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TO: Mr. Edson G. Case	FROM: Westinghouse Electric Corp. Pittsburgh, Pa. M. H. Judkis
DATE OF DOCUMENT	11/18/77
DATE RECEIVED	11/21/77

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DESCRIPTION

ENCLOSURE

Documentation of the presentation made to the NRC on 11/11/77 re. the D. C. Cook steam generator enclosure pressure analysis.....

PLANT NAME : Cook Unit No. 2 (2-P) (10-P)
RJL 11/21/77

40 ENCL

FOR ACTION/INFORMATION

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BRANCH CHIEF:	KNIEL	BRANCH CHIEF:
PROJECT MANAGER:	MLYNCZAK	PROJECT MANAGER:
LIC. ASST: LTR	J. LEE	LIC. ASST:
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AEW-7037

Westinghouse Electric Corporation Power Systems

PWR Systems Division
Box 355
Pittsburgh Pennsylvania 15230

November 18, 1977

NS-PLC-4549
S. O. AMP-460

Mr. Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20014

Dear Mr. Case:

AMERICAN ELECTRIC POWER
Donald C. Cook Nuclear Plant
Steam Generator Enclosure Pressure Analysis

This letter serves to document the presentation made to the NRC on November 11, 1977 regarding the D. C. Cook Nuclear Plant steam generator enclosure pressure analysis. The attached copies of the slides present a summary of preliminary results which Westinghouse has obtained with a multi-node model of the enclosure (Slide 1). The analysis was performed with the Westinghouse TMD code using unaugmented critical flow and the compressibility factor. A multi-node representation of the enclosure geometry was established and is shown in slide #2. Vent flowpaths exist out the bottom of each enclosure to the lower compartments. Also, vent flowpaths exist between adjacent enclosures; specifically between nodes 46 and 55, between nodes 47 and 56 and between nodes 48 and 57. The two break locations considered were:

1) Break at the top - TMD node 46
2) Break at the side - TMD node 51.

In order to keep the cases clearly referenced either the words "BREAK IN 46" or "BREAK IN 51" appear in the upper right hand corner of each slide depicting results.

For the case of the break in the top region (46), slides #3 and #4 show the pressure and temperature transients in the break node (46), respectively. Slide #5 shows the differential pressure which would be present from the break node to the upper compartment (across the roof and the

top portion of the enclosure wall). Slide #6 illustrates the differential pressure which would be present in the high pressure region across the internal wall between the adjacent enclosures. In both cases of slides #5 and #6 the maximum pressure differential which would exist across the structure is presented. In the case of the pressure differential across the enclosure wall, the maximum pressure differential at a mid-elevation would be approximately 26 psi and 11 psi at a lower elevation. The pressure differentials would vary similarly along the internal wall.

For the case of the break along the side of the vessel (51), slide #7 shows the pressure transient in the break node (51). Slide #8 presents the bounding pressure differential which would be present across the crane wall. In reality the ice condenser region exists on the other side of the crane wall from the steam generator enclosure, however the upper compartment pressure was used as the backpressure for the pressure differential calculation and represents an upper bound of the differential pressure. The short duration inertial peak is approximately 38.8 psi and the steady state peak later in time is approximately 22 psi for the pressure differential across the crane wall. Slide #9 illustrates the maximum pressure differential across the internal wall from the break node (51) to the adjacent enclosure. The short duration peak differential pressure is approximately 38.8 psi and the steady state peak later in time is approximately 22 psi. Slide #10 illustrates the maximum pressure differential across the steam generator vessel from the break node to the opposite side of the vessel (DP 51-53). The short duration inertial peak is approximately 38 psi and the steady state peak later in time is approximately 13 psi. These results represent maximum pressure differentials; other locations yielded lower pressure differentials across structures and the vessel.

Very truly yours,

M. H. Judkis, Manager
American Electric Power Project

I. C. Ratsep/mw
Attachment Forty (40)

cc: R. W. Jurgensen, 1L (AEP), 5A
R. S. Hunter, 1L (AEP)
R. F. Hering, 1L (AEP)
S. H. Horowitz, 1L (AEP)
P. W. Daley, 1L (AEP)
S. J. Milioti, 1L (AEP)
J. G. Feinstein, 1L (AEP), 1A

