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Thermal and Fluid Mixing in 1/2-Scale Test Facility

Data Report

Prepared by J. A. Valenzuela, F. X. Dolan

Creare Incorporated

Prepared for
U.S. Nuclear Regulatory Commission

and
Electric Power Research Institute

and
Creare Incorporated

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Title Page

ABSTRACT

This report presents data from an experimental study of fluid mixing in a 1/2-scale model of the cold leg, downcomer, lower plenum, pump simulator, and loop seal typical of a Westinghouse Pressurized Water Reactor. The tests were transient cooldown tests in that they simulated an extreme condition of Small Break Loss of Coolant Accident (SBLOCA) during which cold High Pressure Injection (HPI) fluid is injected into stagnant, hot primary fluid with complete loss of natural circulation in the loop.

Extensive temperature, velocity, and heat transfer coefficient data are presented at two cold leg Froude numbers: 0.052 and 0.076. The 1/2-scale data are compared with earlier data from a 1/5-scale, geometrically similar facility to assess scaling principles.

ACKNOWLEDGEMENTS

The authors of this report acknowledge the valuable contributions made to the design of this test project by the plant owners and vendors through their input to EPRI, and by the technical consultants of the NRC Advanced Code Review Group. The several scaling and design reviews conducted by Dr. Jean-Pierre Sursock of EPRI and Dr. Novak Zuber of NRC were extremely effective in achieving wide input and verification of the approaches taken in this project. We are also grateful to Dr. Jose Reyes and Dr. Avtar Singh for their effective project management and their technical support in reviewing the data.

Much of the basis of this facility and project design is derived from small scale flow visualization studies sponsored by EPRI during 1981 and 1982; we acknowledge the foresight and technical contributions of Dr. Bill K.H. Sun, Project Manager, in establishing this essential early data base.

Many people at Creare also made significant contributions to the overall experimental program. Mike Hall was responsible for the test facility design with major design and construction support from Frank LeBlanc, Harold Clark, Mario Langsten and John White. Instrumentation system design and development were carried out by Tom Tantillo. Norm Williams fabricated many of the special purpose instruments and Bob Eccher designed and built the data acquisition system. Computer programming for data acquisition and data reduction and reporting was done by Judy Durant. Becky Cummings performed the data reduction. This report was prepared by Beverly Brooks and Leann Cushman with figures drafted by John Wickman. Their efforts are greatly appreciated.

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NOMENCLATURE

A	Area, m^2
B	Specific buoyancy (Equation 3.5), m^3/s^3
C	Specific heat, J/kg-°C
D	Diameter, m
F	Froude number
g	Acceleration of gravity, m/s^2
H	Vertical distance along downcomer, measured from cold leg centerline, m
h	Heat transfer coefficient, W/m^2-°C
j	Superficial velocity, m/s
k	Thermal conductivity, W/m-°C
Nu	Nusselt number
Pr	Prandtl number
Q	Volumetric flow rate, m^3/s
q	Heat flux, W/m^2
Re	Reynolds number
S	Downcomer gap width, m
T	Temperature, °C
t	Time, s
v	Velocity, m/s
V	Volume, m^3
W	Width, m
X	Horizontal distance along downcomer, measured from cold leg centerline, m
Y	Horizontal across downcomer, distance measured from vessel wall, m
Z	Vertical distance measured from bottom of cold leg, m

Subscripts

a	Ambient
AV	Average
CL	Cold leg
D	Down
DC	Downcomer
DB	Dittus Boelter
E	Effective
exp	Experimental
F	Fluid
H	HPI
j	Superficial
L	Loop
M	Metal
p	Plume
R	Residence
s	Standpipe
T	Total
∞	Fully developed

Superscripts

*	Dimensionless

Greek Symbols

Γ	Effective thermal mixing volume, m^3
μ	Absolute viscosity, kg/m-s
ν	Kinematic viscosity, m^2/s
ρ	Density, kg/m^3
τ	Mixing time, s

SUMMARY

This report presents data from an experimental study of fluid mixing in a 1/2-scale model of the cold leg and downcomer of a Pressurized Water Reactor (PWR). Knowledge of fluid mixing is of interest for the analysis of over-cooling transients where potential flow stratification could induce high thermal stresses on the vessel wall and hence lead to Pressurized Thermal Shock (PTS). The first volume of this report describes the experimental facility and the data acquisition and reduction procedures. This volume presents the data for two transient cooldown experiments performed at Froude numbers of 0.052 and 0.076 and compares these data with data obtained earlier in a 1/5-scale transparent model. The experiments were performed at Creare Inc. under the joint sponsorship of the Electric Power Research Institute (EPRI) and the U.S. Nuclear Regulatory Commission (NRC).

The results from 1/2-scale experiments and 1/5-scale experiments performed at equal Froude number are in good agreement, demonstrating the validity of Froude number scaling. As was the case in the 1/5-scale experiments, the 1/2-scale experiments show that even at these relatively high values of the Froude number, the overall response of the facility closely approximates that of a well mixed vessel. Local temperature distributions show some degree of stratification, especially in the cold leg and core barrel side of the downcomer. However, as shown in Figure S-1, fluid temperatures near the vessel wall are practically uniform, with the exception of a small region near the cold leg nozzle which is somewhat colder during the early part of the transient. Even this colder region does not deviate by more than 10 percent from the perfectly mixed response.

The heat transfer coefficient in the downcomer is a function of the local plume velocity and downcomer geometry (entrance effects). The plume velocity measure-ments are in good agreement with existing planar plume correlations and the entrance effect correction is also in good agreement with existing data for heat transfer coefficients in the entrance regions of ducts. As shown in Figure S-2, the measured heat transfer coefficients are in good agreement with widely accepted heat transfer correlations if the Reynolds number is based on the plume velocity and entrance effects are taken into account.

The actual heat transfer coefficients are an order of magnitude larger than those calculated using a Reynolds number based on the superficial velocity. During the first characteristic mixing time the measured heat transfer coefficients at the downcomer vessel wall range from 1700 to 6000 W/m^2-C (300 - 1100 Btu/ft^2-hr-F).

For equal Froude number, the Nusselt number is proportional to the Reynolds number raised to the 0.8 power. Since Reynolds numbers are about 6.5 times larger in the prototype than in the 1/2-scale model,

