(17)

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WM DOCKET CONTROL CENTER

'84 FEB -1 P3:20

31 January 1984
Ref. No. 1086-008-02
Express Mail B 58383386

WM Record File
B7328

WM Project 10,11,16
Docket No.
PDR ✓
LPDR ✓ (B,H,S)

Distribution:
T Seamans
(Return to WM, 623-SS) 2

Mr. Trueman Seamans
Waste Management Engineering Branch
Division of Waste Management
U. S. Nuclear Regulatory Commission
7915 Eastern Avenue
Mail Stop 623-SS
Silver Spring, MD 20910

Subject: Data obtained from the DOE during the Data Review Visit of January 24-26, 1984

Dear Mr. Seamans:

Enclosed is a copy of the data that was either obtained or requested from the DOE during the above mentioned Data Review visit. We will be sending the trip report next week.

If you have any questions, please call me.

Sincerely,

ENGINEERS INTERNATIONAL, INC.

V. Rajaram
Project Manager

VR/ja

Enclosure

8403260350 840227
PDR WASTE
WM-10 PDR

W/CTA 8403260349 840227
RD
1085D

CORE OBSERVED BY NRC, 25 JAN 84

Cell	Box
RR1-02	407
"	408
"	409
"	410
RR1-02	472
"	473
"	474
RR1-06	425
"	426
"	427
"	428
RRL-06	486
"	487
"	488
RRL-02	405
"	420
"	468
RRL-14	50
"	28
DC-12	260
"	261
"	262
"	263

OVER

Well	Box
DC-C4	298
"	299
"	300
"	301
"	302

ENGINEERS INTERNATIONAL, INC.