D. C. COOK

STEAM GENERATOR ENCLOSURE PRESSURE ANALYSIS

1) LATEST VERSION OF W2 TMD CODE

2) MULTI-NODE REPRESENTATION OF ENCLOSURE GEOMETRY

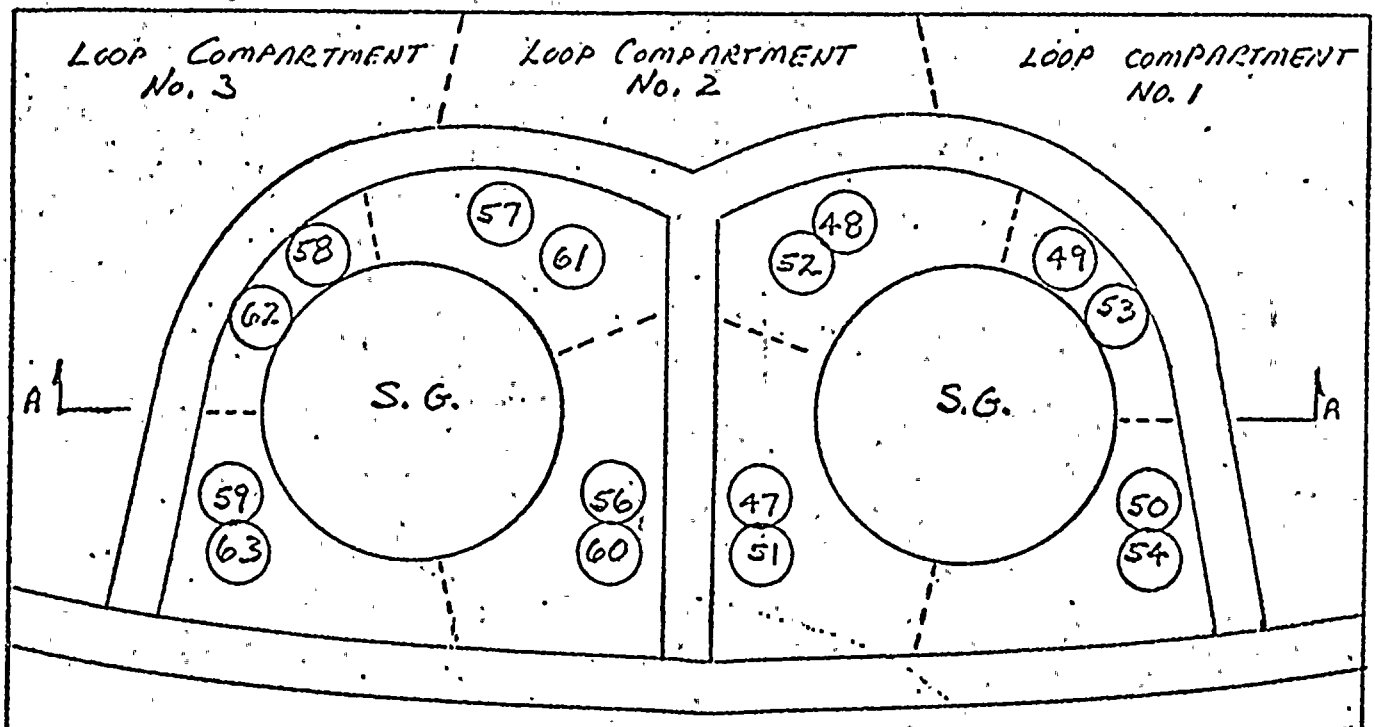
3) BREAK LOCATIONS

   A) TOP REGION (46)

   B) SIDE OF VESSEL (51)

