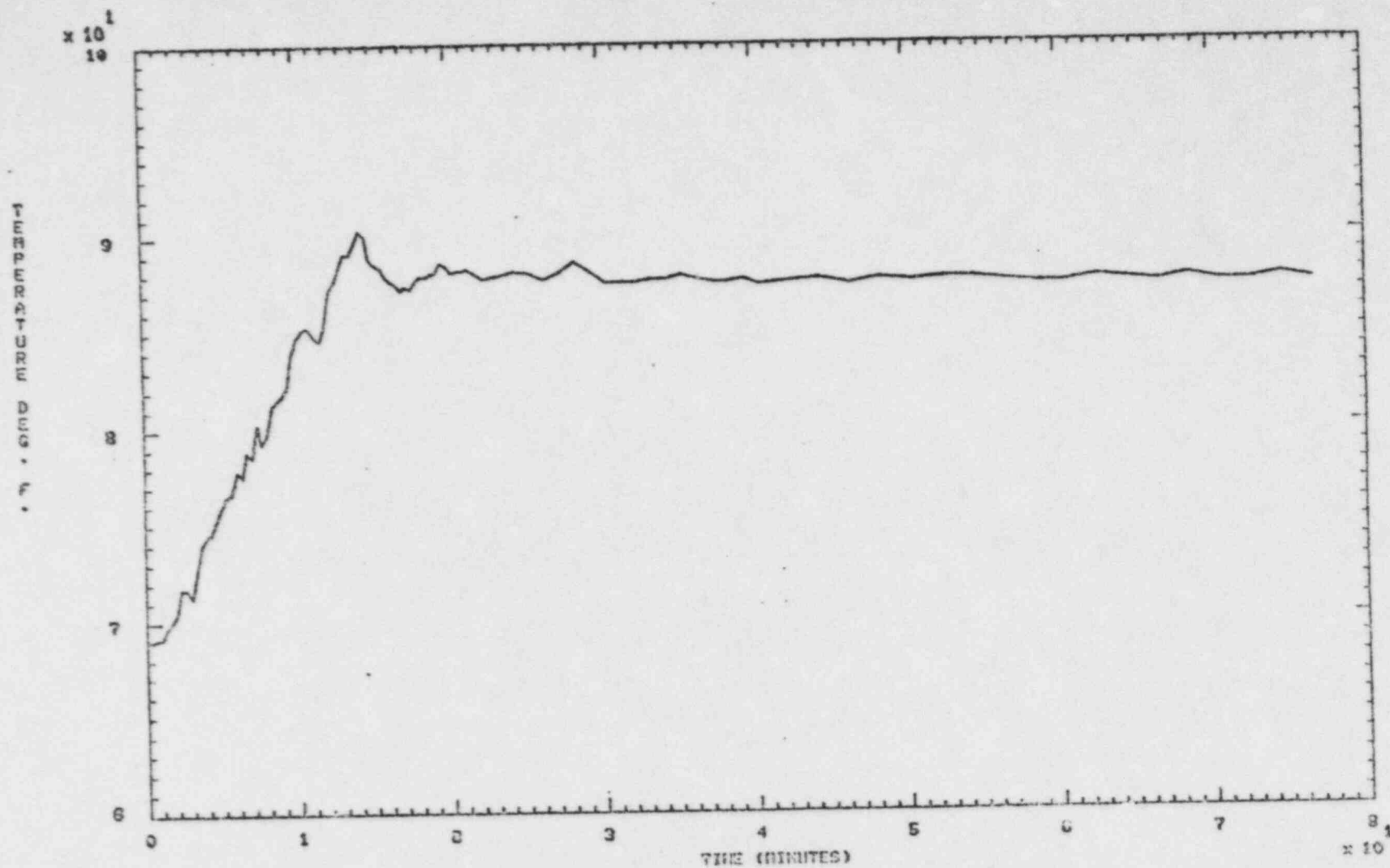
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 17



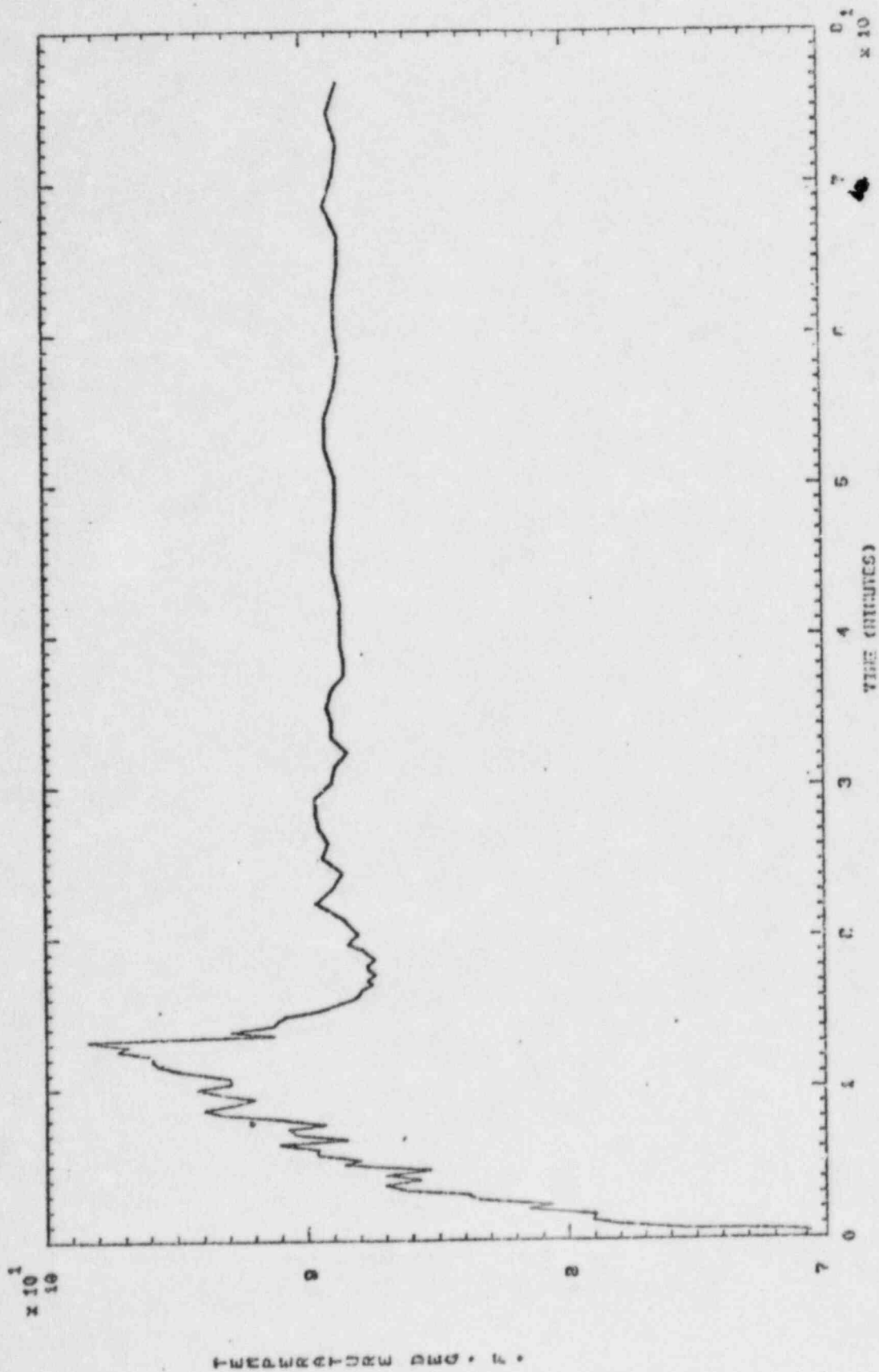
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 18



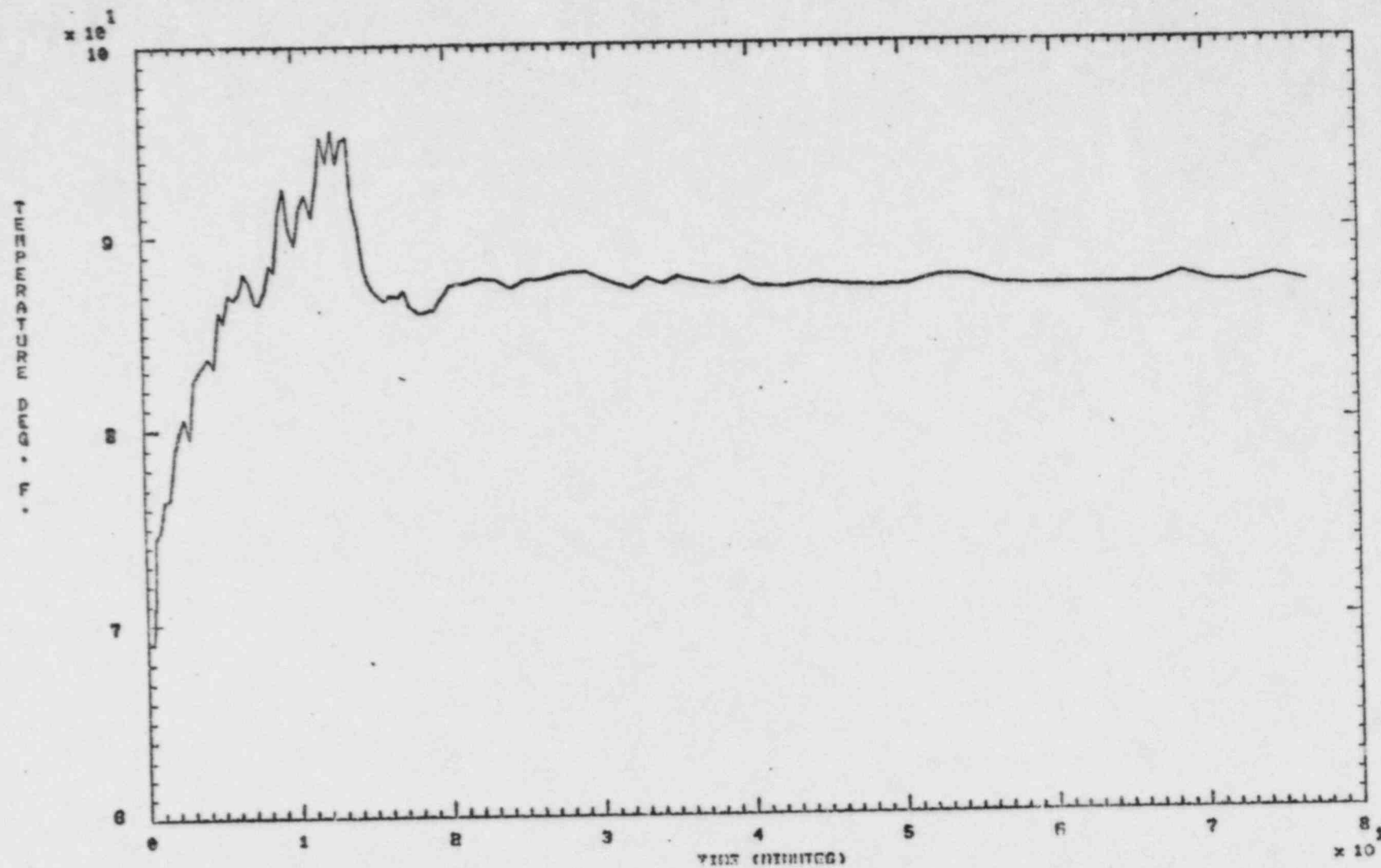
VALVE OPENS AT 10.1 SEC
 EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 19



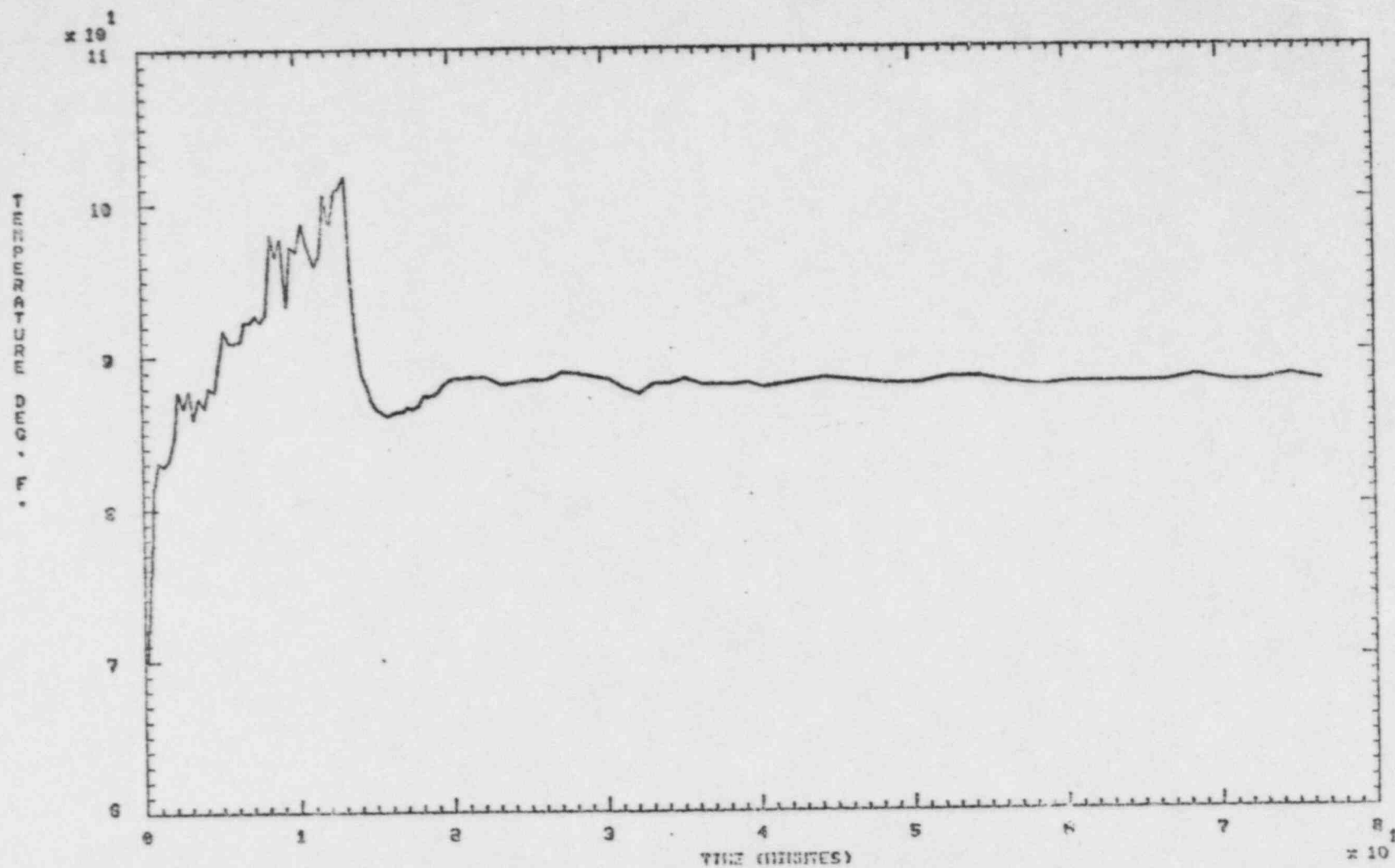
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 20



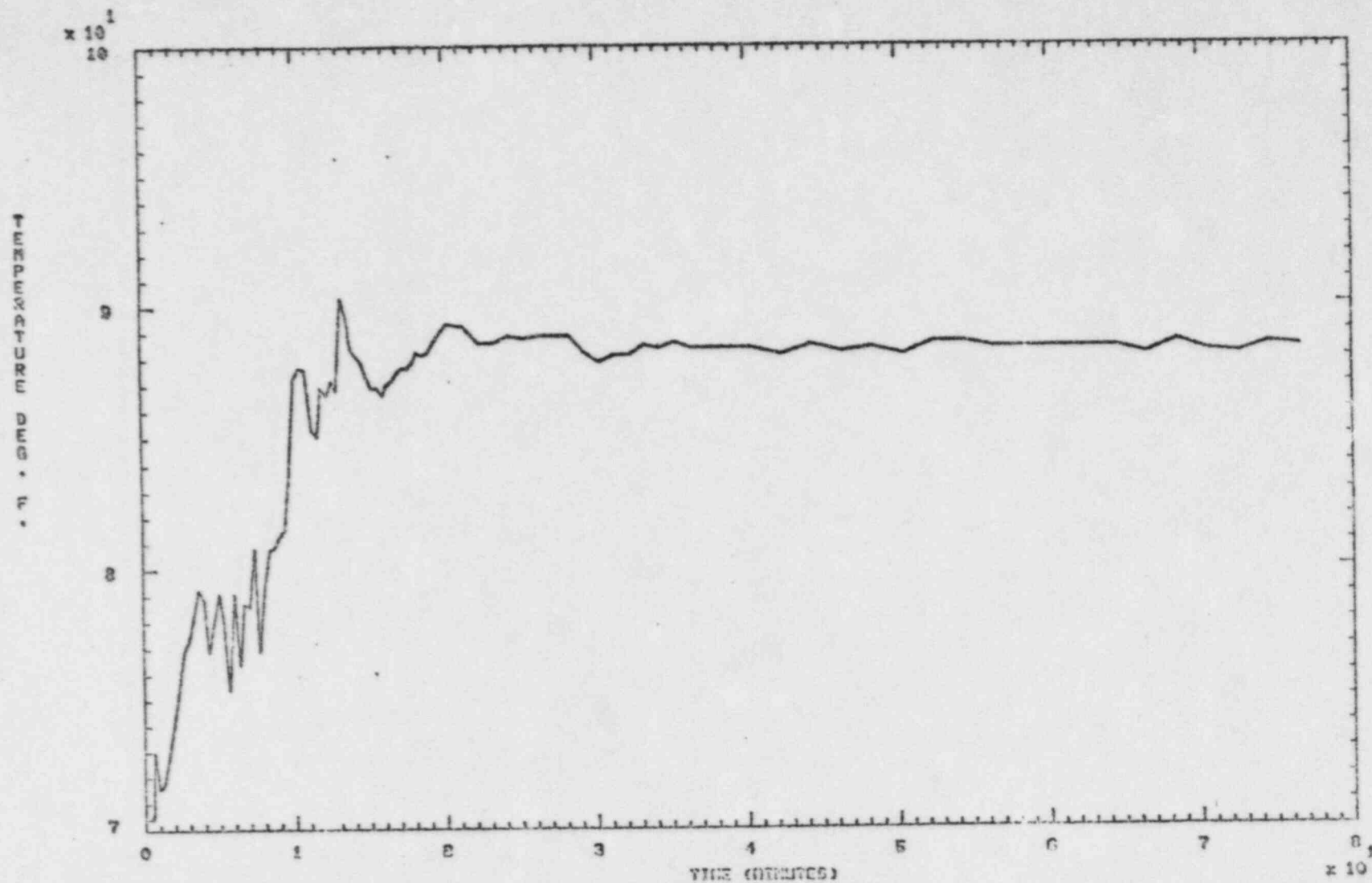
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 21



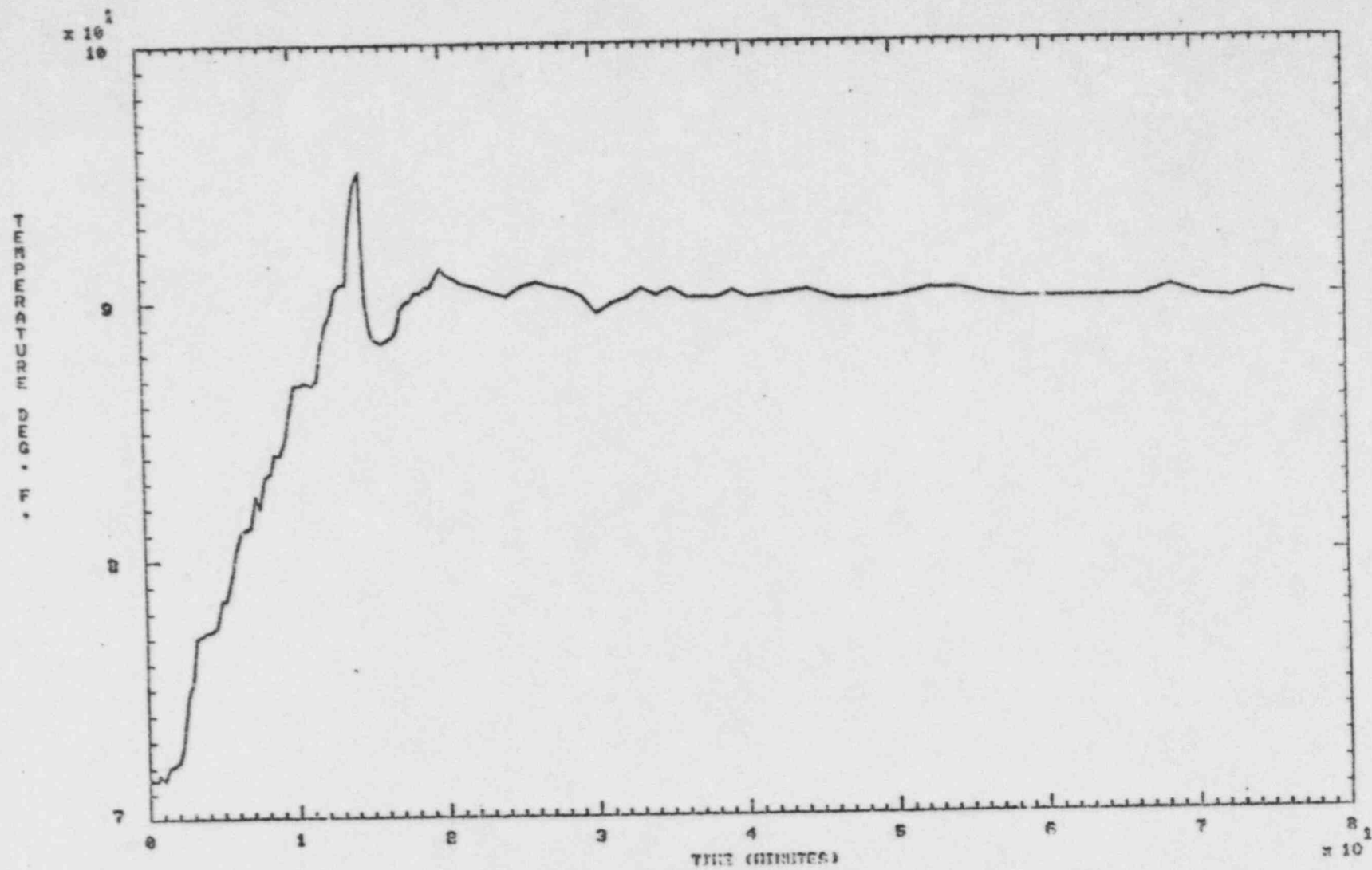
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 22



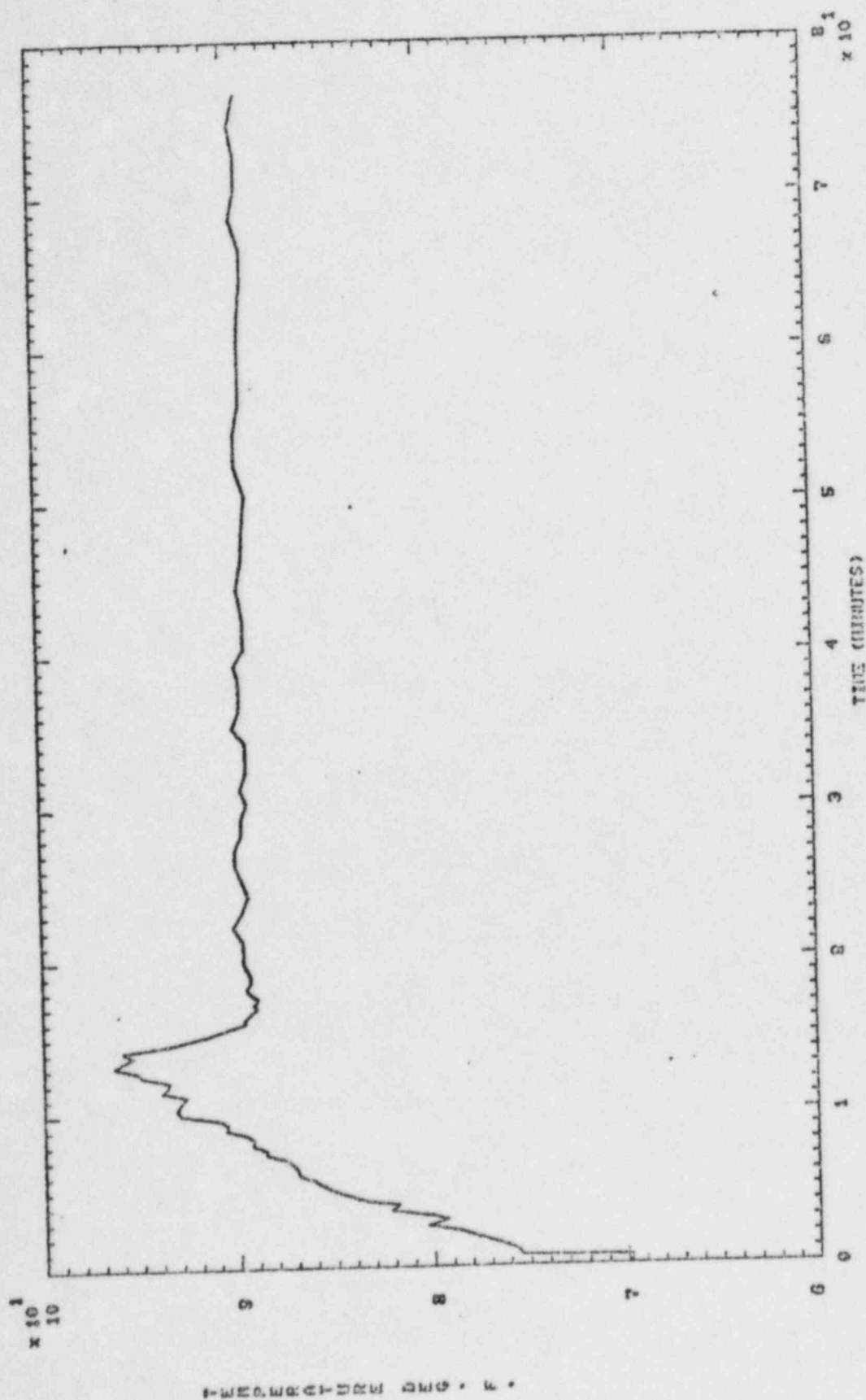
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 23