BY RAC DATE 1/26/84 CLIENT NRC SHEET NO 1 OF 1

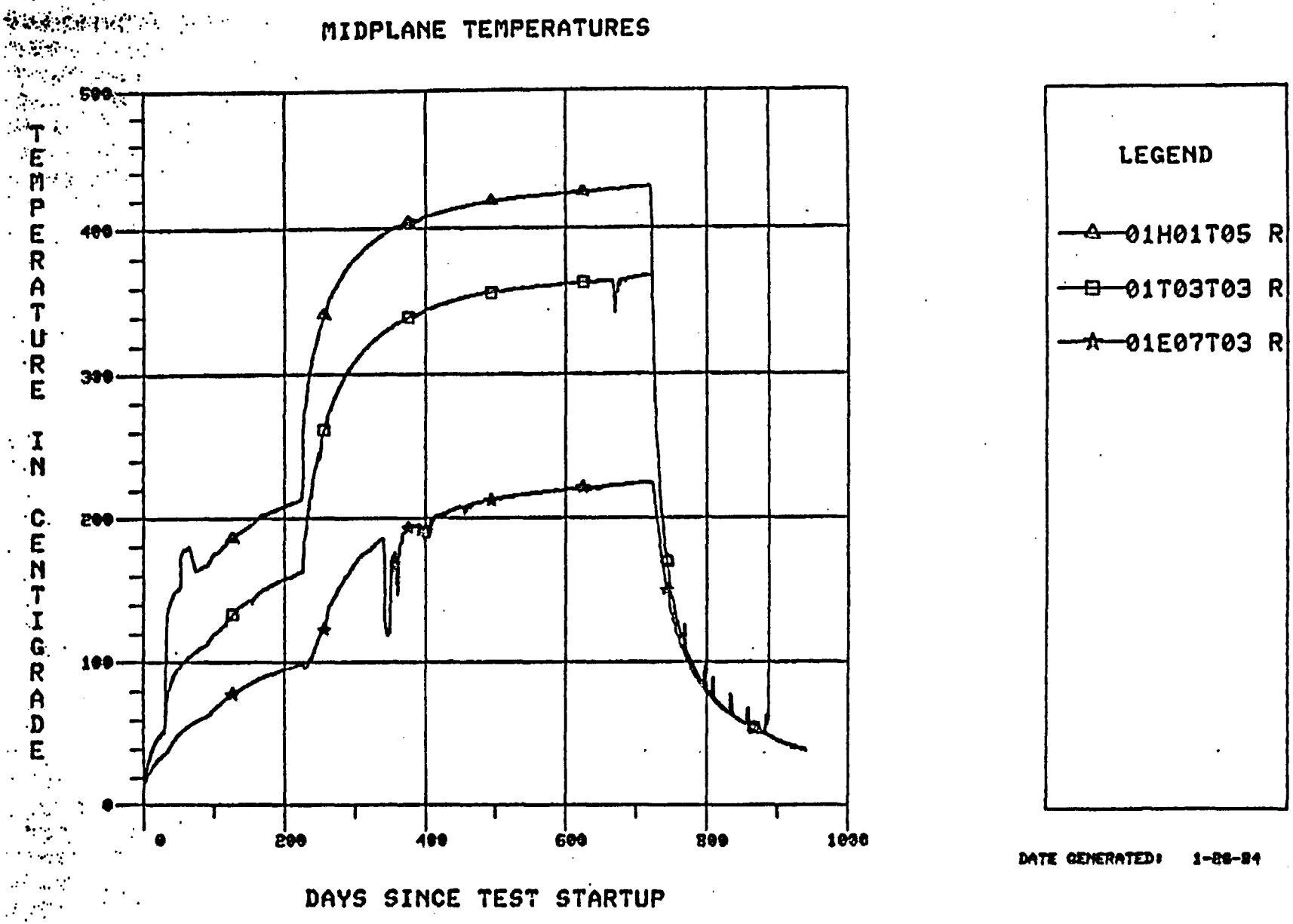
CHKD DATE PROJECT PROJ. NO. 1085008-02

Geomechanics Data Collected at the BWIP

Data Review Visit, 23-27 January, 1984

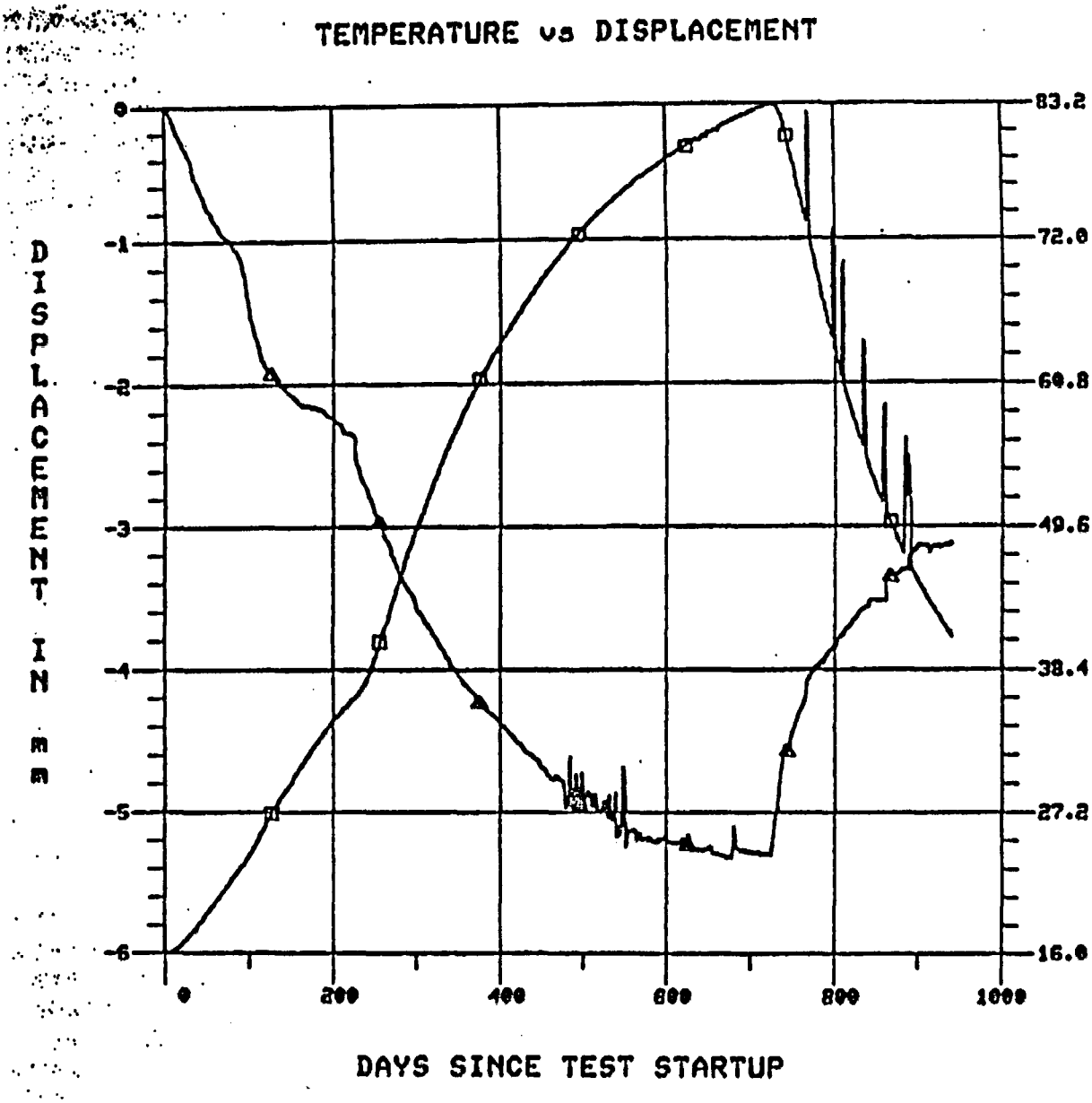
	DDH/Sample No.	Cond.	γ	n	V_p	V_s	E_D	ν_D	E_s	ν_s	S_c	S_T
RRL-1	3336.7	I	2.84	1.9	5,731	3,040	68.5		81.8	0.27	260.4	-
	3336.9	I	2.86	1.6	5,732	3,432	82.2		77.9	0.27	499.6	-
	3337.1	J	2.85	1.6	5,709	3,326	78.4		83.4	0.27	178.9	-
	3337.3	I	2.85	1.8	5,628	3,379	79.2		80.4	0.26	533.1	-
	3918.3	I	2.84	0.4	5,752	3,362	79.6	0.24	84.4	0.27	807.8	-
	3918.5	I	2.84	0.5	5,729	3,404	80.8	0.23	-	-	-	9.36
	3899.7	I	2.82	0.9	5,652	3,361	78.1	0.23	-	-	-	14.4
	3899.8	I	2.80	1.6	5,884	3,337	78.8	0.26	-	-	-	8.71
	3805.5	J	2.82	1.4	5,784	3,367	79.5	0.24	51.02	0.29	126.	-
RRL-2	3805.3	I	2.82	0.5	5,998	3,392	82.4	0.26	84.4	0.27	468.4	-
	3804.2	J	2.79	1.3	5,362	3,218	70.4	0.22	-	-	-	11.5
	3804.1	I	2.78	1.5	5,343	3,292	71.4	0.20	-	-	-	14.4
	3824.9	J	2.8	2.3	5,781	3,277	76.0	0.26	65.8	-	158.5	-
	3825.1	I	2.8	1.8	5,689	3,313	76.4	0.24	78.2	0.26	334.2	-

Notes:
1. Sample numbers reflect the depth in the borehole indicated
2. Cond. = condition (I = intact, J = jointed)
3. γ = bulk density, g/cc
4. n = apparent porosity, percent
5. V_p = P-wave velocity, m/sec. V_s = shear wave velocity, m/sec,
6. E_D = Young's Modulus, dynamic, GPa. ν_D = dynamic Poissons Ret
7. E_s = Young's Modulus, static, at 50% of S_c, GPa. ν_s = static P.R.
8. S_c = Compressive strength, MPa.
9. S_T = Brazilian tensile strength, MPa