SKETCH SHEET
FORM 28577

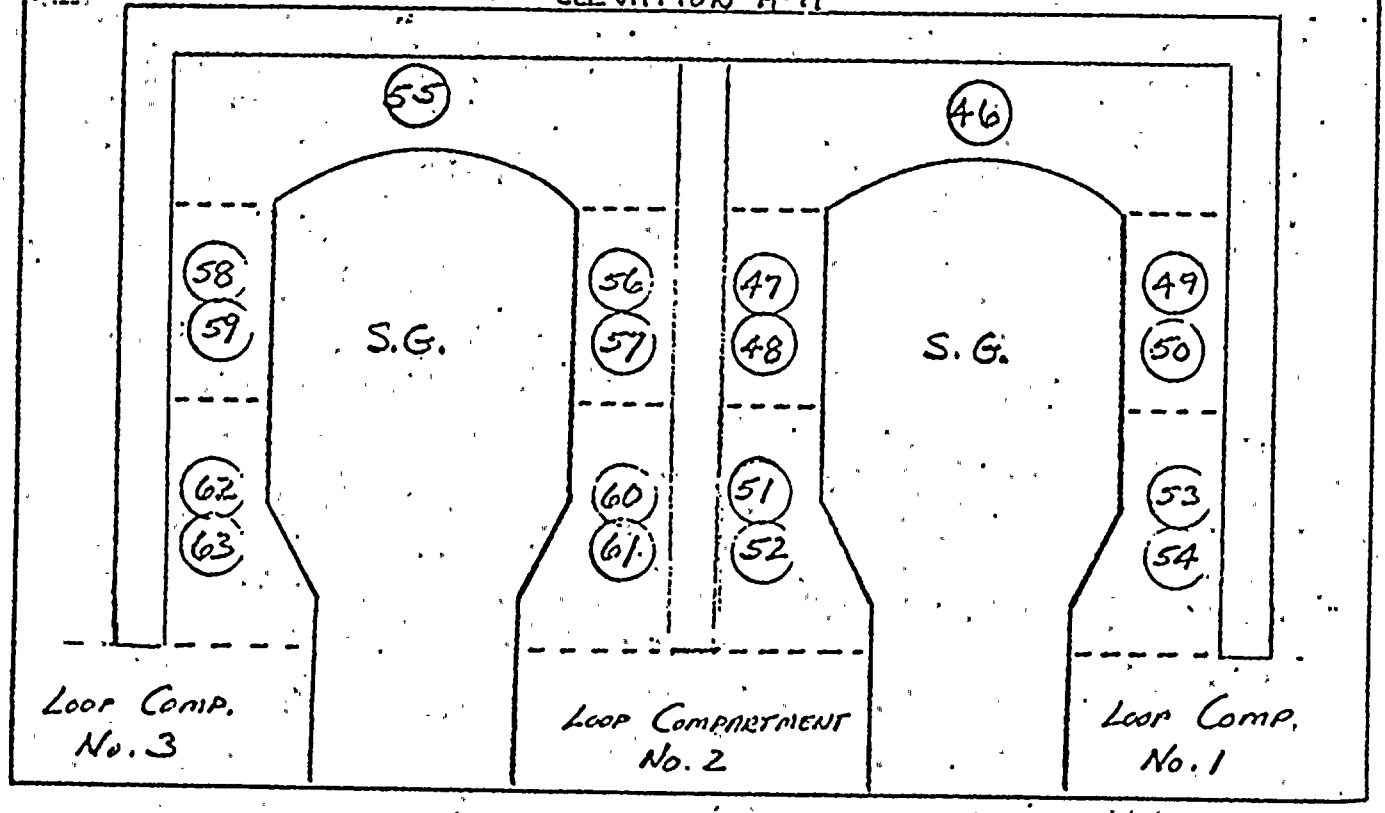
WESTINGHOUSE ELECTRIC CORPORATION



D. C. COOK

STEAM GENERATOR ENCLOSURES