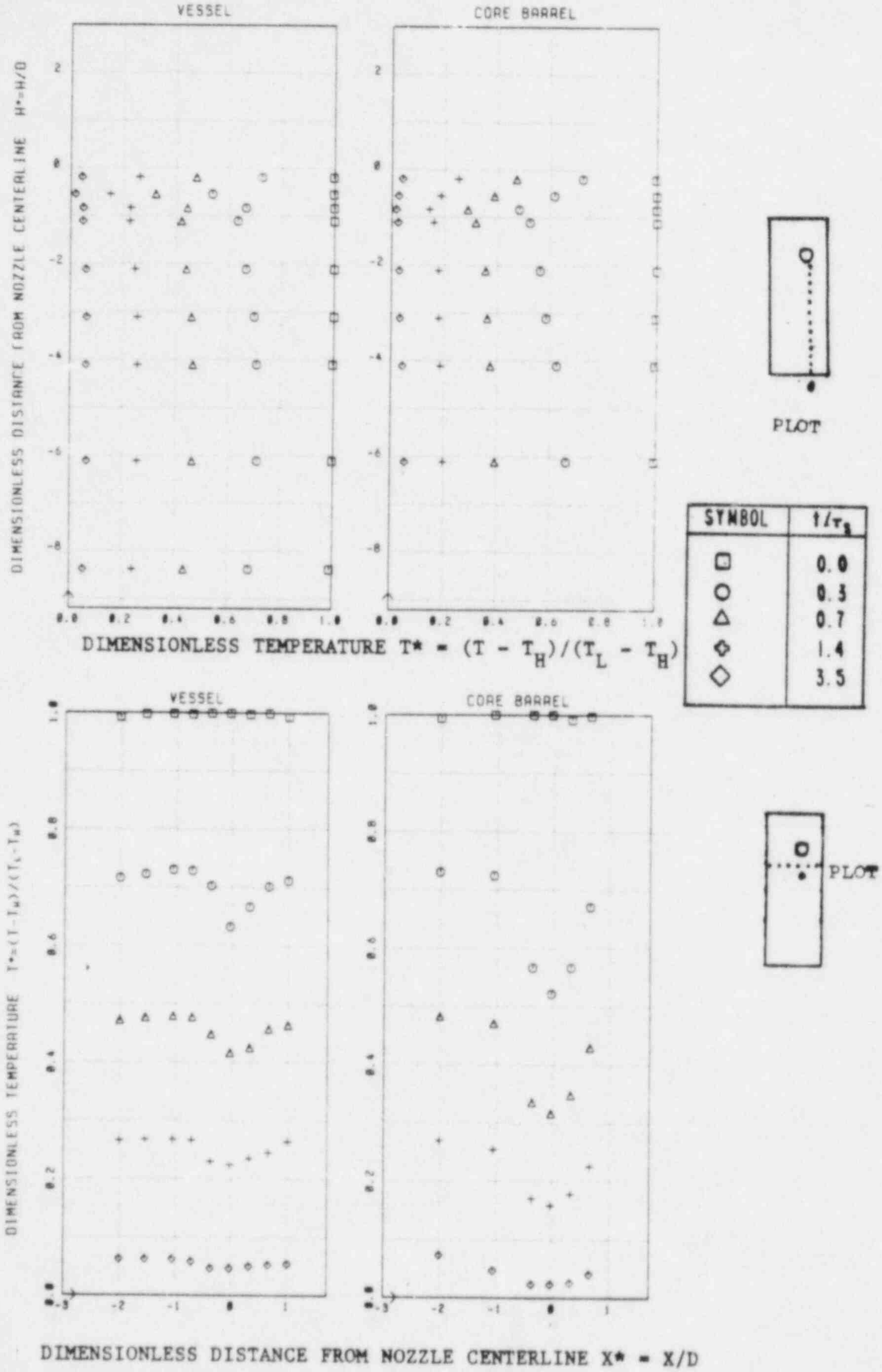


Figure S-1. Downcomer Vertical and Horizontal Temperature Distributions

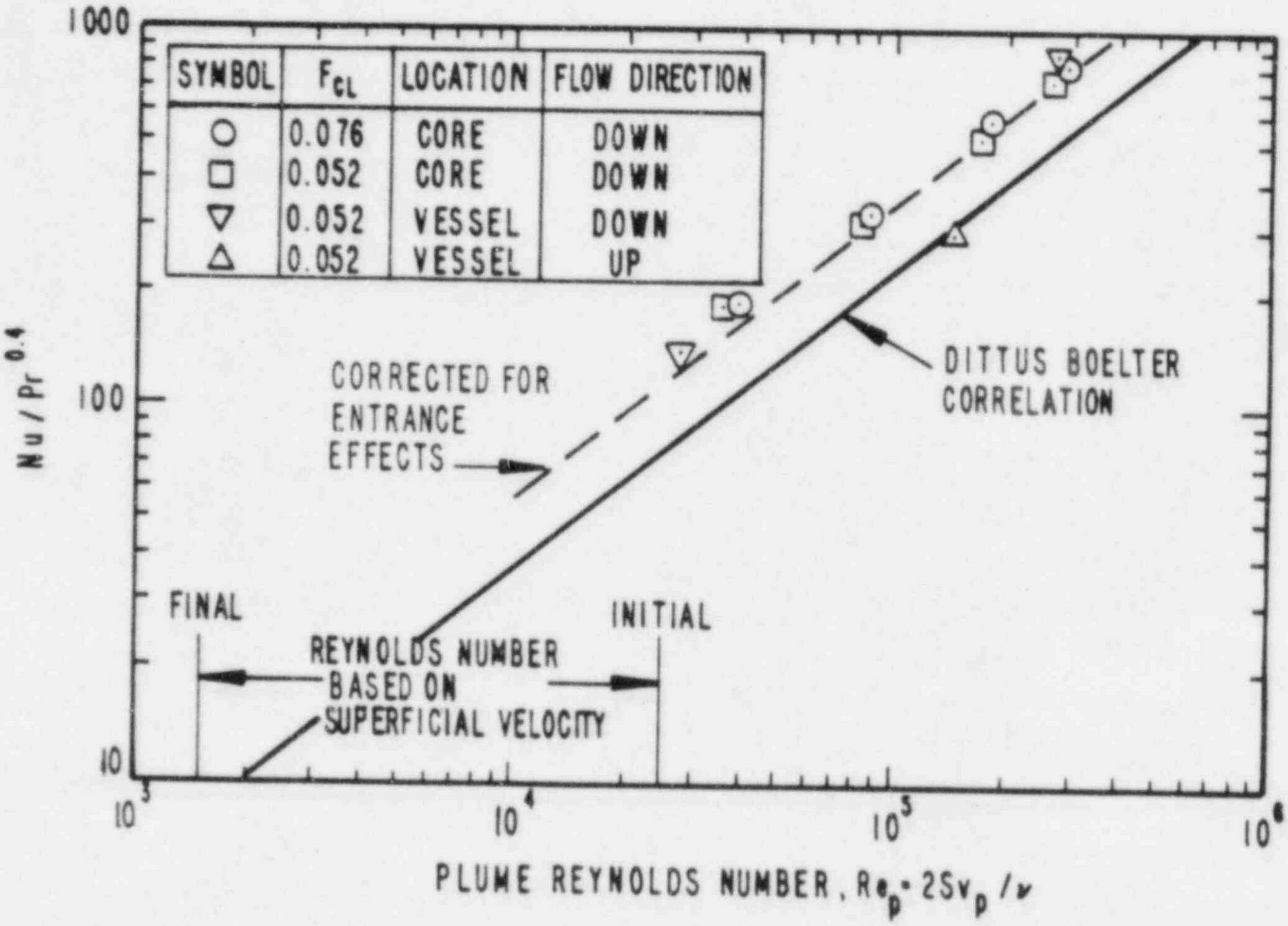


Figure S-2. Comparison of Downcomer Heat Transfer Coefficients with Existing Correlations

Nusselt numbers in the prototype will be about 4 times larger than in these experiments and heat transfer coefficients will be about twice as large.

1. INTRODUCTION

This is the second volume of a two volume report dealing with thermal and fluid mixing experiments performed in a 1/2-scale model of the cold leg and downcomer of a pressurized water reactor (PWR). The first volume (1) describes the experimental facility and the data acquisition and reduction procedures. This volume presents the data for the two transient cooldown experiments performed in this facility, and compares these data with data obtained earlier in a 1/5-scale transparent model. A separate report (2) presents the data from seven shakedown tests performed in the 1/2-scale facility. The experiments were performed at Creare Inc. under the joint sponsorship of the Electric Power Research Institute (EPRI) and the U.S. Nuclear Regulatory Commission (NRC).

In this section we present some background information and describe the project objectives. Section 2 describes the specific facility geometry and instrument locations. Highlights of the 1/2-scale data are presented in Section 3 and compared with the 1/5-scale data in Section 4. The main conclusions derived from these data are summarized in Section 5. Appendices A and B include detailed tabulated and graphical data for the two 1/2-scale transient cooldown tests.