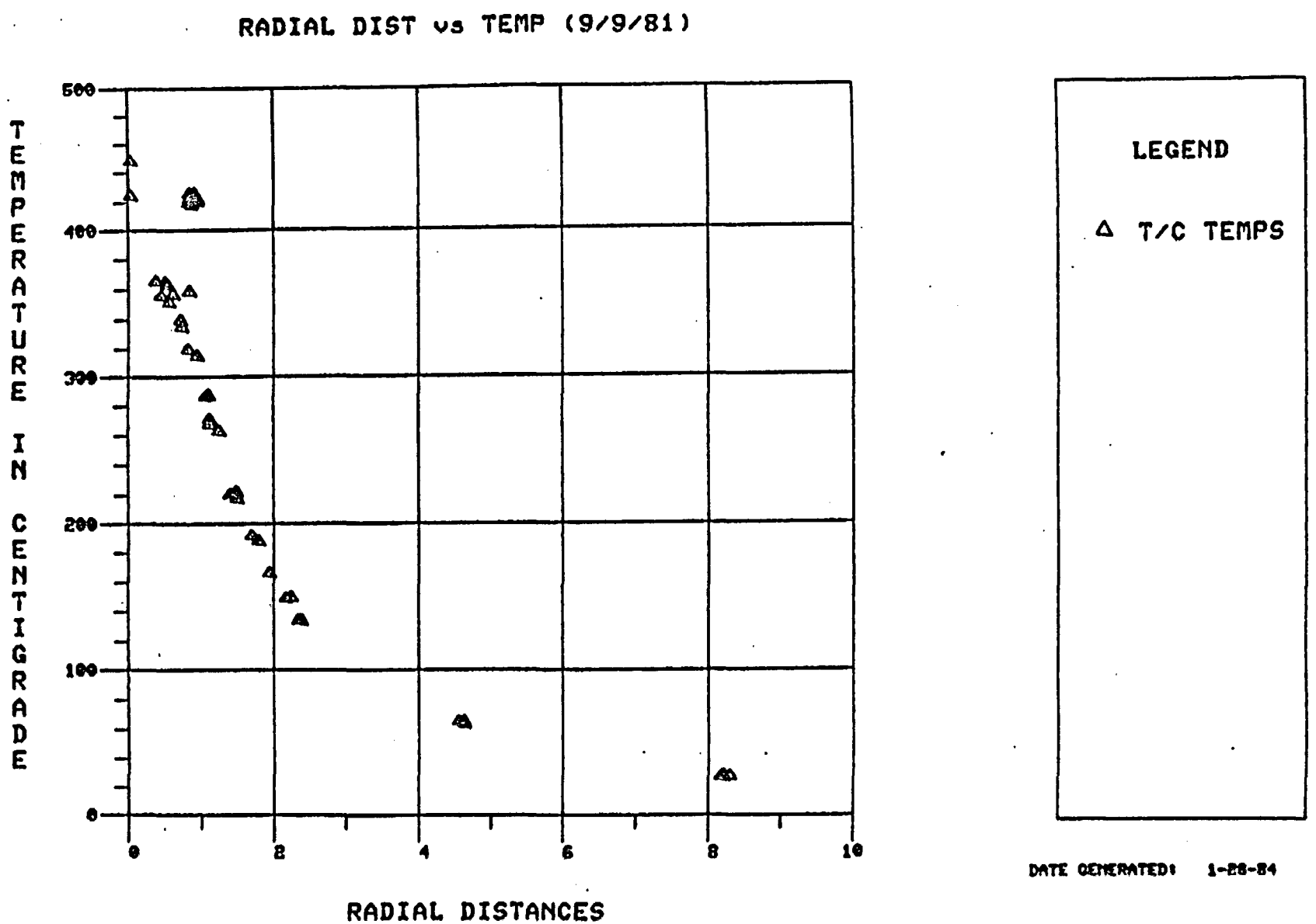


DAS III Revision 6.20 Configuration Controlled Production Software

FULL SCALE HEATER TEST DATA PLOTS OBTAINED FROM RHO/BWIP ON JAN. 26, 1984

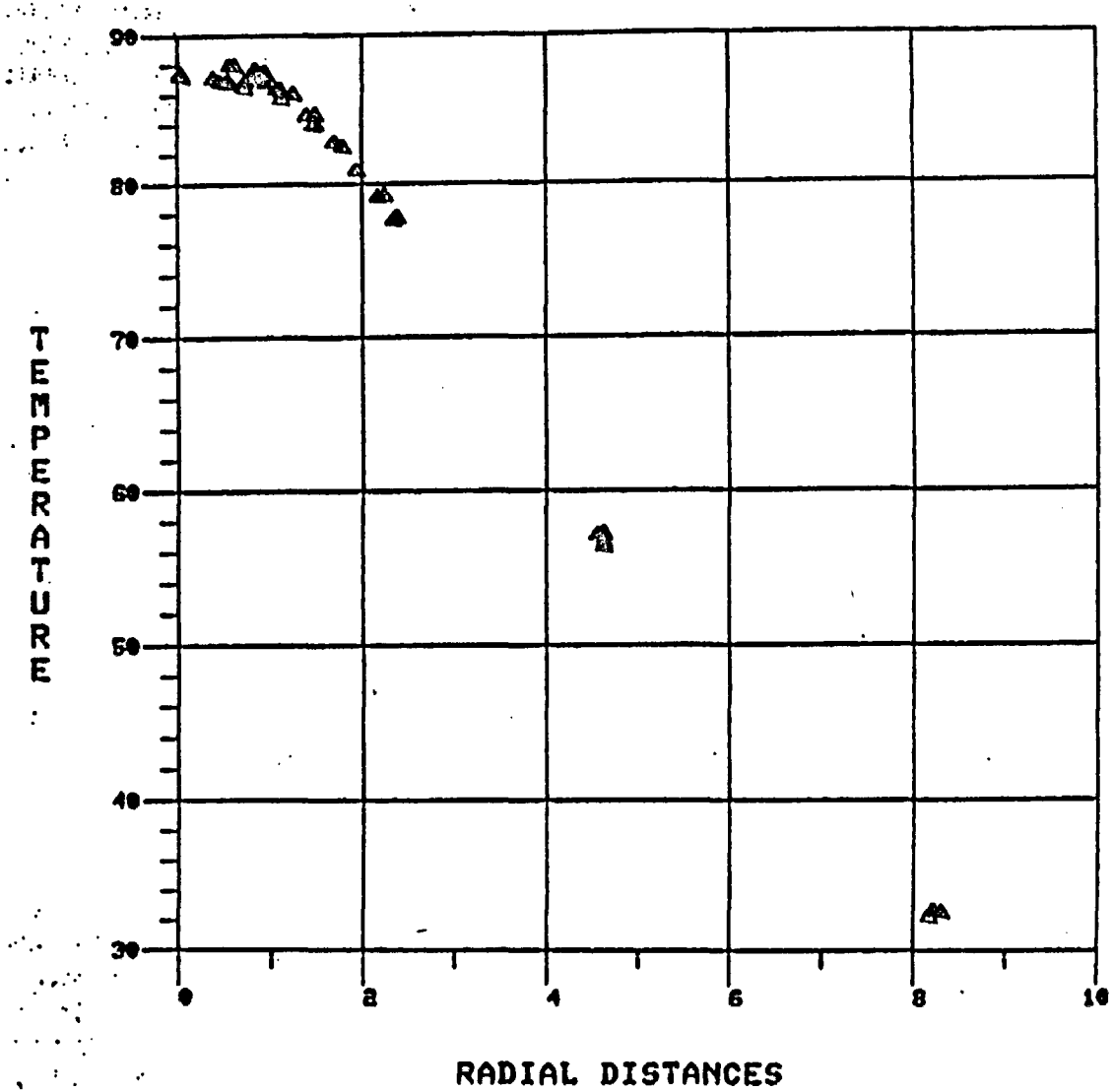


DMS'III Revision 6.20 Configuration Controlled Production Software



DAS III Revision 6.20 Configuration Controlled Production Software

MIDPLANE TEMPERATURES (9/1/82)