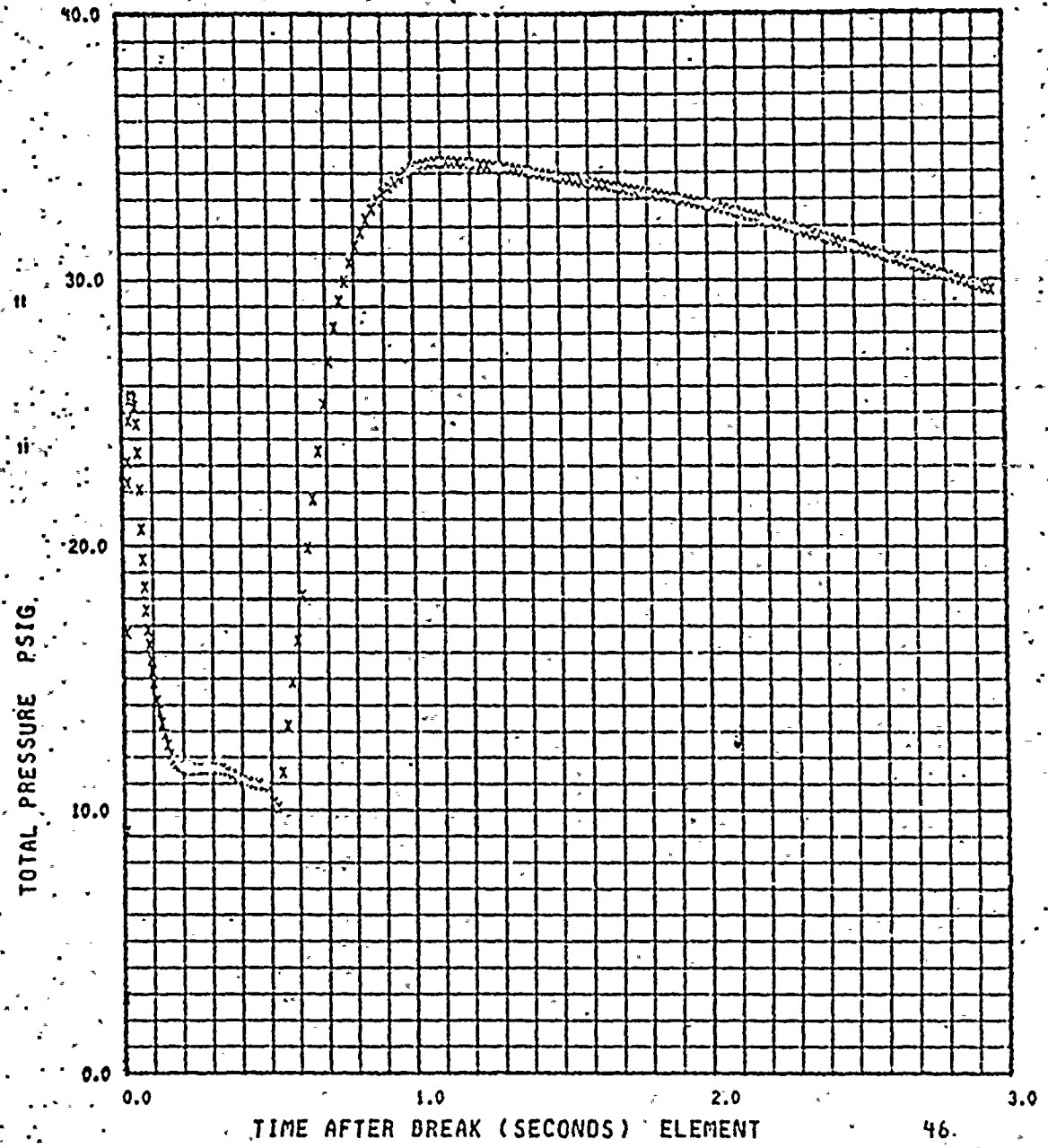
ELEVATION A-A



SLIDE #2

BREAK IN 46

D.C. Cook

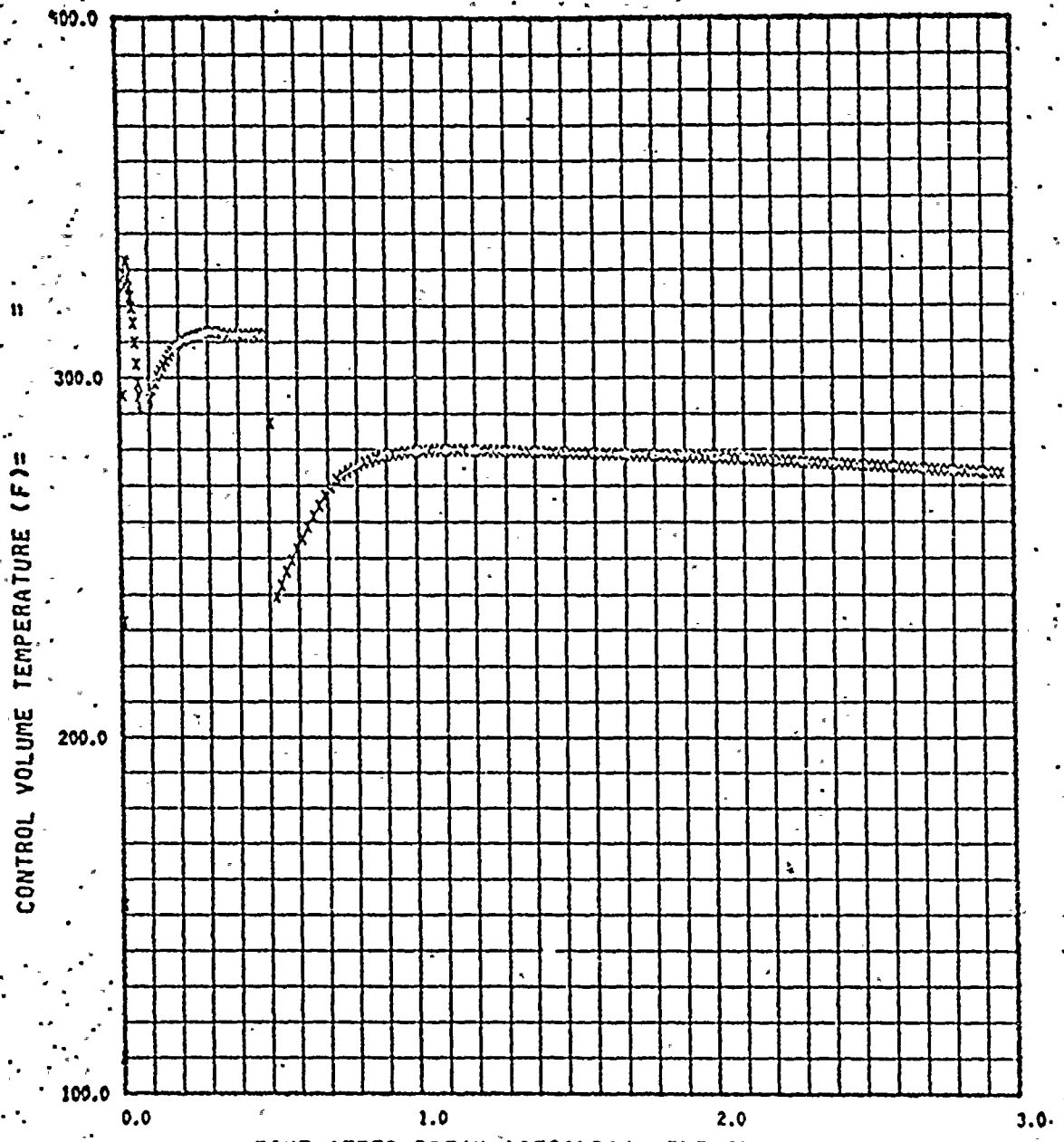


STEAM GENERATOR ENCLOSURE

SLIDE #3

BREAK IN 46