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 24

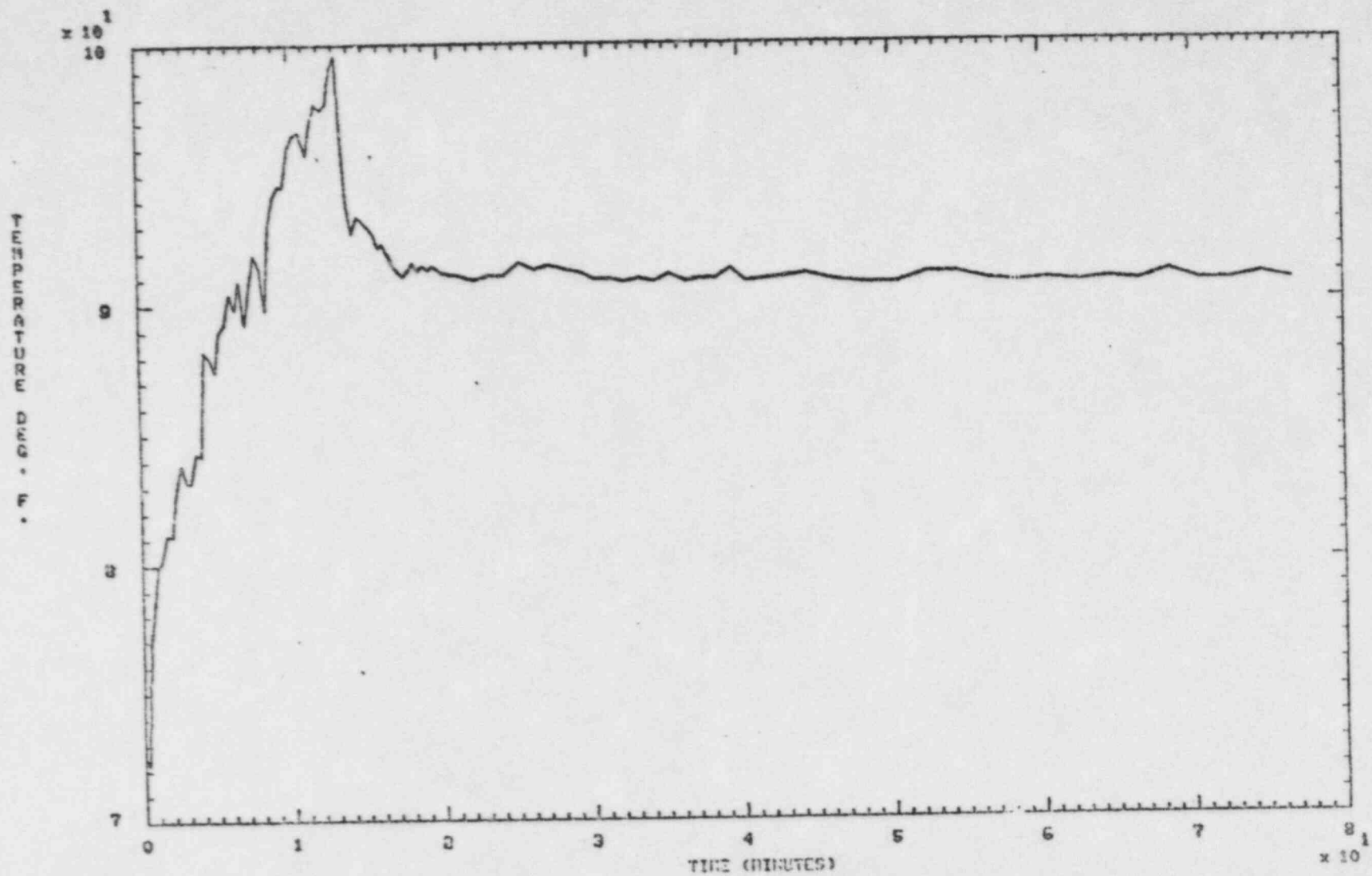


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 25

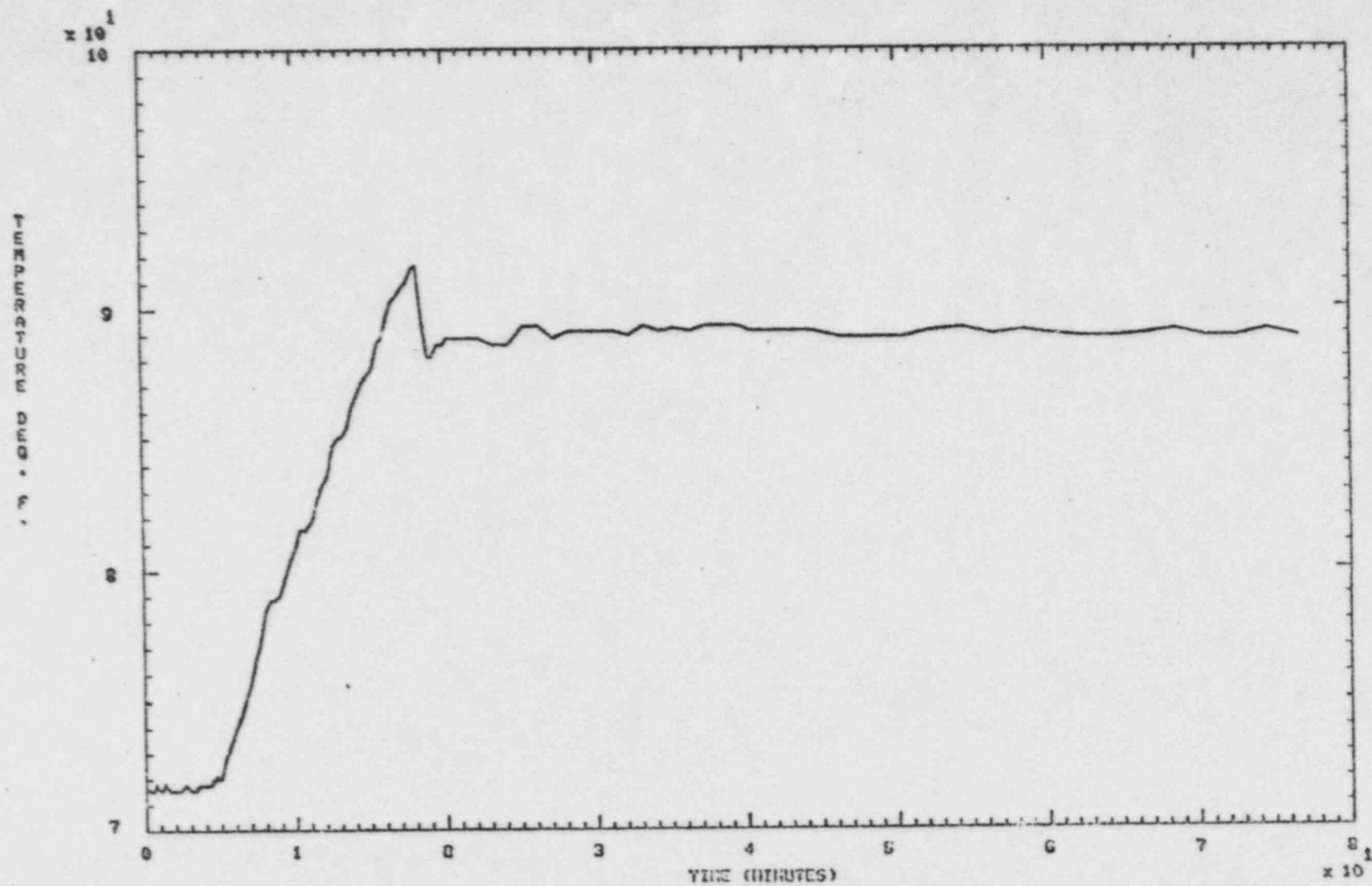


EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 26

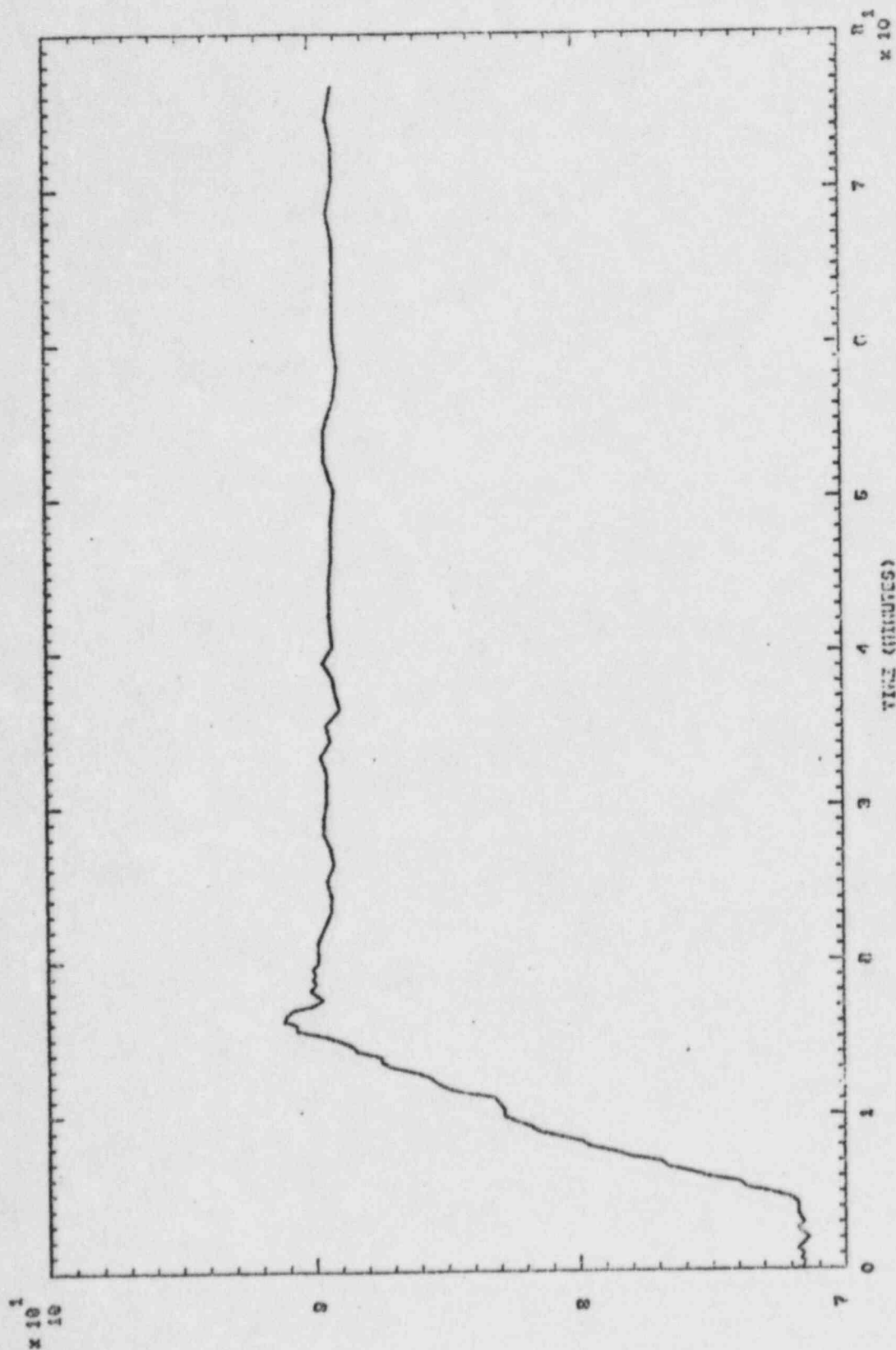
VALVE OPENS AT 10.1 SEC



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 27

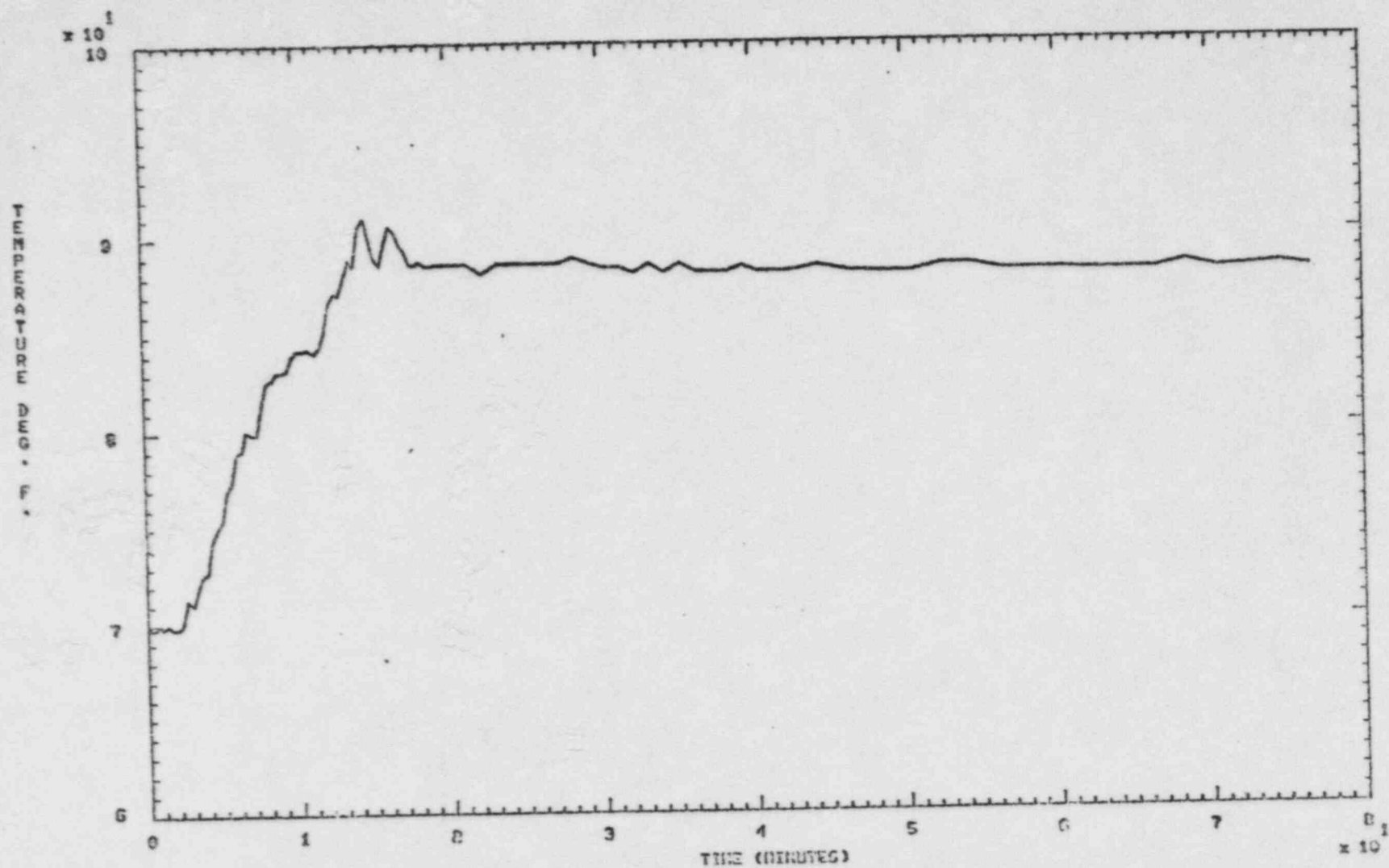


VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 28

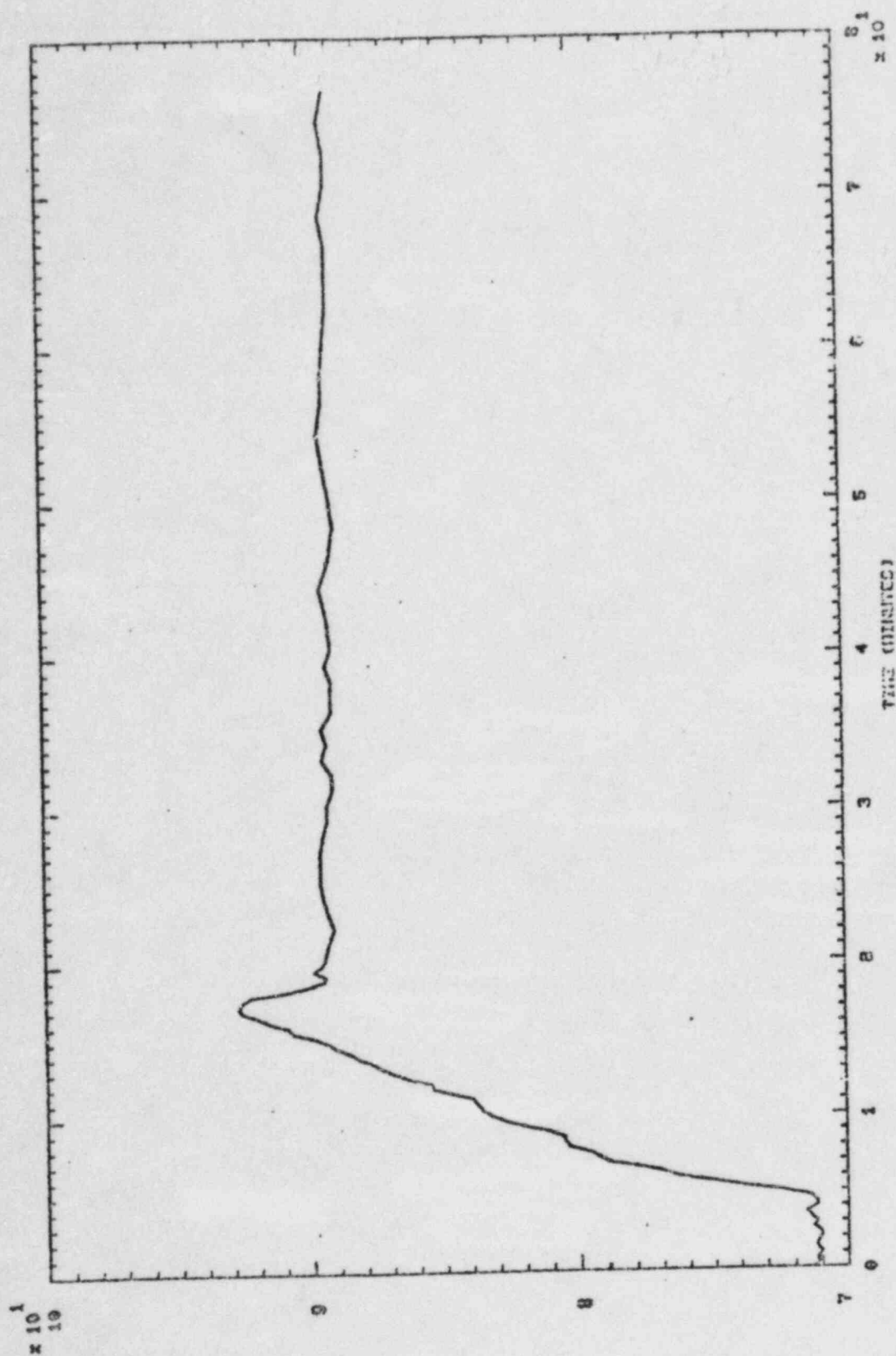


EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 29

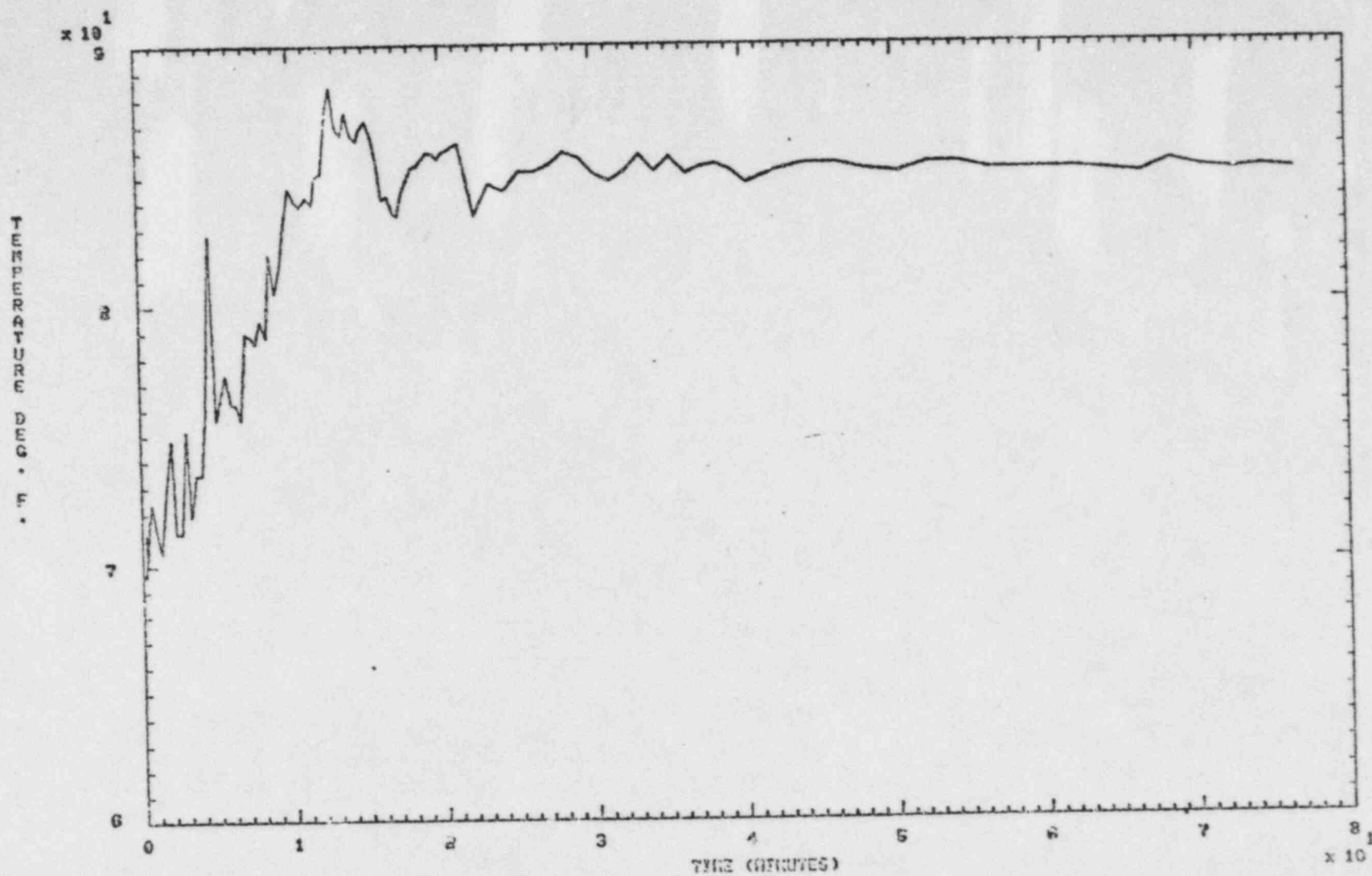
TEMPERATURE DEG. F.



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 30

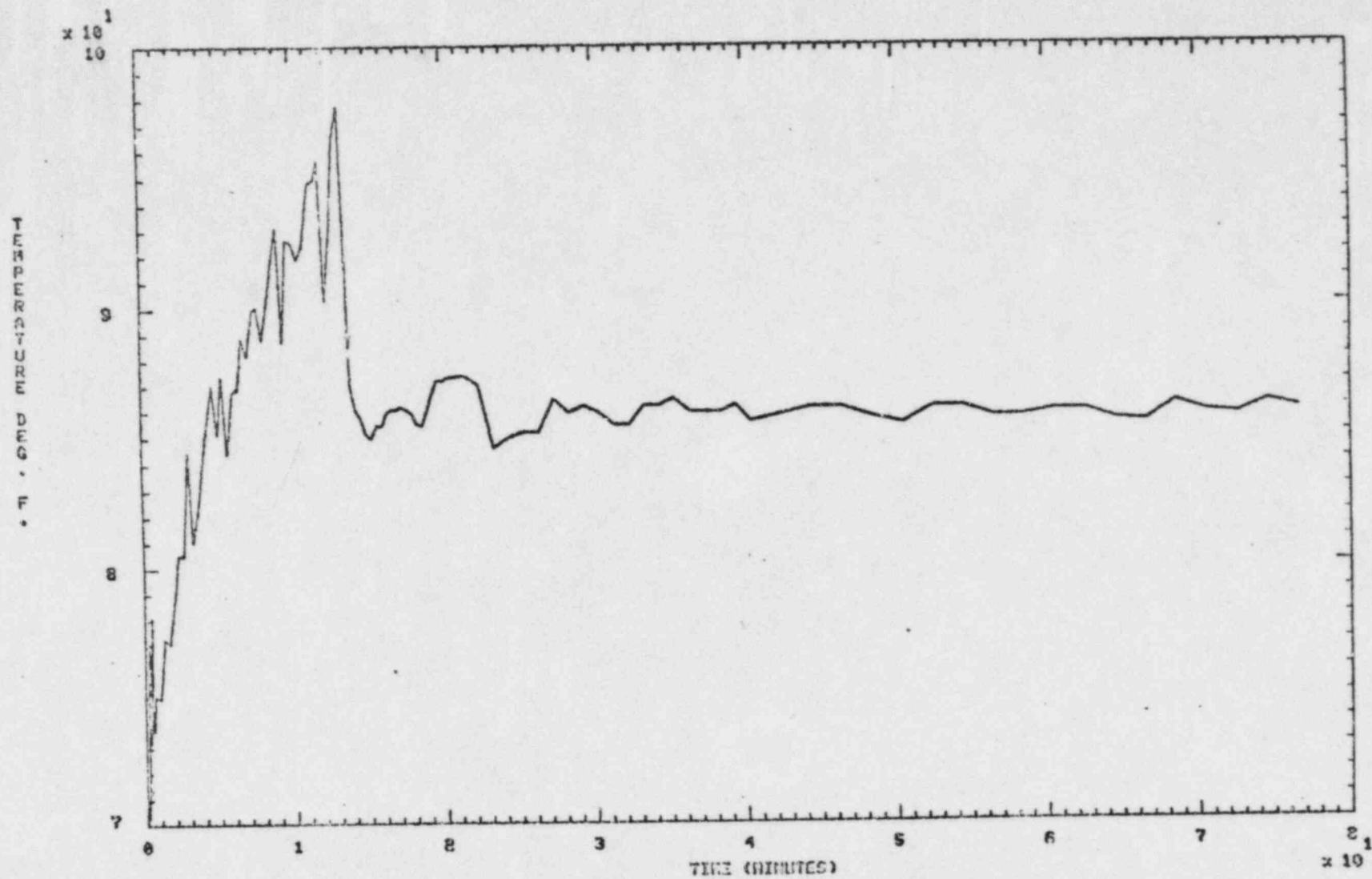


EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 31
VALVE OPENS AT 10.1 SEC

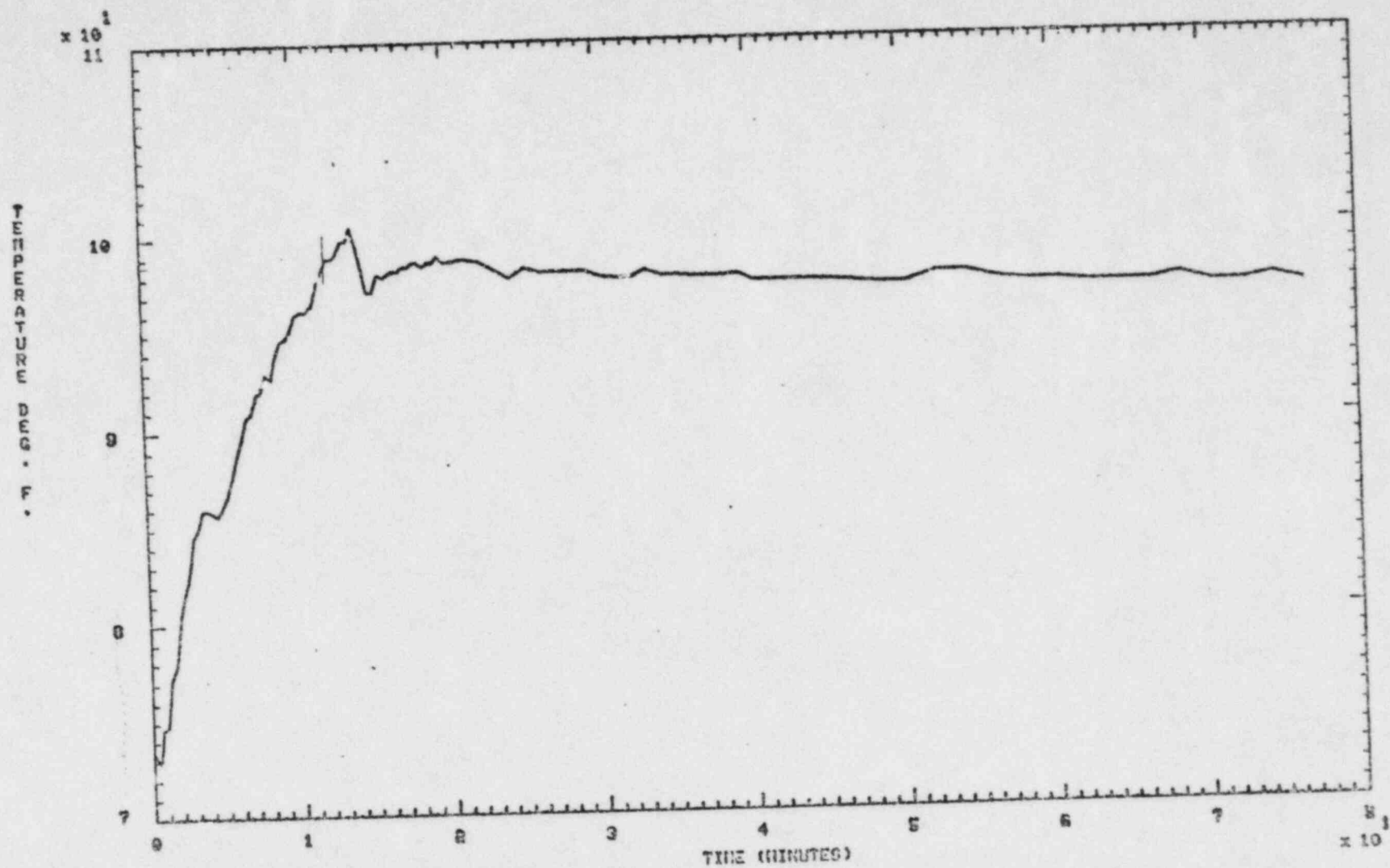


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 32

X

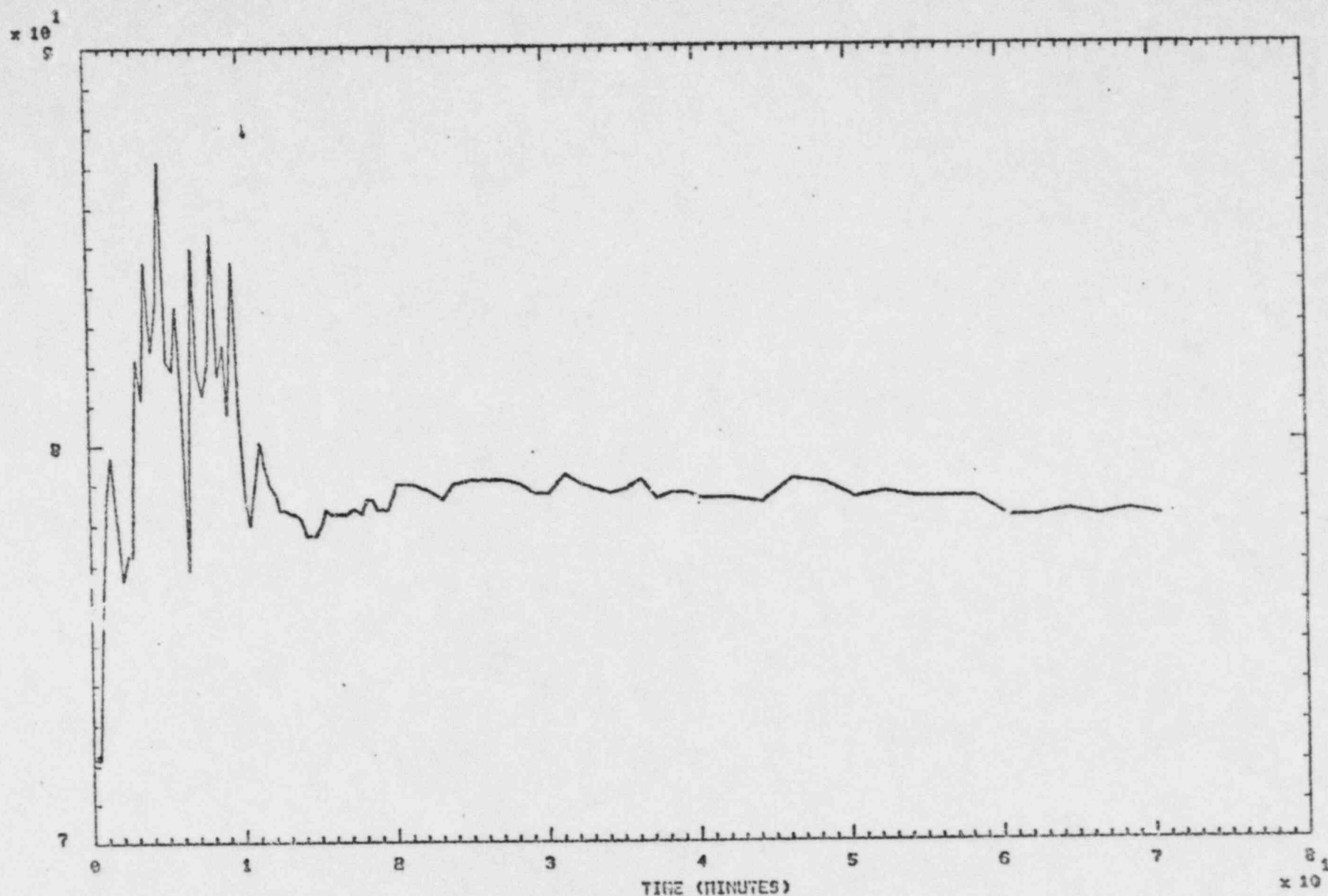


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 33

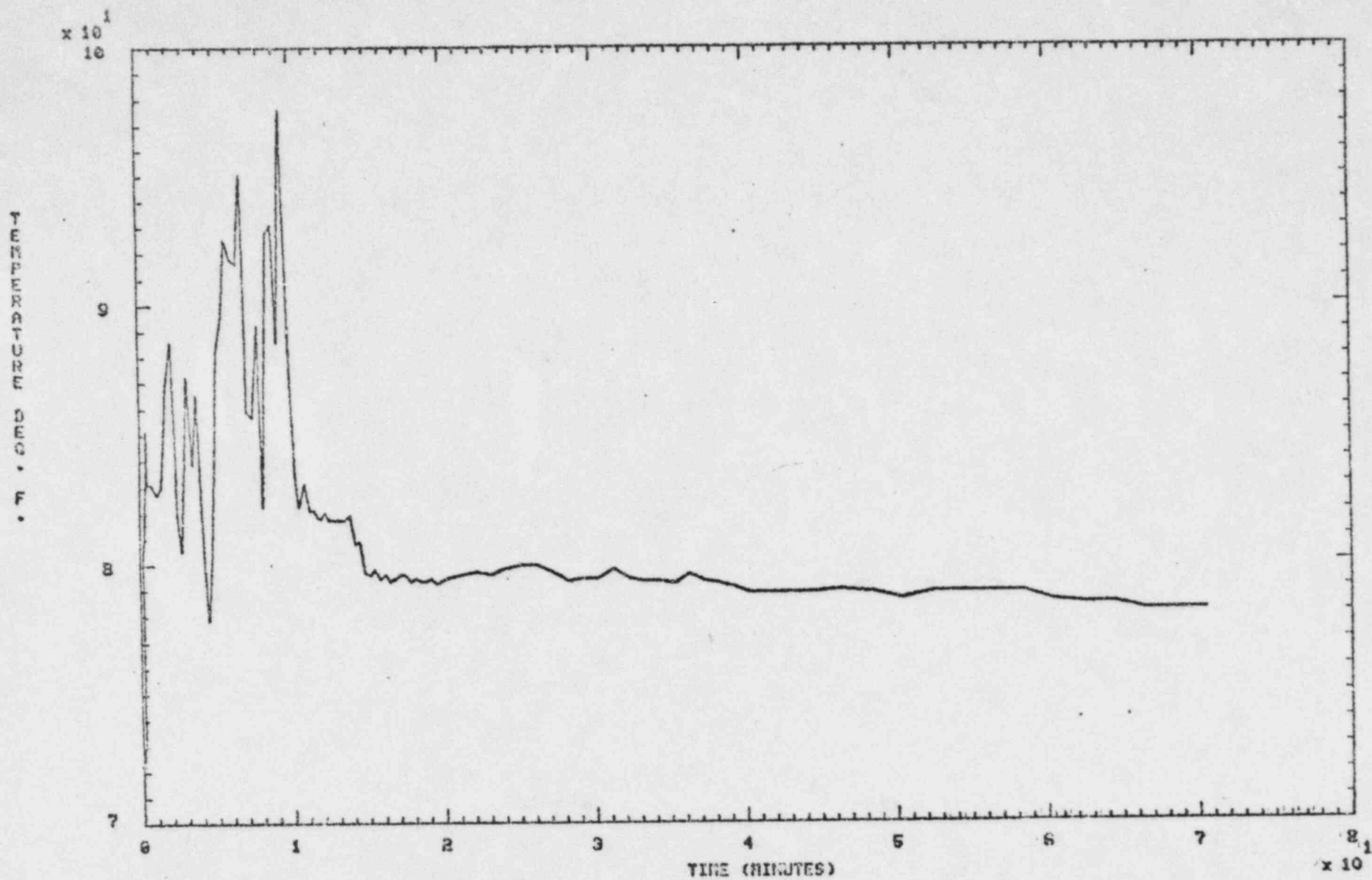


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 073X TT= 48

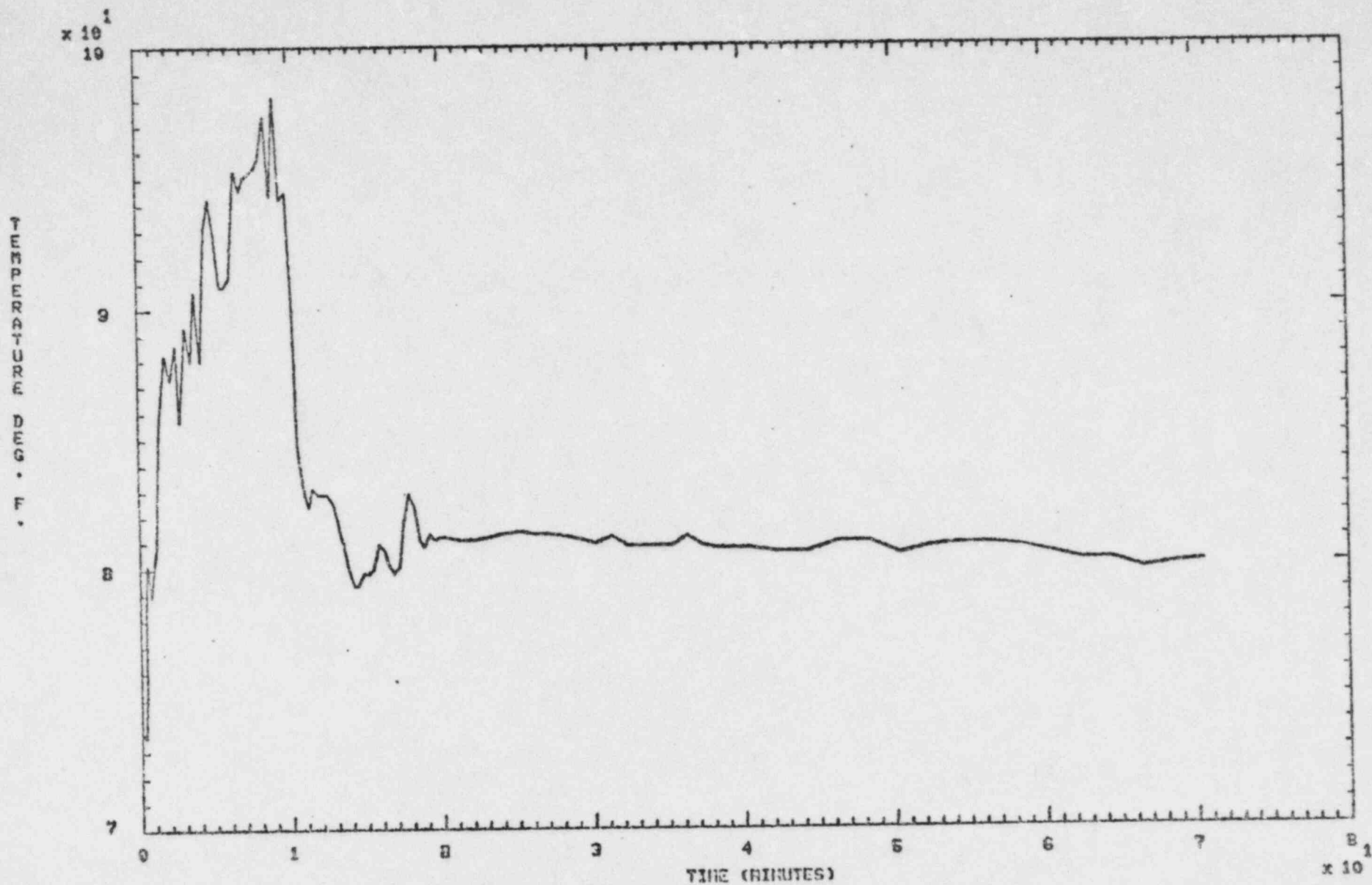
TEMPERATURE DEG. F.



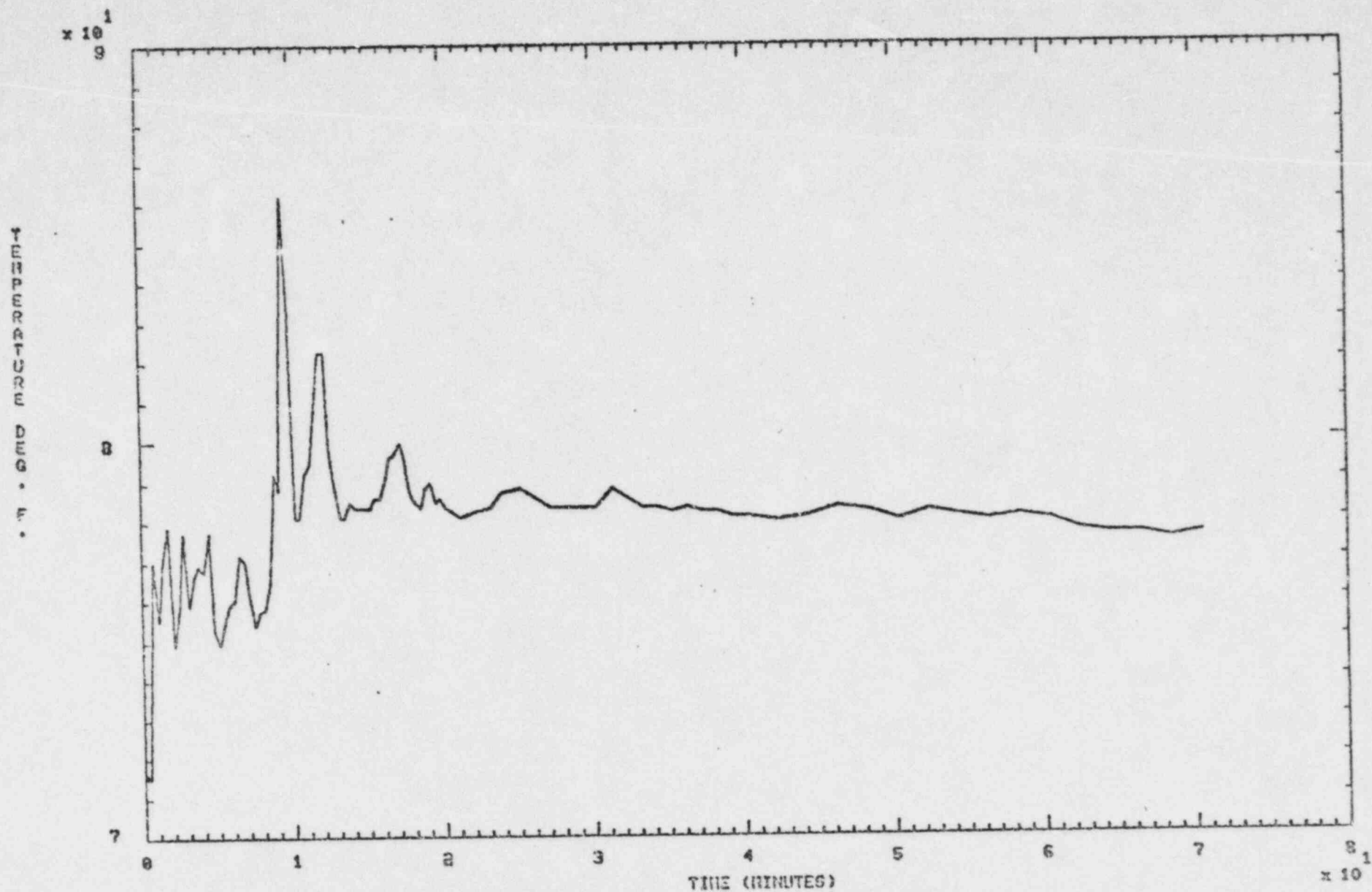
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X-15 TT-1 1