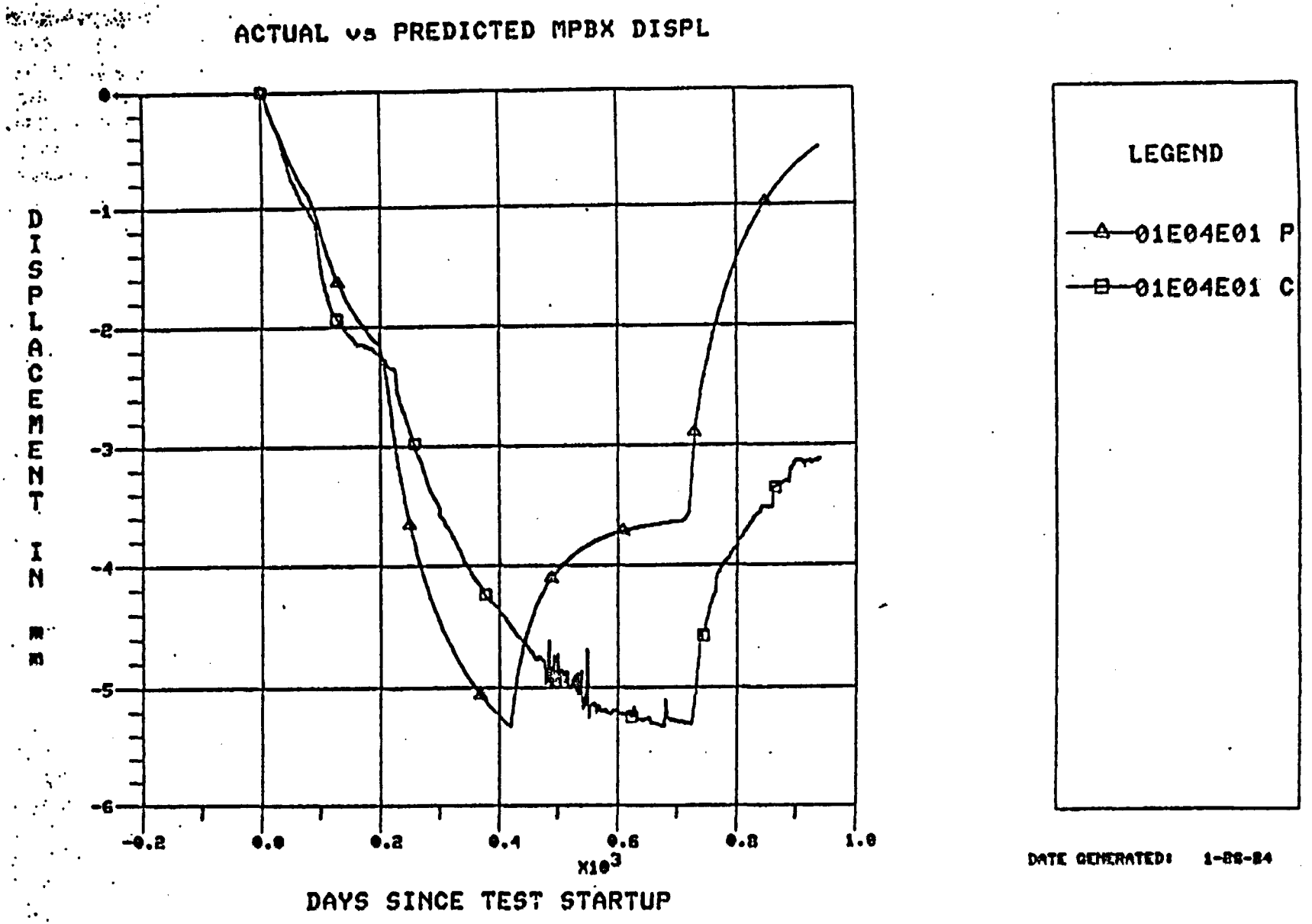


LEGEND

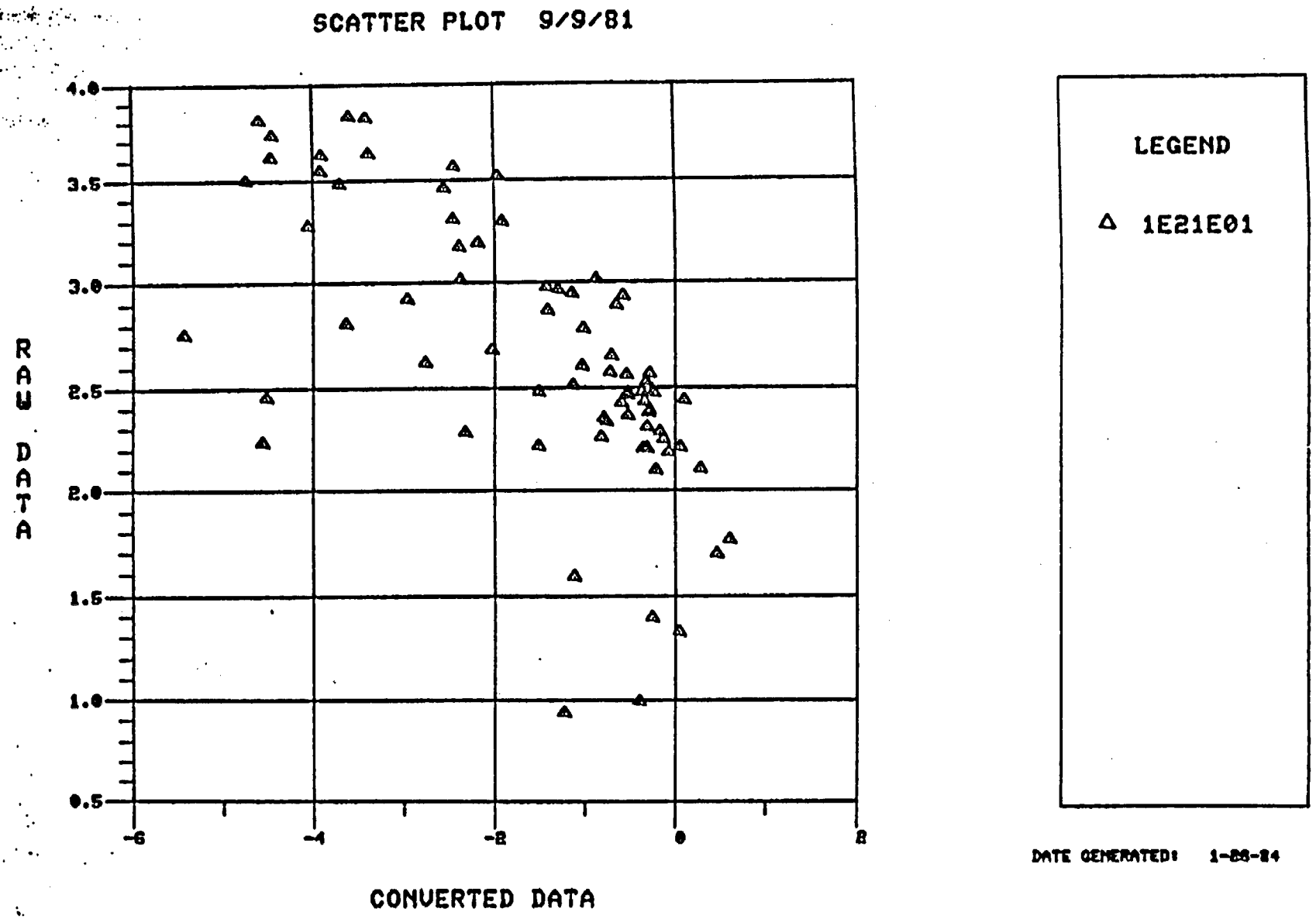
△ T/C TEMPS

DATE GENERATED: 1-26-84