D.C. Cook



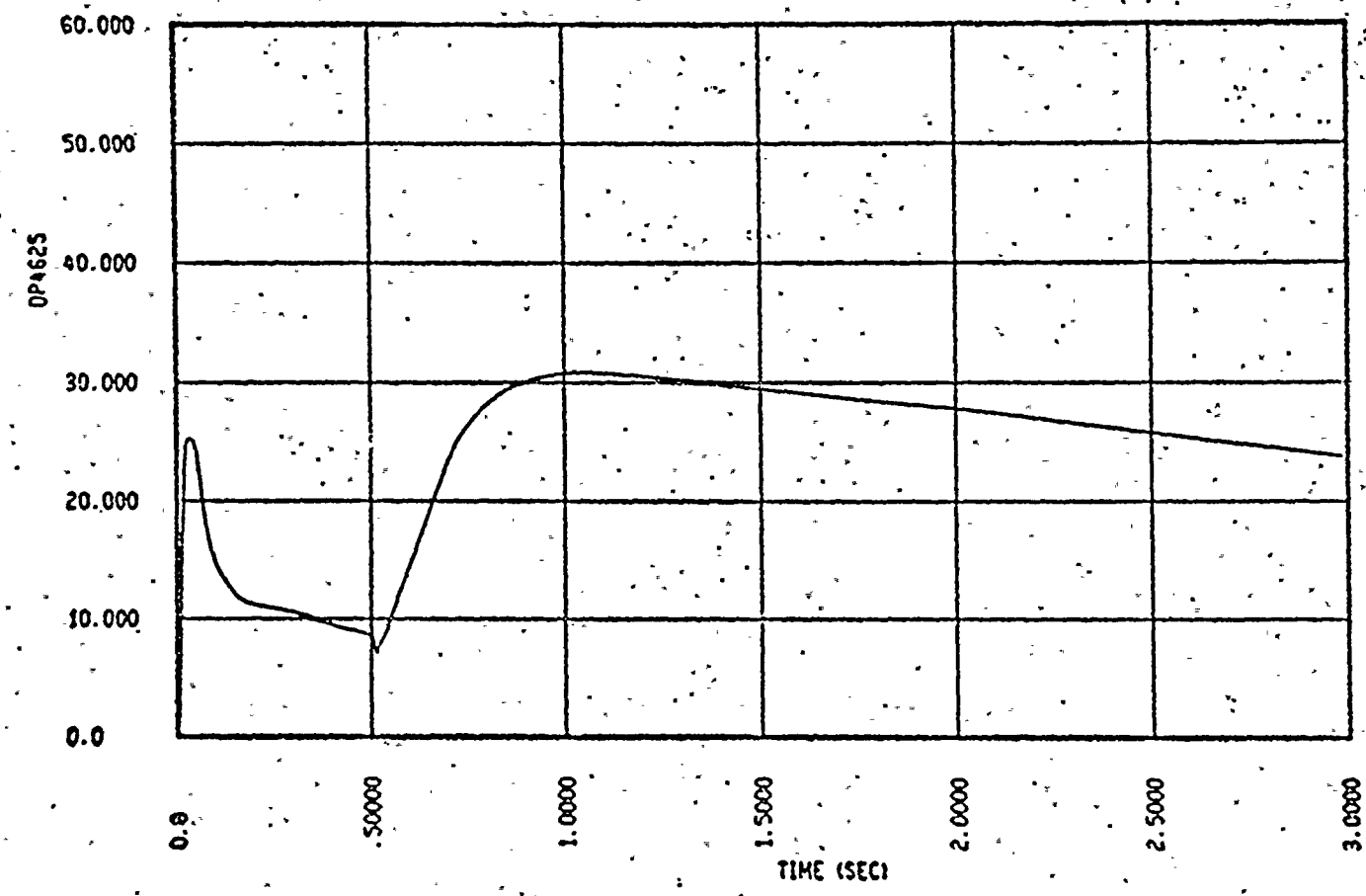
STEAM GENERATOR ENCLOSURE

SLIDE #4

BREAK IN 46

D.C. Cook

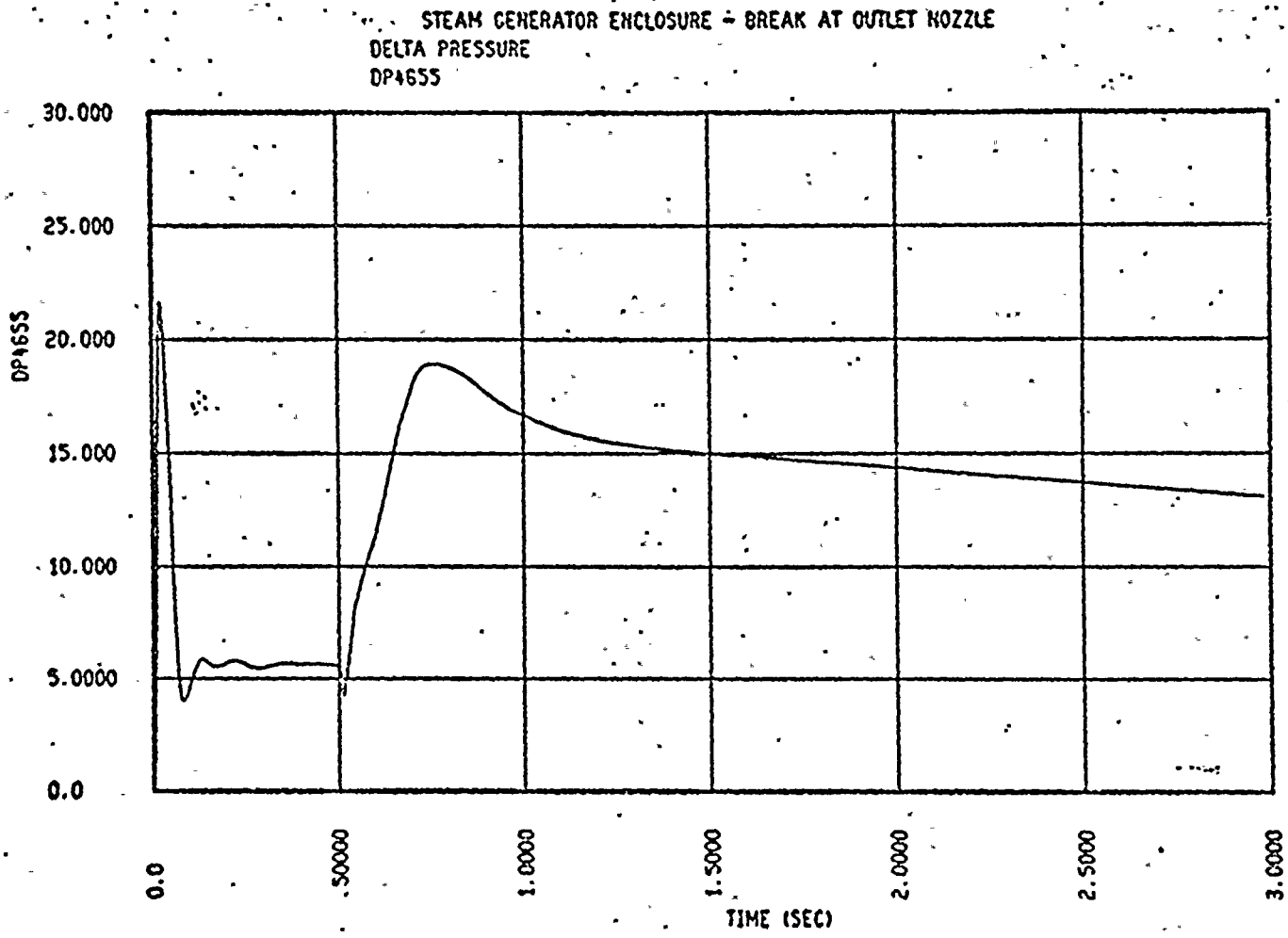