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 2

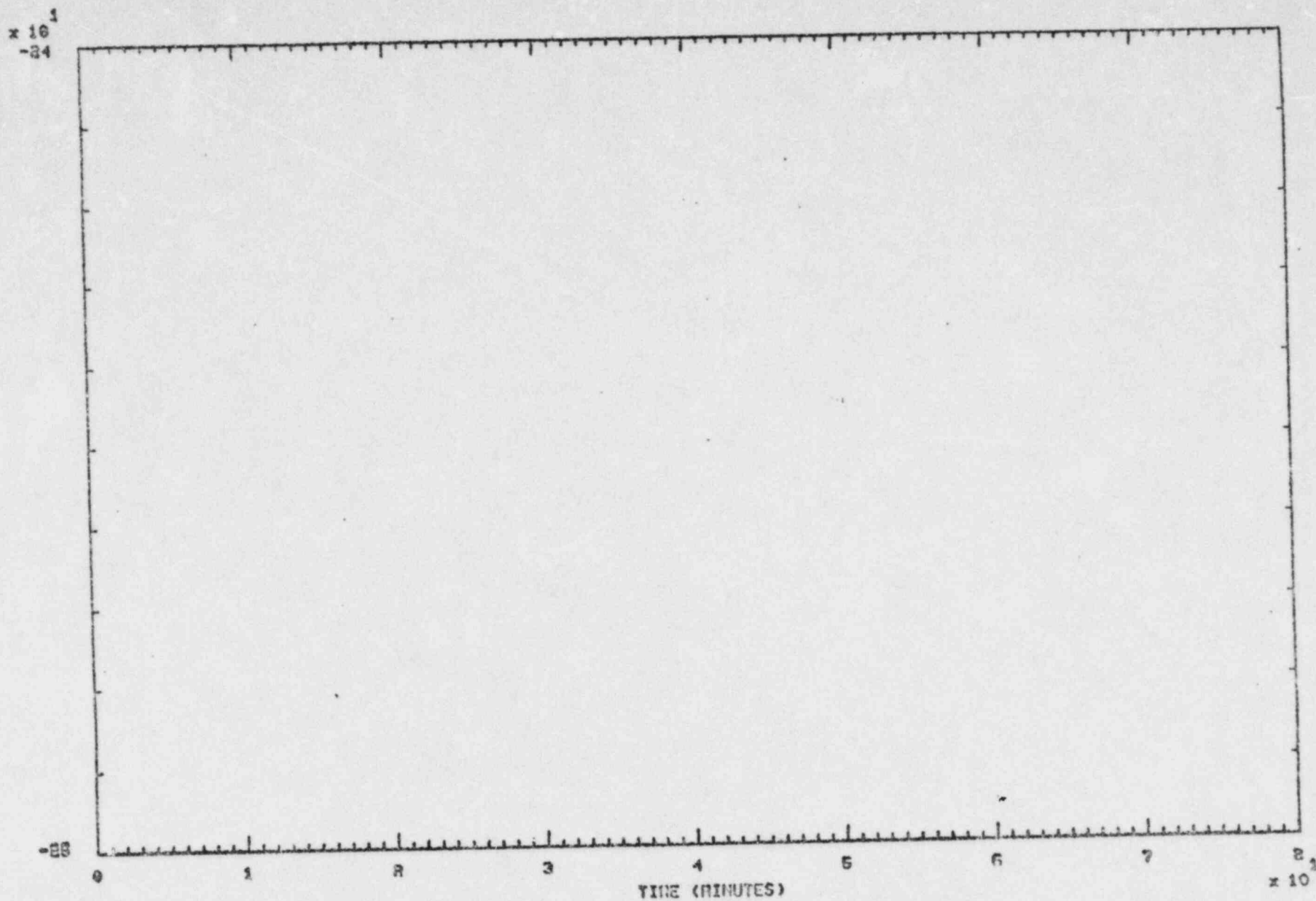


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 3

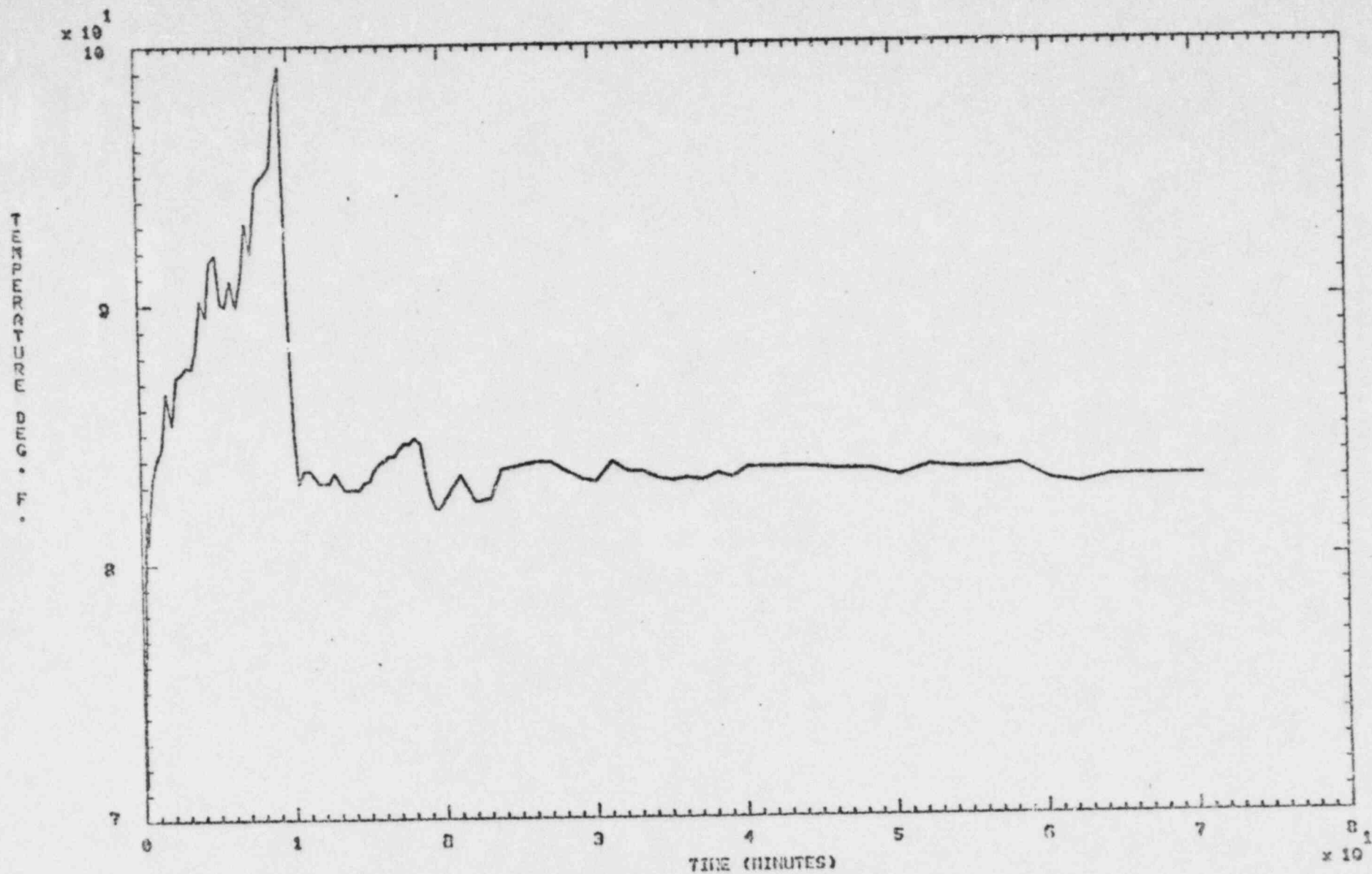


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 4

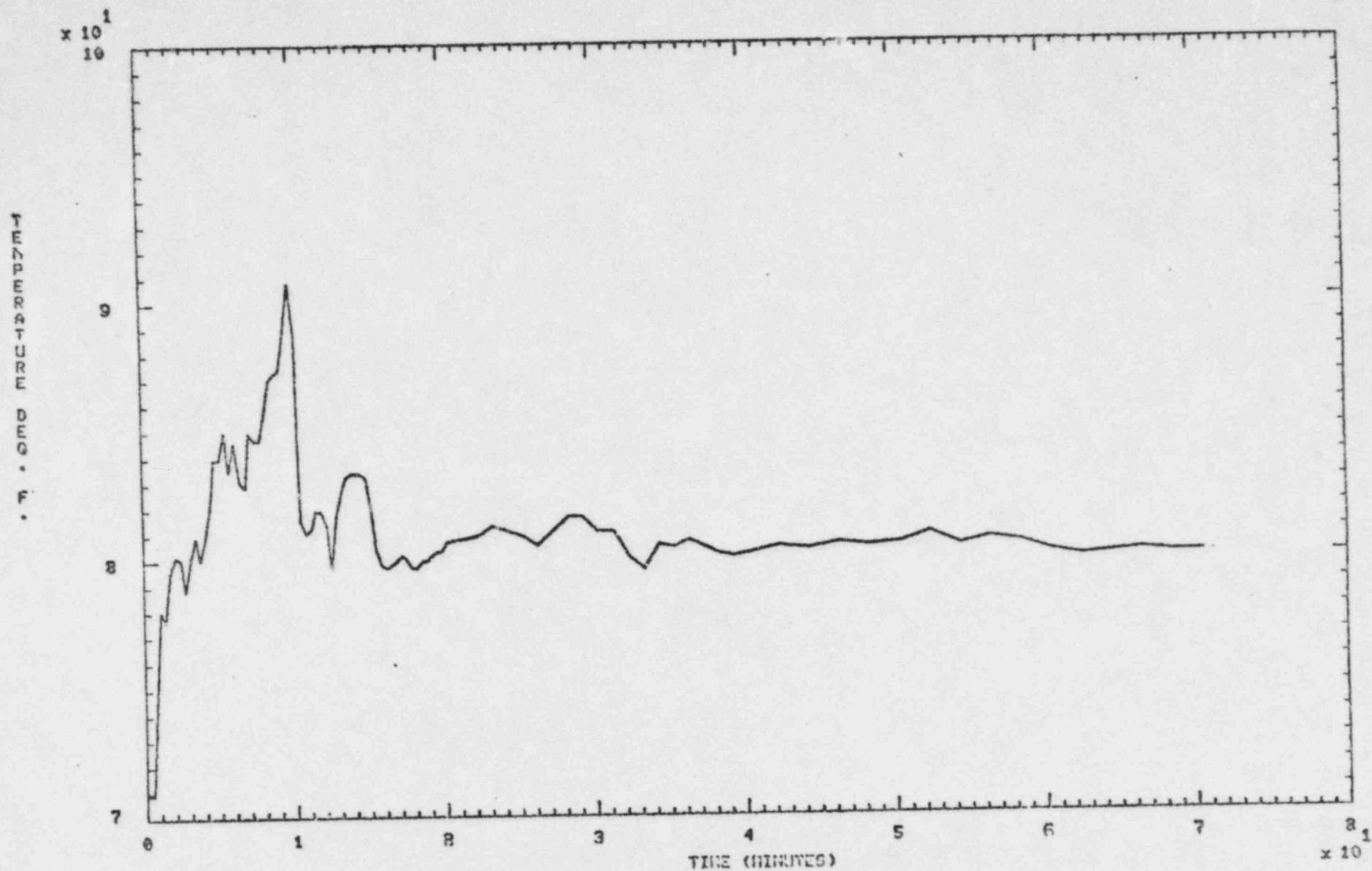
TEMPERATURE



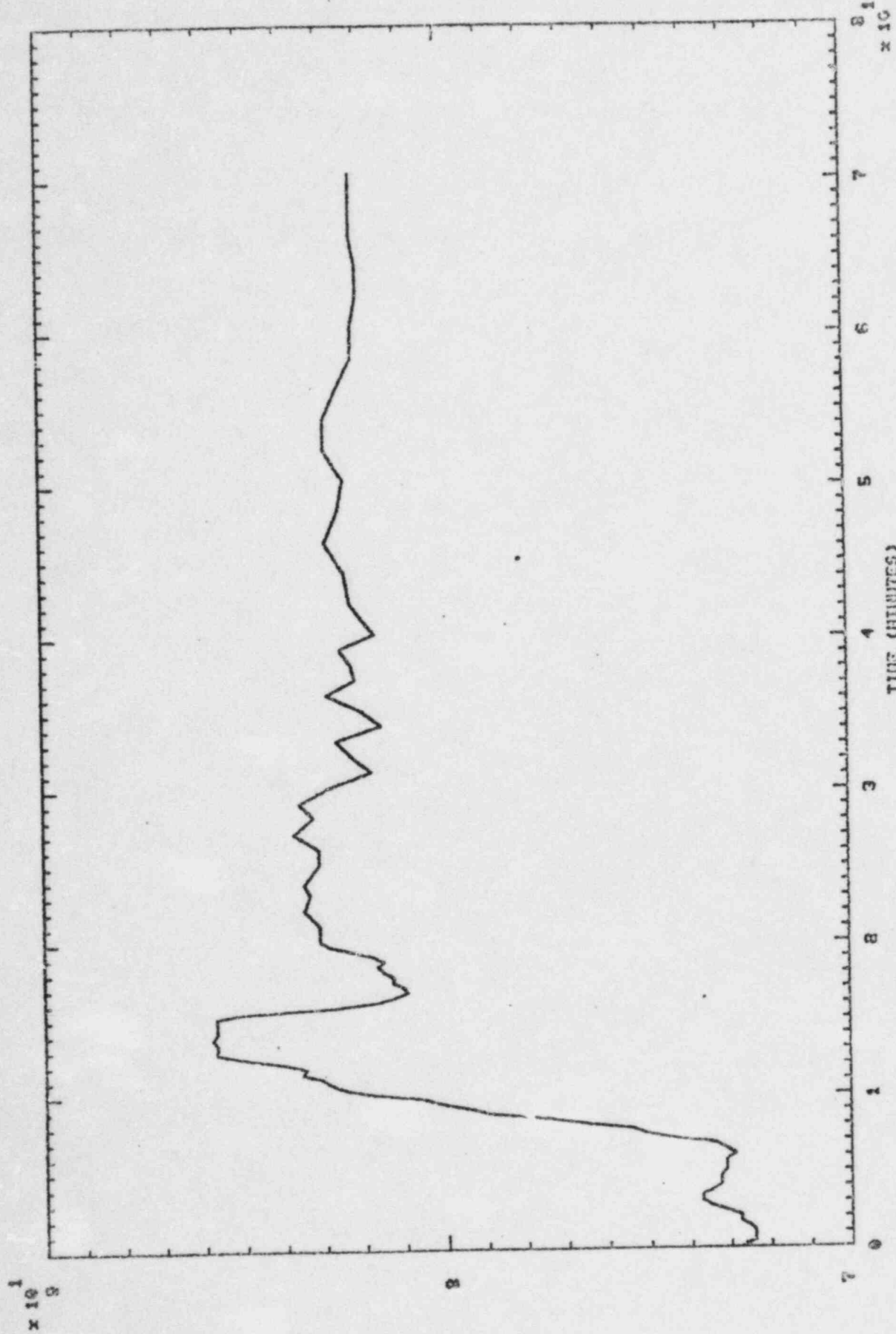
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 6



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO: RUN NO. 074X TT= 7

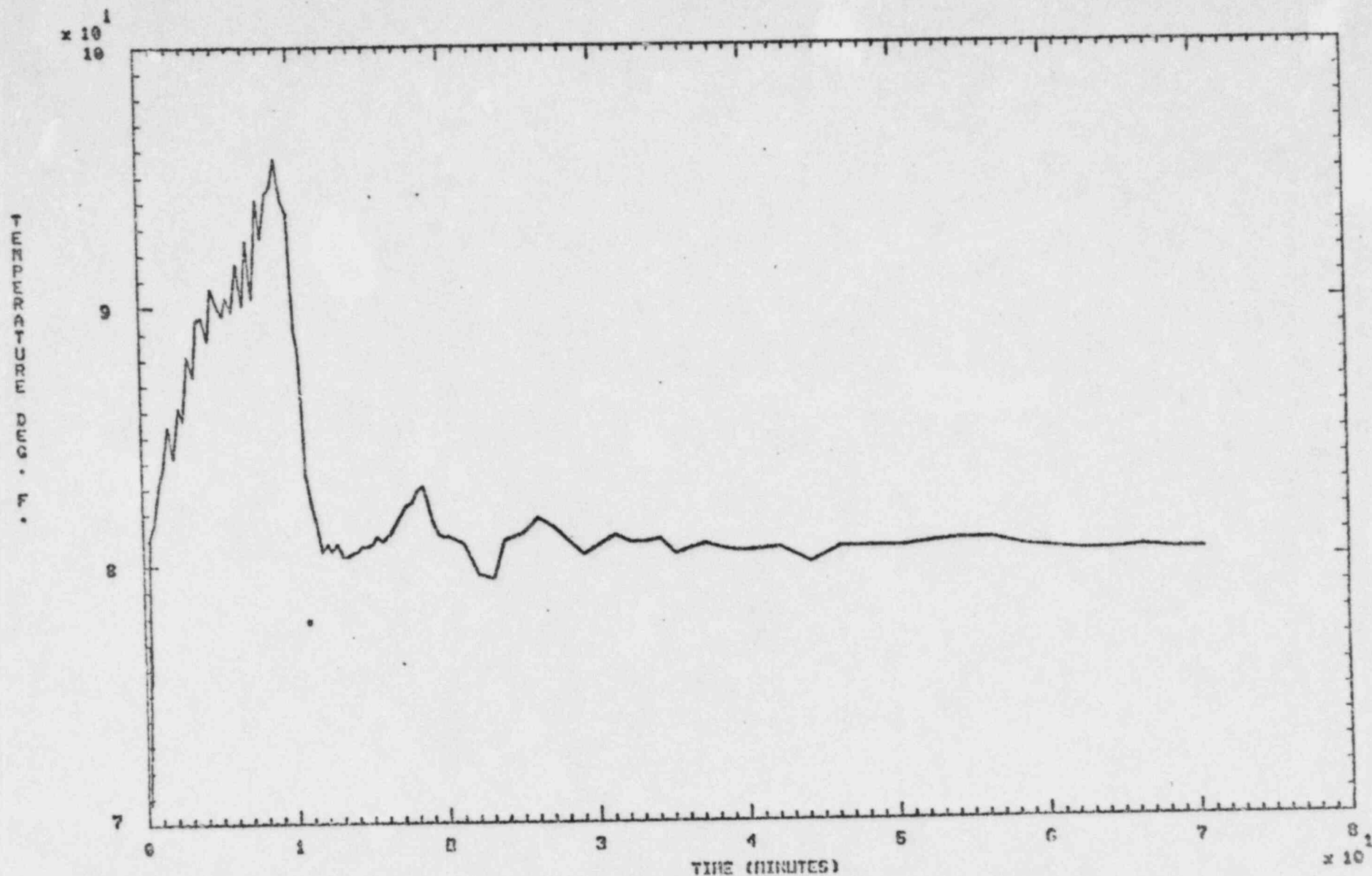


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TTⁿ 8

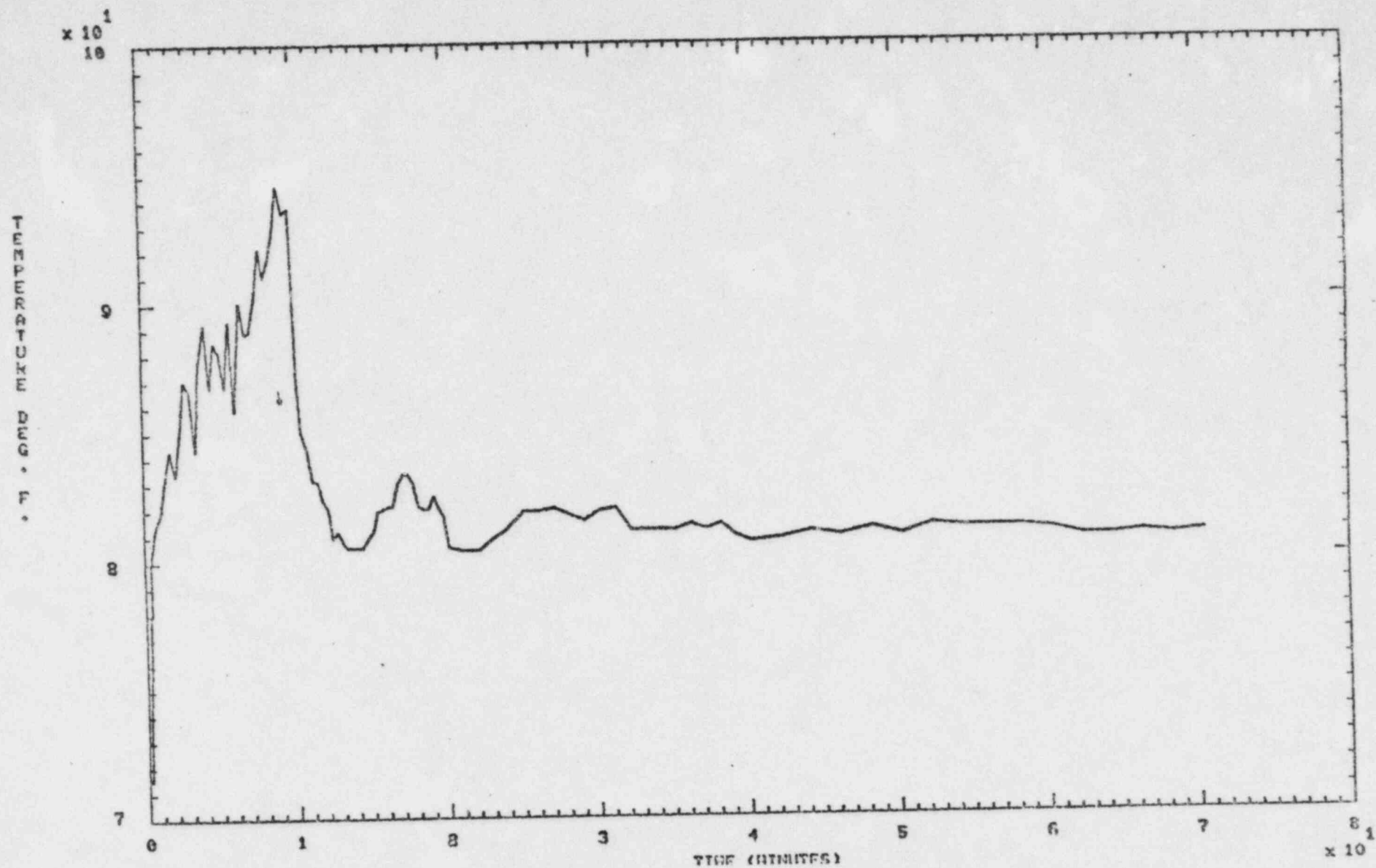


VALVE OPENS AT 17.1 SEC

EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 9

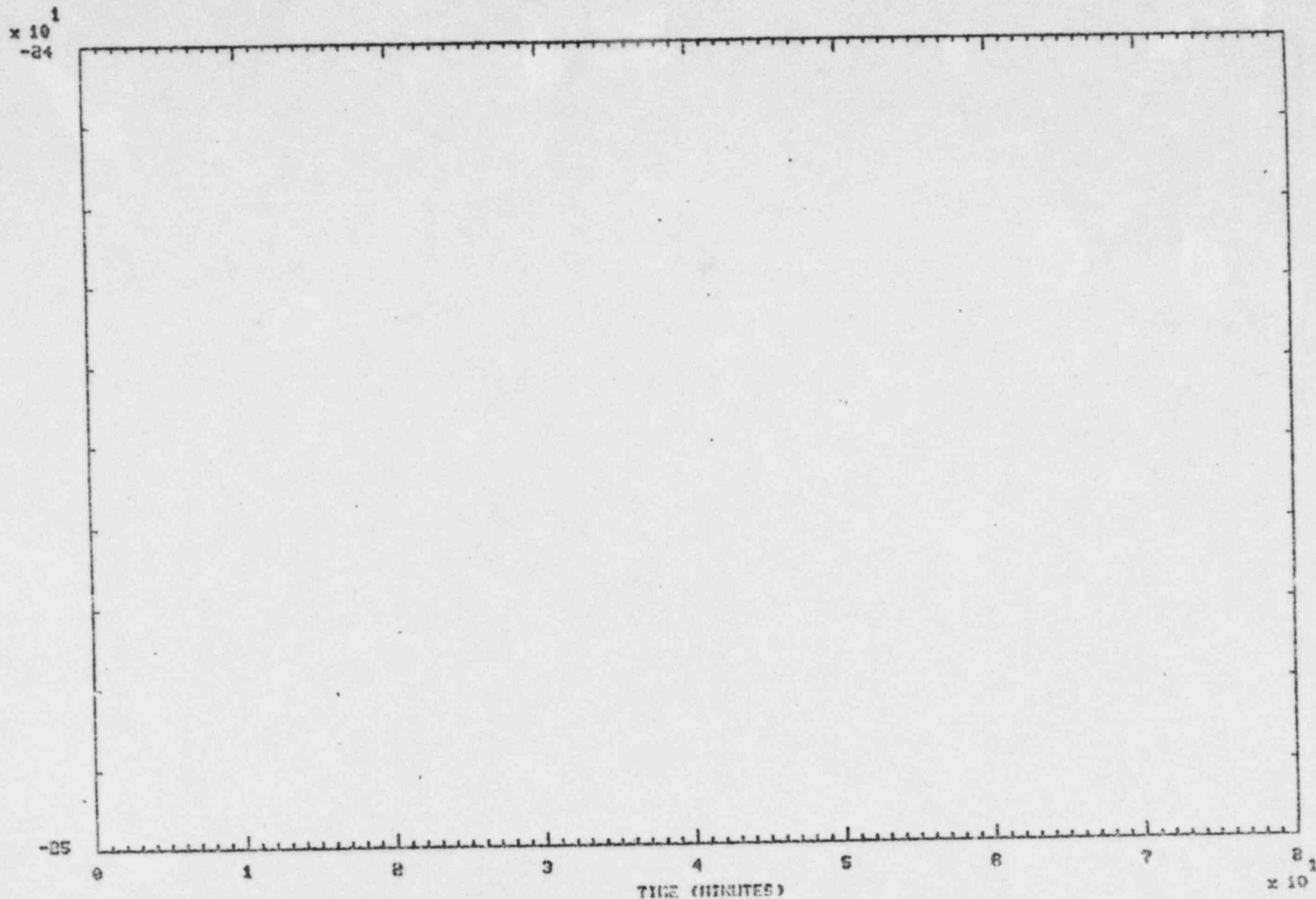


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 10

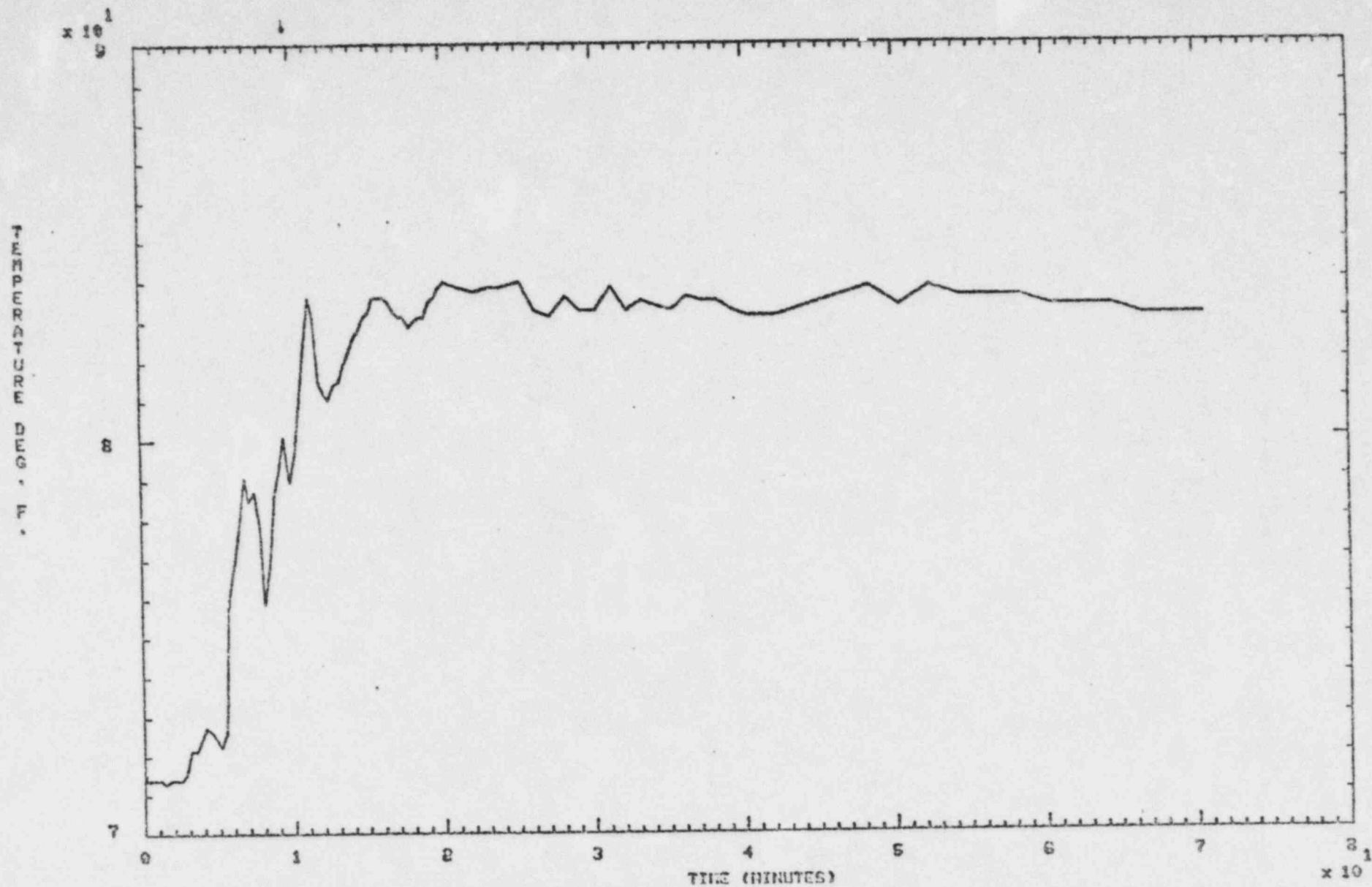


VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 11

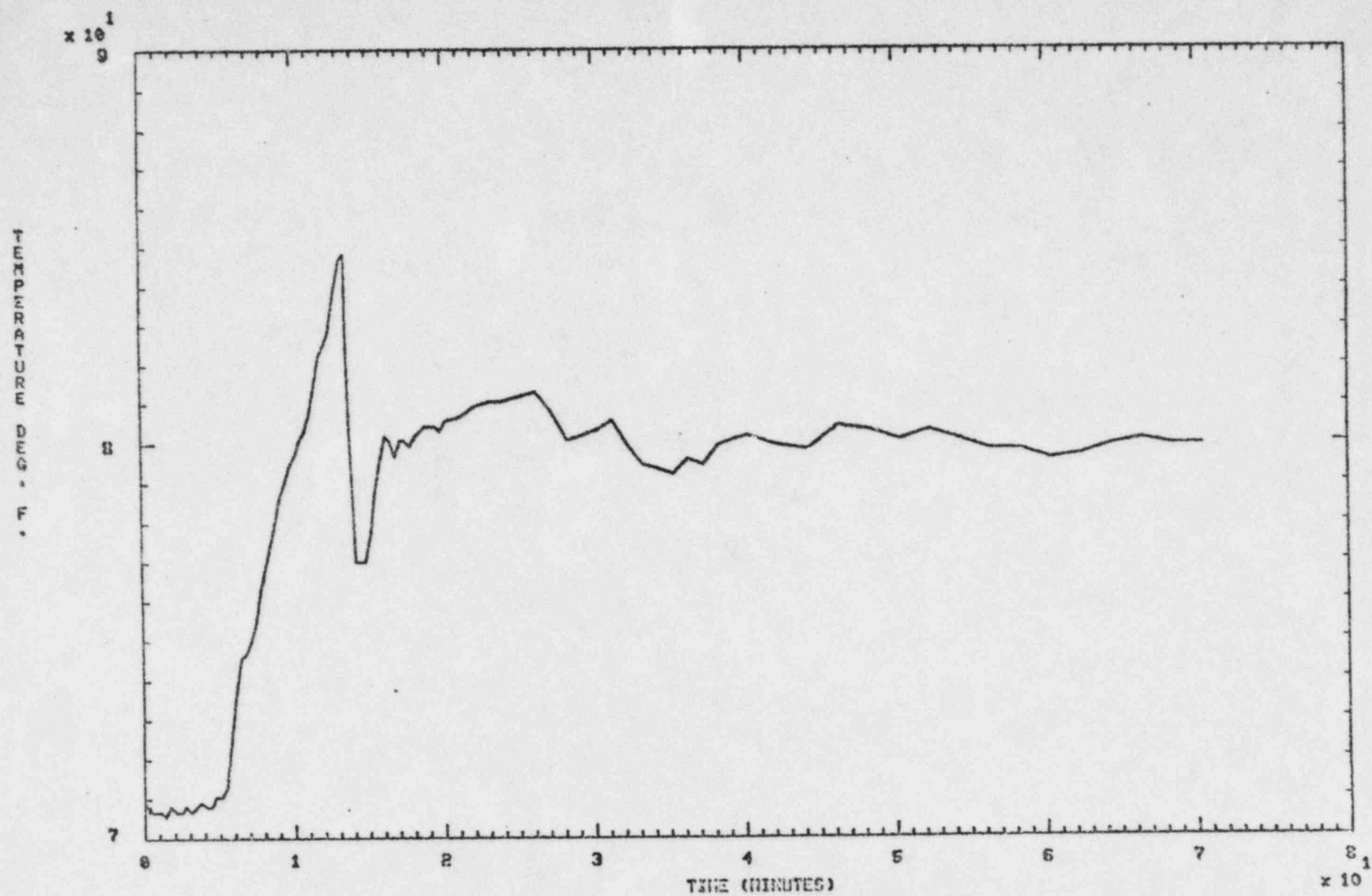
TEMPERATURE
DEG. F.



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 12

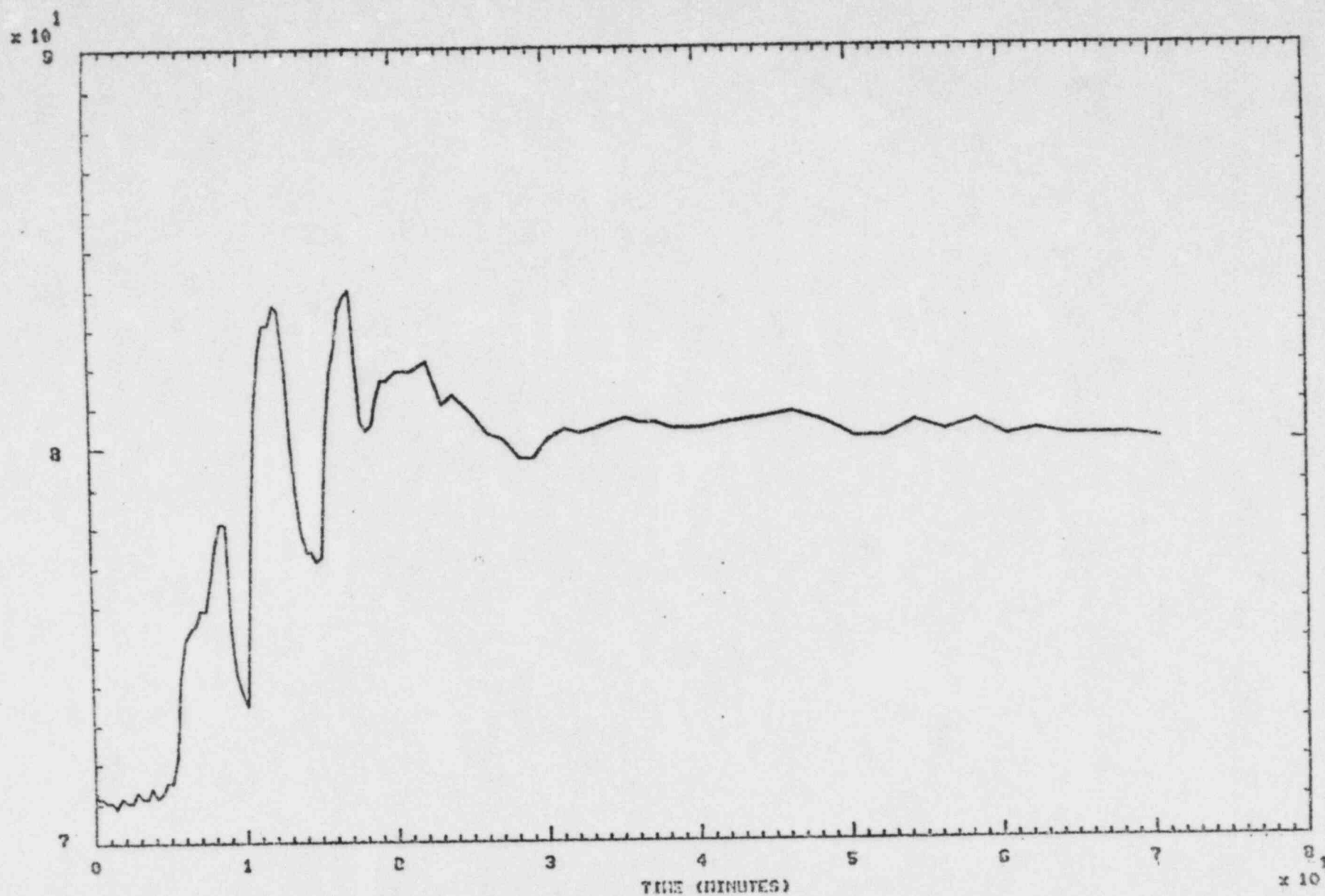


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 13

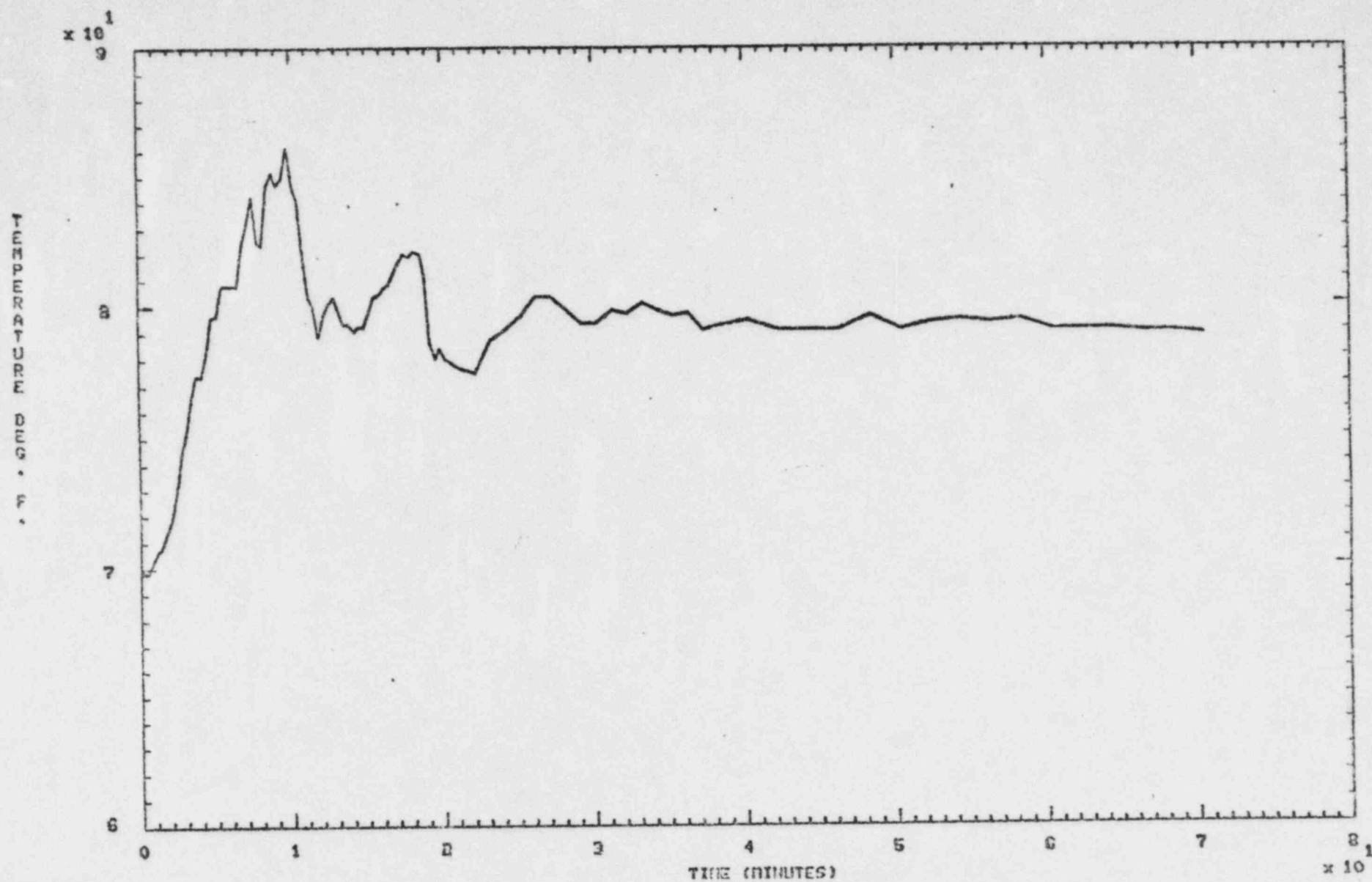


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 14

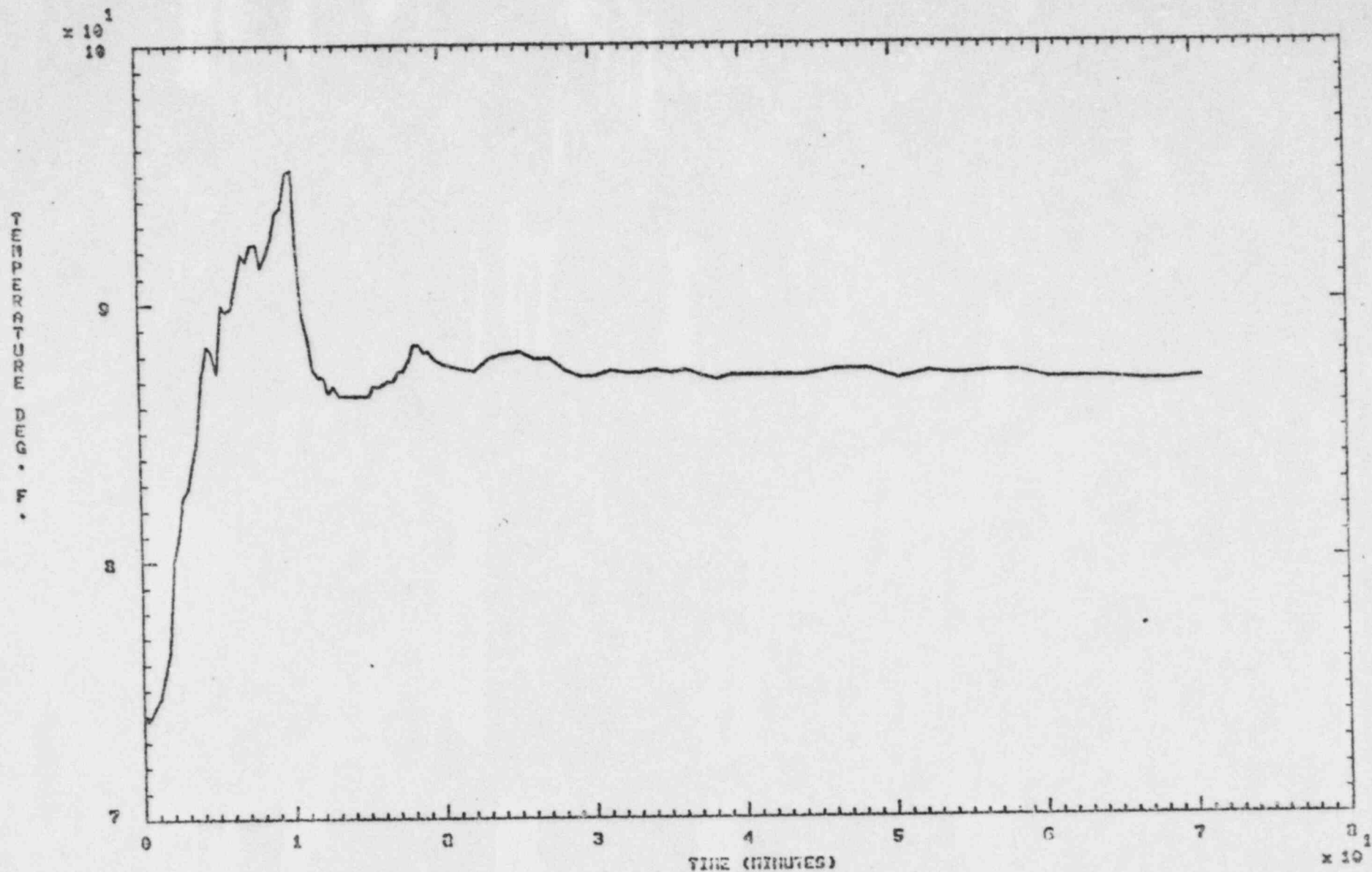
1-11-66 10:00 AM



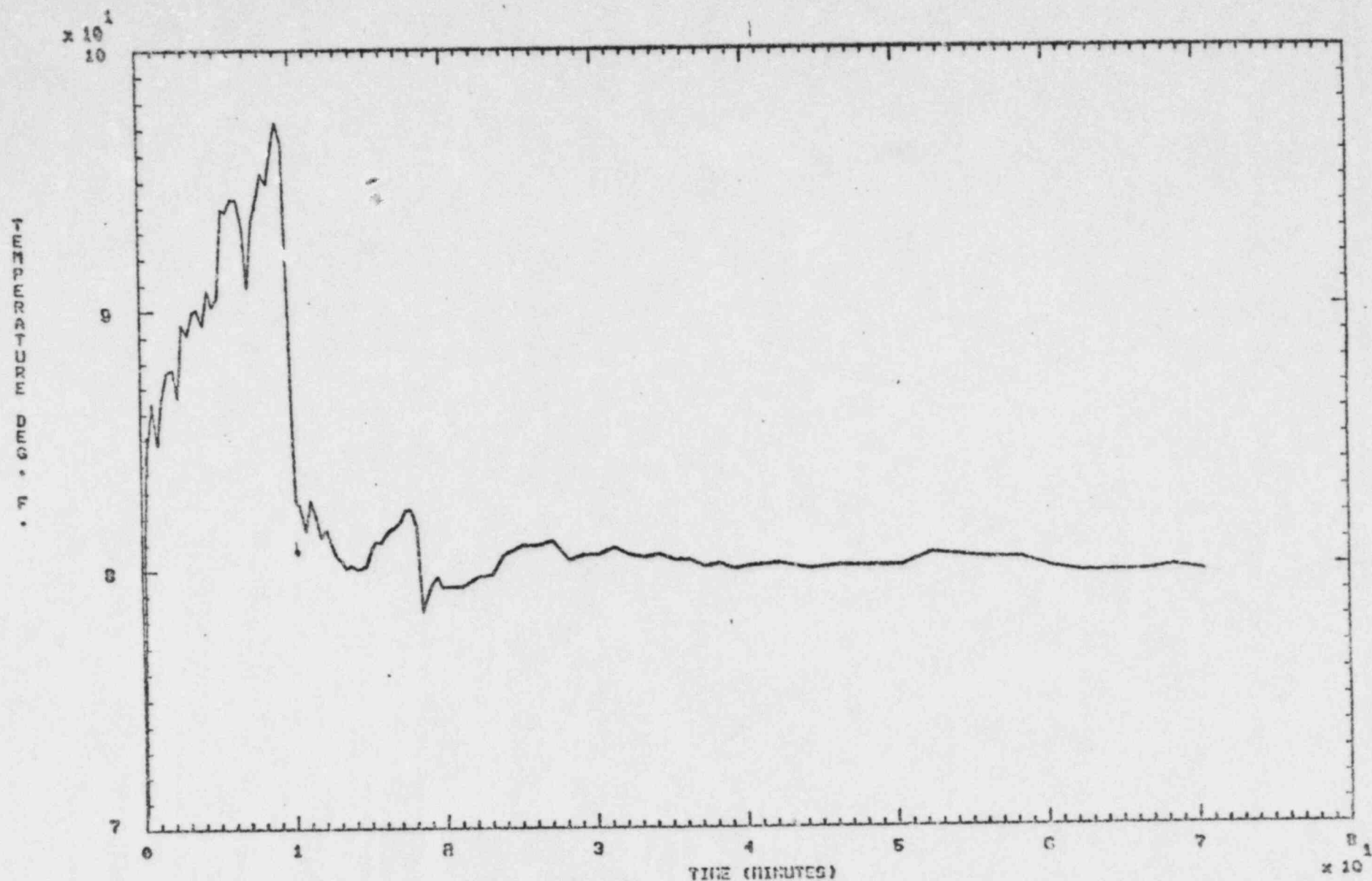
VALVE OPENS AT 10.1 SEC .
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 15