1.1 BACKGROUND

The purpose of this project is to investigate the fluid and thermal mixing phenomena in situations relevant to Pressurized Thermal Shock (PTS) calculations. These situations arise during certain loss-of-coolant accidents or cooling transients in PWRs when cold water is injected under high pressure into the primary coolant loop. Because of the density difference between the cold High Pressure Injection (HPI) water and the warm water in the cold leg there is the potential for flow stratification. Knowledge of the transient fluid temperatures throughout the facility is required to calculate the thermal stresses on the vessel wall and to assess the potential for cracking of the vessel wall following repressurization of the primary system.

The results of extensive experiments performed earlier in a 1/5-scale facility (3 - 8) suggest that the transient response of the fluid temperature adjacent to the vessel wall is close to that of a well mixed vessel. In tests with loop flow the temperature at the coldest point on the vessel wall was found to be within 5 percent of the mixed mean temperature. Those tests show that a small loop flow is sufficient to significantly mitigate the HPI cooling effect.

Even in the absence of loop flow, the 1/5-scale experiments showed significant mixing between the HPI fluid and the stagnant loop water. The large reservoir of hot water in the cold leg, loop seal, downcomer, and lower plenum mixed rapidly with the cold HPI water,

slowing down the cooling rate of the vessel wall. Although the overall response of the system again closely resembled that of a well mixed vessel, greater temperature stratification was observed in the cold leg and downcomer. The degree of stratification was found to be a function of the cold leg Froude number, which represents the ratio of inertial to buoyancy forces:

$$F_{CL} = \frac{Q_H/A_{CL}}{(g\ D\ \Delta\rho/\rho_H)^{0.5}} \tag{1.1}$$

where:
Q_H = HPI volumetric flow rate
A_{CL} = cold leg area
g = acceleration of gravity
D = cold leg diameter
$\Delta\rho$ = density difference between the loop water and the HPI water
ρ_H = HPI water density

It was found that the density difference between the cold HPI water and the warm stagnant loop water actually promotes entrainment and mixing in the injector region of the cold leg--the lower the Froude number, the more uniform the temperatures throughout the facility. The most severe scenario for PTS calculations is therefore HPI injection at high Froude number into a reactor with a stagnant loop flow.

For typical PWR cooling transients, the upper bound of the cold leg Froude number is about 0.05 (9). One-fifth scale experiments at F_{CL} = 0.05 showed that even for these conditions, the degree of temperature stratification in the downcomer is small. Throughout the transient the temperature difference between the coldest region on the downcomer vessel wall and the "perfectly mixed" temperature is less than 20 percent of the available temperature difference (perfectly mixed temperature minus HPI temperature).

Several other experimental and analytical studies dealing with thermal and fluid mixing aspects of PTS have been reported over the last few years. Thermal mixing experiments in a facility with a rectangular cold leg of prototypical height have been performed by SAI (10), and experiments in a facility with a 1/2-scale transparent cold leg and a modified downcomer are currently in progress at Purdue University (11). Empirical correlations of the HPI jet entrainment rates and the cold leg quench front velocity are presented in References 12 and 13. References 14 and 15 present scaling considerations for the thermal mixing phenomena and References 11, 15, and 16, present simplified "mixing region" models for predicting the thermal mixing transient.

Preliminary heat transfer models are described in References 14 and 17. Finally, three-dimensional, numerical calculations of the thermal mixing transient in the cold leg and down-comer are reported in References 18, and 19.

1.2 PROJECT OBJECTIVES

The main objectives of this project are to:

1. Verify scaling principles by providing thermal mixing data in a facility geometrically similar to the 1/5-scale facility but more than twice its size.

2. Provide detailed temperature distribution data in the cold leg and downcomer for validation of numerical, three-dimensional thermal mixing models.

3. Measure heat transfer coefficients in the downcomer to provide adequate boundary conditions for the computation of the vessel wall cooling transient.

2. EXPERIMENTAL FACILITY AND INSTRUMENTATION

This section briefly summarizes the main features of the experimental facility and describes the specific geometry tested. It also provides detailed information about the location of the various measuring probes in these tests. A complete description of the test facility, instrumentation, test procedures, data acquisition and reduction procedures, and measurement uncertainty analyses is included in Volume 1 of this report (1).

2.1 GEOMETRY

Figure 2-1 shows a schematic of the experimental facility. The facility models the cold leg and downcomer of a PWR. Major linear dimensions are scaled to approximately one-half of the dimensions of prototype PWR plants. While the principal geometric features common to many of the existing PWR plants have been included, the facility does not model all the geometric features of any specific plant.

The facility was designed to accommodate geometric features characteristic of three vendor designs: Westinghouse (W), Combustion Engineering (CE), and Babcock & Wilcox (B&W). The two tests reported here were performed in the Westinghouse configuration. That is, the geometries of the cold leg, loop seal, pump simulator, HPI injector, and cold leg nozzle are characteristic of the W design. The principal dimensions are shown in Figures 2-2 through 2-4 and Table 2-1.

The downcomer is represented by a planar section having width, height, and gap comparable to a 90 degree sector of a reactor downcomer. It includes certain internals such as blockage simulating a "hot leg" and a thermal shield located below the cold leg nozzle. The thermal shield spans the full width of the downcomer and is sized and located so as to preserve ratios of all important dimensions. The downcomer walls are made out of 70 mm (2.75 in) thick steel plates. Although the wall thickness is less than half of prototypical, it is thermally thick, as described in Reference 14.

2.2 INSTRUMENTATION

The measurements made during a test fall into two categories:

1. System measurements

2. Principal measurements

System measurements consist of flow rates, pressures, and temperatures of the facility inlet and exit flow from the facility. These measurements are used to establish and control the operating conditions of the facility. The location and description of these measurements are shown in Figures 2-5 and 2-6 and in Table 2-2.