STEAM GENERATOR ENCLOSURE - BREAK AT OUTLET NOZZLE
DELTA PRESSURE
DP4625



SLIDE #5

BREAK IN 46

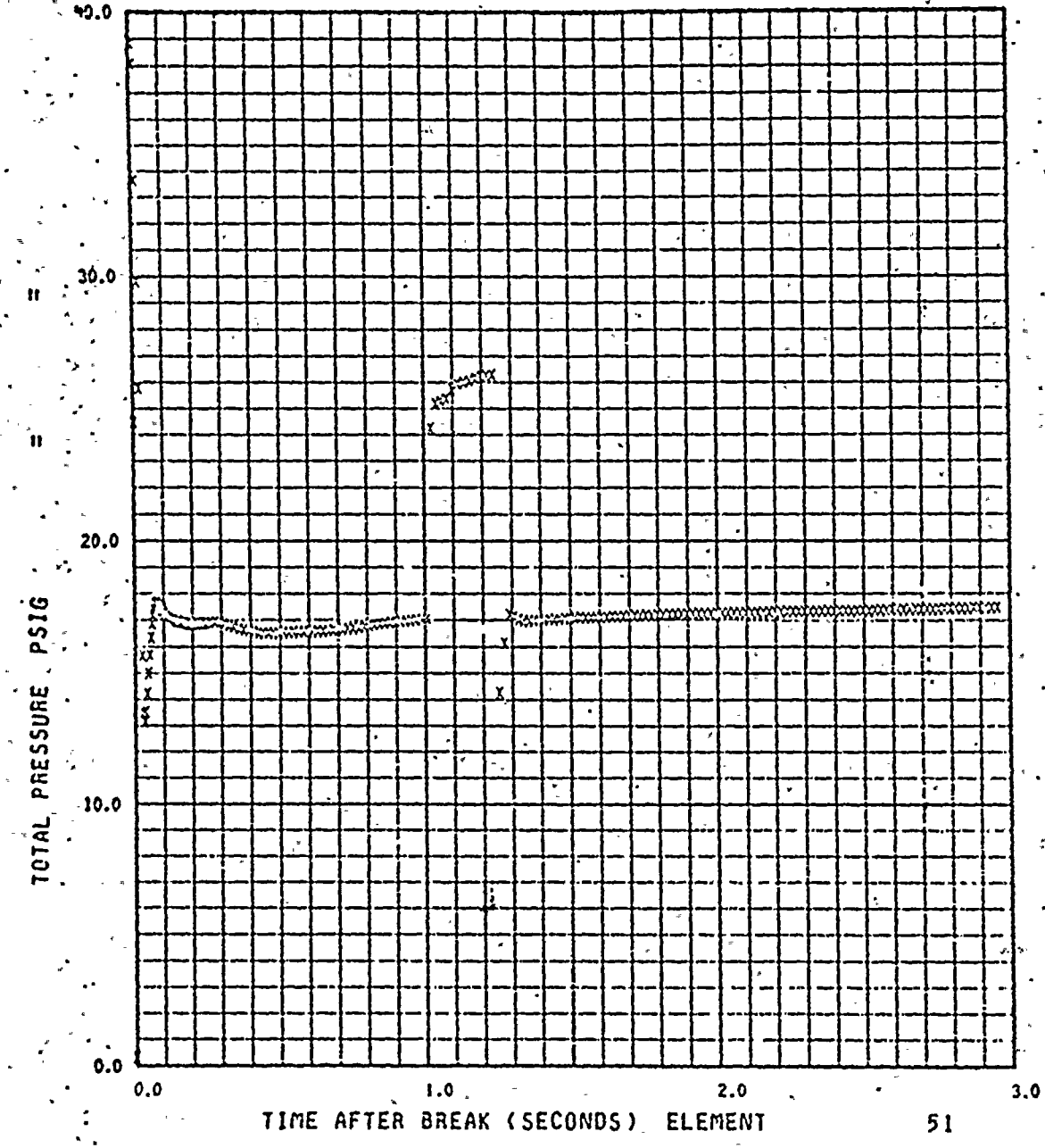
D.C. Cook



SLIDE # 6