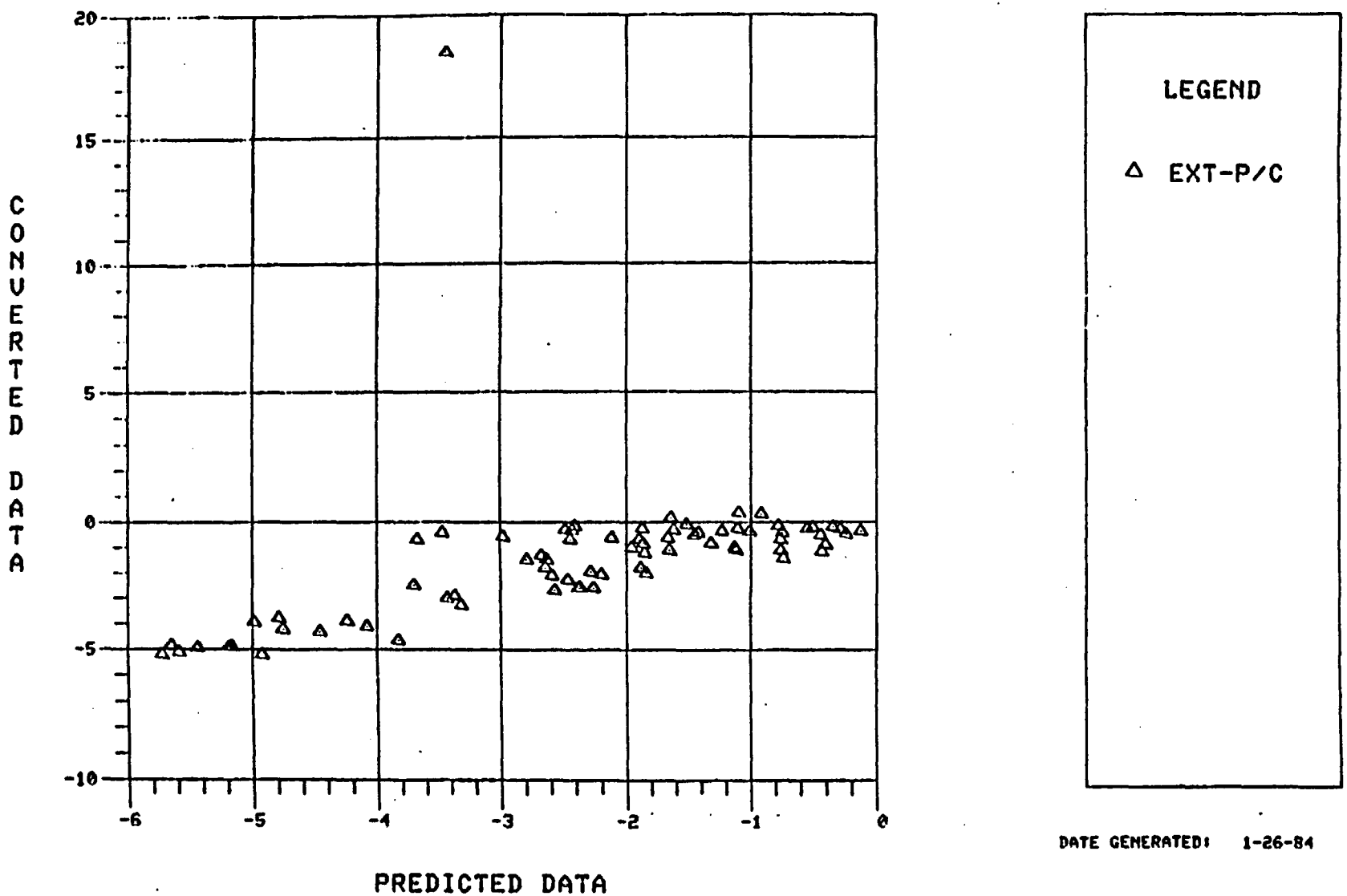
DAS III Revision 6.20 Configuration Controlled Production Software