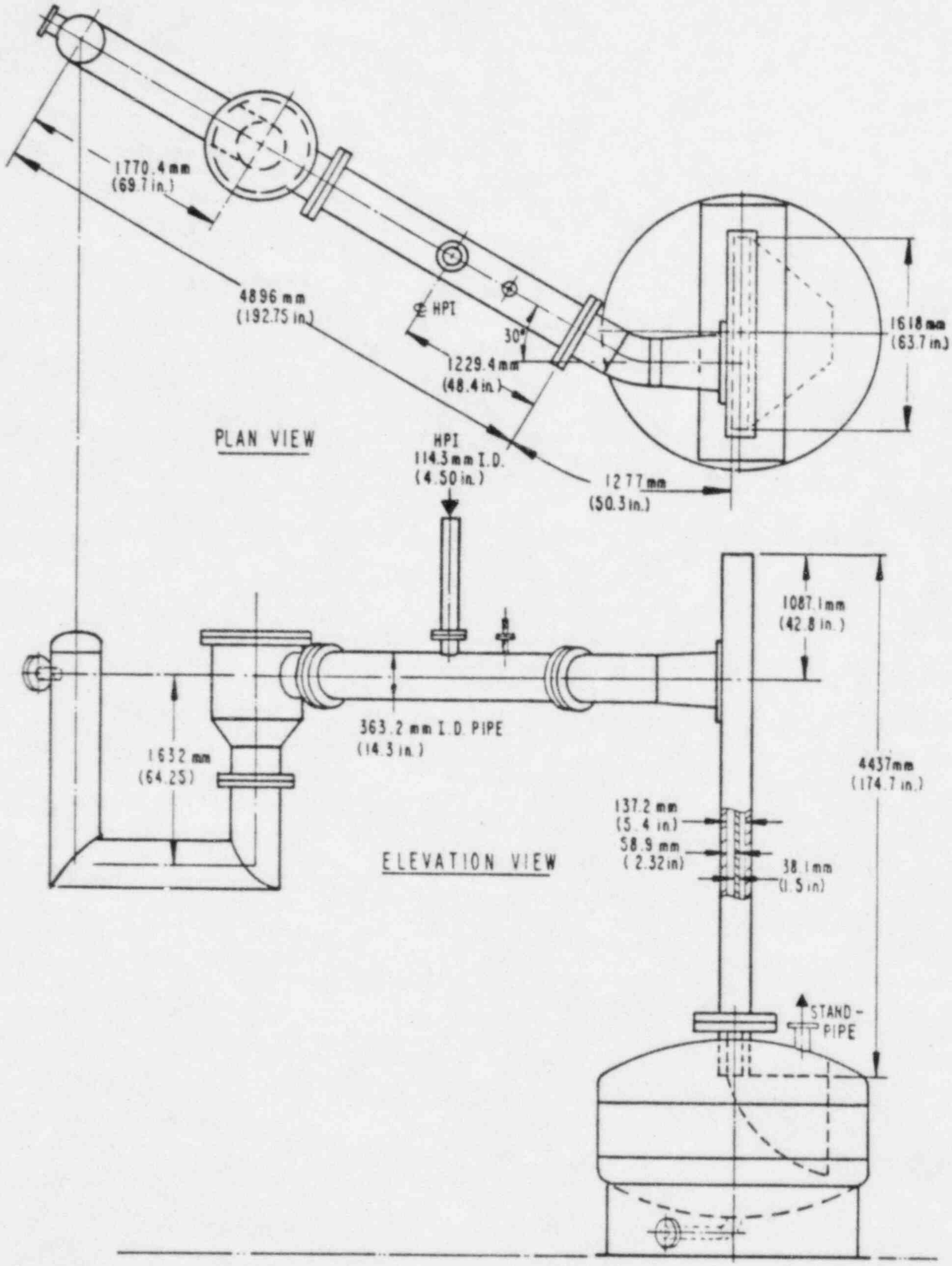
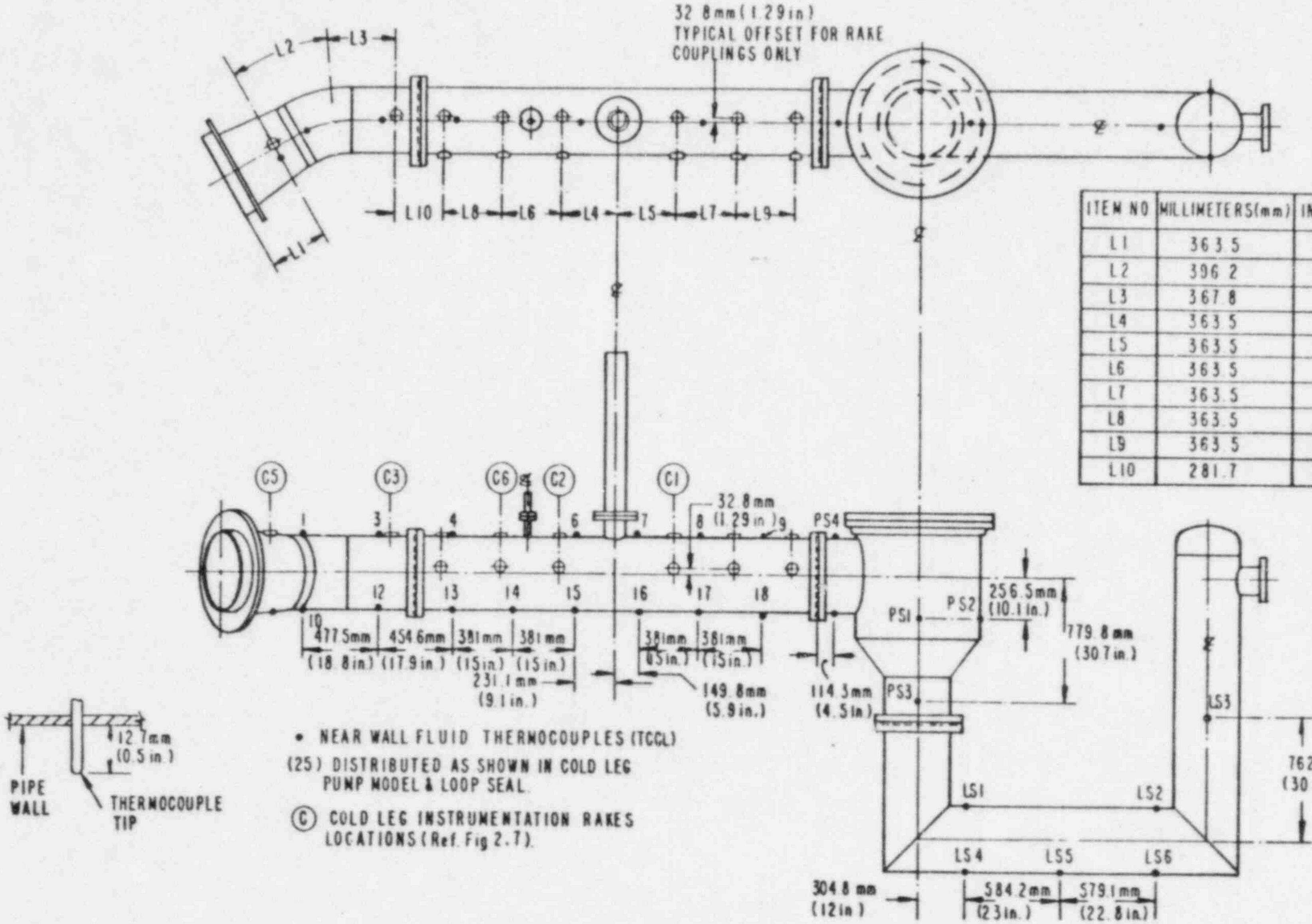