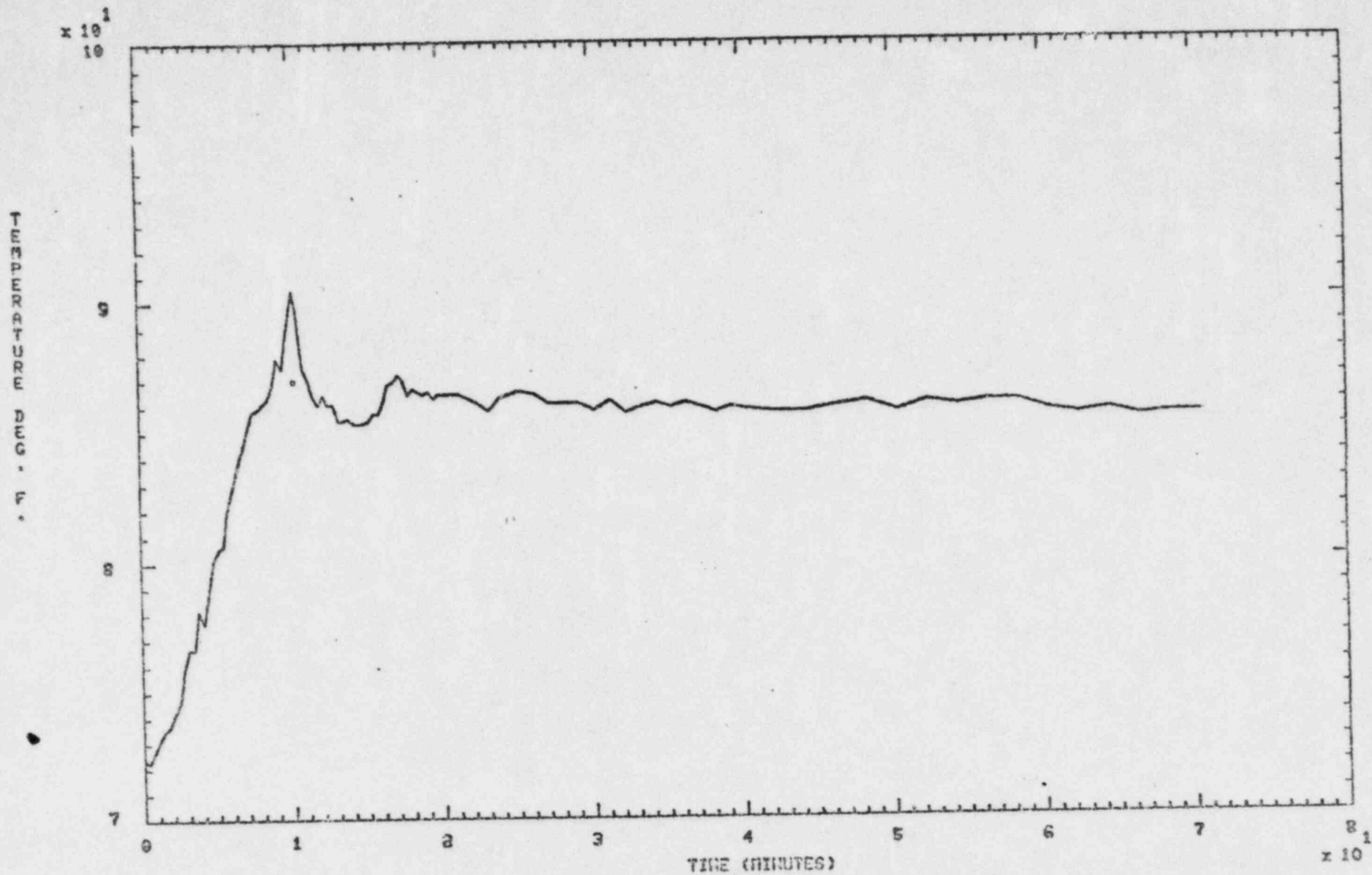
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 16



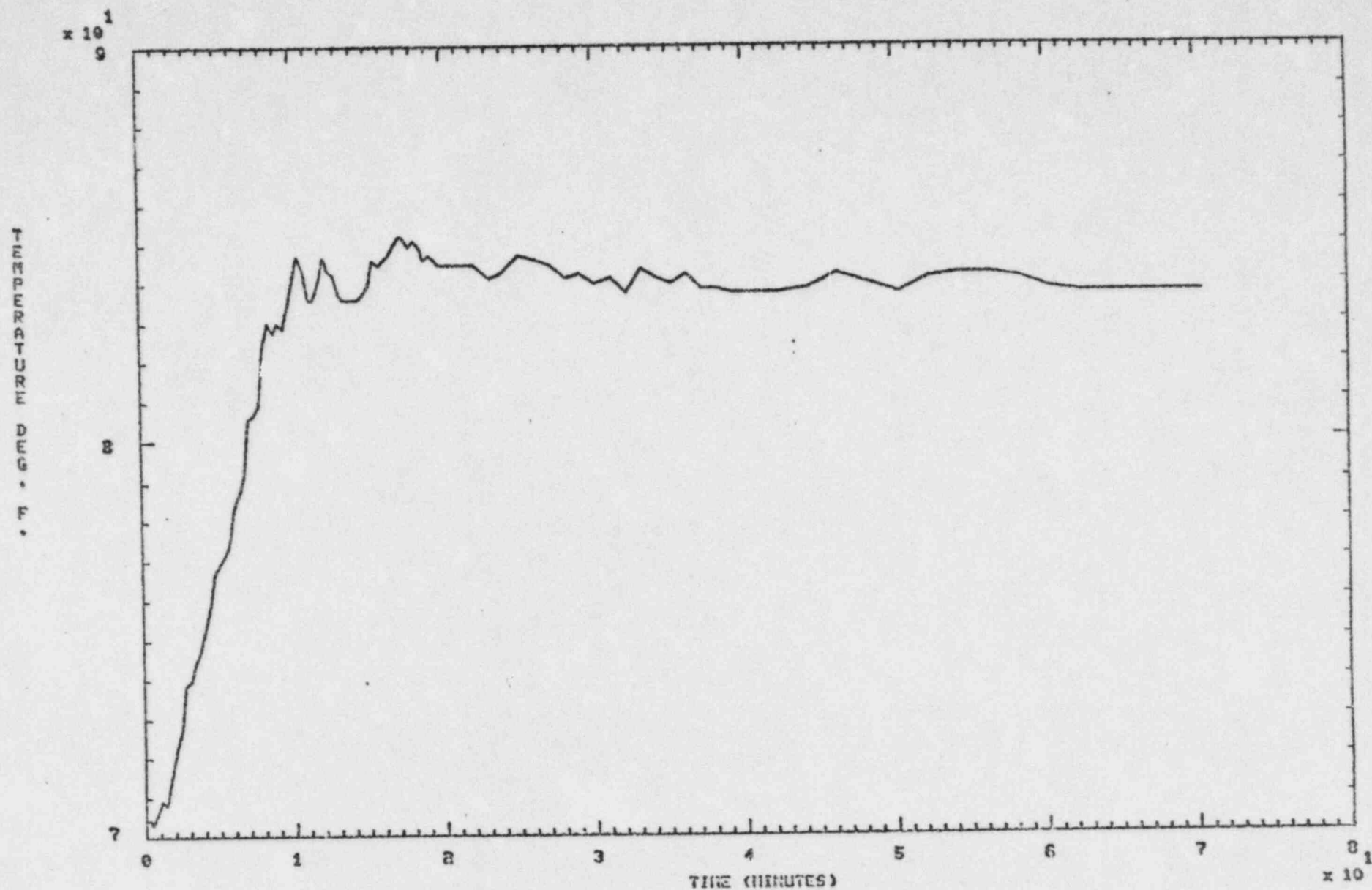
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 17



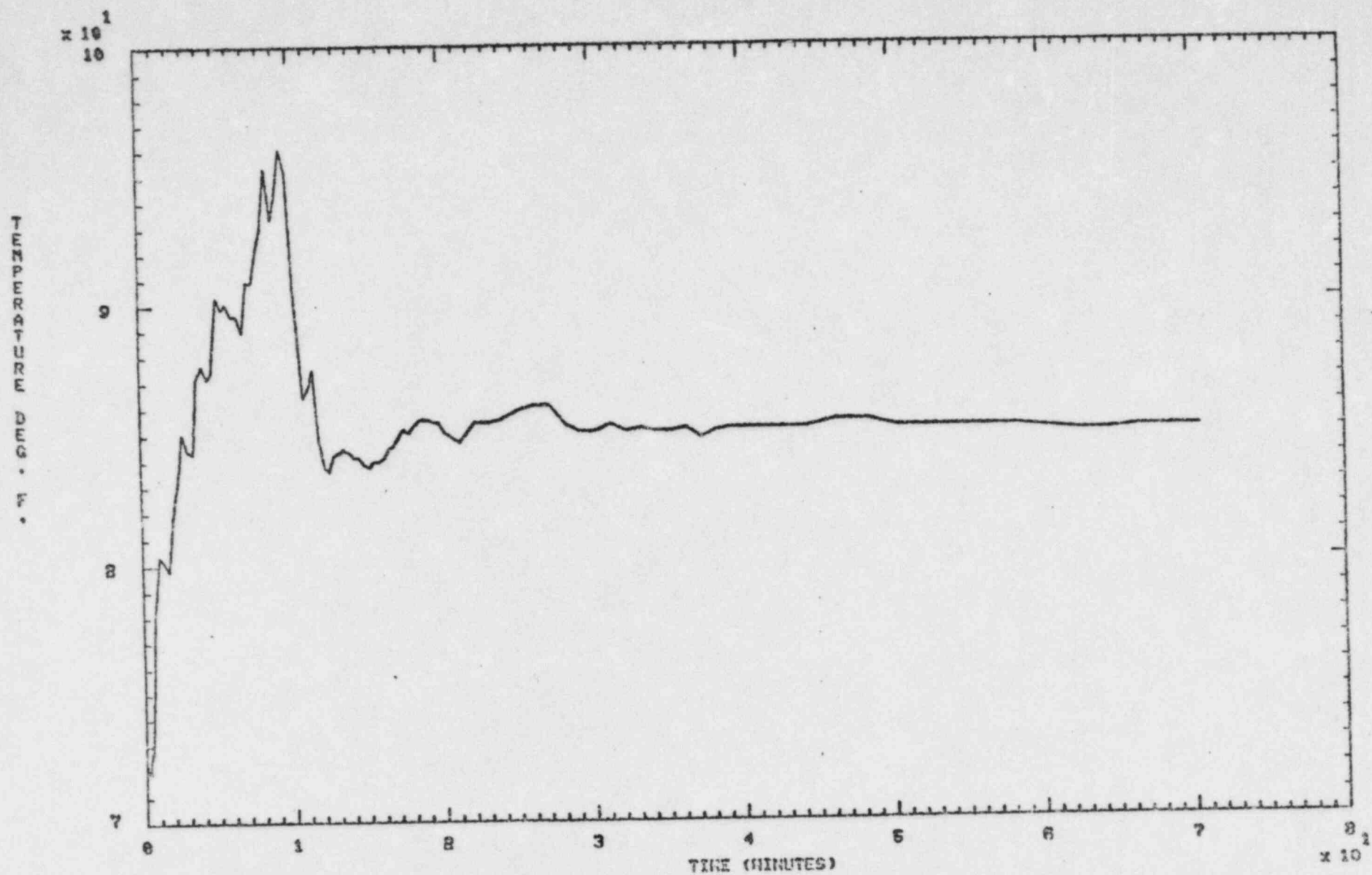
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 18



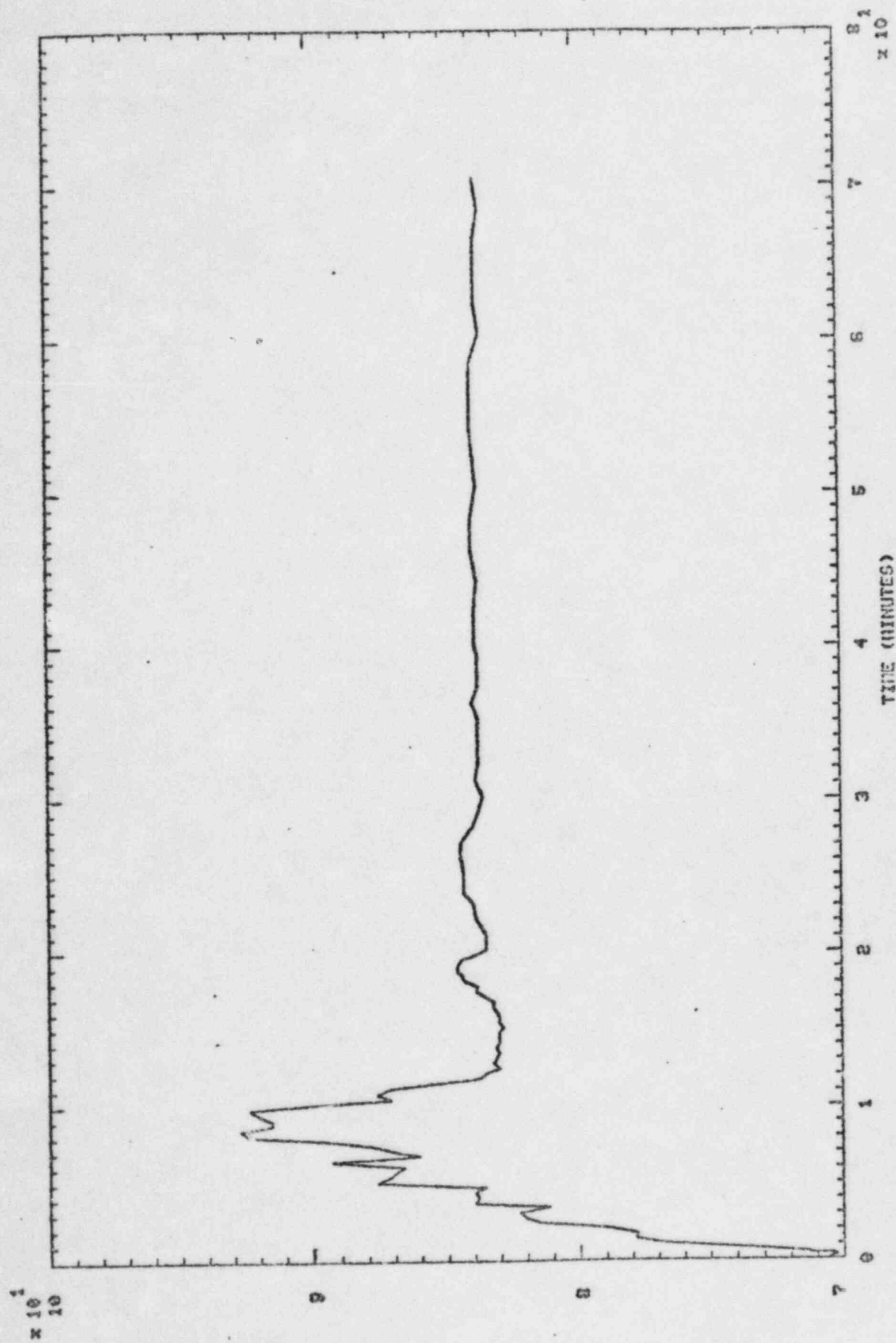
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 19



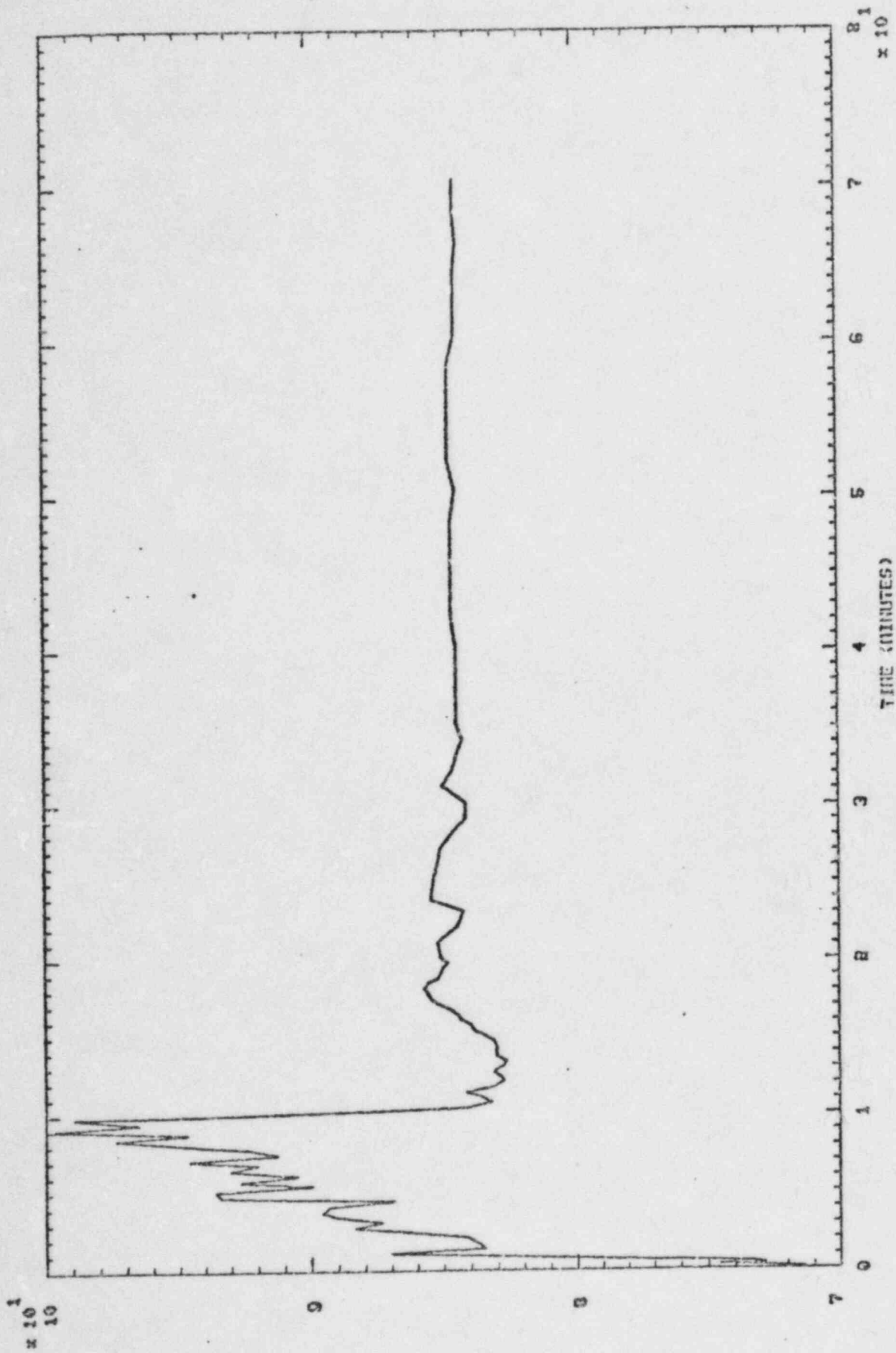
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 20



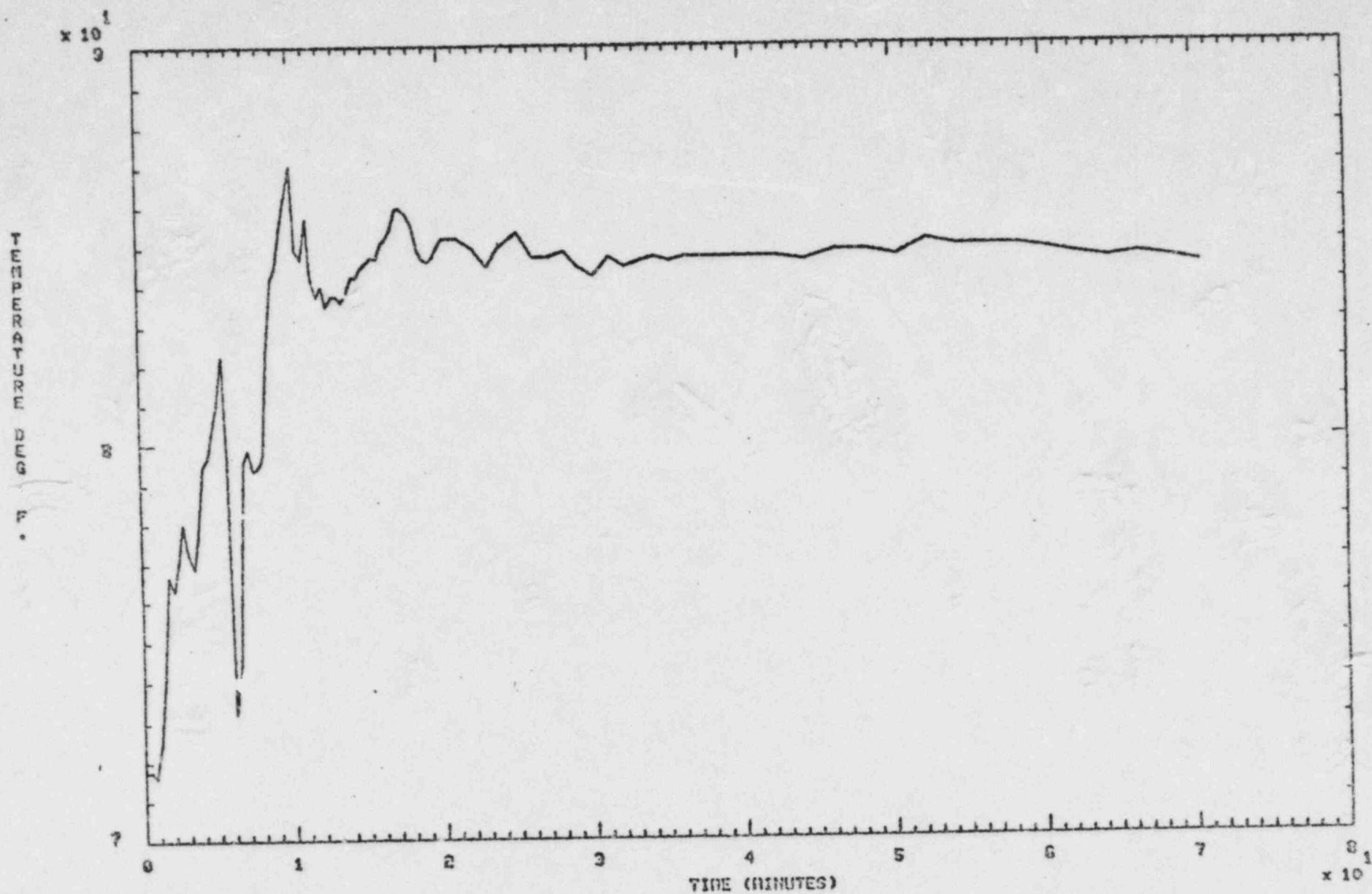
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 21



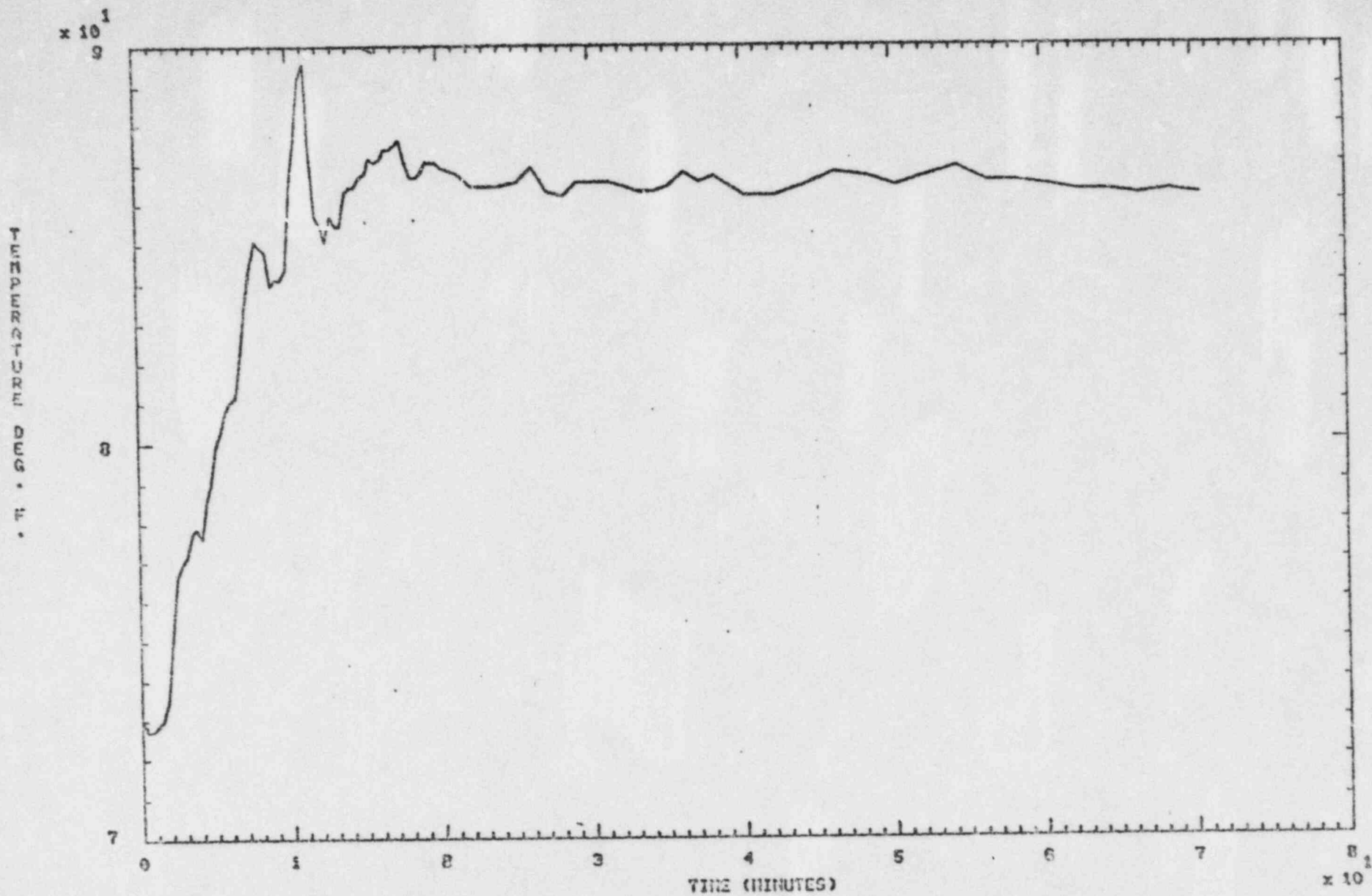
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 22



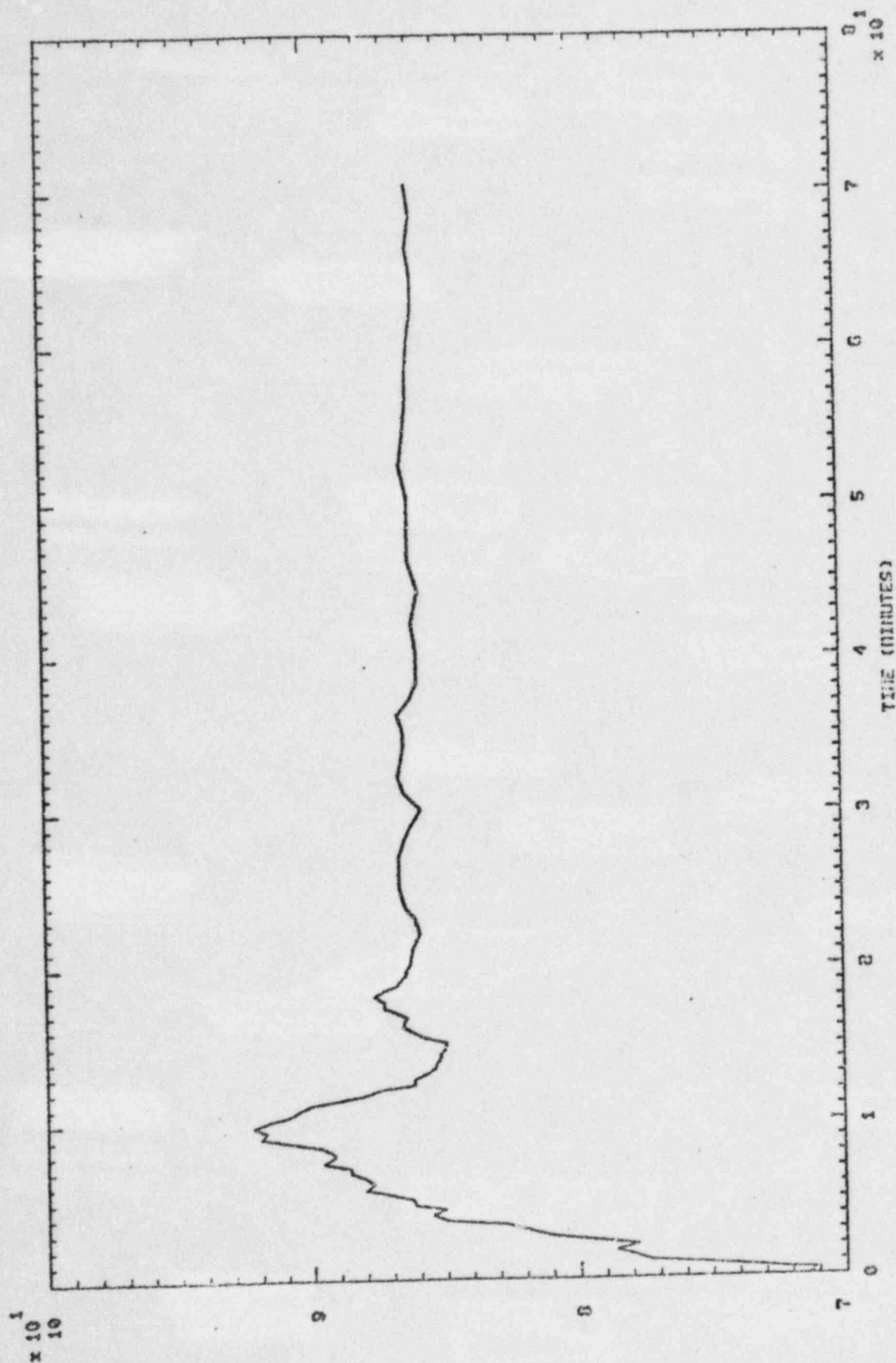
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 23
VALVE OPENS AT 10.1 SEC



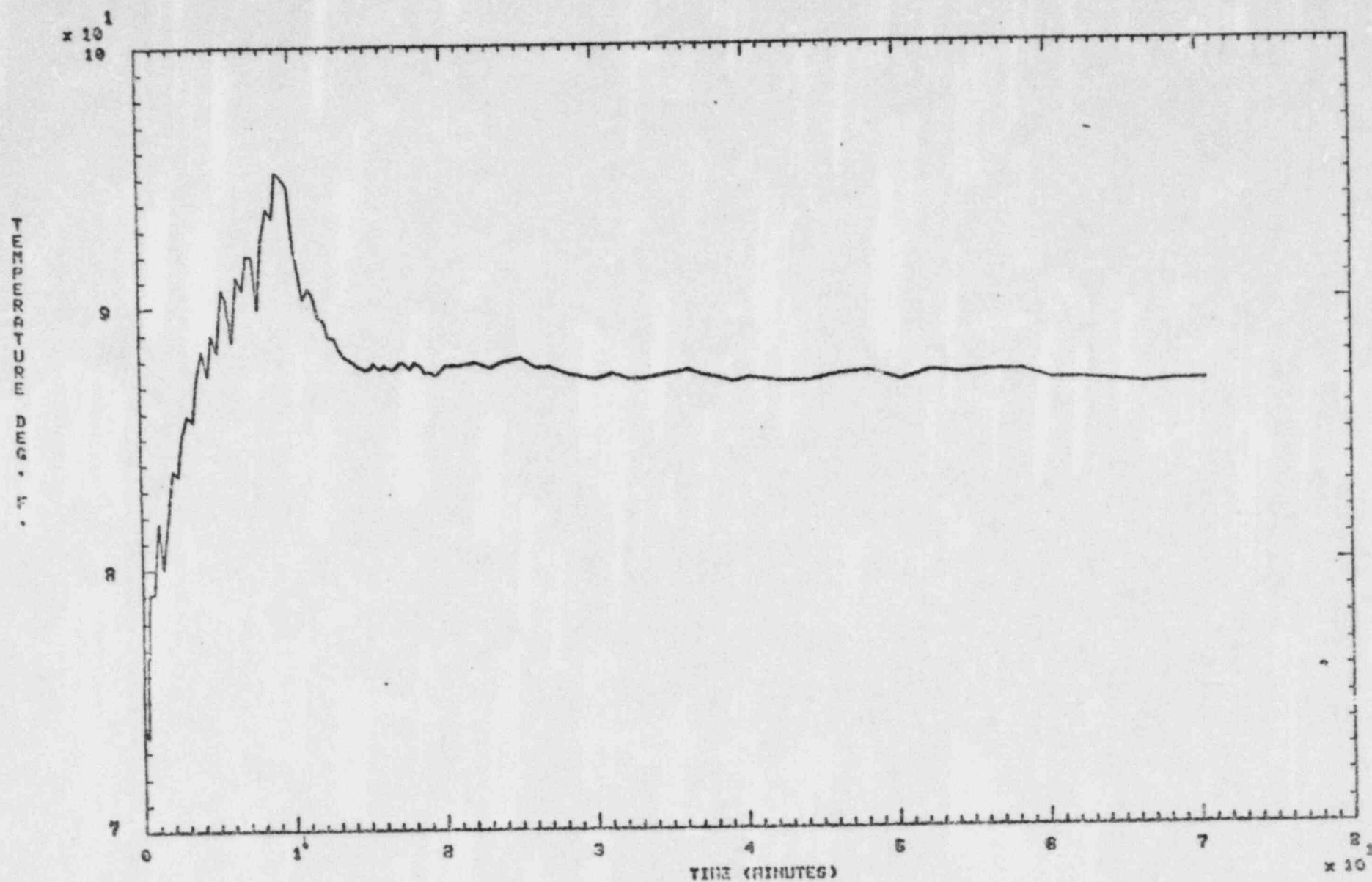
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 24