DAS III Revision 6.20 Configuration Controlled Production Software


SCATTER PLOT 9/9/81
RAW DATA
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
-6
-4
-2
0
2
CONVERTED DATA
LEGEND
1E21E01
DATE GENERATED: 1-28-84

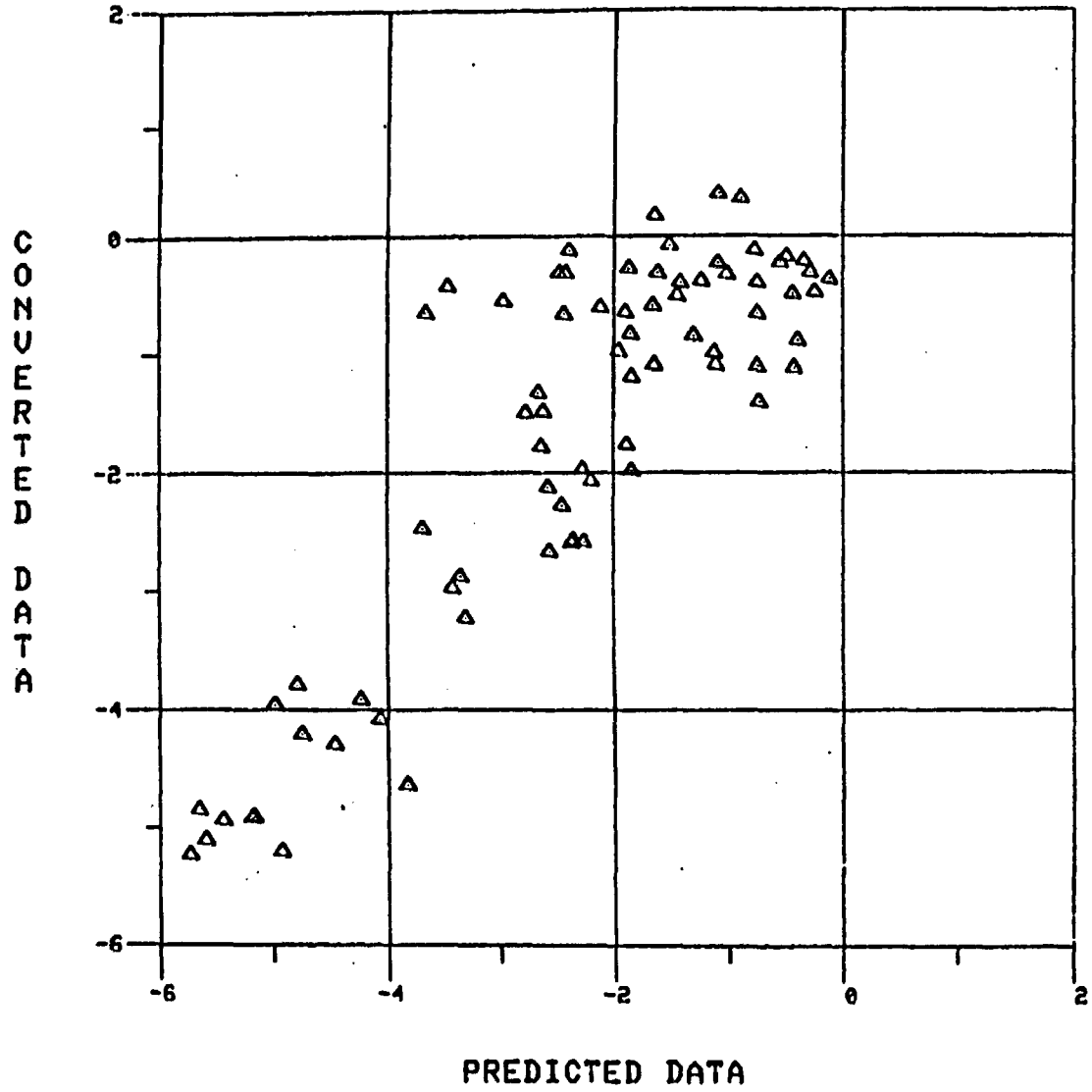
Scatter Plot - 2/21/82 - Dang Gov



DATE GENERATED: 1-26-84

DAS III Revision 6.20 Configuration Controlled Production Software

Scatter Data 2/21/82 - Day 600



LEGEND

△ EXT-P/C

DATE GENERATED: 1-26-84

DAS III Revision 6.20 Configuration Controlled Production Software

DAS III Revision 6.20 Configuration Controlled Production Software

Channel number	937	Idb (39)	.100000E 39
Instrument ID	01E21E01	Idb (41)	.238200E 01
Date Enabled	-.900000E 50	Idb (43)	.100000E 39
Date Disabled	.674868E 03	Idb (45)	-.863130E-01
Replaced Chnl#	-999	Idb (47)	.100000E 02
Idb (16)	102	Idb (49)	.114800E 02
Units: converted	MM	Idb (61)	.101100E 02
Radius	.163000E 01	Idb (63)	4
Theta Coord.	.246400E 03	Idb (65)	.995400E 01
Z Coordinate	-.655000E 01	Idb (67)	.114800E 02
Raw Grael rec	1060	Idb (69)	5
Cnv Grael rec	636	IDB (35)	.100000E 39
Pred. Grl rec	637	IDB (37)	.100000E 39
Idb (53)	3	Idb (51)	.000000E 00
Idb (71-90)	.157000E 02	Idb (91-100)	251
Idb (71-90)	.157000E 02	Idb (91-100)	252
Idb (71-90)	.157000E 02	Idb (91-100)	253
Idb (71-90)	.159000E 02	Idb (91-100)	254
Idb (71-90)	.171000E 02	Idb (91-100)	255
Idb (103)	1613		

----------> Another Instrument?

```
Idb (1)          Channel number
Idb (2-9)        Instrument Id
Idb (11)         Enabled date
Idb (13)         Disabled date
Idb (15)         Replaced instrument channel
Idb (16)         Undefined
Idb (17)         Converted data units
Idb (19)         Radius coordinate
Idb (21)         Theta  coordinate
Idb (23)         Z      coordinate
Idb (25)         Smoothed raw data record #
Idb (26)         Smoothed converted data record #
Idb (27)         Smoothed predicted data record #

Idb (35)         Coefficient 1 for Jack Deformeters
                 Principle stress smoothed data record for BDG's
Idb (37)         Coefficient 2 for jack Deformeters
                 Secondary Stress Smoothed data record for BDG's
Idb (39)         Thermocouple location for MPBX Thermocouples
                 Temperature at startup for BDG's
```

Press any key to continue,(or ESCape)...

Idb (41)	Instrument output at initialization
Idb (43)	Instrument temperature at initialization
Idb (45)	K7 calibration coefficient for MPBX's
	K1 calibration coefficient for BDG's
Idb (47)	Power Supply voltage at time of calibration
Idb (49)	Length of MPBX rod.
	Theta smoothed data record for BDG's
Idb (51)	Reinitialization offset compensation (DmAdd or VmAdd)
Idb (53)	Orientation of VWS guage in degrees
	Number of MPBX rods per head assembly
	Flag to indicate plane stress or strain for BDG's
	1= plane stress assumption : 2= Plane strain assumption
Idb (61)	Length to heater center line for MPBX's
	K2 Calibration constant for BDG's
Idb (63)	Channel number of power supply for this gauge
Idb (65)	Power supply voltage at initialization
Idb (67)	Length of longest rod in an MPBX assembly
	K3 Calibration constant for BDG's
Idb (69)	Number of thermocouples for an MPBX assembly
Idb (71 - 90)	Temperature at initialization for each sensor/gauge

Press any key to continue,(or ESCape)...

DAS III Revision 6.20 Configuration Controlled Production Software

Idb (91 - 100) Channel number of each thermocouple for gauge
Idb (103) Millheat of this MPBX rod (INVAR)