BREAK IN 51

D. C. COOK



SLIDE # 3017S

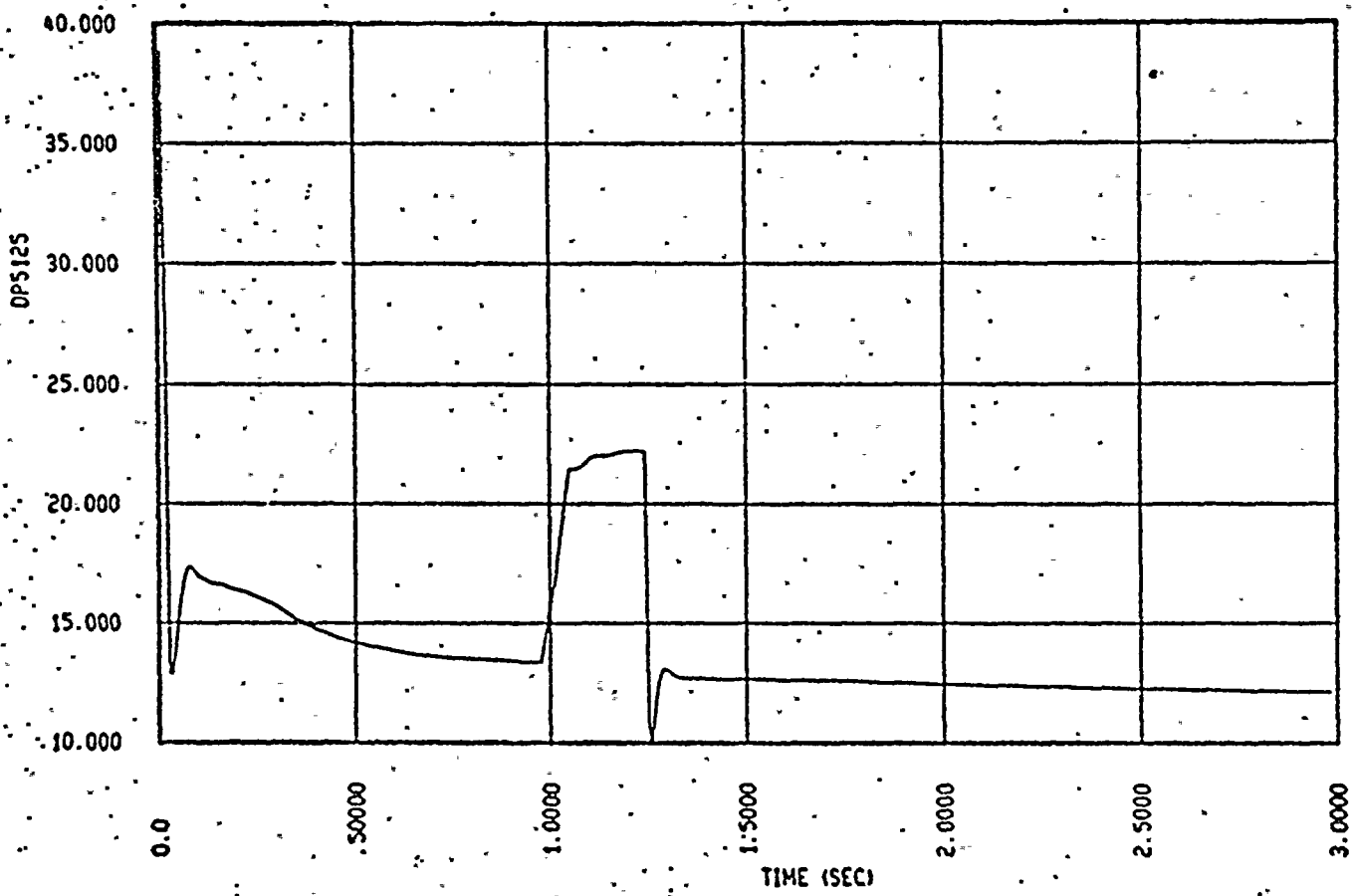
BREAK IN 51

D.C. Cook

STEAM GENERATOR ENCLOSURE - BREAK AT EL. 652 FT.