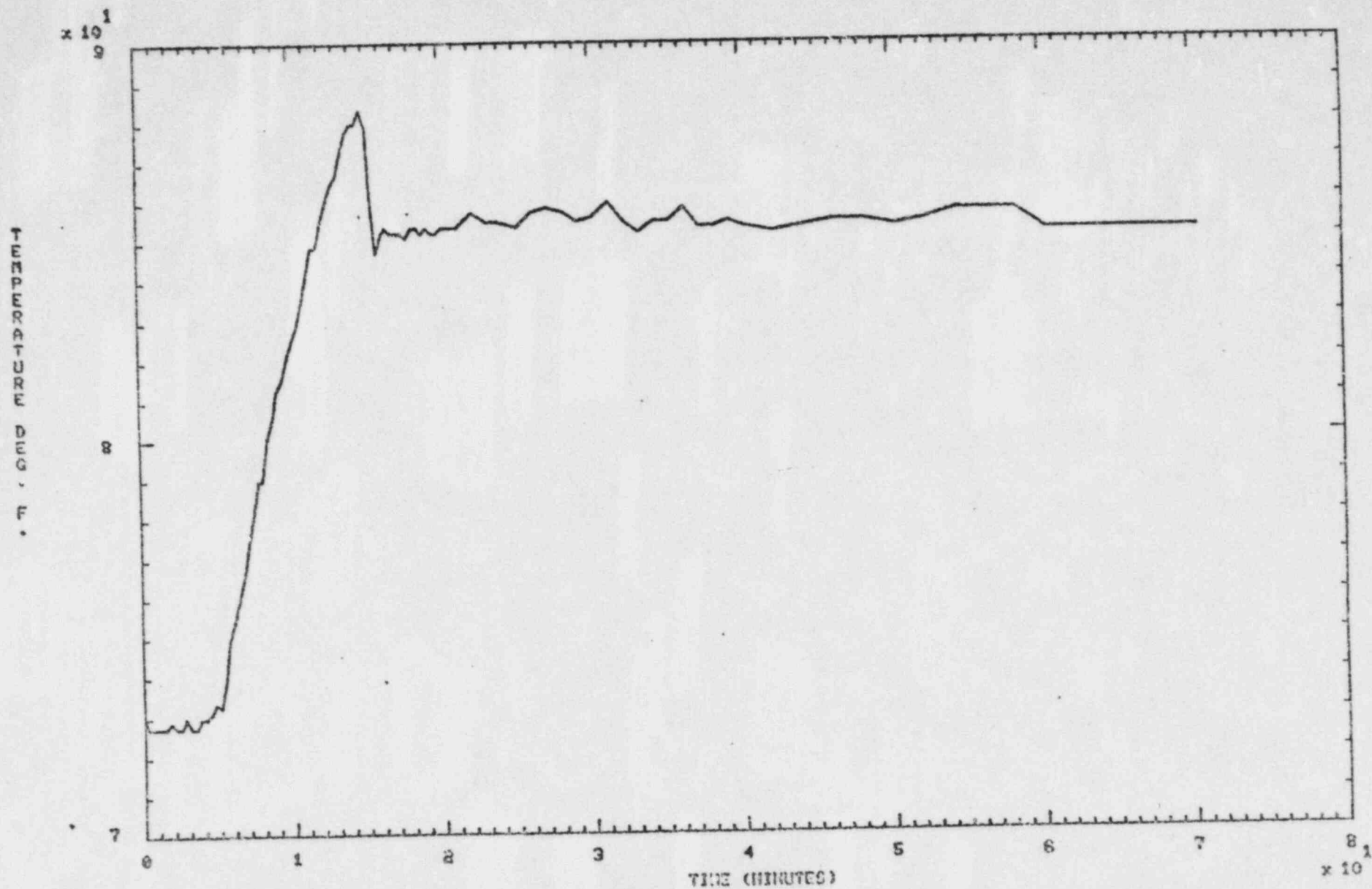
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 25



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 26

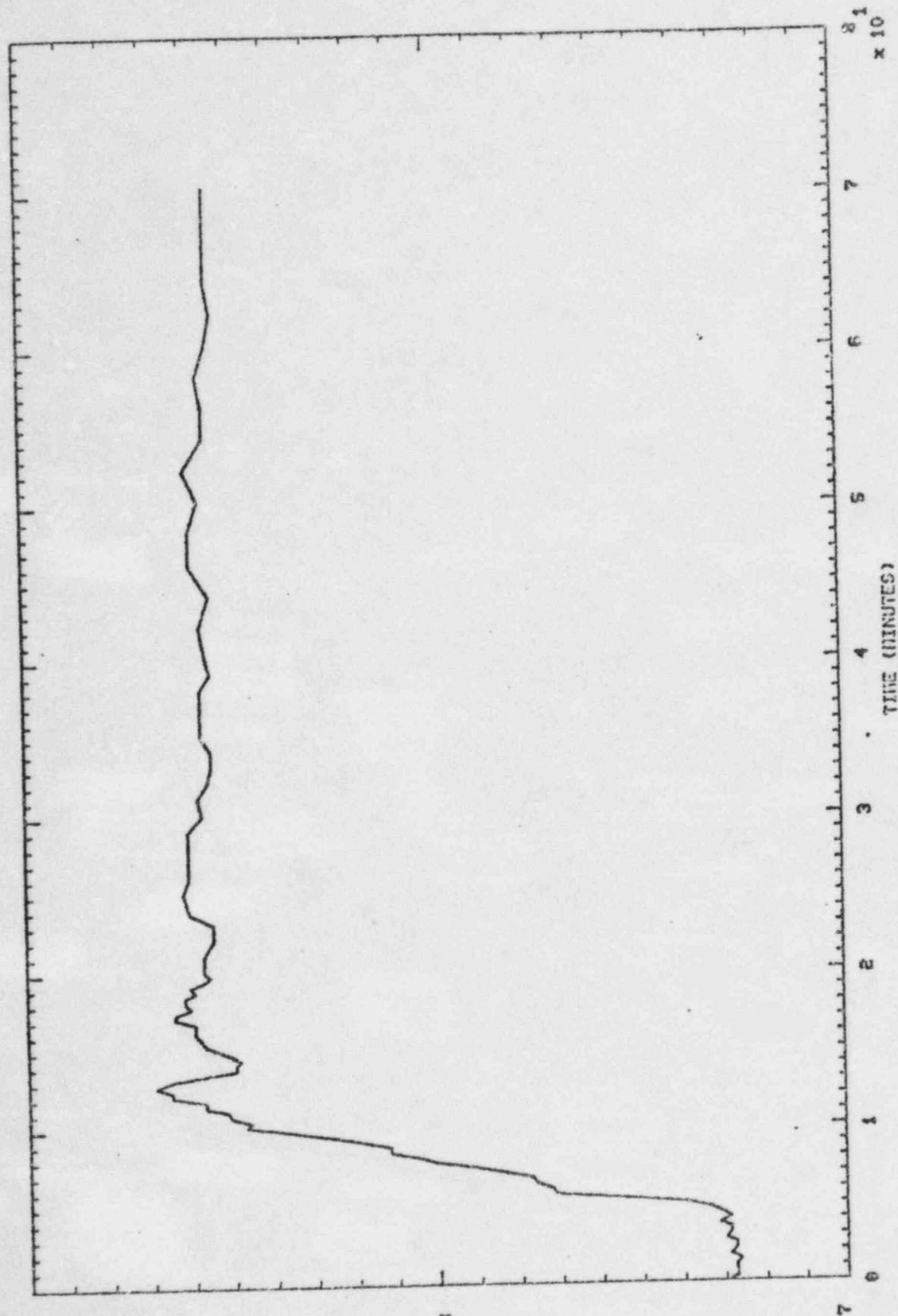


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 27

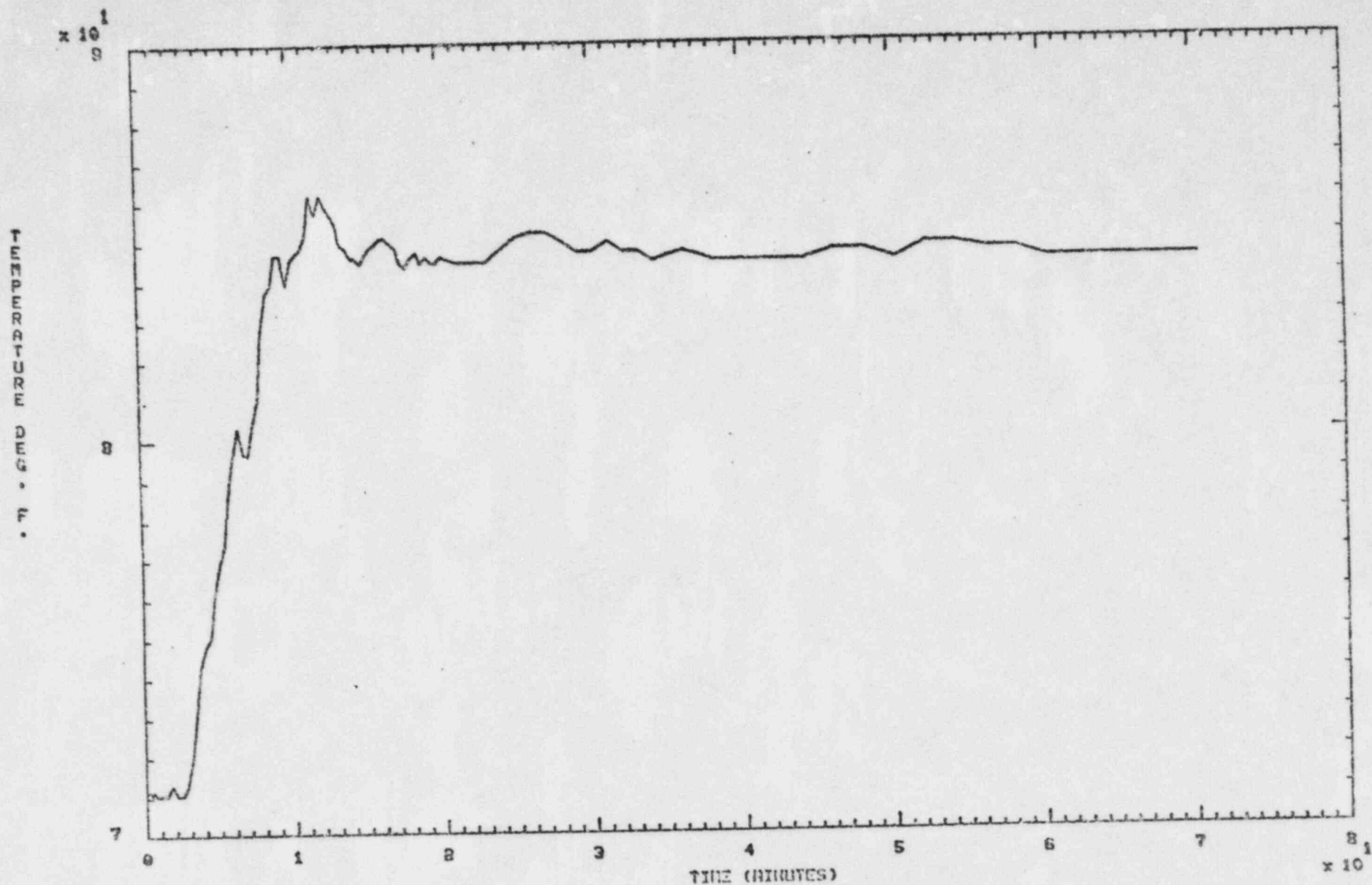


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 28

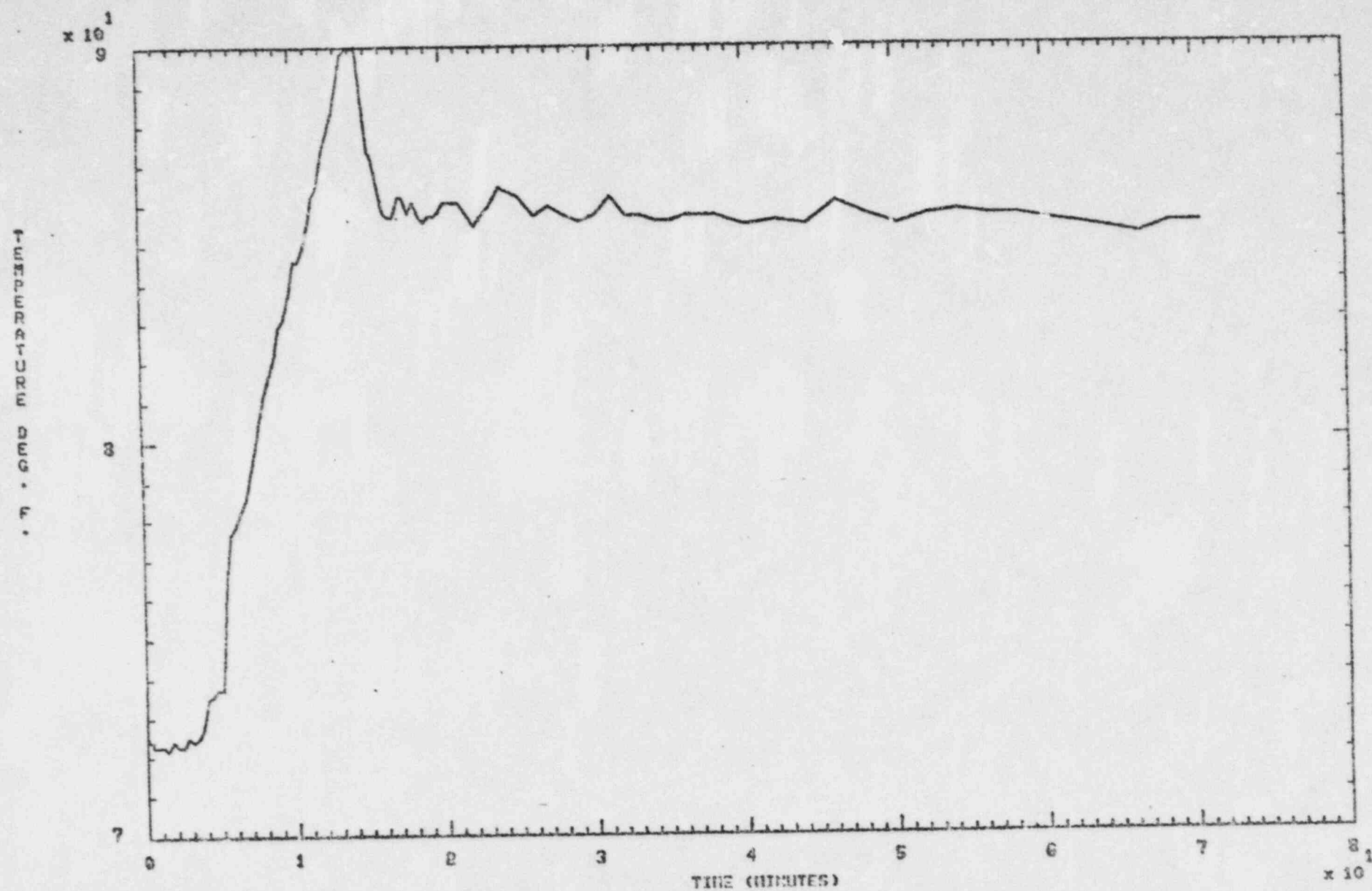
$\times 10^9$



EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 29
VALVE OPENS AT 10.1 SEC

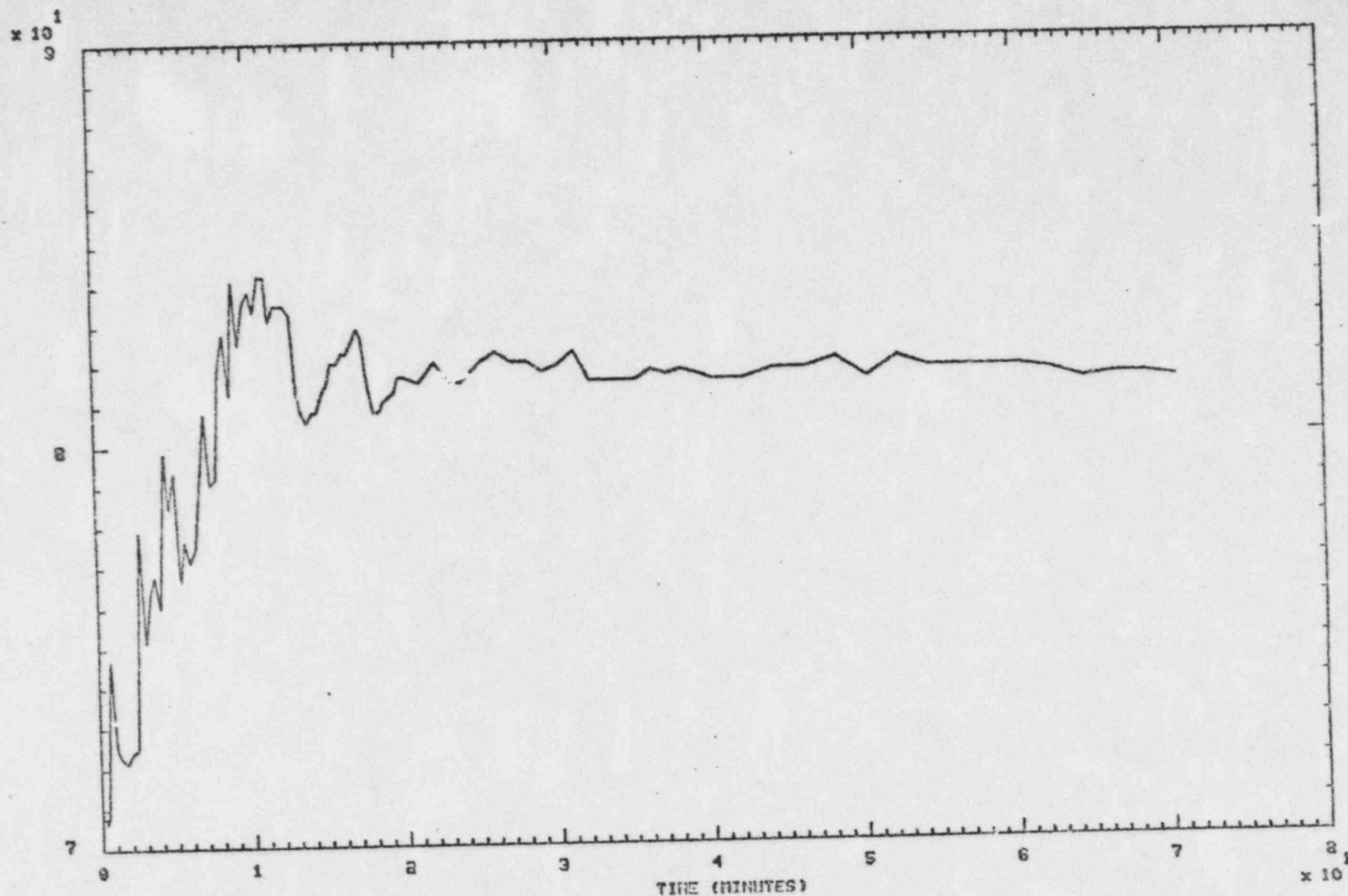


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 30

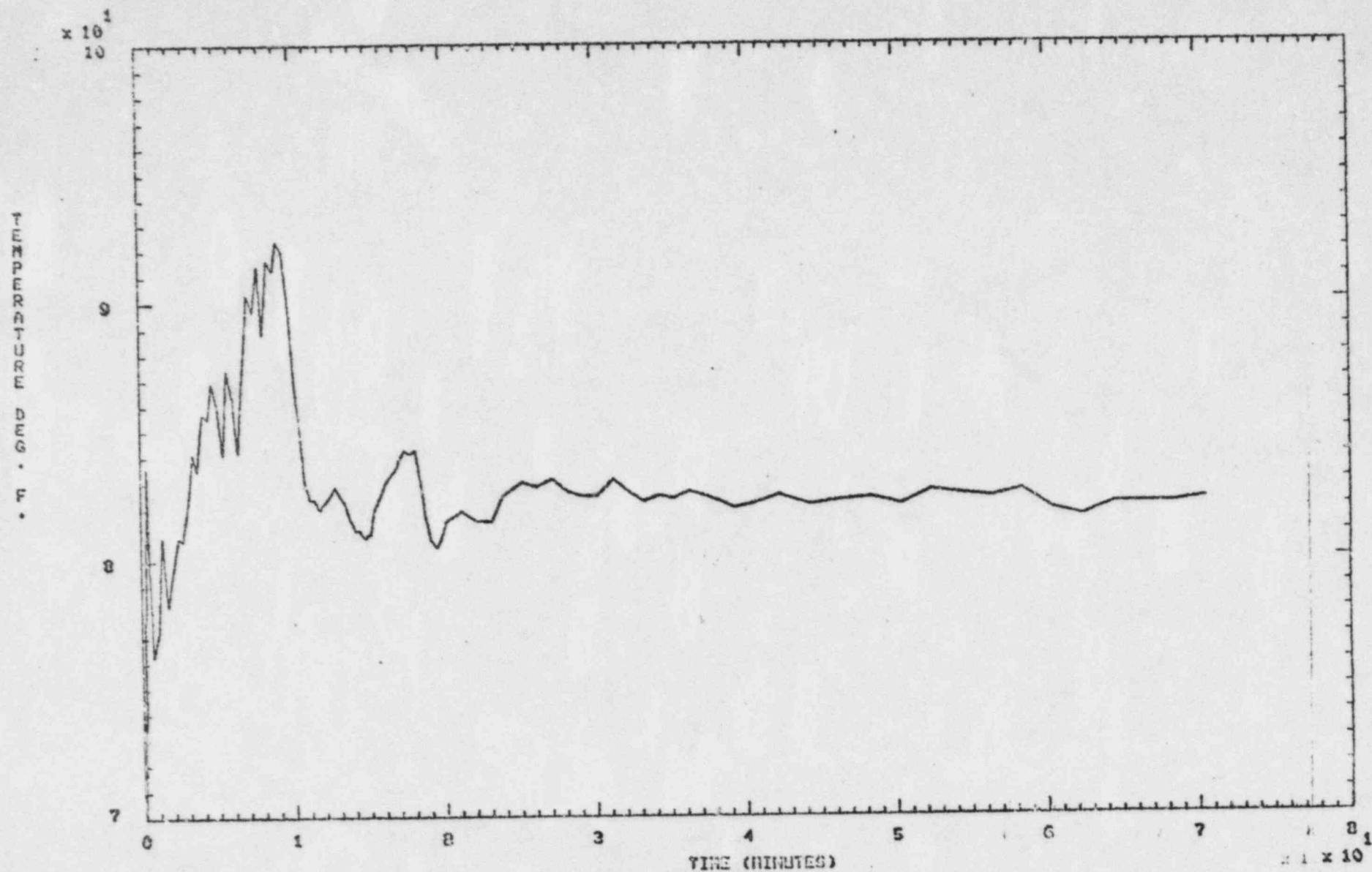


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 31

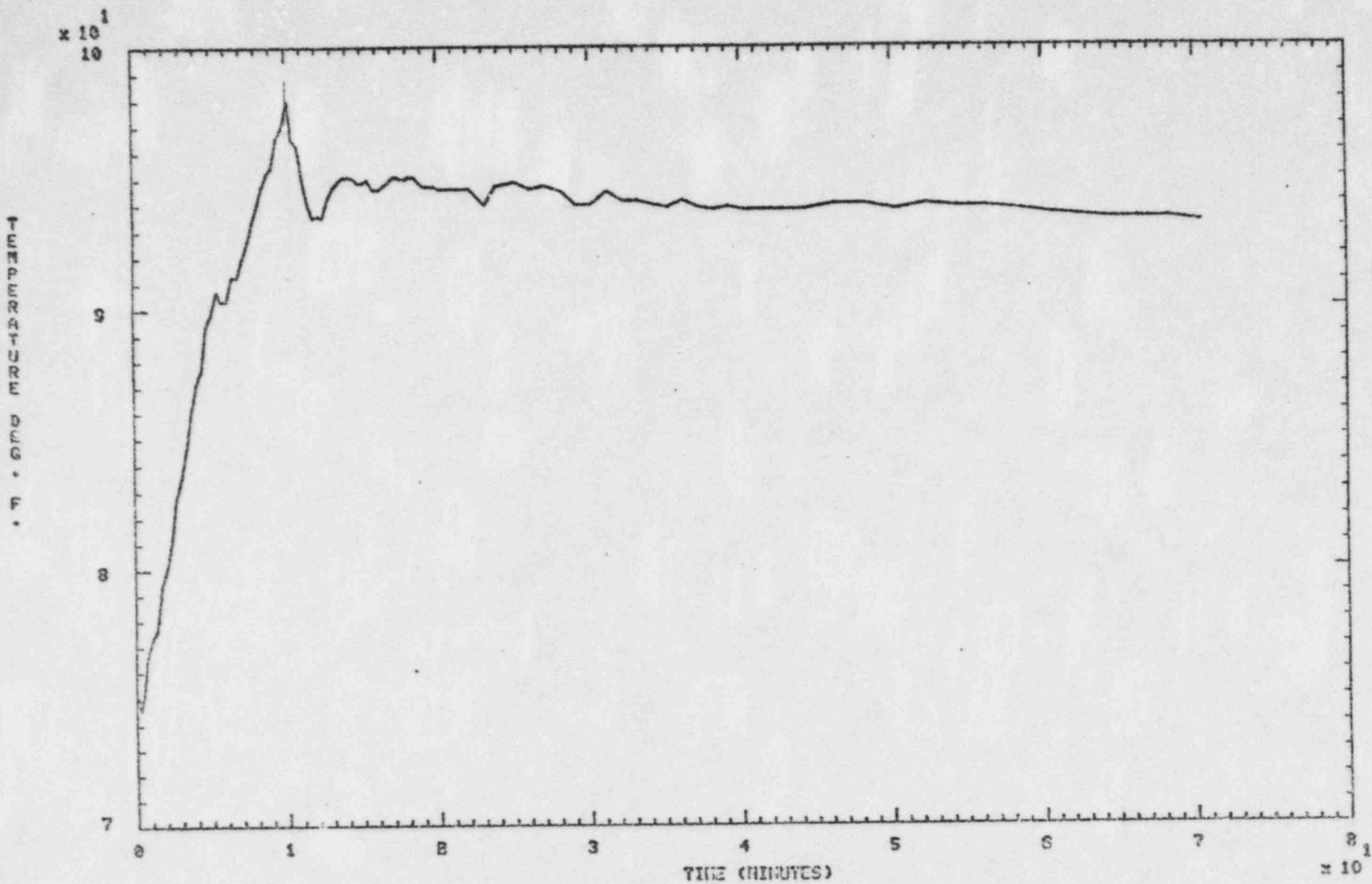
TEMPERATURE



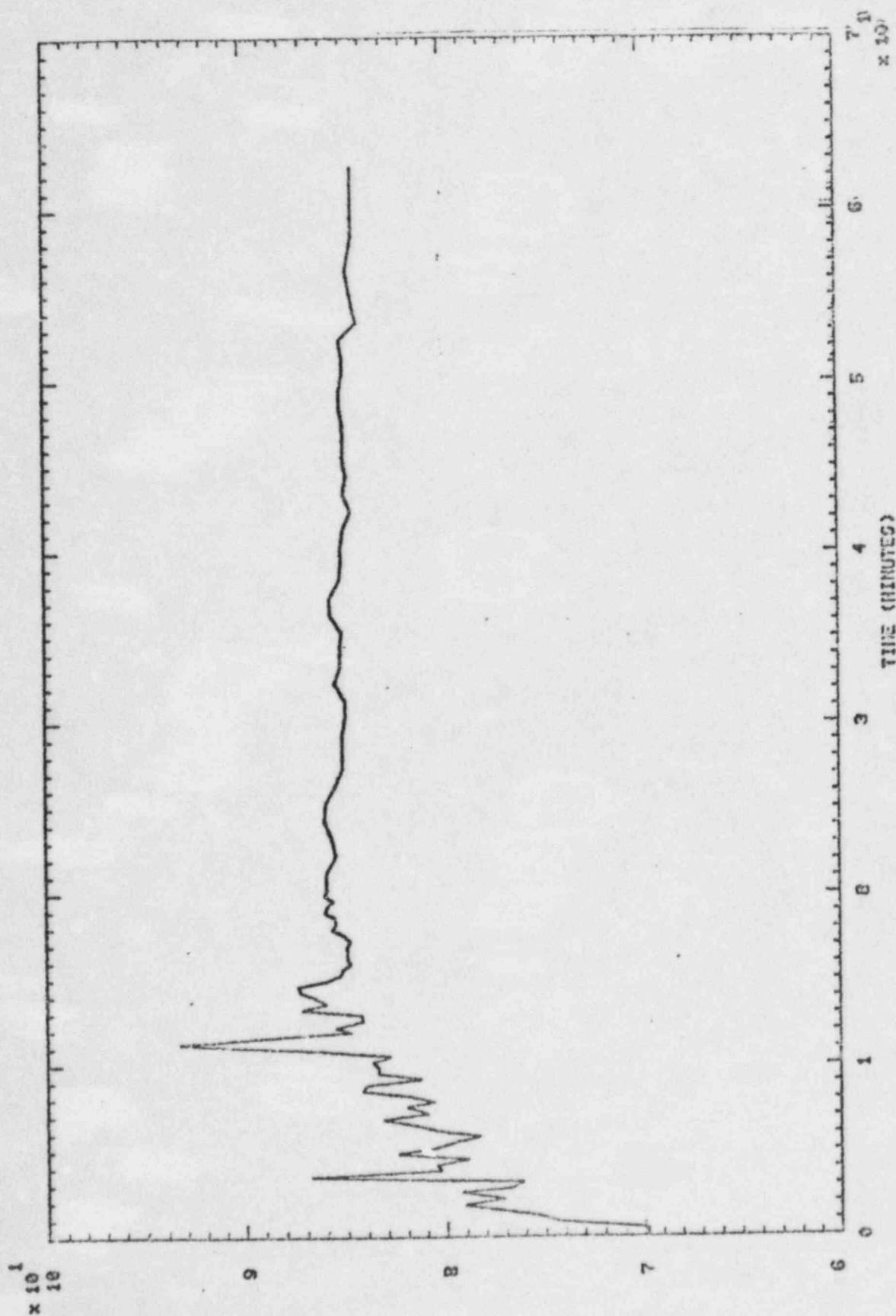
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 32



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TTTT# 33



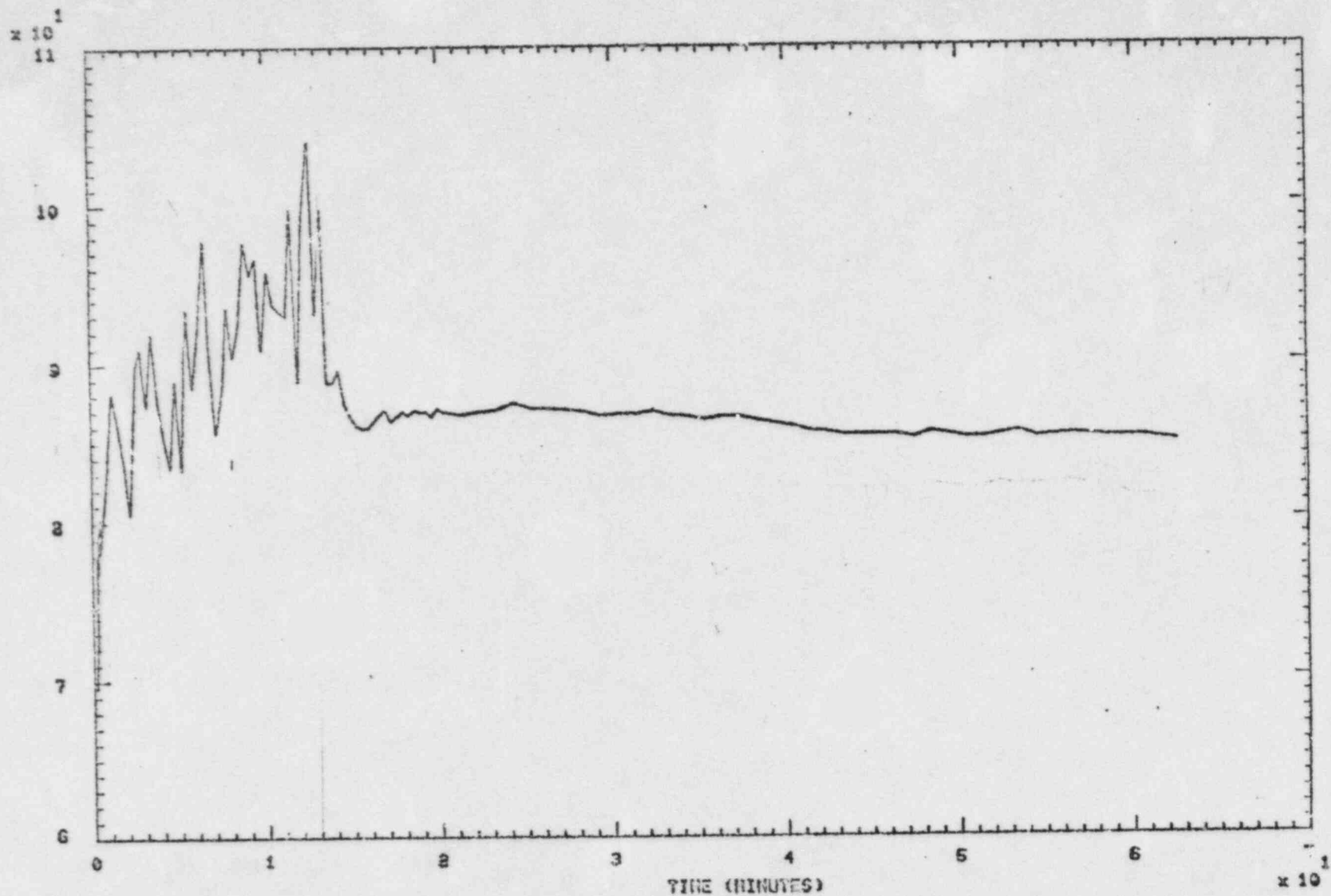
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 074X TT= 48



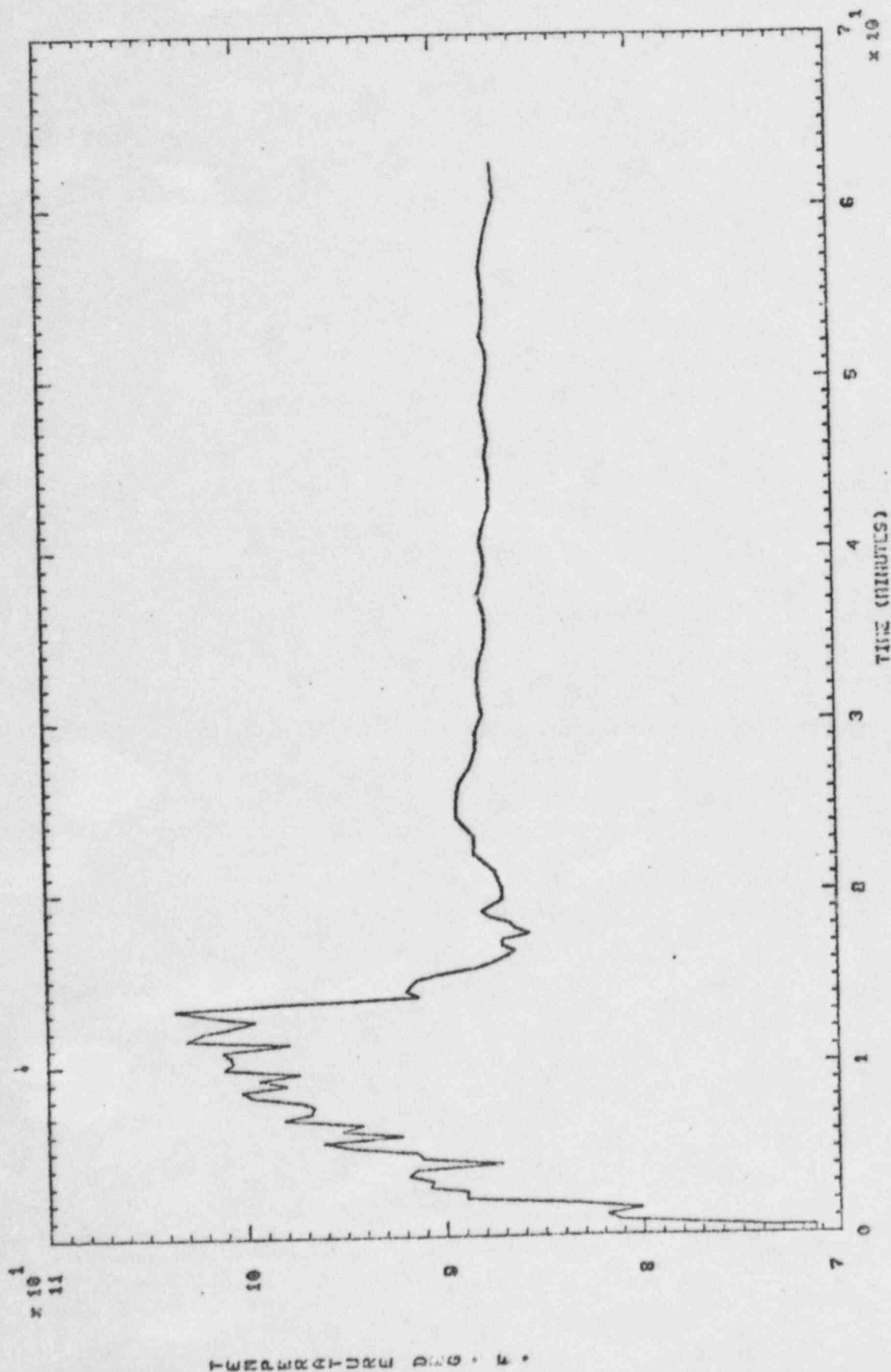
TEMPERATURE DEG. F.

EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 1
VALVE OPENS AT 10.1 SEC

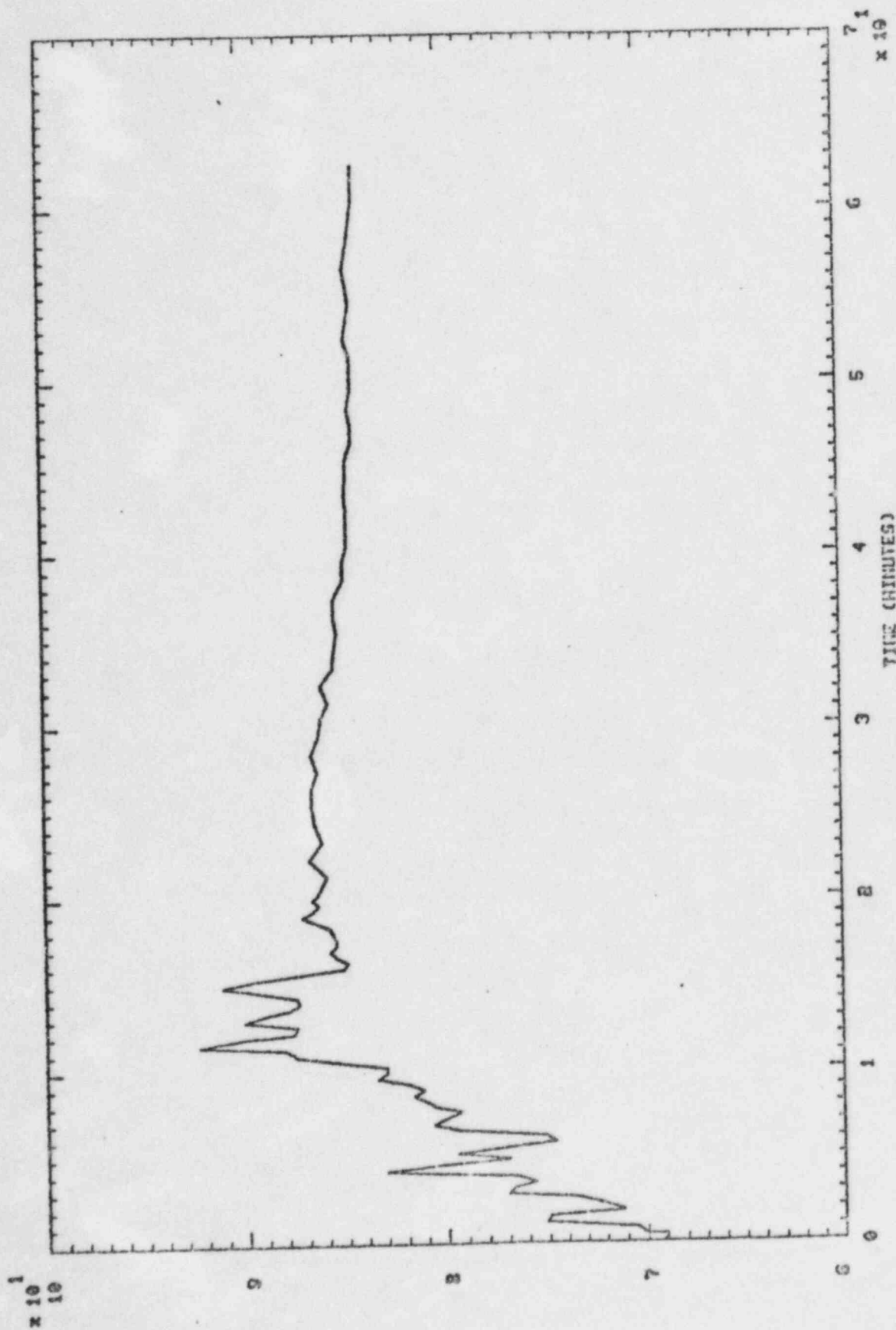
1
2
3
4
5
6
7
8
9
10
11
12



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 2

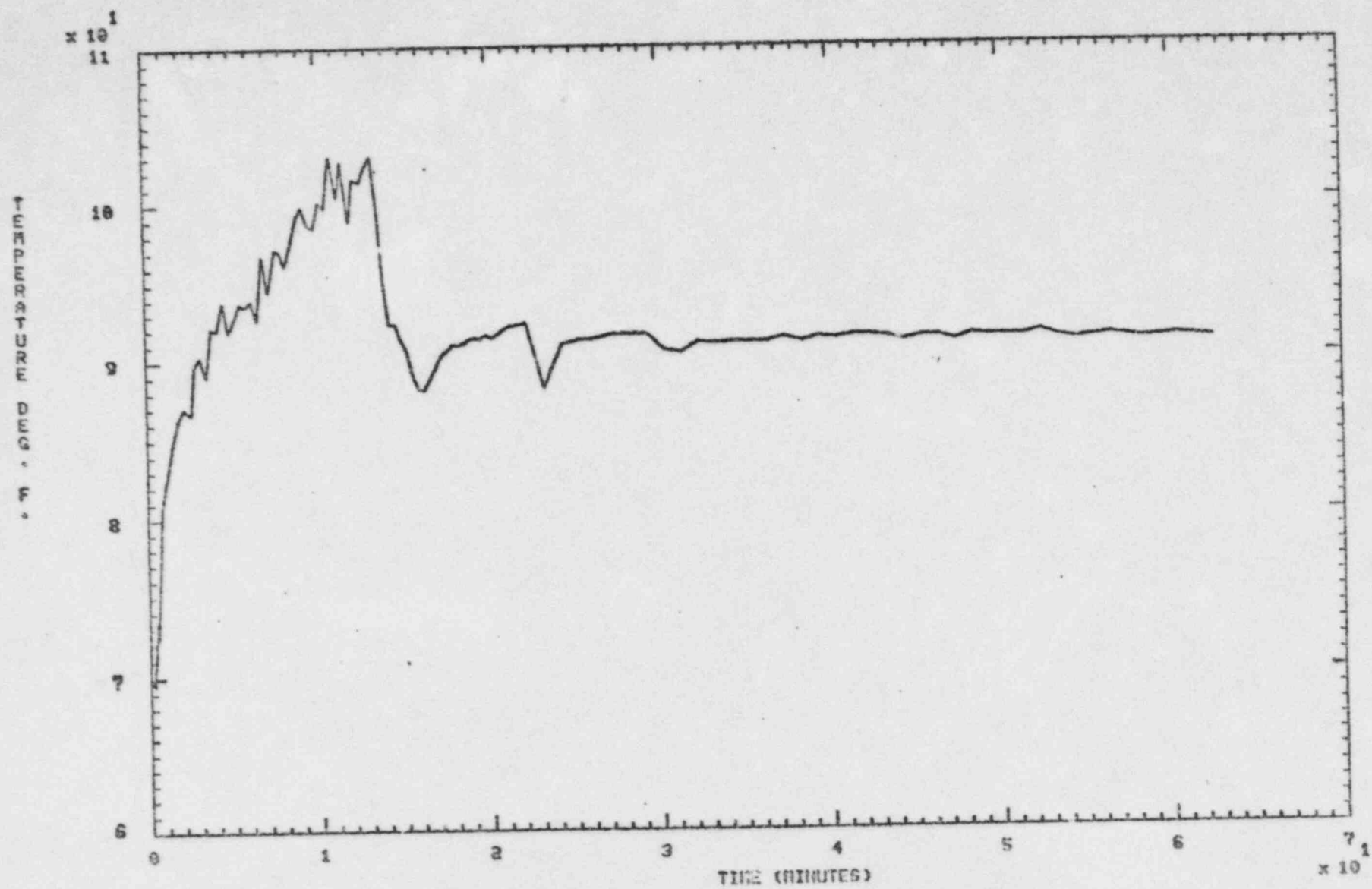


EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 3
VALVE OPENS AT 10.1 SEC

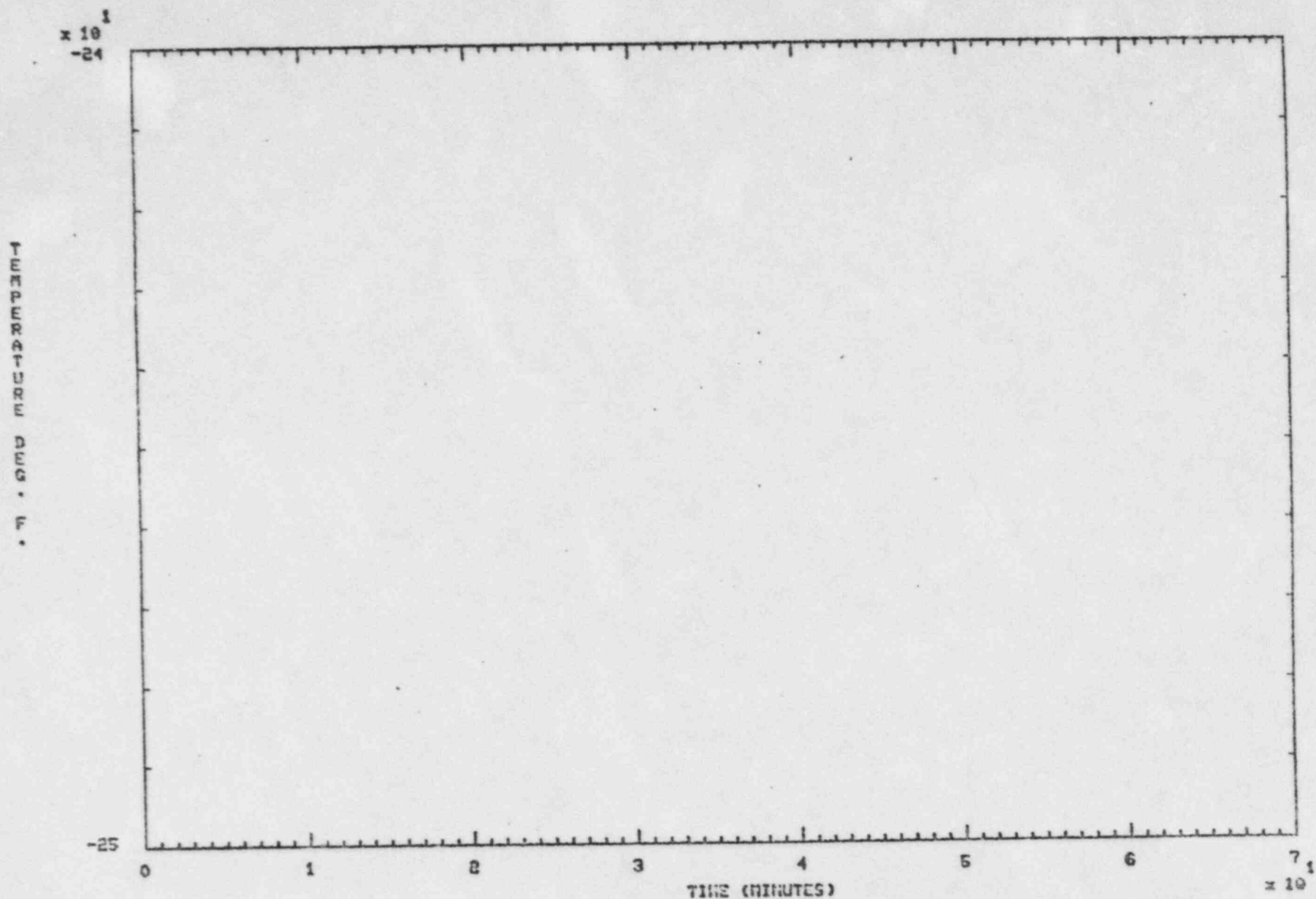


VALVE OPENS AT 10.1 SEC

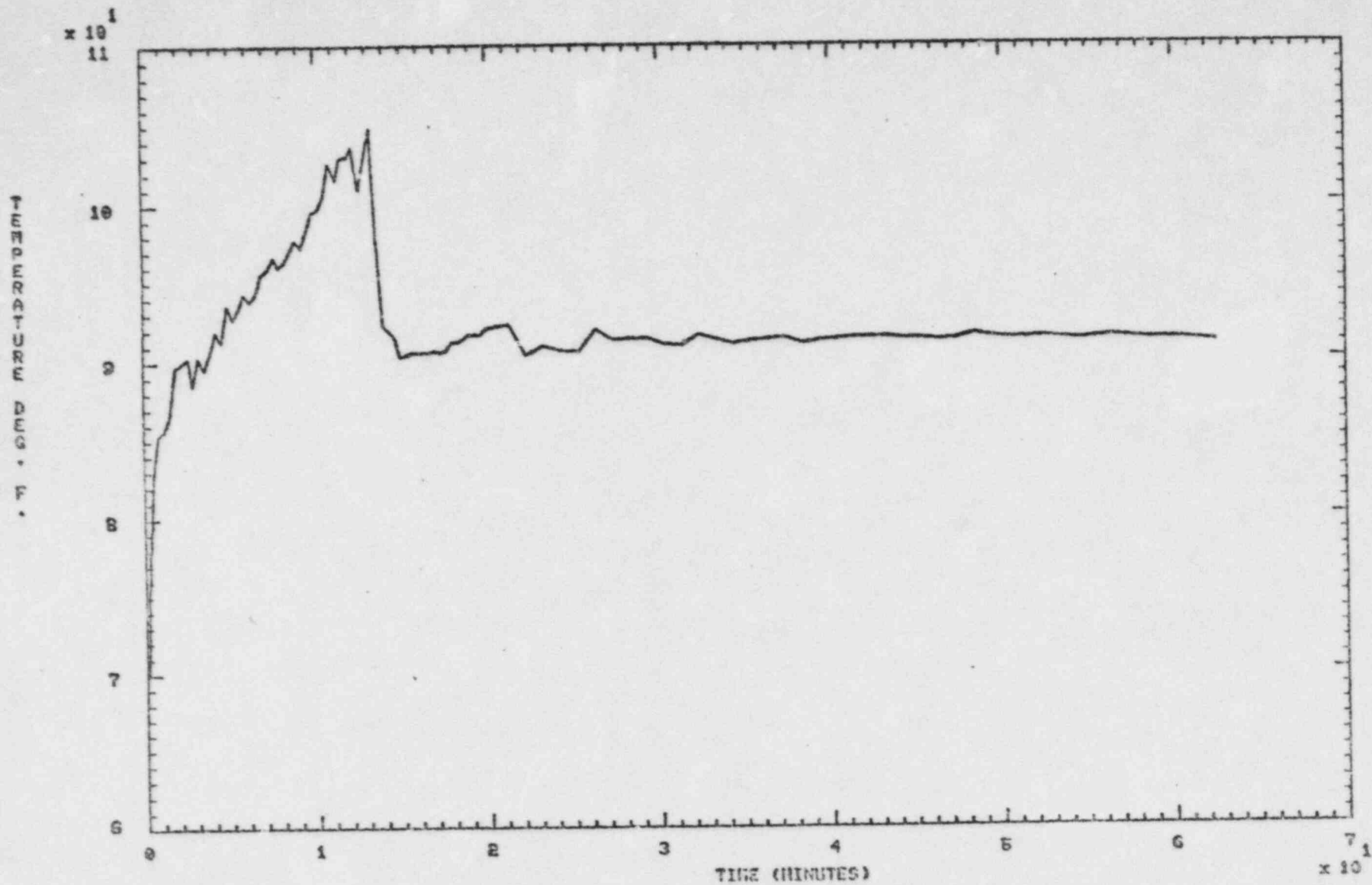
EXTENDED BLOW DOWN CECO: RUN NO. 075X TT= 4



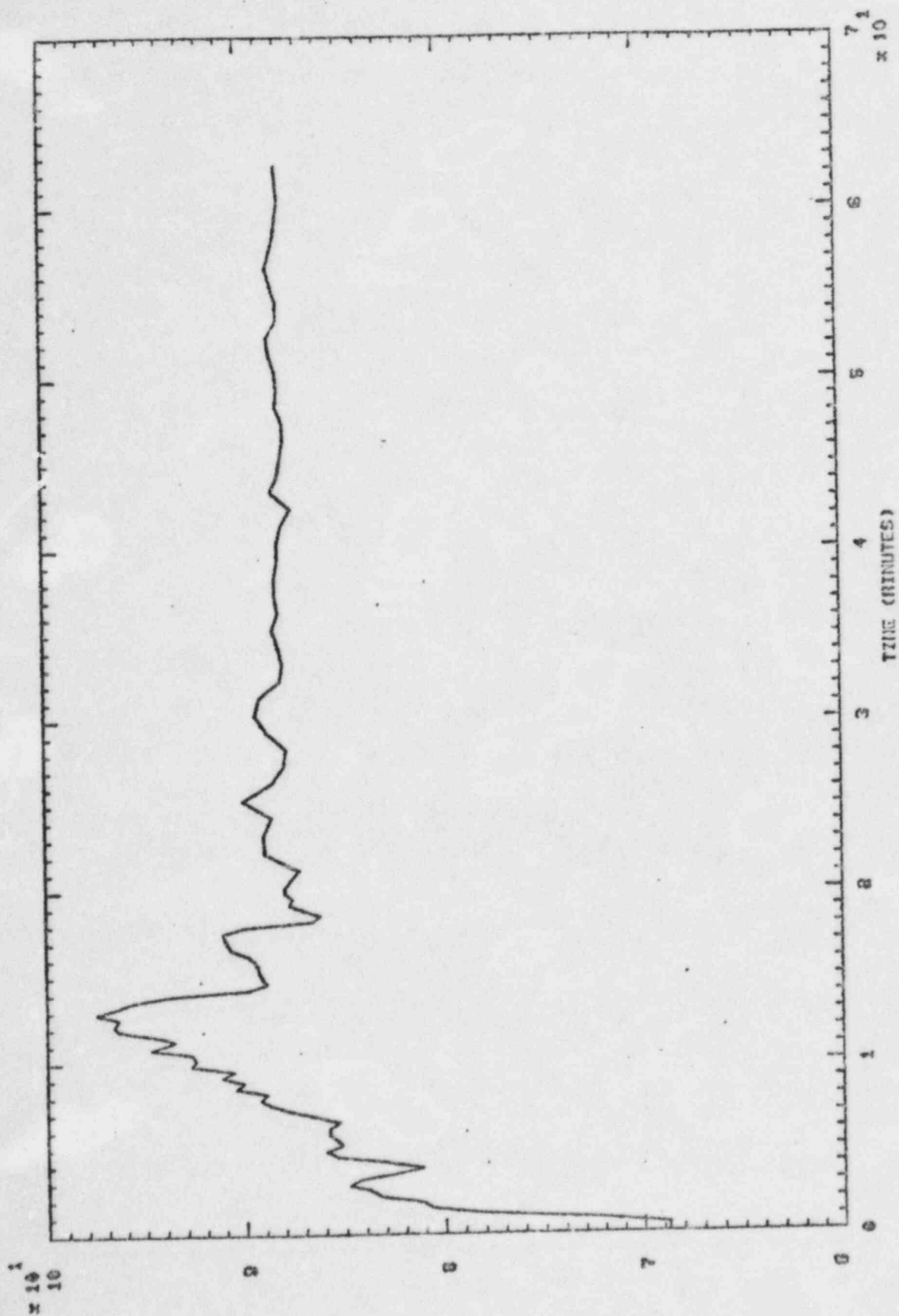
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 5



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 6

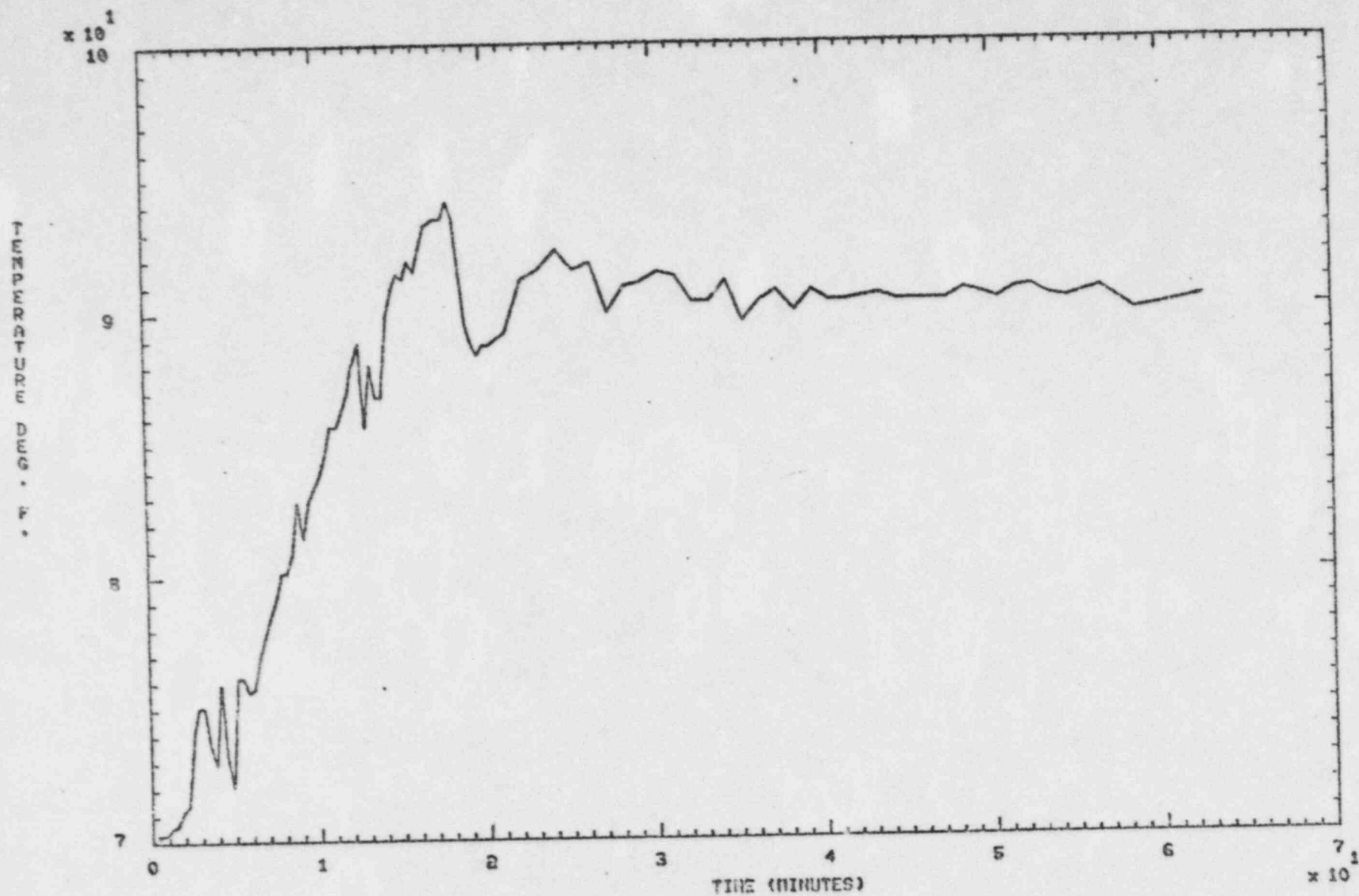


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 7

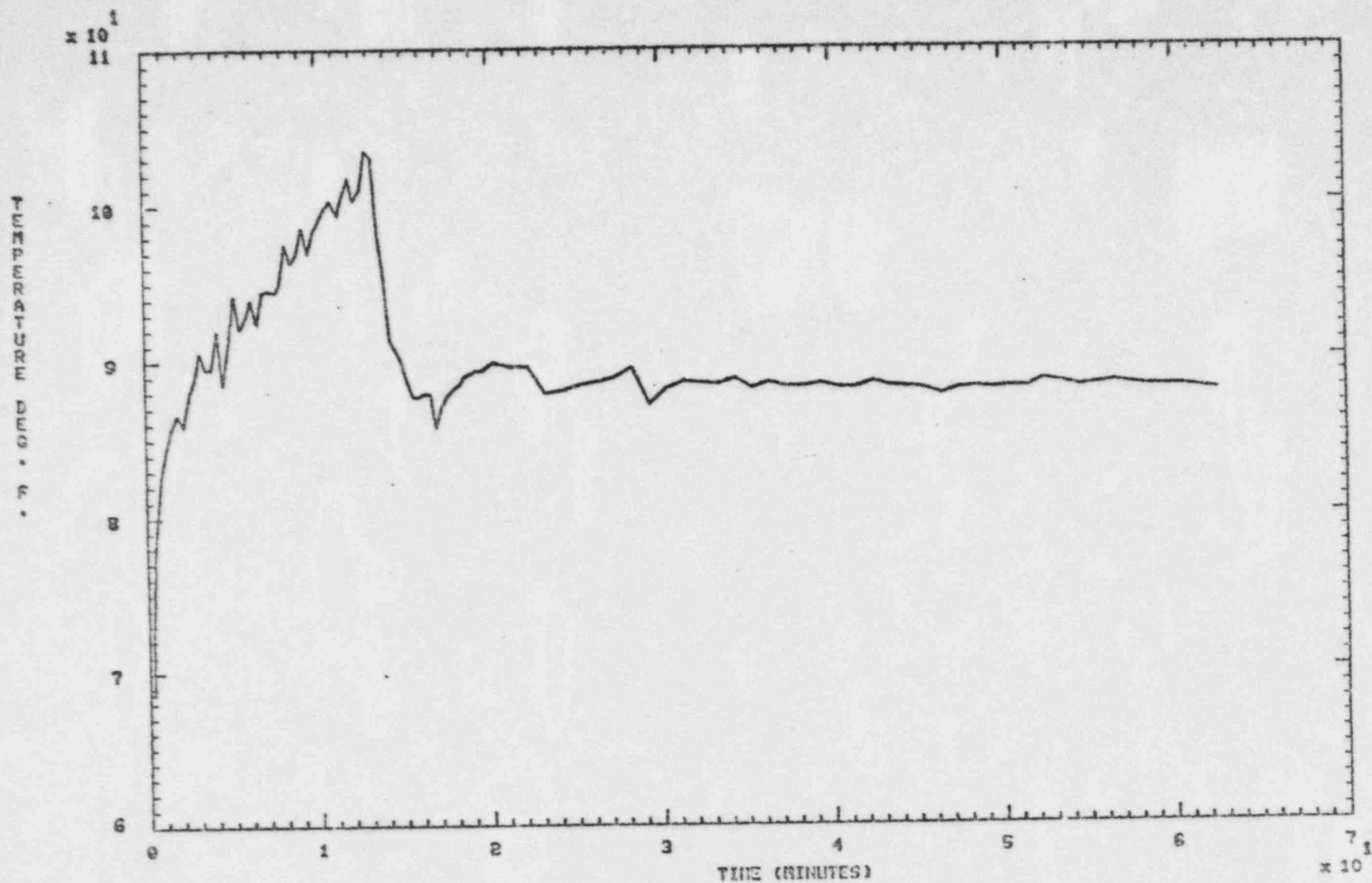


TEMPERATURE DEG. F.

EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 8
VALVE OPENS AT 10.1 SEC

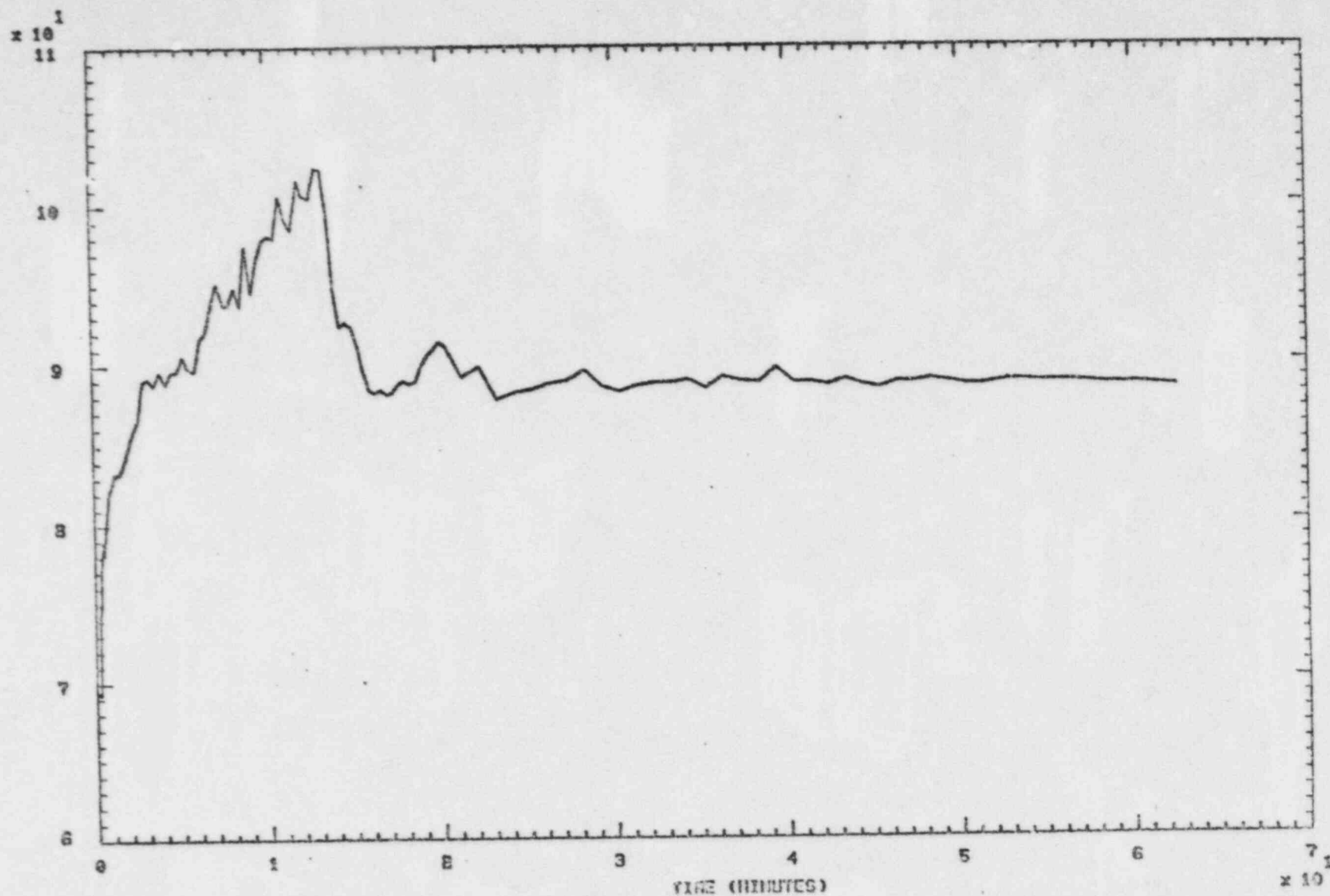


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 9



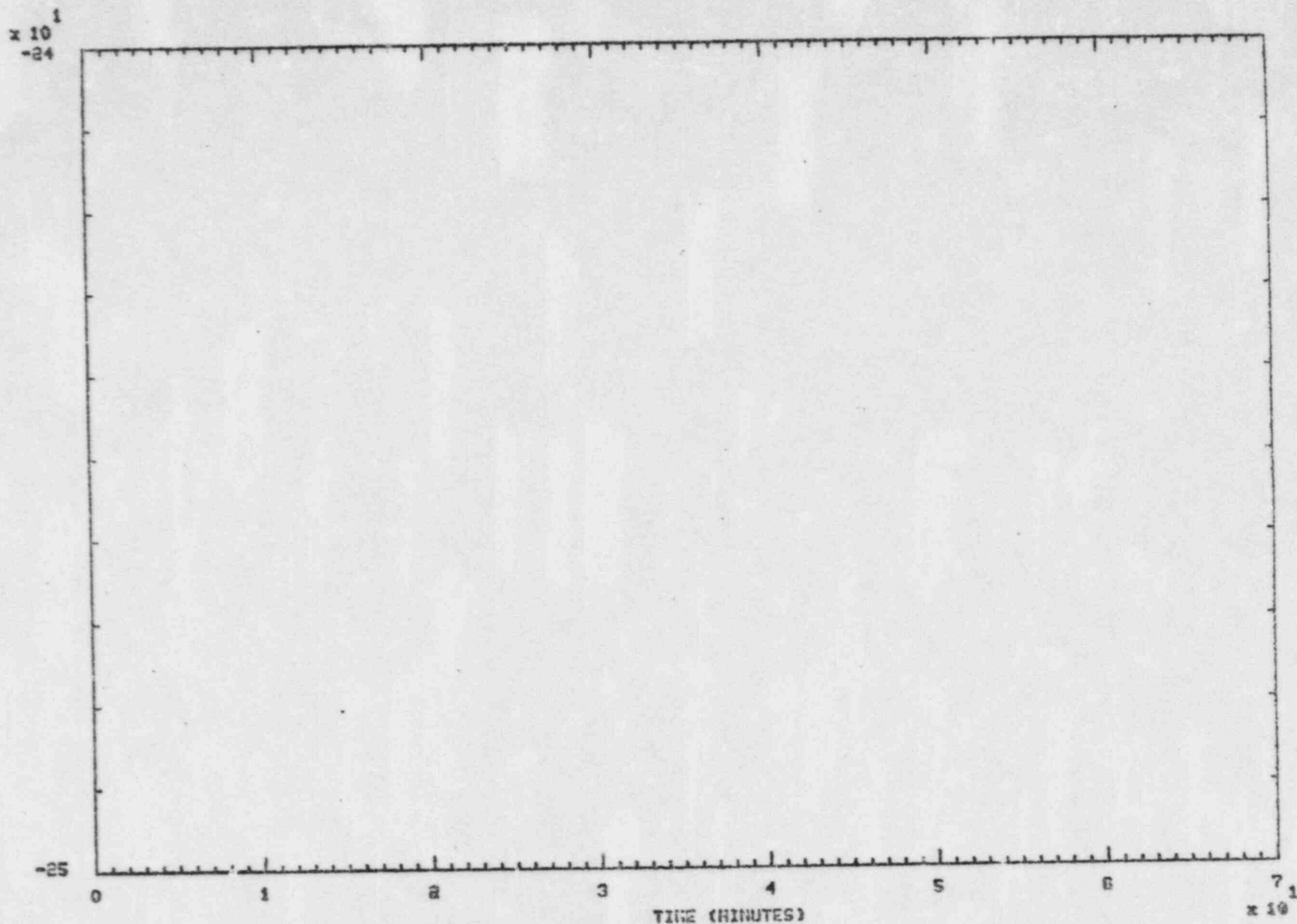
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 10

4-13-60 10:00 AM

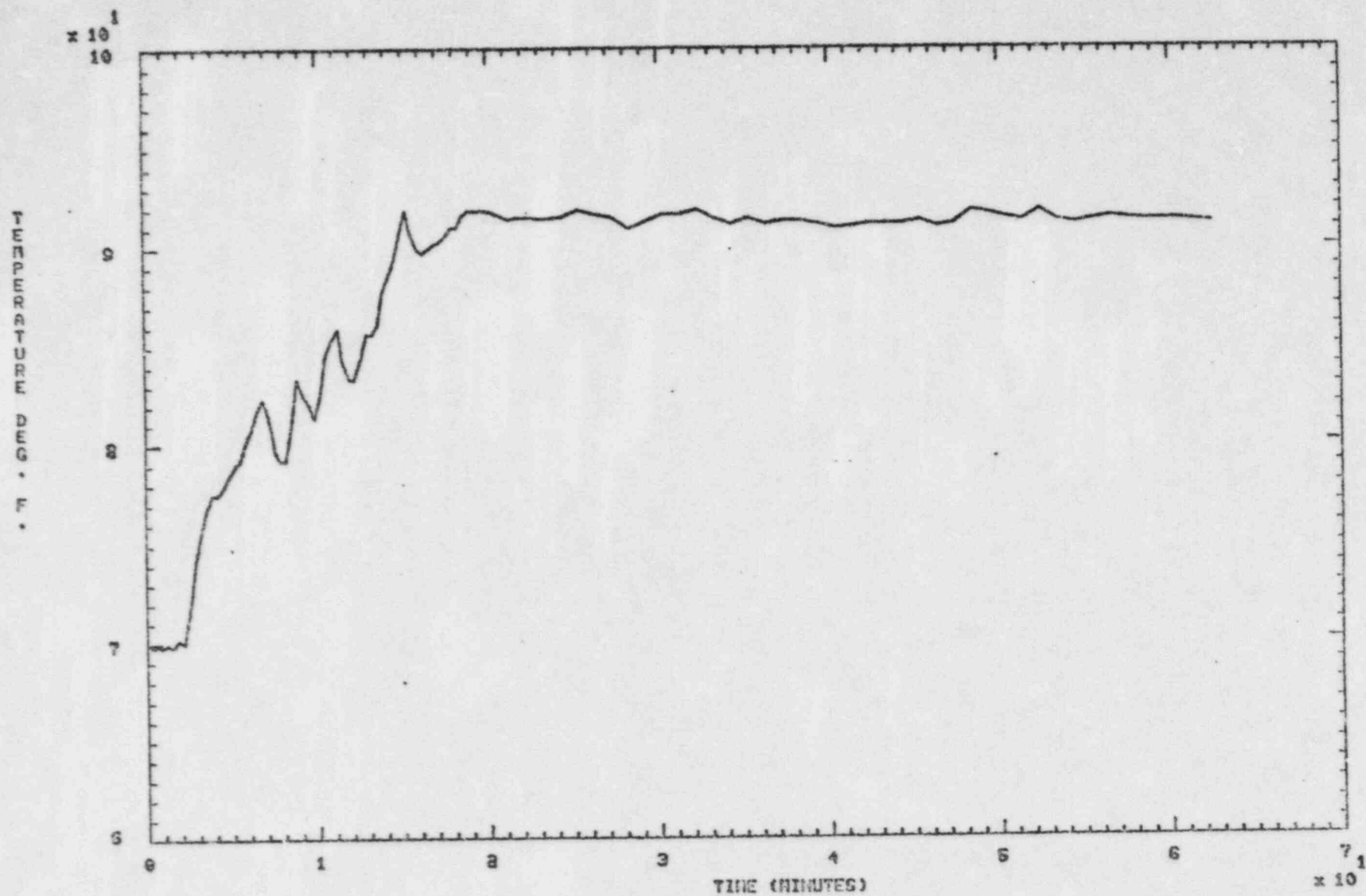


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 11

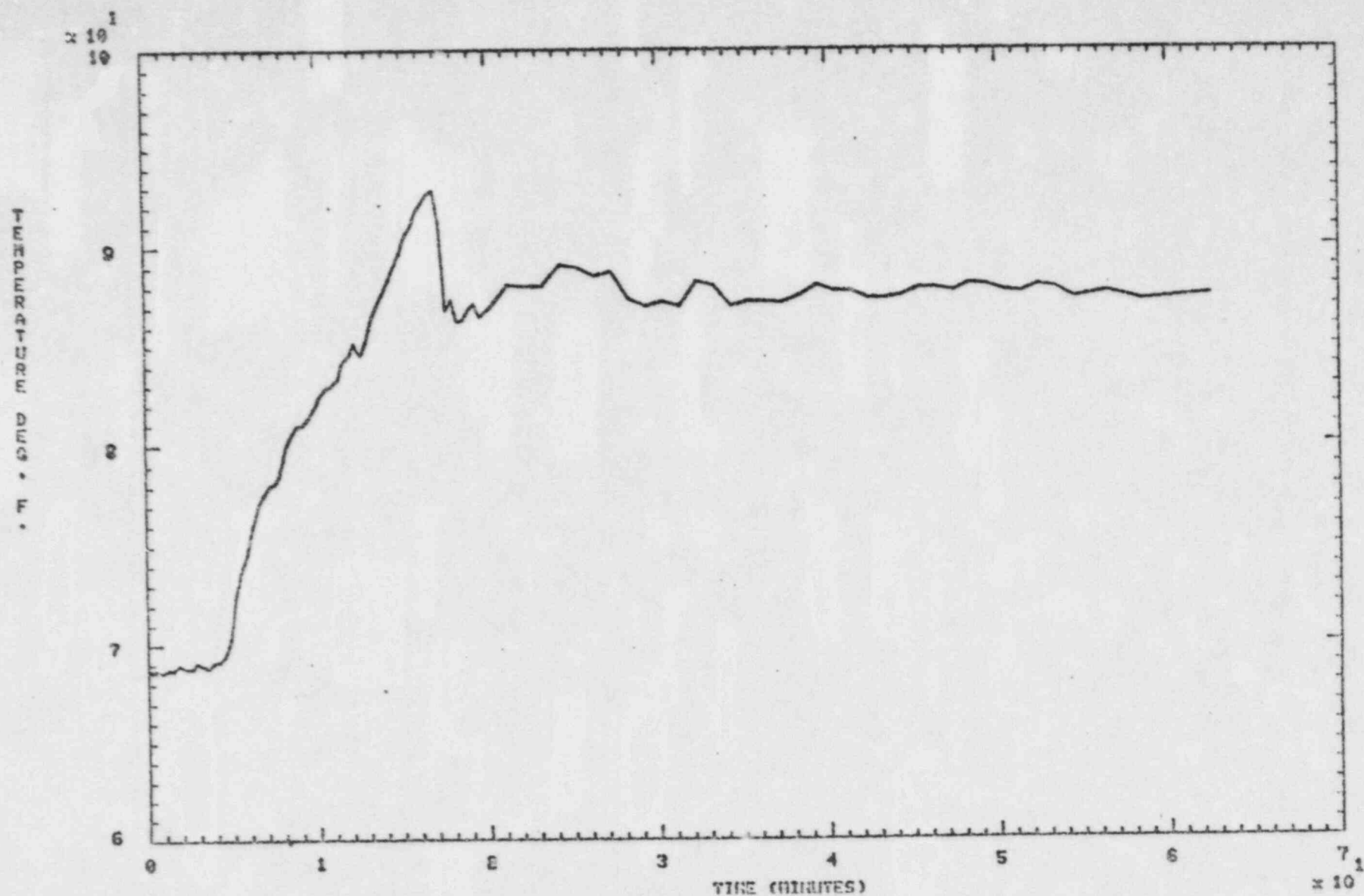
TEMPERATURE AND PRESSURE



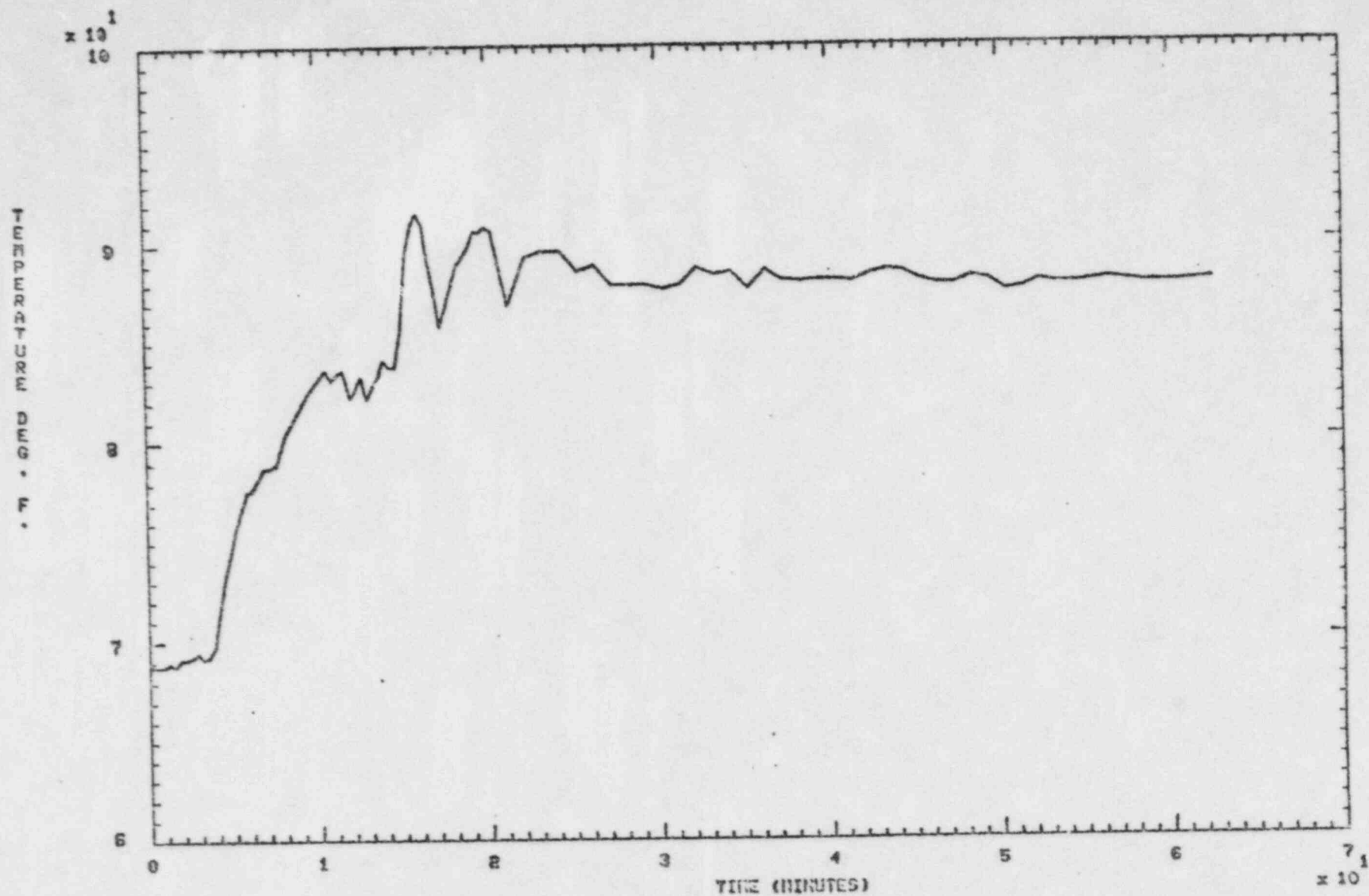
VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 12