Would you like to re-display your report?

```
C*************************************************************
C                ******************************
C*************************************************************
C     MODULE NAME:        CNVRTE.FR
C
C     AUTHORS:            J.L.STARR
C
C     DATE OF CREATION:   NOV. 19, 1980
C
C     MODIFIED:           3/11/81, JLS, TO INCLUDE TSTCOM2.INC, AND
C        CHANGE DEBUGGING CODE TO TYPE STATEMENTS.
C                ALSO INCLUDED THE POSSIBILTY OF MORE THAN 5 THERMO-
C        COUPLES (ZPMAXTCS).
C
C     MODIFIED:           10/1/81 AJC, TO INCLUDE DISPLACEMENT ADDITION
C                         SCR #147
C
C     Modified:           12/21/82,ajc, add ZMIIheat for calculation
C                         of Thermal expansion of Invar.
C                         Remove Initial and Current Parameters for
C                         Consideration by thrmxp.
C                         Algorithm Change 10410-KK-82-052
C
C     DESCRIPTION:        CALCULATES DISPLACEMENT OF A GIVEN ROD
C                         WITHIN A GIVEN EXTENSOMETER BOREHOLE
C                         AT A GIVEN TEMPERATURE.
C
C     COMMENTS:           ORIGINAL ALGORITHM PUBLISHED IN RSD-BWI-TI-009
C                         WAS TRANSLATED INTO FORTRAN BY D.N.BERGMAN.
C
C*************************************************************
C
C     INPUTS:
C        FILES:           NONE
C
C        ARGUMENTS:       POWSUPPLYVOLTS - POWER SUPPLY VOLTAGE
C                         TEMPARRAY- ARRAY OF TEMPERATURES (THERMOCOUPLES)
C                         EXTMVOLTS - VOLTAGE READING
C
C        COMMON:          NONE
C
C*************************************************************
C
C     OUTPUTS:
C        FILES:           NONE
C
C        ARGUMENTS:       DISPLACEMENT - DISPLACEMENT
C                               0 IS NORMAL
C
C        COMMON:          NONE
C
C*************************************************************
C
C     CALLED
C     ROUTINES:           THRMXP - THERMAL EXPANSION
C
C*************************************************************
C
C     INTERNAL
C     VARIABLES USED:
C                         TCLOCS-(ARRAY)THERMOCOUPLE LOCATIONS ON ROD
```

```
C                       LCL - LENGTH TO CENTER LINE FROM END OF ROD
C                             (SEE INACIDN.DOC)
C                       K7  - K7 CONSTANT FOR ALGORITHM POLYNOMIAL
C                           SEE ALGORITHM PUBLISHED IN RSD-BWI-TI-009
C                       INITPOWSUPPLYVOLTS- POWER SUPPLY VOLTAGE
C                             @INITIALIZATION
C                       INITEXTMVOLTS - EXTM VOLTAGE @INITIALIZATION
C                       INIT THERM EXP - THERMAL EXPANSION OF ROD
C                                        @INITIALIZATION
C                       CURRENT THERM EXP - THERMAL EXPANSION OF ROD NOW
C
C*************************************************************
C    CALLING
C    MODULES:           PREPE.FR-GATHERS ALL INFO FOR ARGUMENTS.
C
C*************************************************************
C    REQUIREMENTS
C    PLACED ON
C    CALLING MODULES:   INCLUDE 'TSTCOM.INC'
C
C*************************************************************
      SUBROUTINE CNVRTE(DISPLACEMENT, RODLNGTH, TCINITTEMPS,
     *  TCLOCS, LNGSTROD, LCL, TCTEMPS, K7, EXTMVOLTS,
     *  INITEXTMVOLTS, POWSUPPLYVOLTS, INITPOWSUPPLYVOLTS,
     *  NUMTCS,DISP_ADDITION,Millheat,IER)
C*************************************************************
X     TYPE 'CNVRTE: RODLNGTH=', RODLNGTH
X     TYPE 'CNVRTE: TCINITTEMPS=', (TCINITTEMPS(K),K=1, NUMTCS)
X     TYPE 'CNVRTE: TCLOCS=', (TCLOCS(K),K=1, NUMTCS)
X     TYPE 'CNVRTE: LNGSTROD=', LNGSTROD, 'LCL = ', LCL
X     TYPE 'CNVRTE: TCTEMPS=', (TCTEMPS(K),K=1, NUMTCS)
X     TYPE 'CNVRTE: K7=', K7,' EXTMVOLTS=', EXTMVOLTS
X     TYPE 'CNVRTE: POWSUPPLYVOLTS=', POWSUPPLYVOLTS
X     TYPE 'CNVRTE: DISP_ADDITION =', DISP_ADDITION
X     TYPE 'CNVRTE: INITPOWSUPPLYVOLTS=', INITPOWSUPPLYVOLTS
X     Type 'Cnvrte: Millheat = ',Millheat
C*************************************************************
      INCLUDE 'TSTCOM2.INC'
      IMPLICIT INTEGER (A-Z)
      REAL INIT THERM EXP, RODLNGTH, TCINITTEMPS(ZPMAXTCS)
      REAL TCLOCS(ZPMAXTCS),LNGSTROD, LCL,DISPLACEMENT ,DISP_ADDITION
      REAL CURRENT THERM EXP, TCTEMPS(ZPMAXTCS), K7, EXTMVOLTS
      REAL INITPOWSUPPLYVOLTS, POWSUPPLYVOLTS
      REAL INITEXTMVOLTS
C*************************************************************************
C  GET THE THERMAL EXPANSION OF ROD AT INITIALIZATION
C*************************************************************************
      CALL THRMXP(INIT THERM EXP, RODLNGTH, TCINITTEMPS,
     *  TCLOCS, LNGSTROD, LCL, NUMTCS, Millheat ,IER)
X     TYPE 'CNVRTE: INIT THERM EXP=', INIT THERM EXP
      IF(IER.NE.1)GO TO 890
C*************************************************************************
C  GET THE THERMAL EXPANSION OF ROD AT THIS TEMPERATURE
C*************************************************************************
      CALL THRMXP(CURRENT THERM EXP, RODLNGTH, TCTEMPS,
     *  TCLOCS, LNGSTROD, LCL, NUMTCS, Millheat,IER)
X     TYPE 'CNVRTE: CURRENT THERM EXP=', CURRENT THERM EXP
      IF(IER.NE.1) GO TO 880
C*************************************************************
X     TYPE 'CNVRTE: CALCULATE DISPLACEMENT.....'
C*************************************************************
X     TYPE 'CNVRTE: EXTMVOLTS = ', EXTMVOLTS
```

```
X       TYPE 'CNVRTE: INITEXTMVOLTS = ', INITEXTMVOLTS
X       TYPE 'CNVRTE: INITPOWSUPPLYVOLTS = ', INITPOWSUPPLYVOLTS
X       TYPE 'CNVRTE: CURRENTTHERMEXP = ', CURRENTTHERMEXP
X       TYPE 'CNVRTE: INITTHERMEXP = ', INITTHERMEXP
C*************************************************************
        DISPLACEMENT=DISP_ADDITION+ 25.4*K7*((10.*EXTMVOLTS/   ;SCR #147
     *  POWSUPPLYVOLTS)-(10.*INITEXTMVOLTS/INITPOWSUPPLYVOLTS))
     *  - CURRENT THERM EXP + INIT THERM EXP
X       TYPE 'CNVRTE: DISPLACEMENT=', DISPLACEMENT
        GO TO 9999
C*************************************************************
C               ******************************
C*************************************************************
890     CONTINUE
        CALL NSYSER(IER,'CNVRTEINIT','THRMXP ERR',ZPVIABLE)
        DISPLACEMENT = ZPBADREAL
        GO TO 9999
880     CONTINUE
        CALL NSYSER(IER,'CNVRTECURR','THRMXP ERR',ZPVIABLE)
        DISPLACEMENT = ZPBADREAL
C*************************************************************
C               ******************************
C*************************************************************
9999    CONTINUE
        RETURN
        END
```