DELTA PRESSURE

DP5125

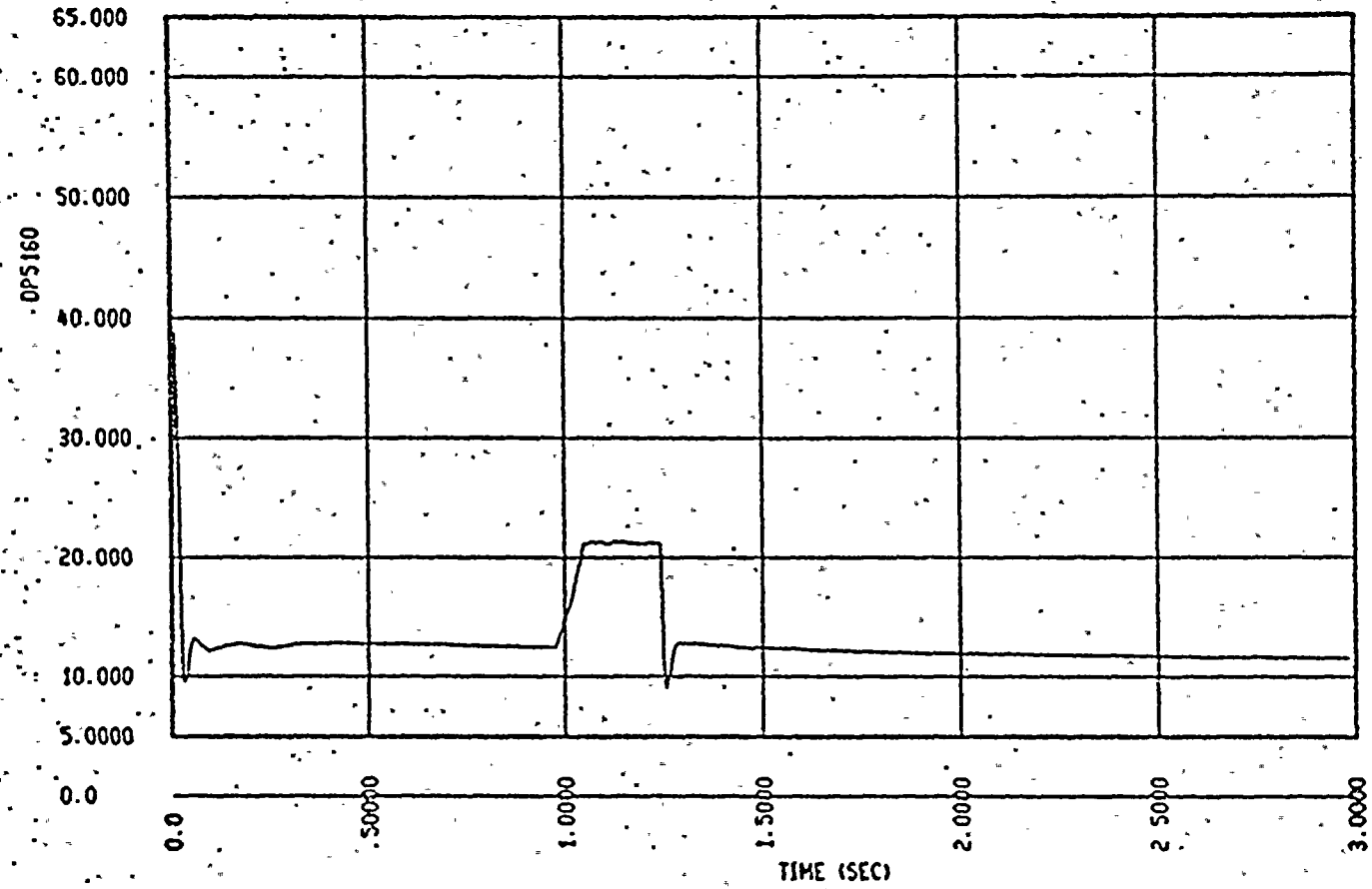


SLIDE #8

BREAK IN 51

D.C. Cook

STEAM GENERATOR ENCLOSURE - BREAK AT EL. 652 FT..
DELTA PRESSURE
DPS160

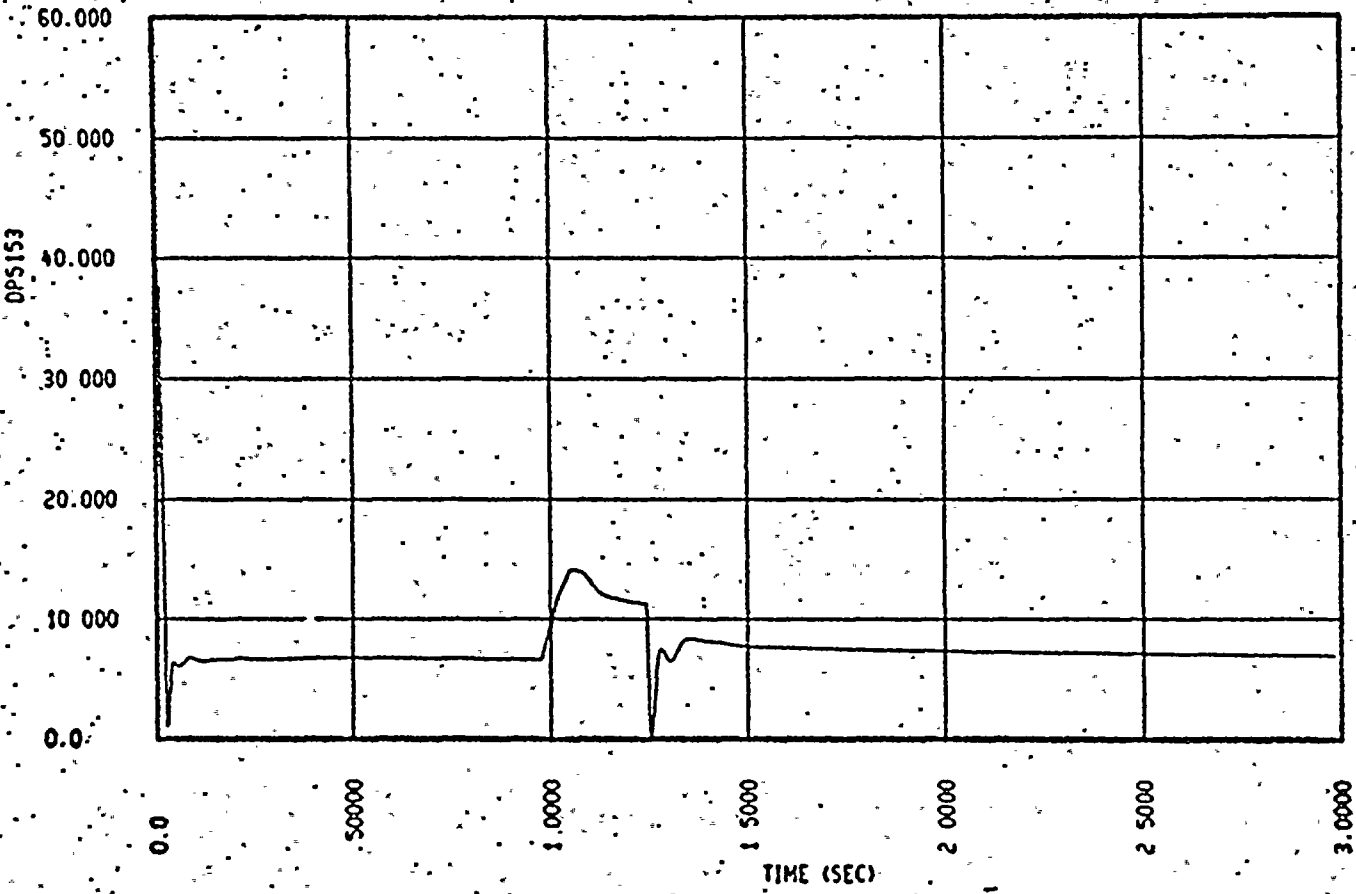


SLIDE #9

BREAK IN S1

D.C. Cook

STEAM GENERATOR ENCLOSURE - BREAK AT EL. 652 FT.
DELTA PRESSURE
DPS153



SLIDE #10