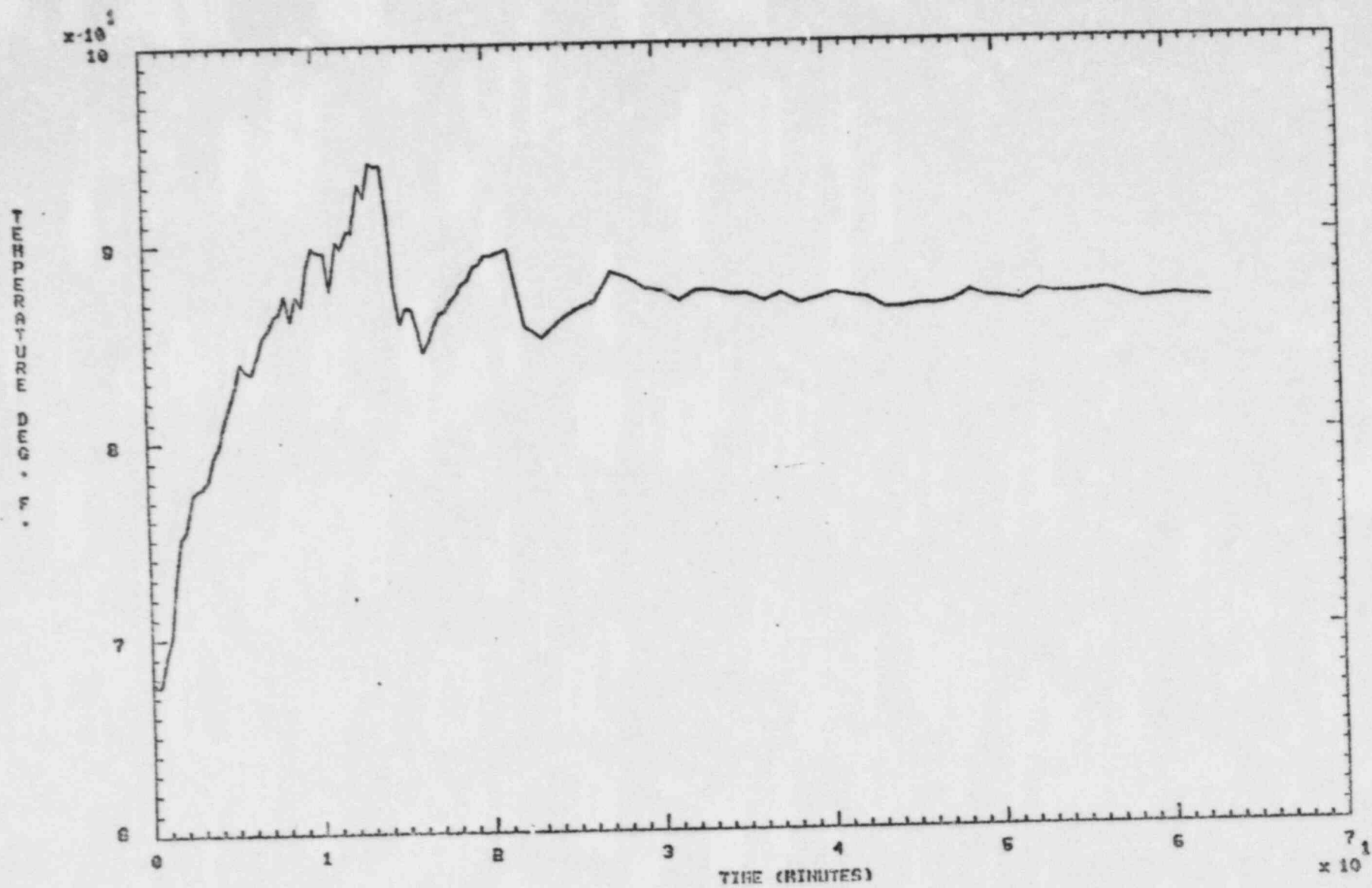
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 13



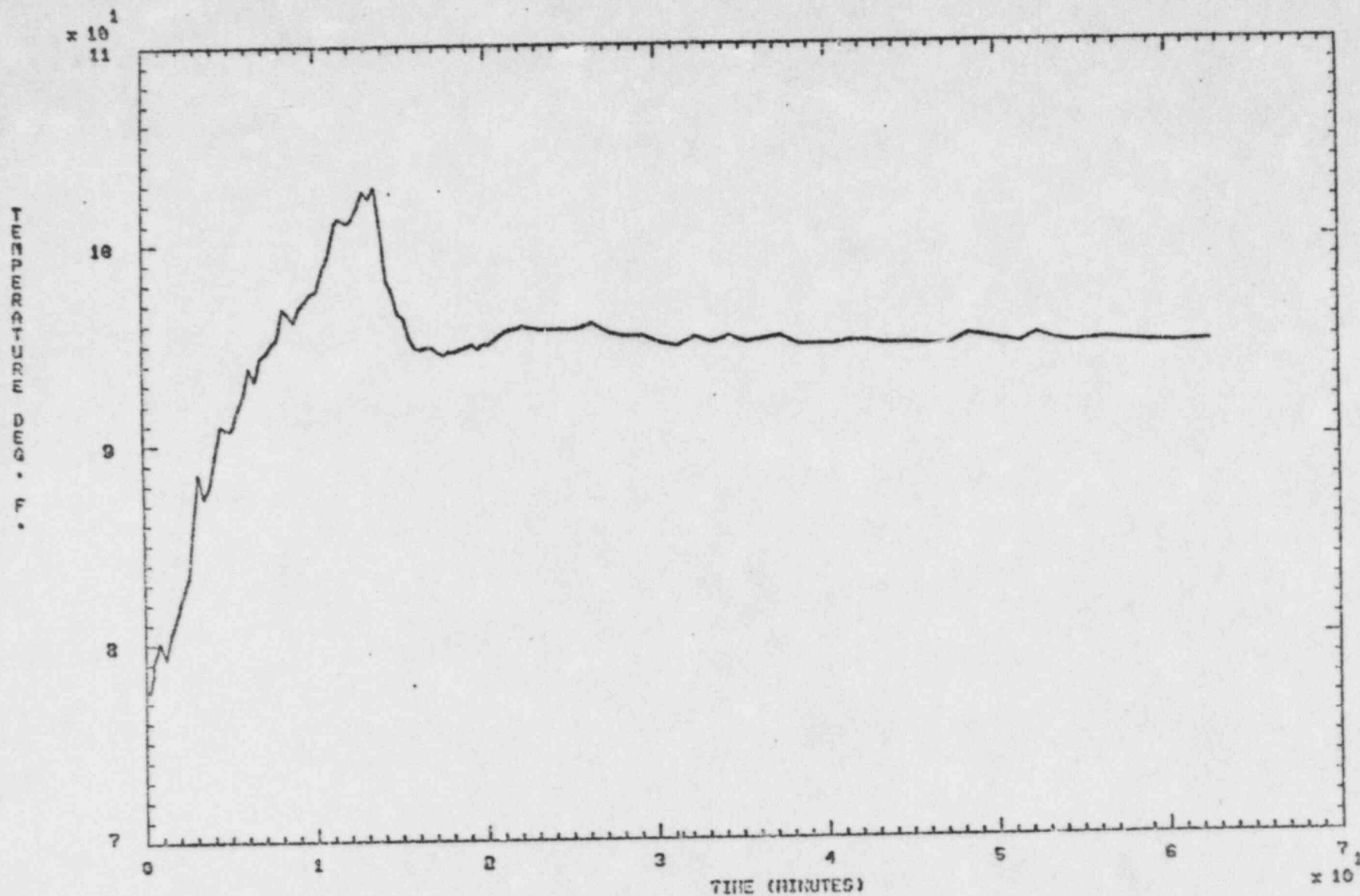
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 14



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 15

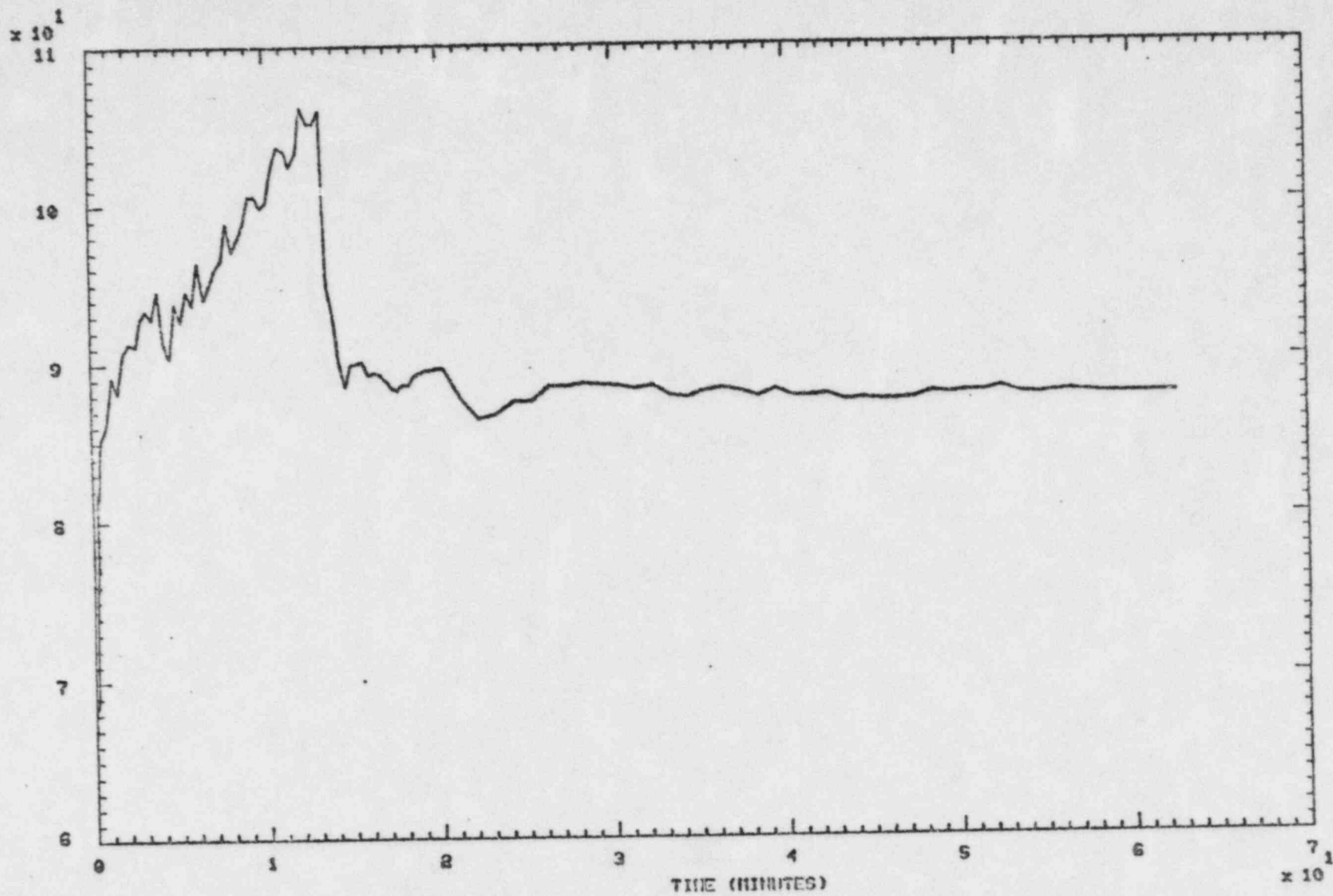


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 16

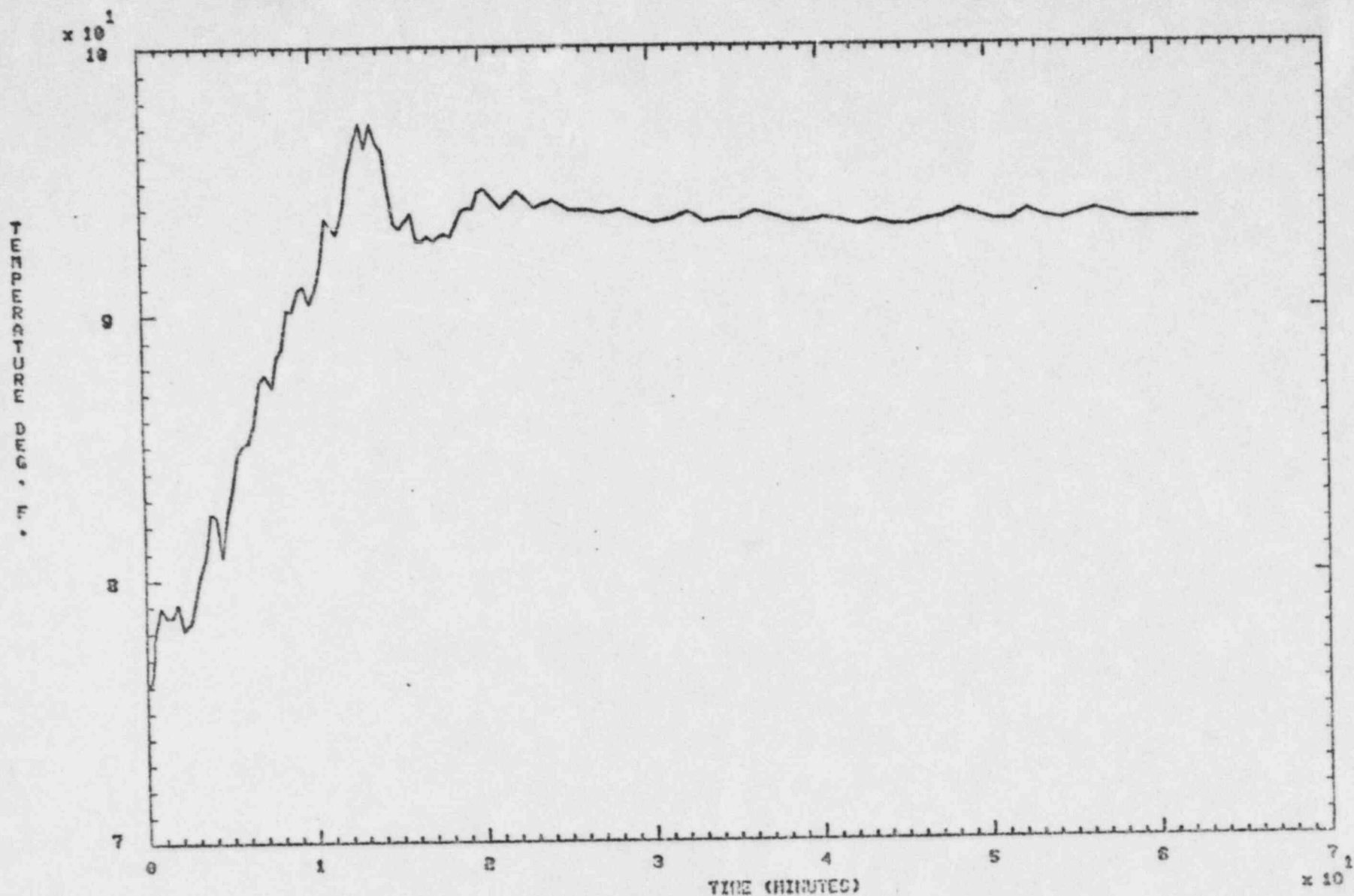


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 17

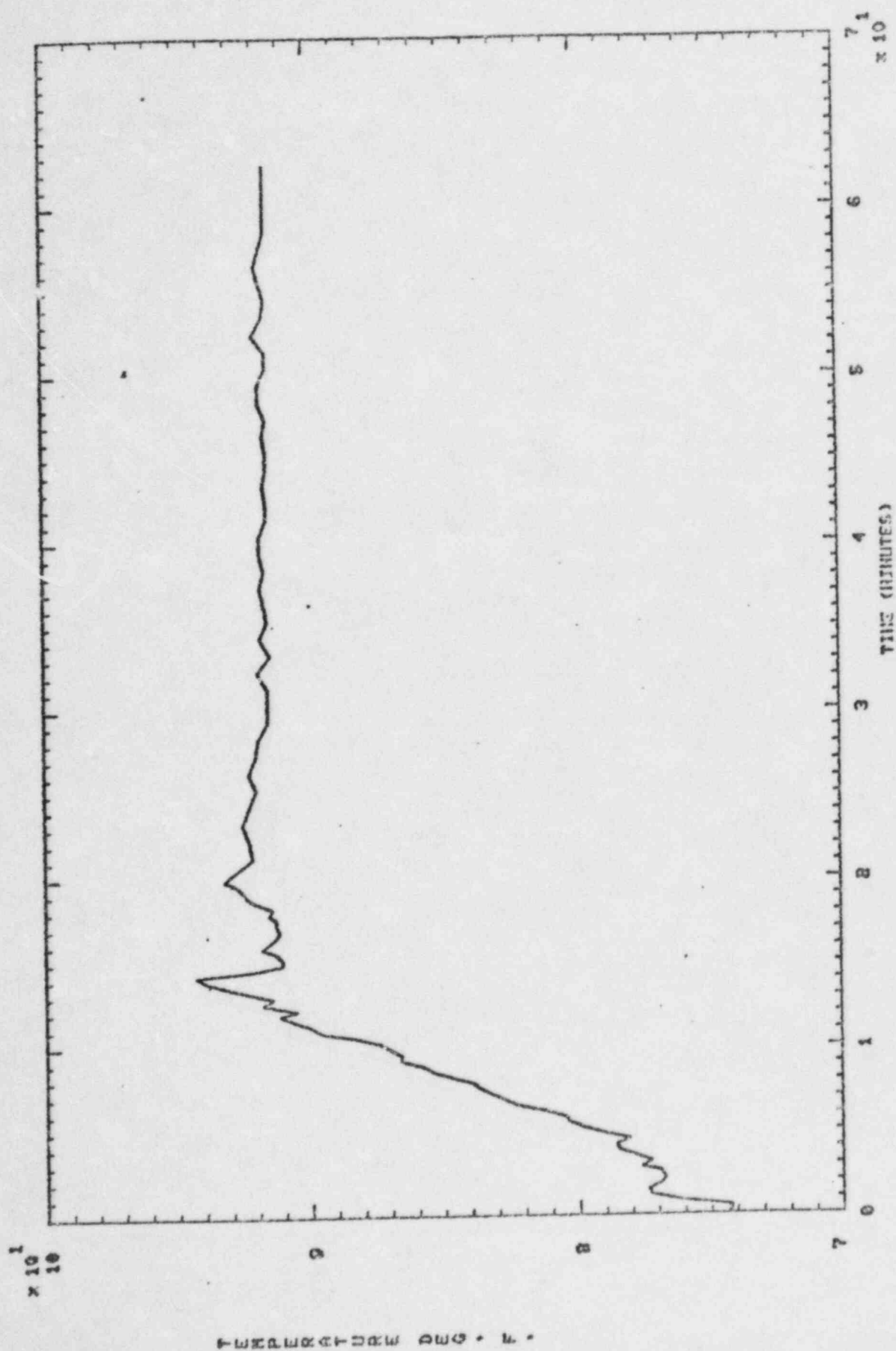
TEMPERATURE (°C)



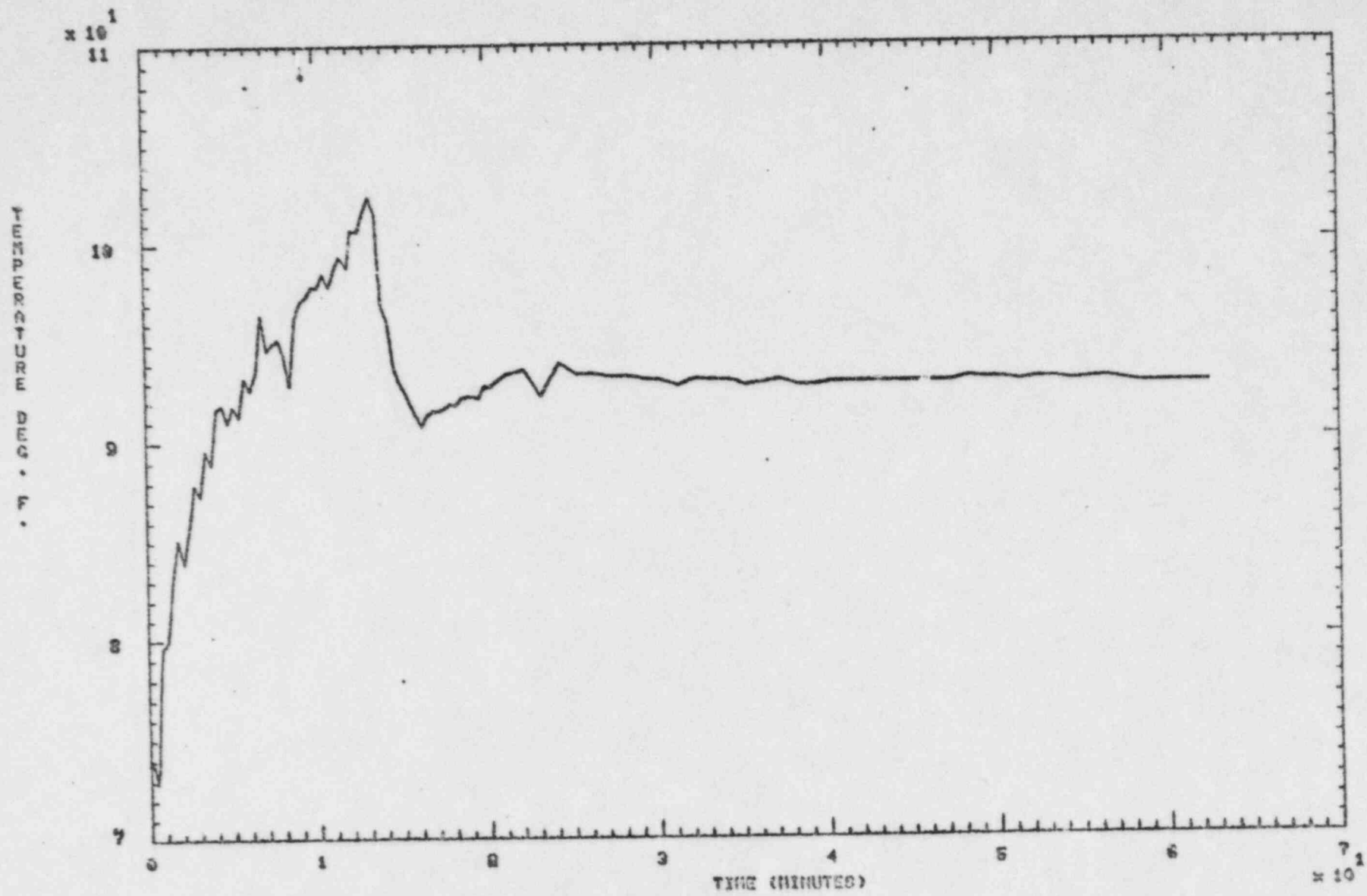
VALUE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 18



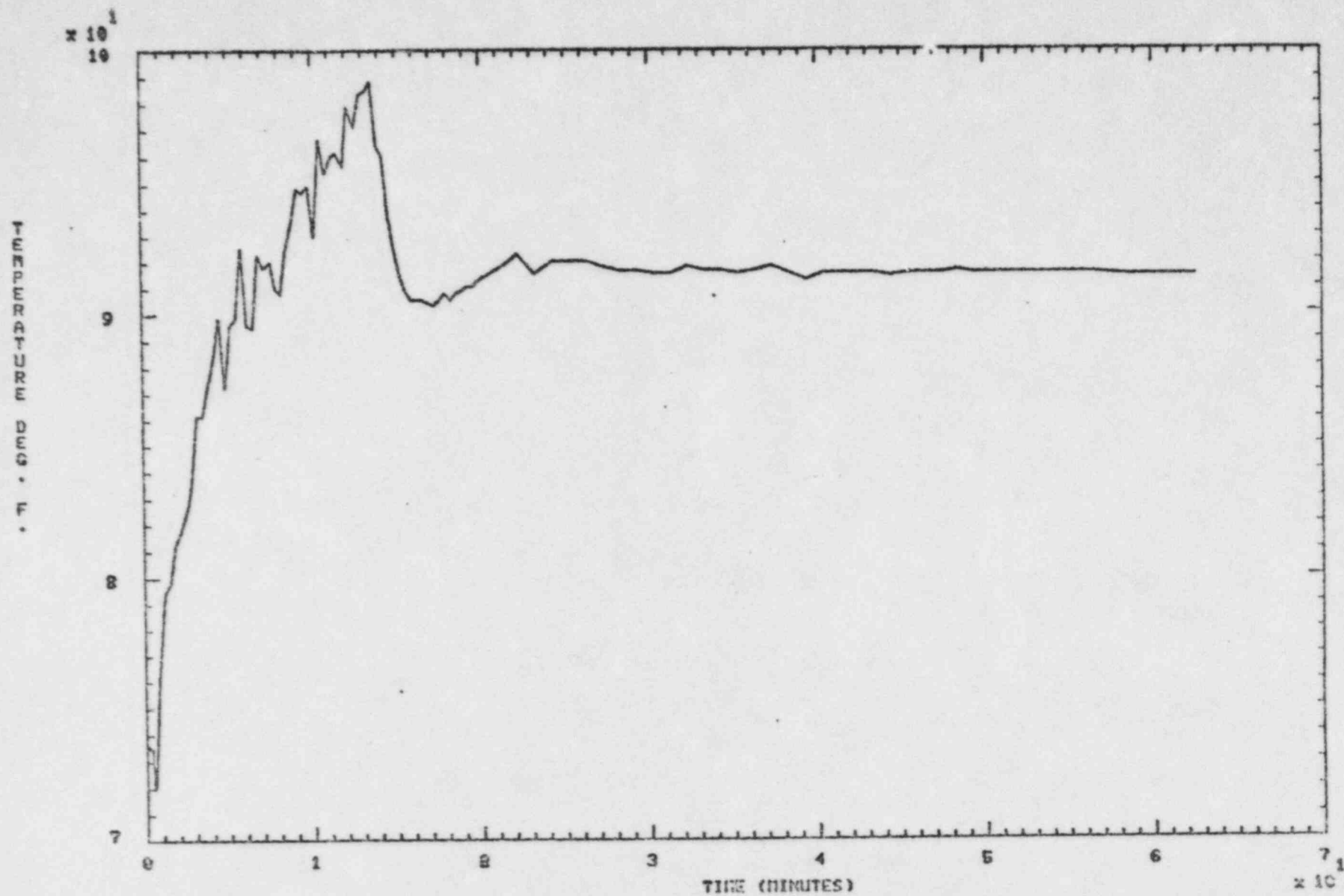
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 19



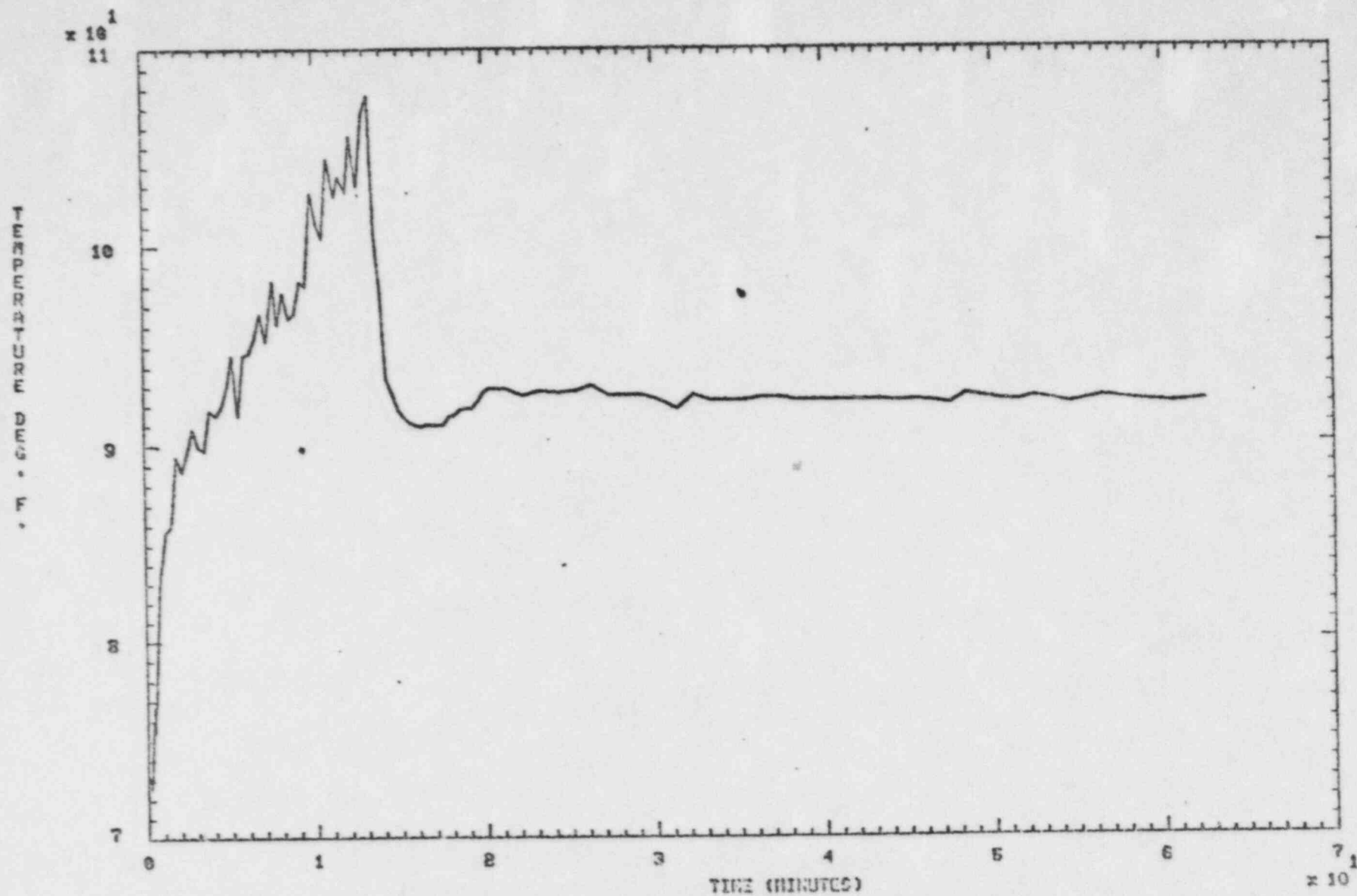
UVALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 20