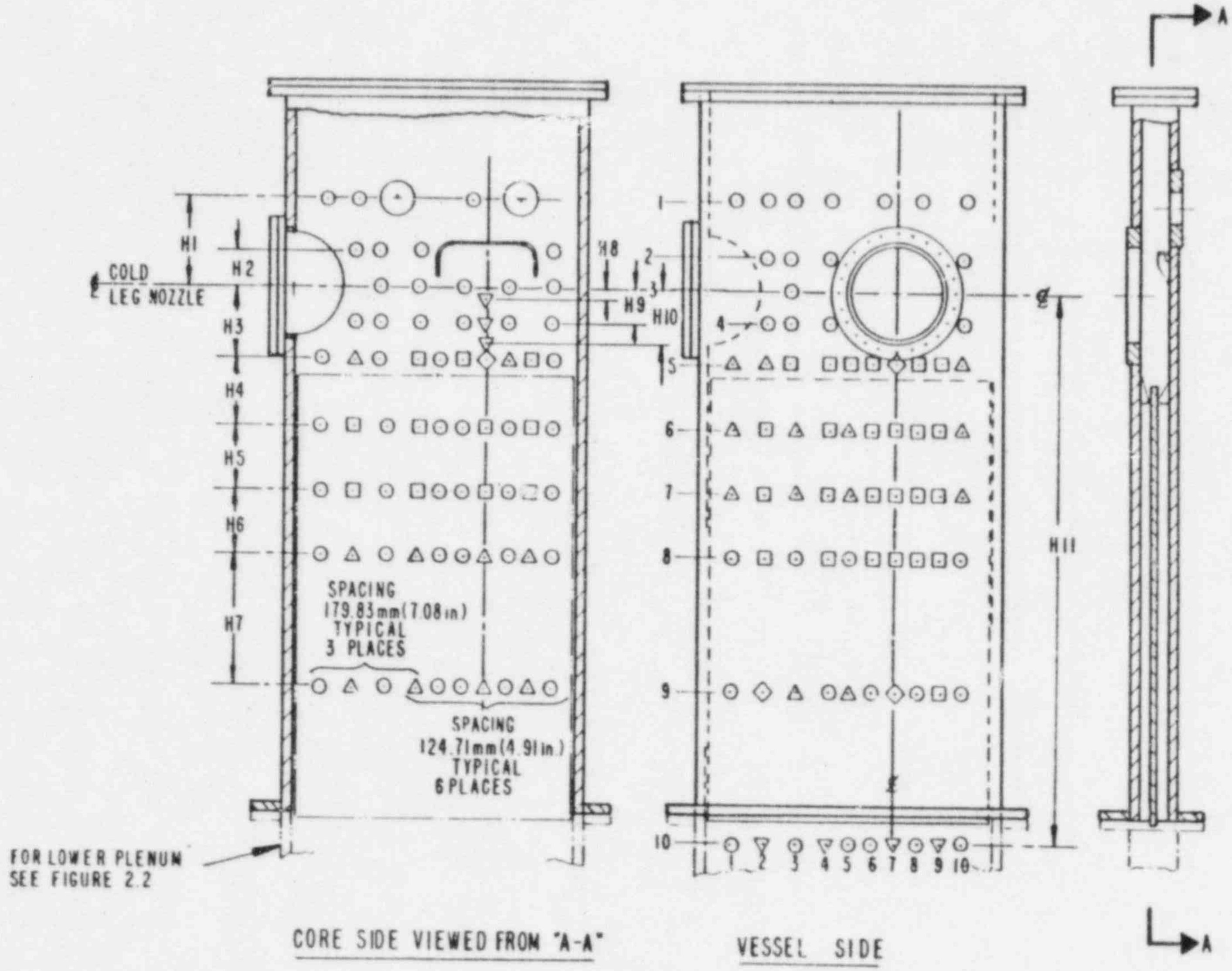


Figure 2-1. Schematic of 1/2-Scale Test Facility for Tests MAY105 and MAY106



ITEM NO	MILLIMETERS (mm)	INCHES (in.)
L1	363.5	14.31
L2	396.2	16.80
L3	367.8	14.48
L4	363.5	14.31
L5	363.5	14.31
L6	363.5	14.31
L7	363.5	14.31
L8	363.5	14.31
L9	363.5	14.31
L10	281.7	11.0

Figure 2-2. Cold Leg Instrument Locations (W Cold Leg Configuration)



INSTRUMENT KEY

- △ CENTER-OF-GAP FLUID THERMOCOUPLE
- □ HEAT FLUX PROBE WITH CENTER-OF-GAP THERMOCOUPLE
- ◇ VELOCITY PROBE WITH HEAT FLUX & CENTER-OF-GAP THERMOCOUPLE
- ▽ FLUID THERMOCOUPLE RAKE
- ○ SPARE INSTRUMENT LOCATIONS

ITEM NO	MILLIMETERS (mm)	INCHES (in)
H1	492.3	19.38
H2	181.5	7.16
H3	406.4	16.0
H4	363.5	14.31
H5	363.5	14.31
H6	363.5	14.31
H7	726.9	28.62
H8	72.9	2.87
H9	203.2	8.0
H10	304.8	12.0
H11	3048.0	120.0

Figure 2-3 Downcomer Instrument Locations

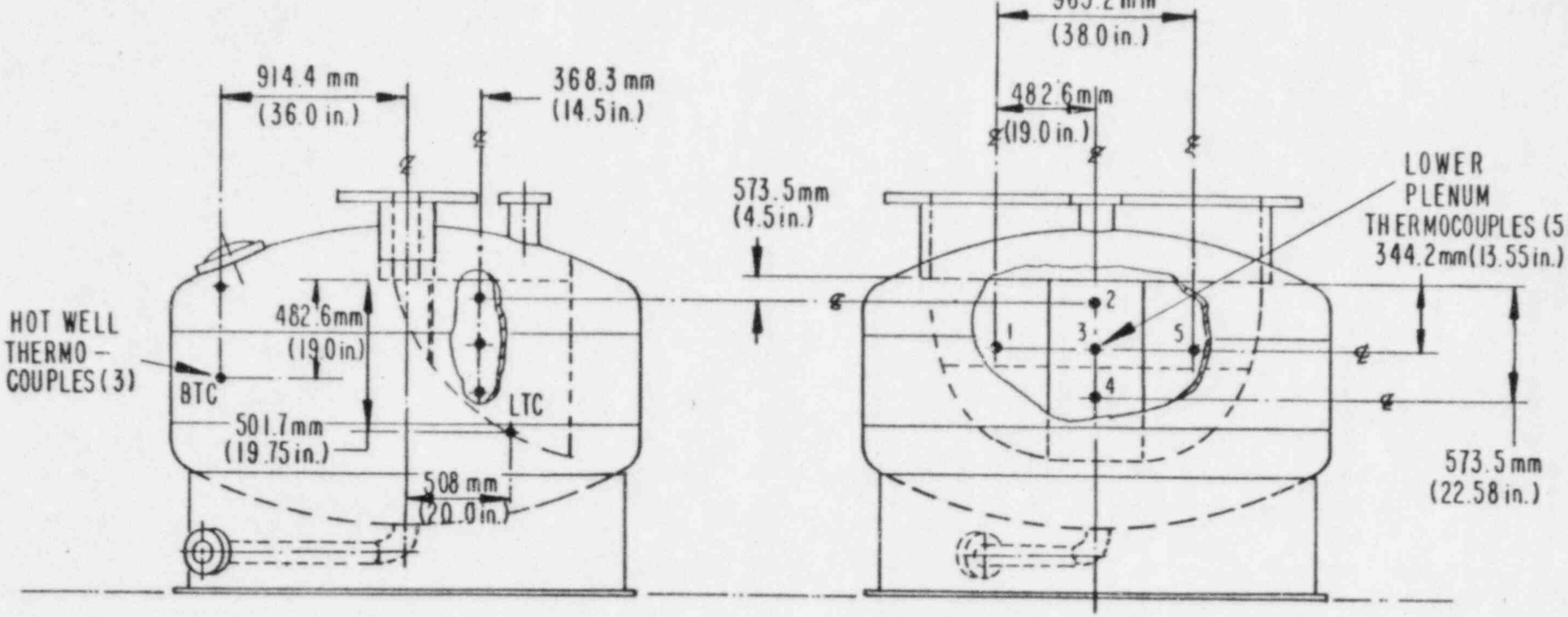


Figure 2-4. Lower Plenum Instrument Locations

TABLE 2-1
GEOMETRIC CONFIGURATION

TEST SETUP*		
COLD LEG:	Horizontal 2	
HPI INJECTOR:	D	
THERMAL SHIELD:	In place	
LOWER PLENUM FLOW SKIRT:	Not in place	
VOLUMES, m^3 (ft^3)		
LOOP SEAL - RISER	0.219	(7.73)
- HORIZONTAL	0.202	(7.13)
- PUMP LINK	0.081	(2.86)
PUMP	0.272	(9.60)
COLD LEG - UPSTREAM INJ.	0.131	(4.62)
- DOWNSTREAM INJ.	0.276	(9.73)
DOWNCOMER - ABOVE NOZZLE	0.242	(8.54)
- BELOW NOZZLE	0.592	(20.91)
LOWER PLENUM	0.605	(21.35)
STAND PIPE	0.120	(4.24)
TOTAL	2.740	(96.71)
DIMENSIONS, m (ft)		
COLD LEG DIAMETER (ID)	0.363	(1.192)
DOWNCOMER WIDTH	1.618	(5.308)
DOWNCOMER GAP - VESSEL	0.059	(0.192)
- CORE	0.041	(0.133)
- THERMAL SHIELD	0.038	(0.125)