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 21

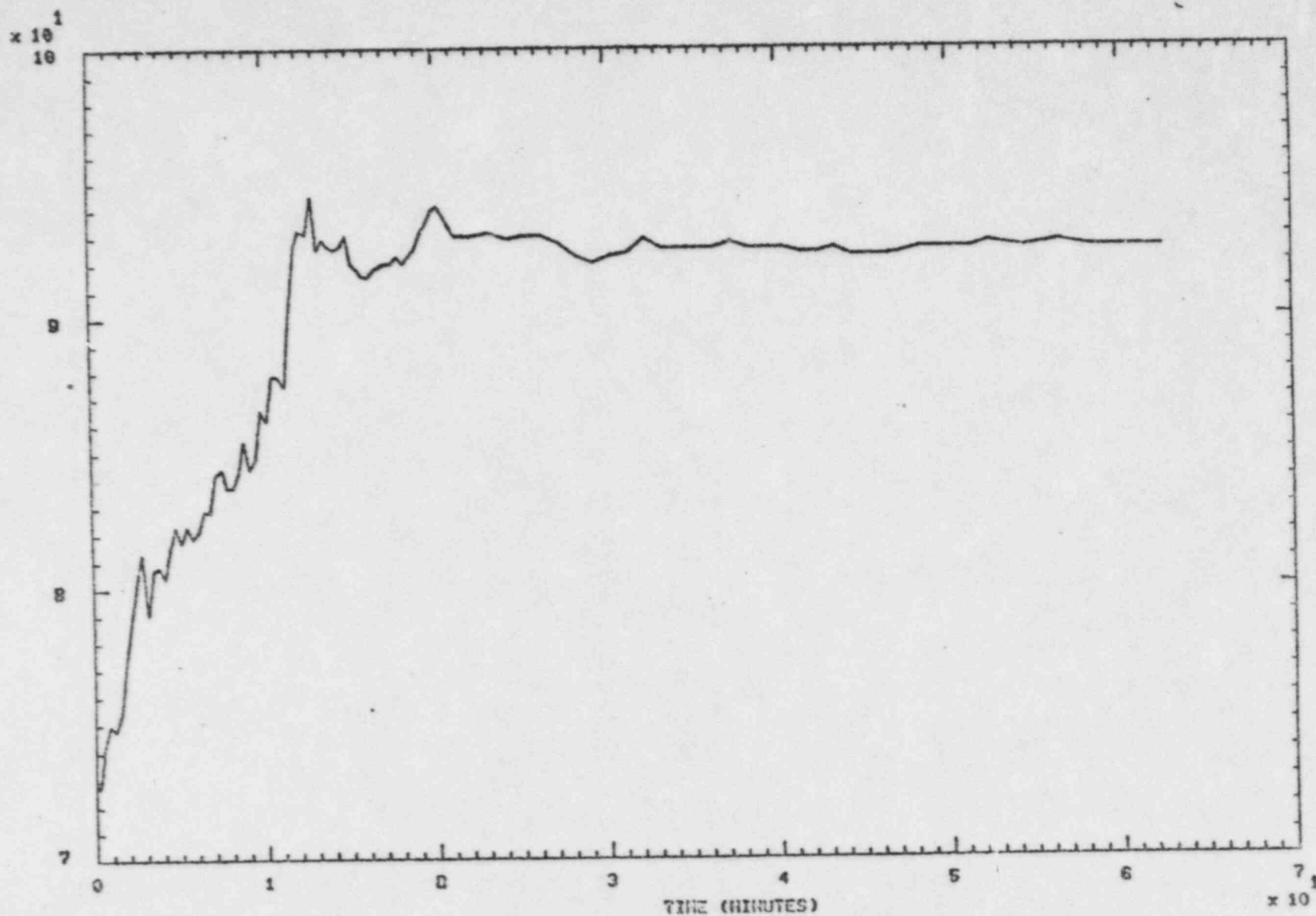


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 22

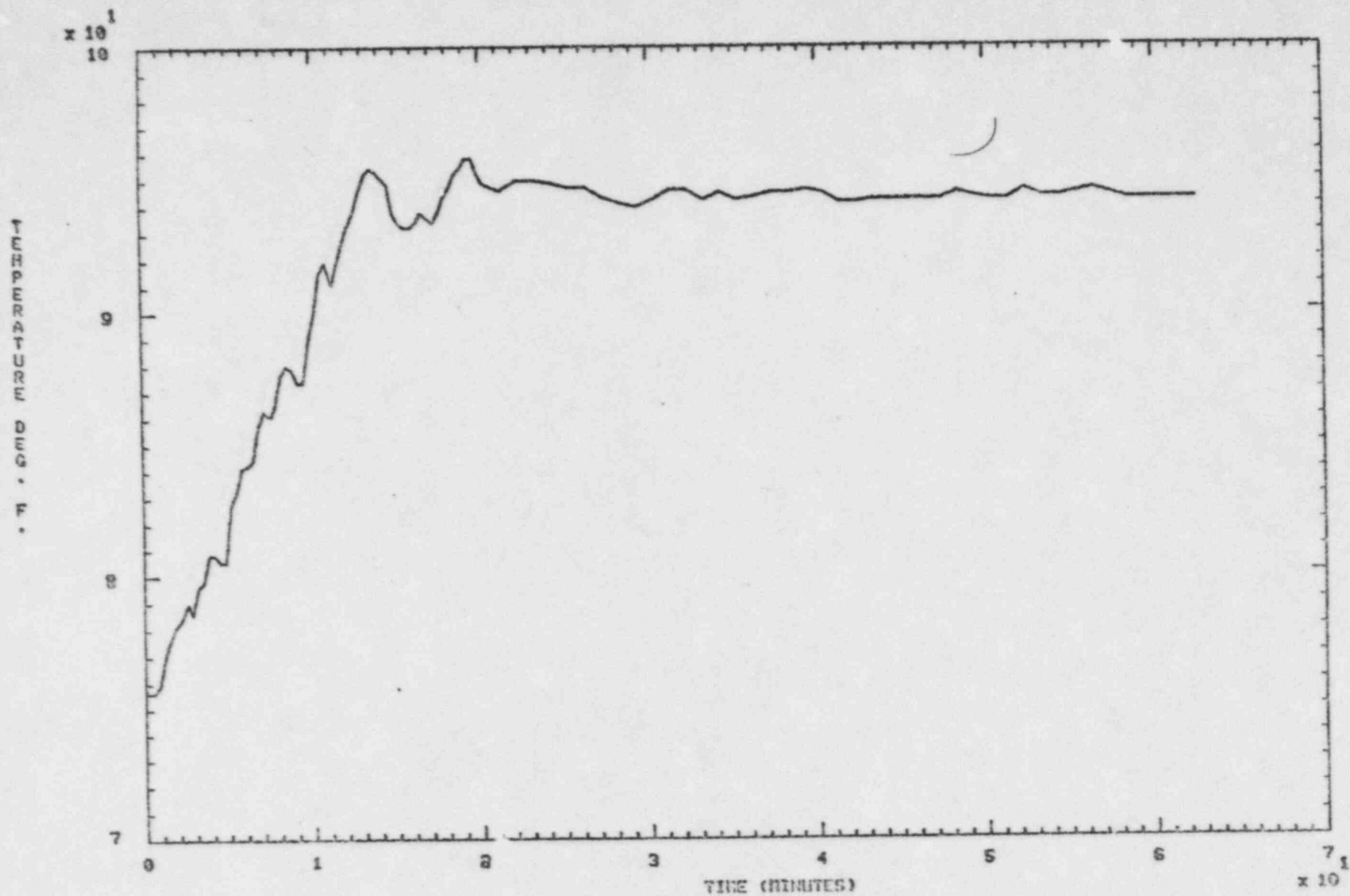


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 23

4-12-64 CEC-4200

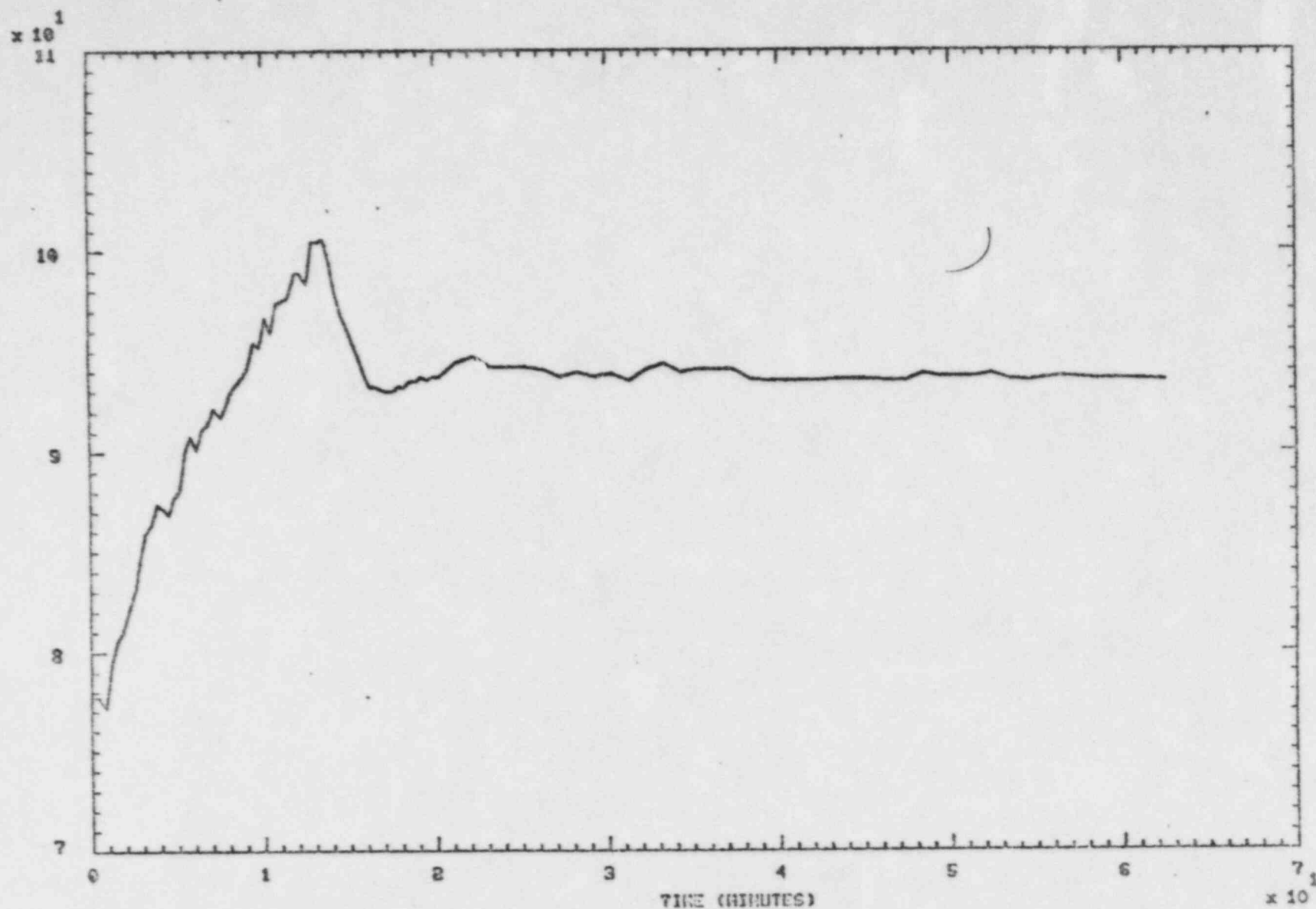


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 24



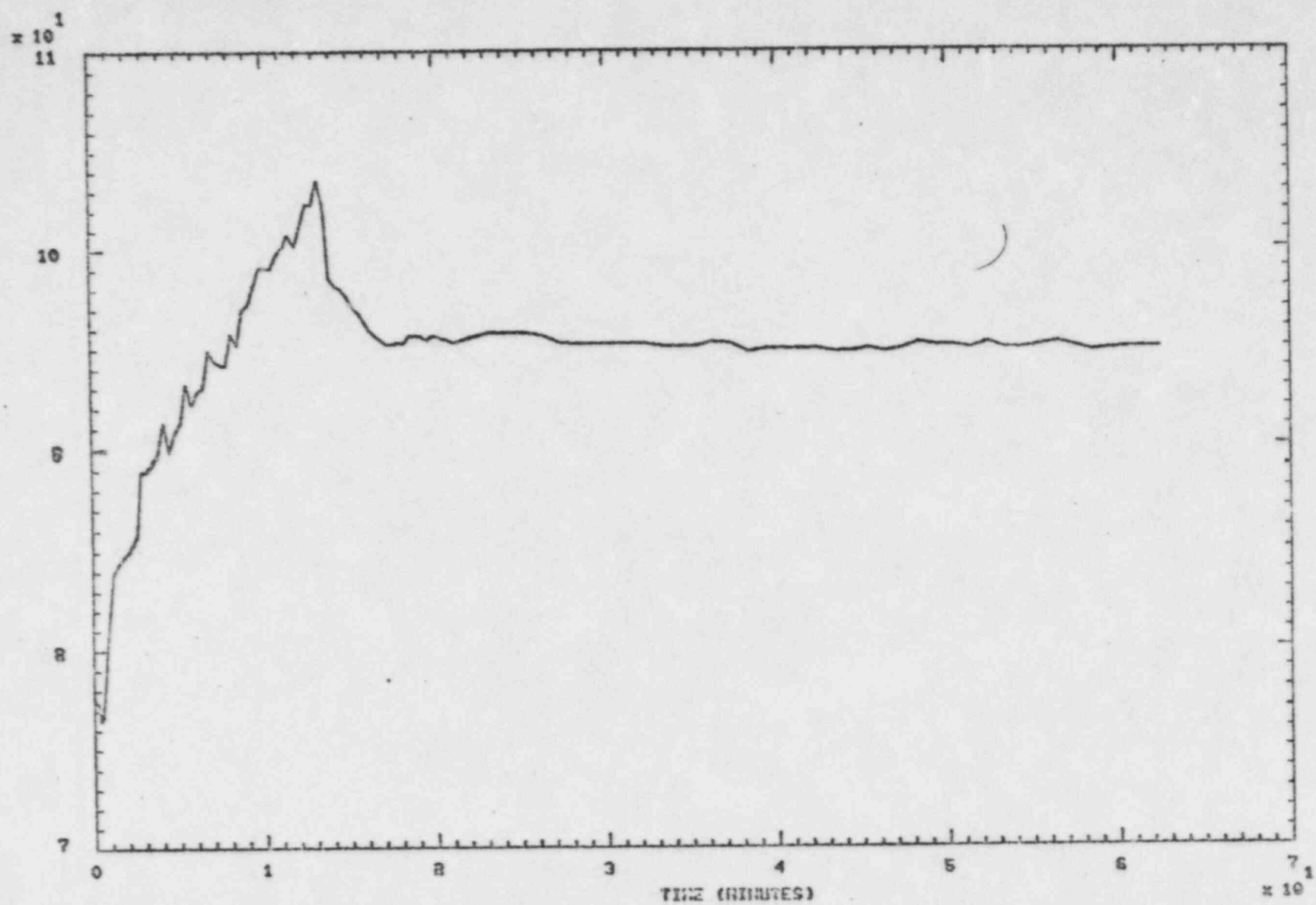
VALVE OPENS AT 10.1 SEC .
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 25

Pressure (PSI) vs. Time (min)

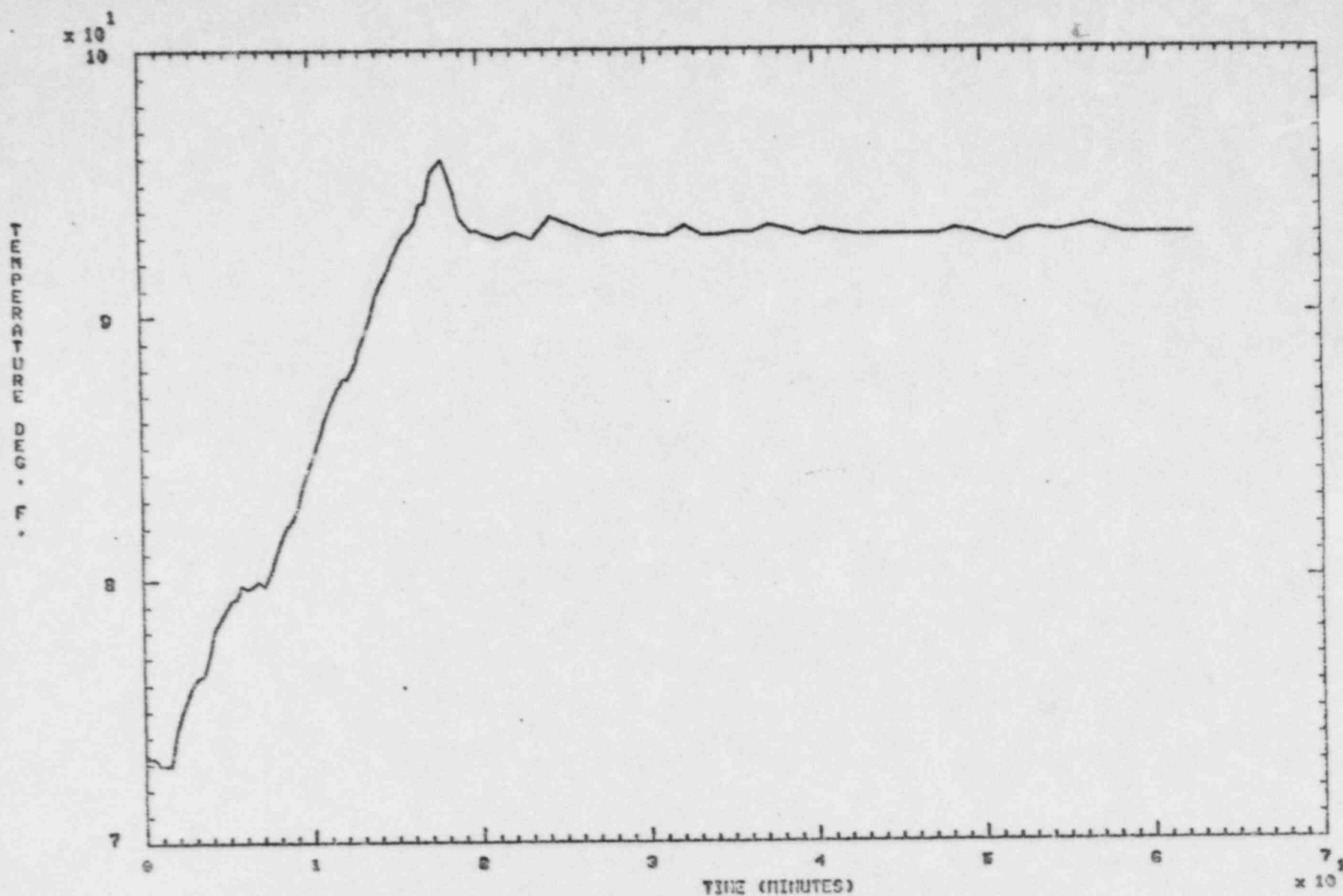


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 26

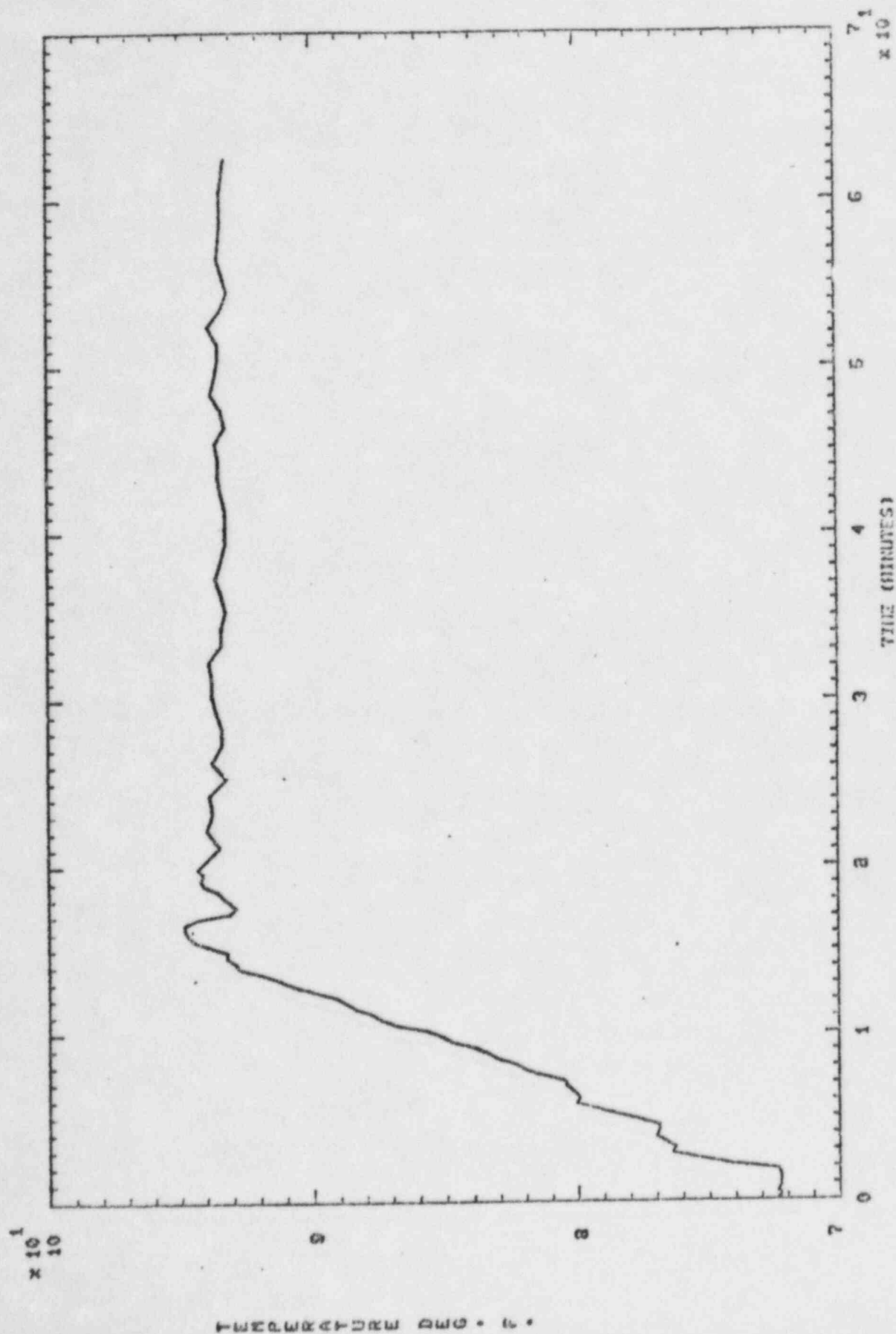
• 11 - 0000 0000-00000000-0



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 27

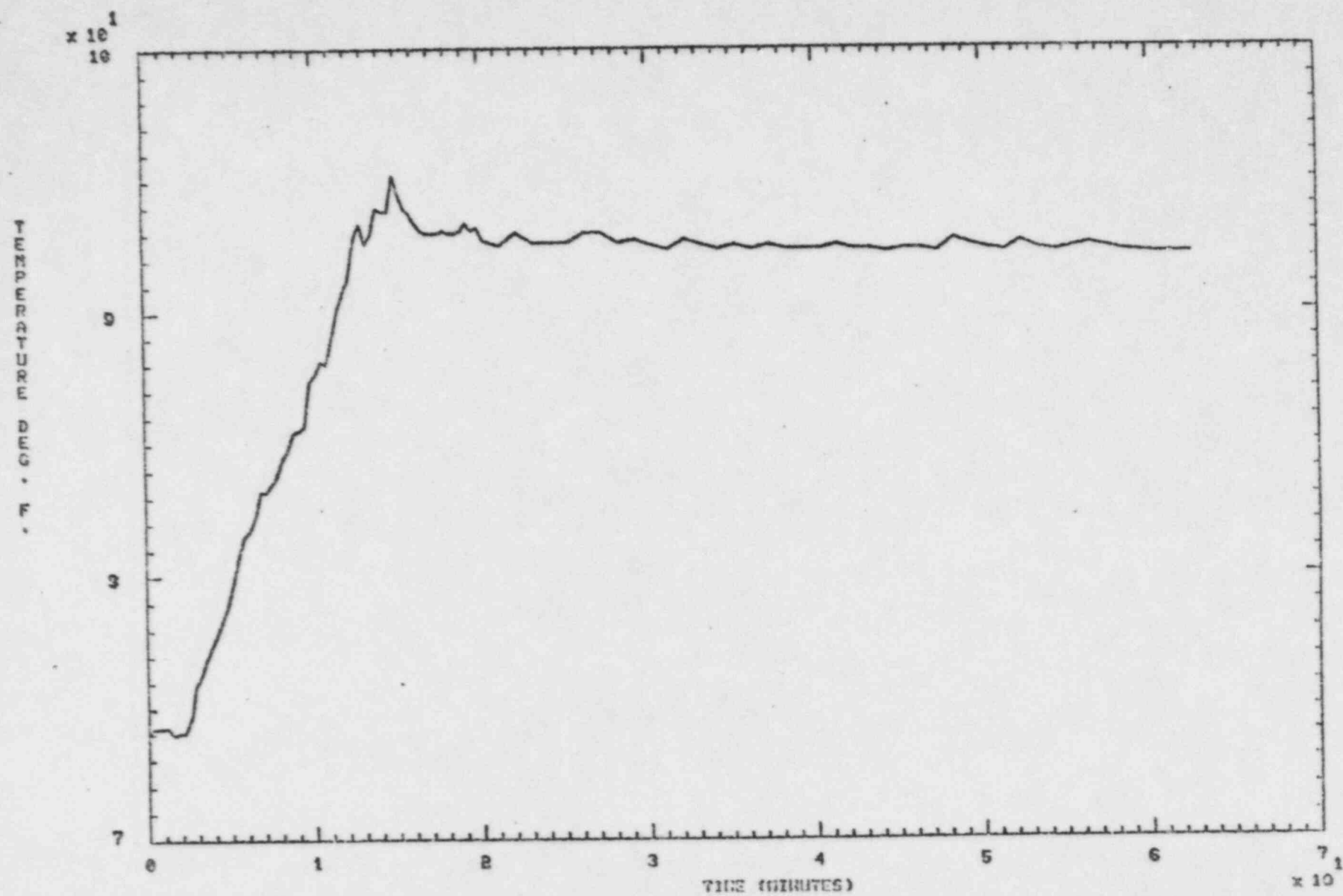


VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 28

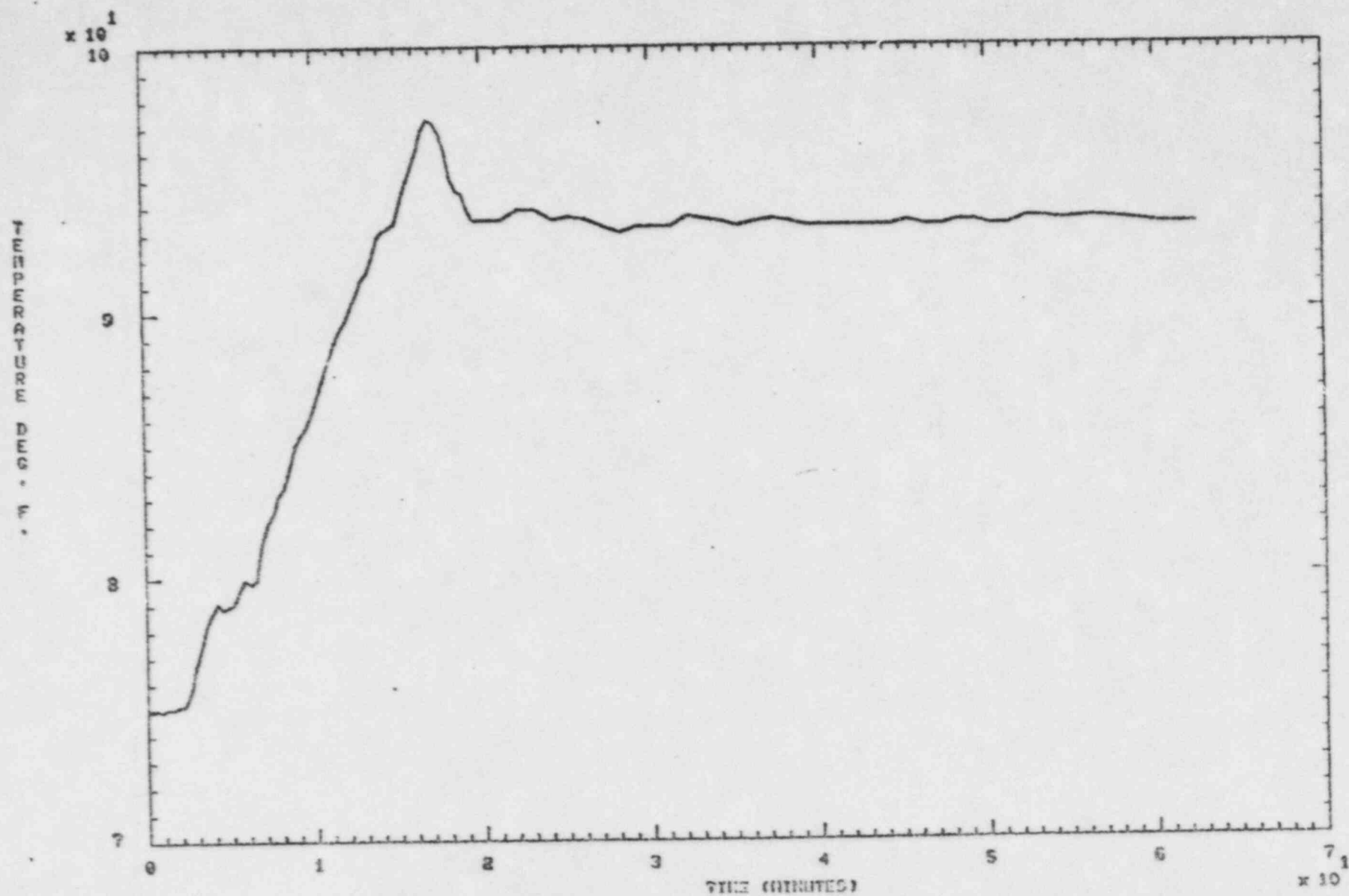


VALVE OPENS AT 10.1 SEC

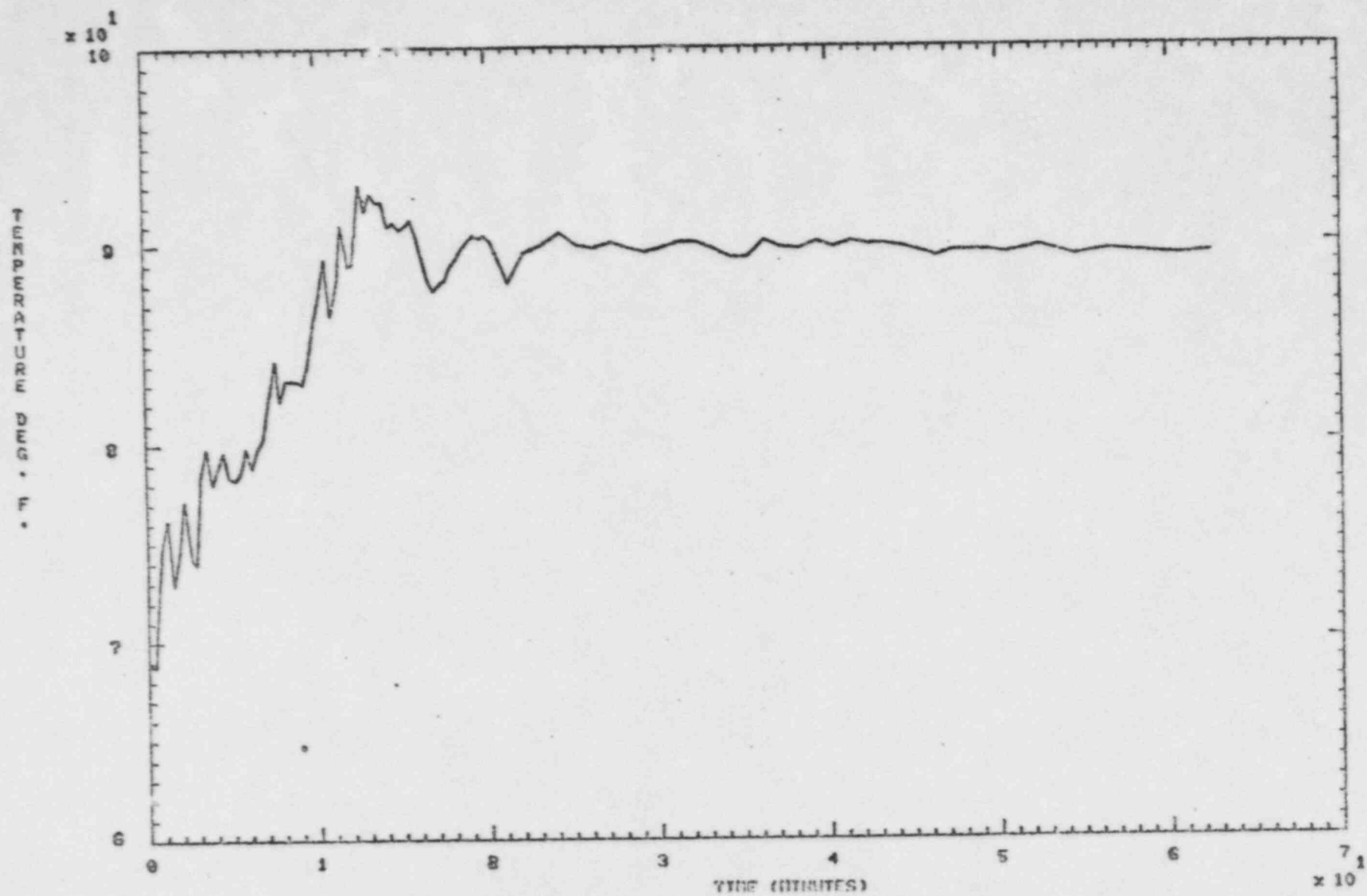
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 29



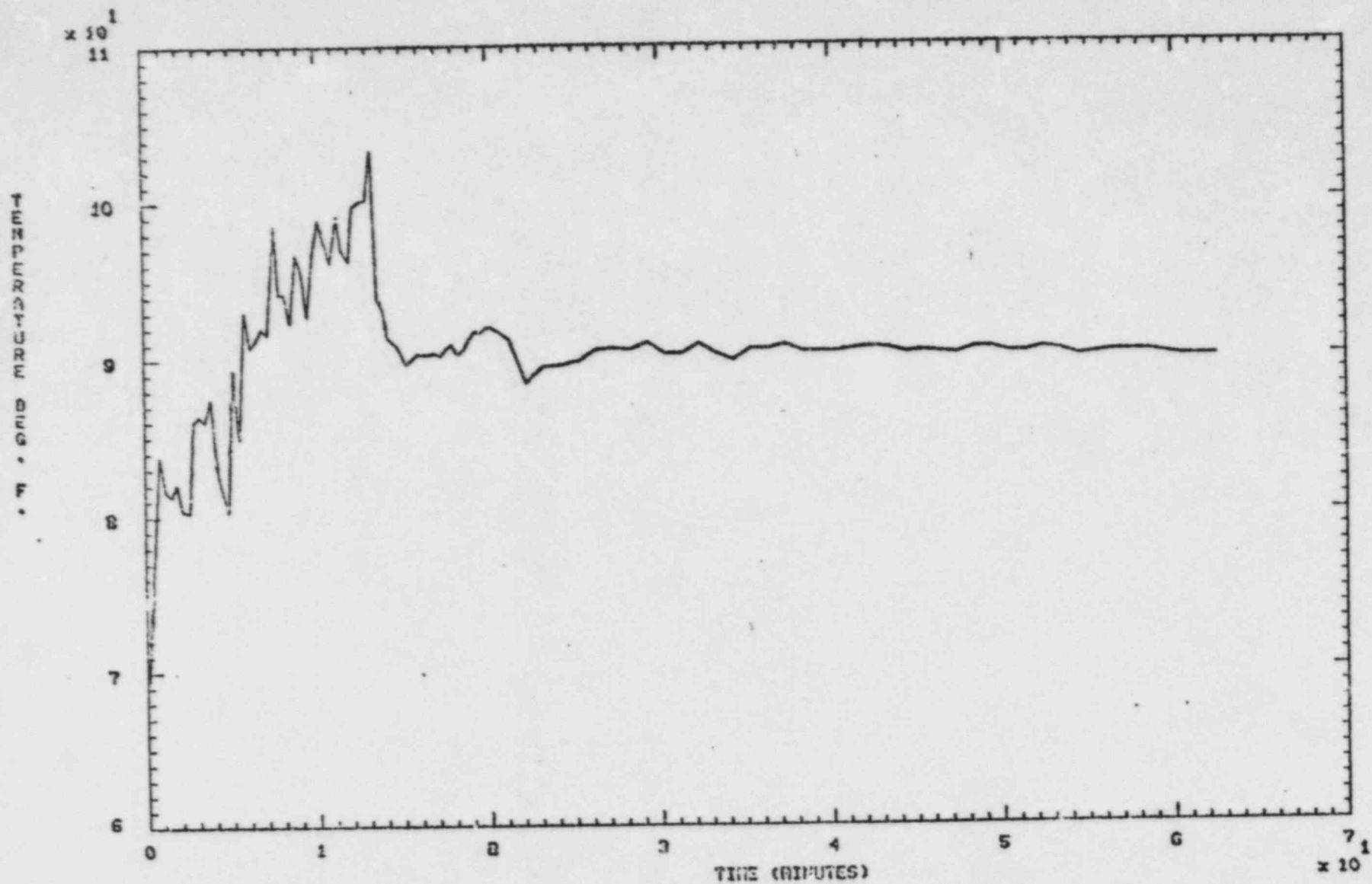
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 30



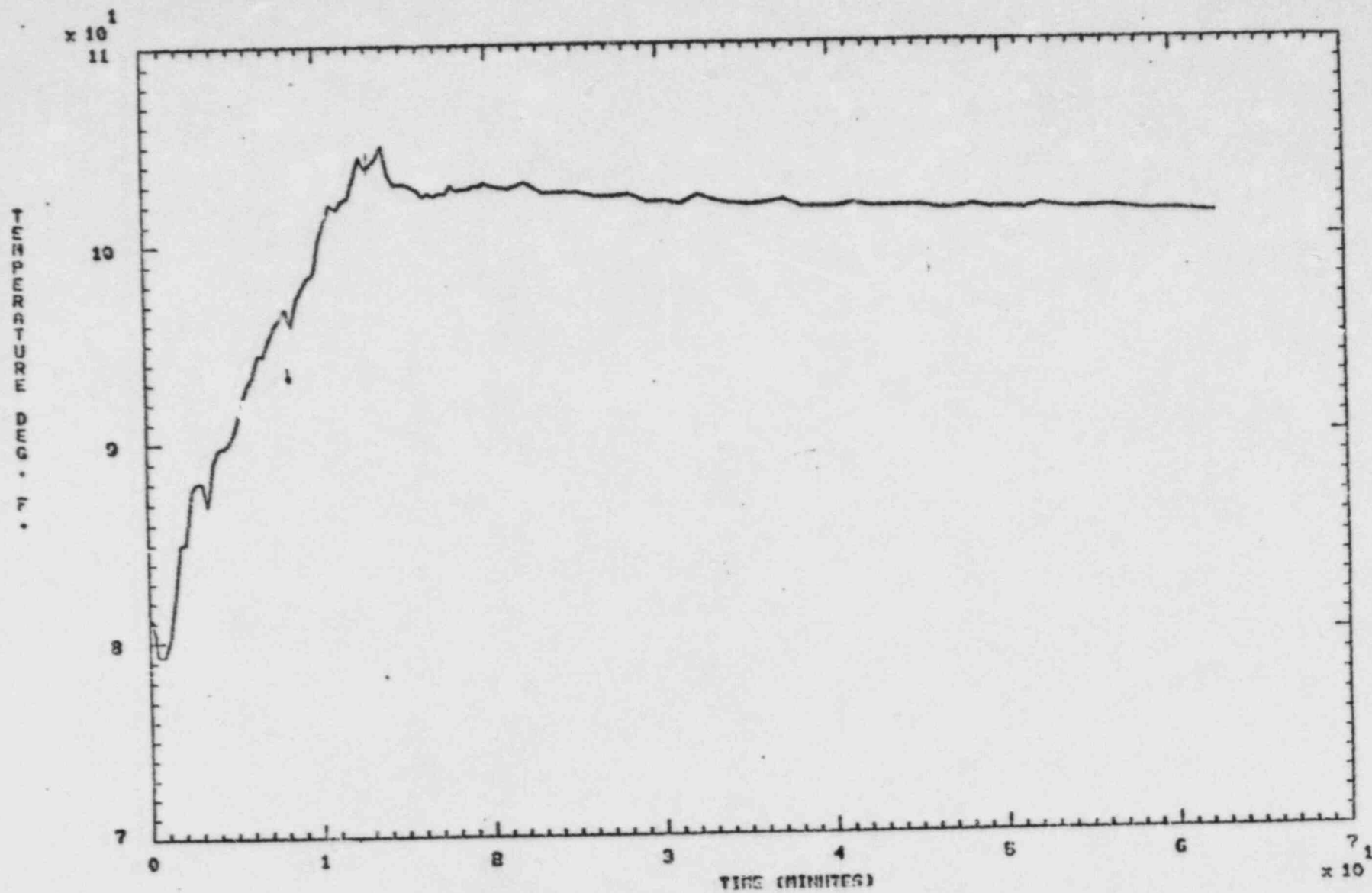
VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 31



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 32



VALVE OPENS AT 10.1 SEC .
EXTENDED BLOW DOWN CECO RUN NO. 075X TT= 33



VALVE OPENS AT 10.1 SEC
EXTENDED BLOW DOWN CECO RUN NO. 075X TTⁿ 48