* See Volume 1 for a detailed description of the various facility components

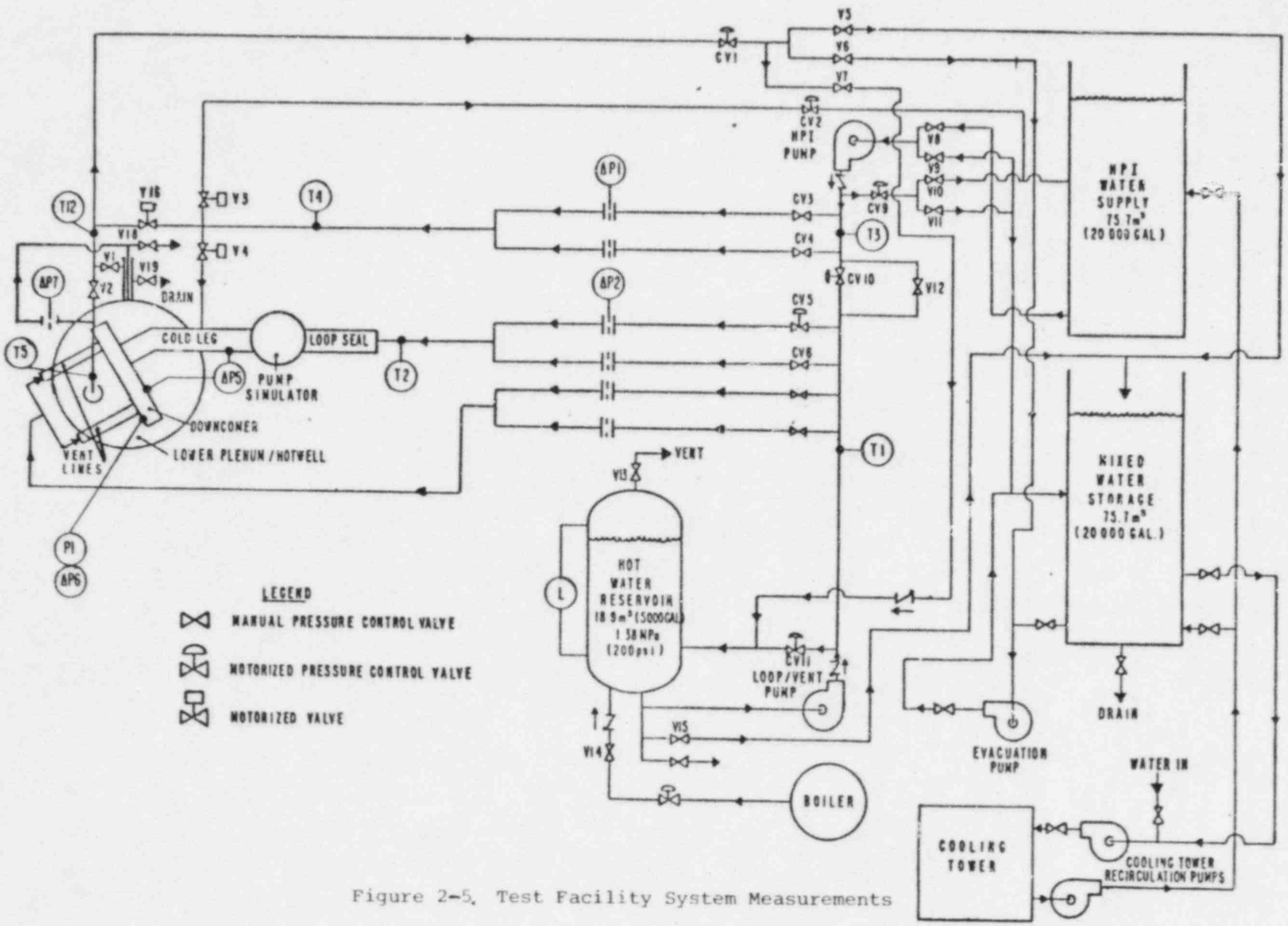


Figure 2-5. Test Facility System Measurements

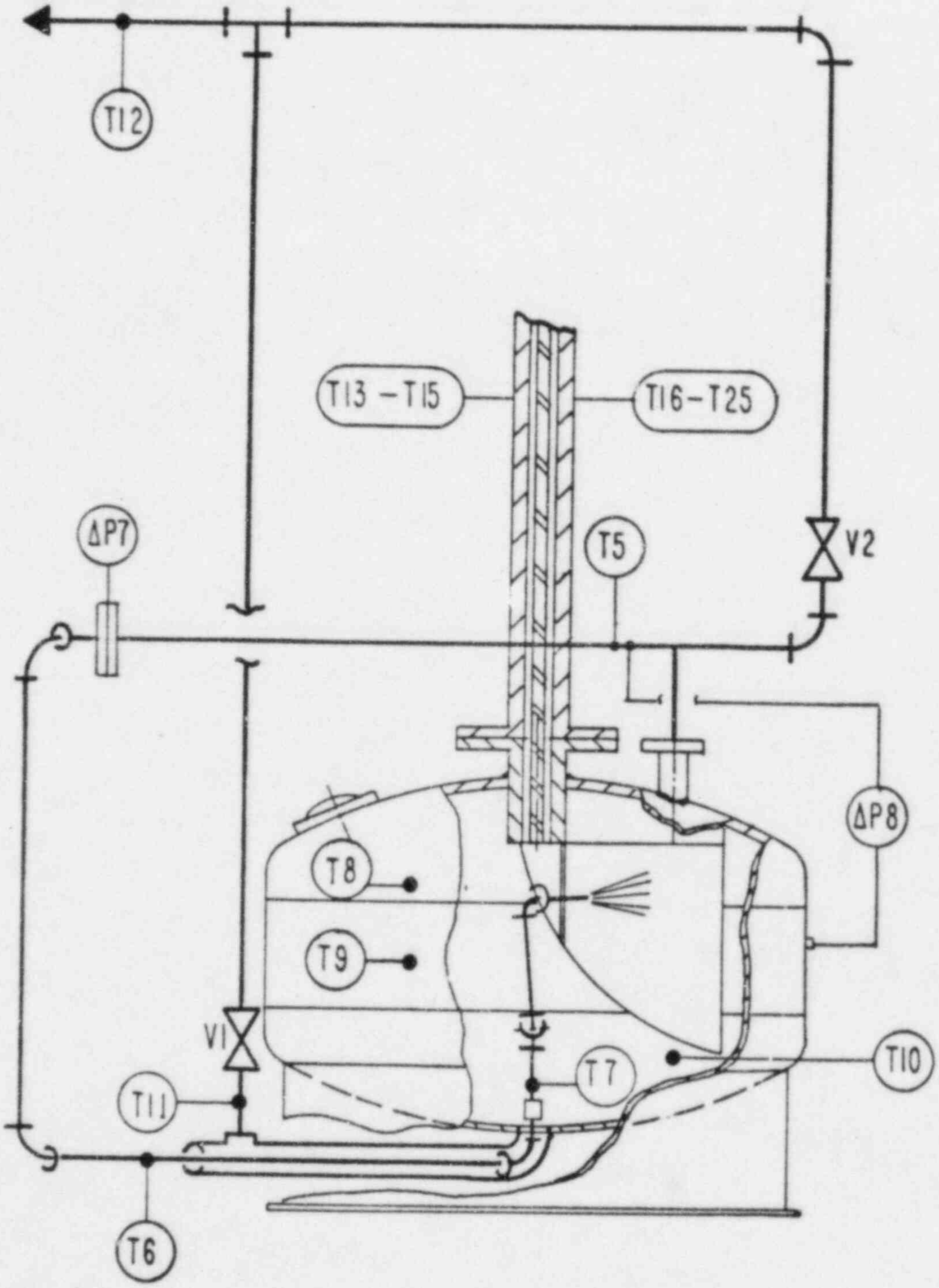


Figure 2-6. System Measurements at Facility Boundary

TABLE 2-2
SYSTEM MEASUREMENTS

INSTRUMENT[1] LABEL	CODE[2]	MEASURED VARIABLE
T1	LOOPT	Loop supply temperature
T2	LOOPT2	Loop seal inlet temperature
T3	HPISUPT1	HPI supply temperature
T4	HPISUPT2	HPI temperature at injector inlet
T5	SPWT	Standpipe water temperature
T6	SPWTC2	Recirculated standpipe water temperature
T7	SPWTC3	Recirculated standpipe water temperature
T8	HWUTC	Upper hotwell temperature
T9	HWBTC	Bulk hotwell temperature
T10	HWLTC	Lower hotwell temperature
T11	HWETC	Hotwell exit temperature
T12	CVITC	Facility exit temperature
T13-T15	C**VWTC[3]	Core outside wall temperature
T16-T17	V**VWTC	Vessel outside wall temperature
T18-T25	V**PWTC	Probe outside wall temperature
P1	TVP	Test vessel pressure
ΔP1	HPIFLOW	HPI flow rate
ΔP2	LOOPFLOW	Loop flow rate
ΔP5	CLDP5	Cold leg pressure drop
ΔP6	DDP6	Downcomer pressure drop
ΔP7	SPHWFLO	Standpipe to hotwell flow rate
ΔP8	HWRDP	Hotwell to standpipe pressure drop

[1] The Instrument Label corresponds to symbols used in Figures 2-5 and 2-6

[2] The CODE designation in this column refers to the nomenclature used to label the data in the computer-generated plots and tables

[3] The asterisks (**) refer to the row and column on the downcomer (Fig. 2-3) where the instruments are located

Principal measurements consist of the local temperatures and velocities measured at various points in the facility. In these tests, temperatures were measured at 80 locations in the cold leg, including four multiple point vertical temperature rakes placed between the HPI injector and the cold leg nozzle and one rake placed between the HPI injector and the pump simulator (Figures 2-2 and 2-7, Table 2-3). Cold leg velocities were measured at rake C2 downstream of the HPI injector.

Fluid temperatures were measured at 86 locations in the downcomer (Figure 2-3, Table 2-3). At 40 locations, the temperatures were measured at the center of the gap between the downcomer wall and the thermal shield, at approximately one-third of the gap width away from the downcomer wall, and at the interior surface of the downcomer walls. The surface temperature measurements were used to compute the transient heat flux at the wall, as described in Reference 1. Temperatures at the exterior surface of the downcomer wall were measured at 13 locations to provide an integral check on the heat flux measurements. Temperatures in the vicinity of the cold leg nozzle were also measured using three rakes with five temperature probes each (Figure 2-8).

Velocities were measured at 4 locations in the downcomer: two below the cold leg nozzle (locations V67 and C67 in Figure 2-3) and two on the vessel side near the bottom of the thermal shield (locations V92 and V97 in Figure 2-3).

Temperatures were also measured at 5 locations in the lower plenum and 3 locations in the pressure vessel surrounding the lower plenum (Figure 2-4).

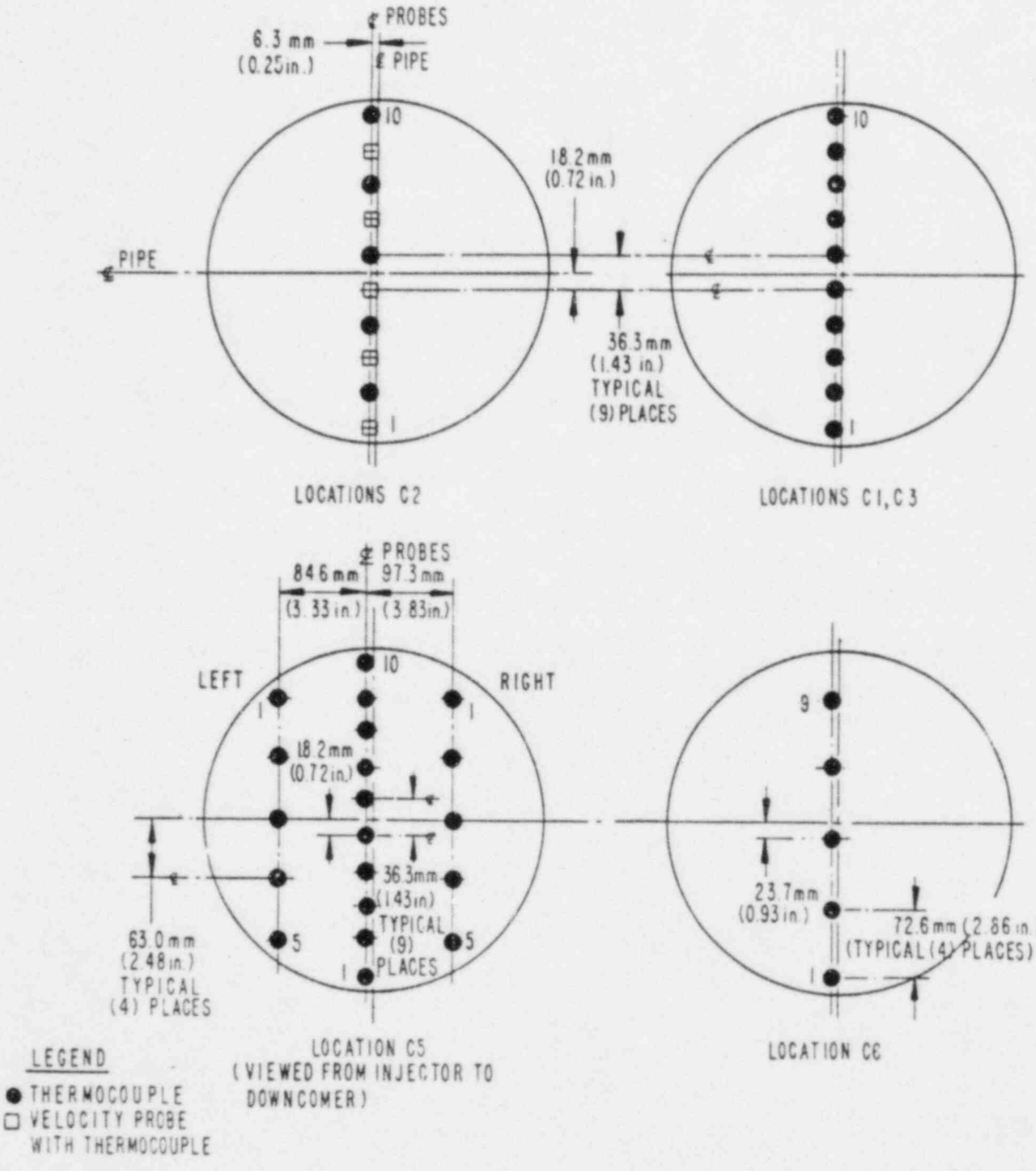


Figure 2-7. Detailed Cold Leg Probe Radial Locations

TABLE 2-3

LOCAL INSTRUMENT IDENTIFICATION CODE

CODE	DESCRIPTION
TC [LS / PS / CL] [i]	Thermocouple [Loop Seal / Pump / Cold Leg] [Position (Figure 2-2)]
[TC / V] CL [Ci] [j]	[Thermocouple / Velocity] Cold Leg [Rake # (Fig. 2.2)] [Position (Fig. 2-7)]
TCLC5 [R / L] [i]	Cold Leg Lateral Thermocouple Rakes at Location C5 [Right / Left] [Position (Fig. 2-7)]
[C / V] [i] [j] [CTC / FTC / MTC / DT / V]	Core Side [Row] [Column] Vessel Side (Figure 2-3) [Centerline Thermocouple / Film Thermocouple / Metal Thermocouple / Metal-Fluid ΔT / Velocity]
GAPJ [i] [j]	Gap Jumper Thermocouple [Row] [Column] (Figure 2-8)
LP [i]	Lower Plenum [Position (Figure 2-4)]

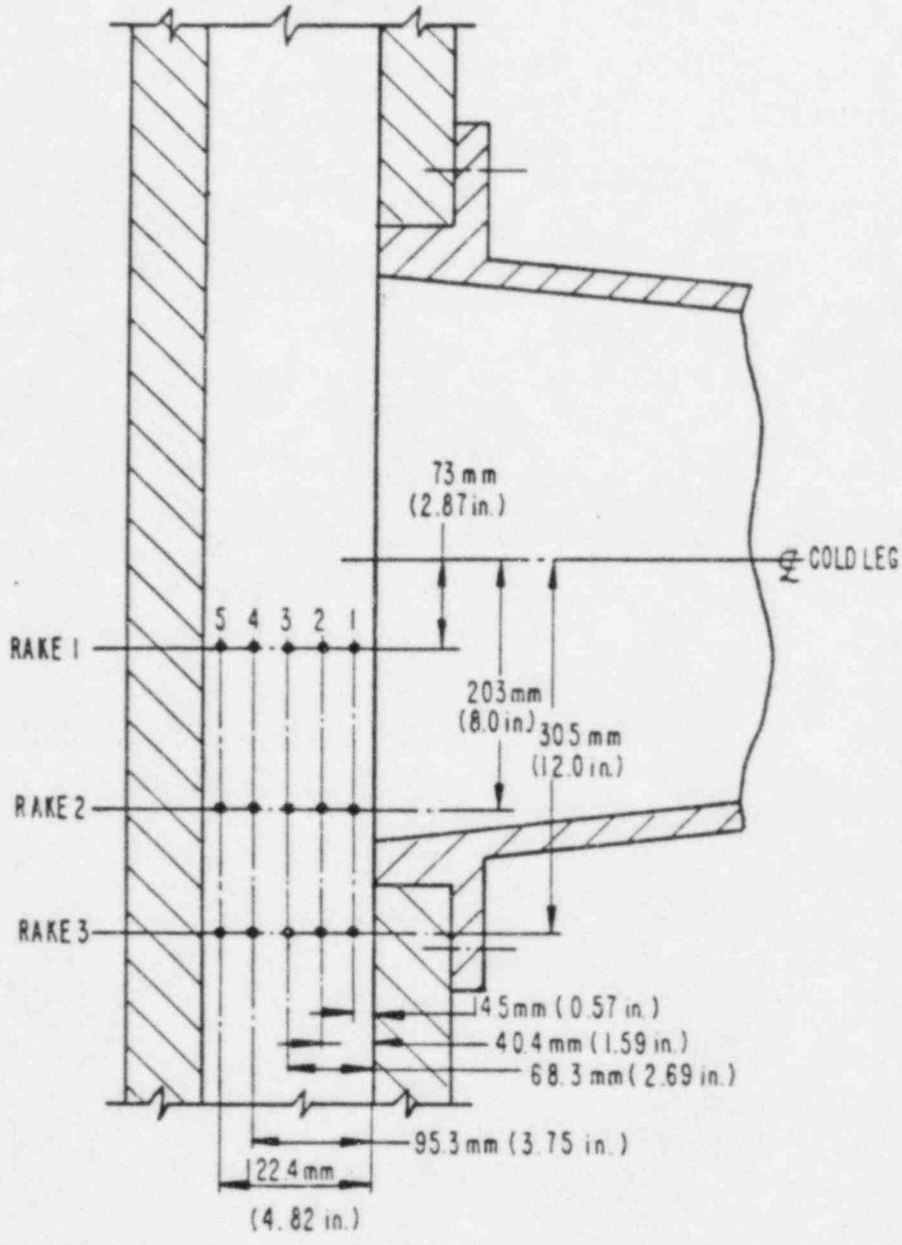


Figure 2-8. Downcomer Gap Temperature Rakes Near Nozzle Elevation

3. EXPERIMENTAL RESULTS OF 1/2-SCALE TESTS

This section presents the highlights of the 1/2-scale data from the two transient cooldown tests performed to date (MAY105 and MAY106). Detailed data for both tests are included in Appendices A and B. Unqualified data from seven shakedown tests are presented in a separate report (2).

3.1 TEST CONDITIONS

Table 3-1 shows the test conditions for tests MAY105 and MAY106. Tests were performed at two values of Froude number: 0.052 (MAY106) and 0.076 (MAY107). Both tests were performed under stagnant loop conditions ($Q_L = 0$). Prior to initiation of the test, loop flow was circulated through the facility until the whole system reached thermal equilibrium at the loop flow temperature of about 190°C (375°F). The loop flow was then turned off and HPI injection initiated. Test duration was approximately 3.5 standpipe characteristic mixing times.

3.2 TEMPERATURES

The detailed temperature measurements performed during these tests can be used to analyze the fluid mixing phenomena following HPI injection. The global mixing characteristics of the facility can be obtained from the standpipe (facility discharge) temperature transient, and the local mixing characteristics from the temperature distribution in various regions of the facility.

3.2.1 Global Mixing Characteristics

The mixing characteristics of the facility as a whole closely approximate those of a perfectly mixed vessel. As shown in Figure 3-1, the standpipe temperature response for test MAY106 deviates by less than 7°C (4% of the overall temperature difference) from a simple exponential decay:

$$T = T_H + (T_L - T_H) \exp(-t/\tau_s) \qquad (3.1)$$

where T_H = HPI temperature
T_L = Stagnant loop initial temperature
τ_s = Characteristic mixing time (standpipe)

Previous 1/5-scale work (6) established the relationship:

$$\tau_s = \Gamma/Q_T \qquad (3.2)$$

TABLE 3-1

TEST CONDITIONS

Parameter	Symbol	Units	MAY105	MAY106
Froude Number	F_{CL}	-	7.35E-02	5.11E-02
Reynolds Number	Re_{CL}	-	1.55E-04	1.08E+04
Density Ratio	$\Delta\rho/\rho$	-	1.22E-01	1.21E-01
HPI flow rate	Q_H	m^3/s	5.17E-03	3.53E-03
Loop flow rate	Q_L	m^3/s	0.00E+00	0.00E+00
HPI temperature	T_H	°C	1.42E+01	1.48E+01
Stagnant Loop Initial Temperature	T_L	°C	1.89E+02	1.90E+02
HPI Flow Properties				
Density	ρ_H	kg/m^3	1.00E+03	1.00E+03
Absolute Viscosity	μ_H	kg/m-s	1.17E-03	1.15E-03
Thermal Conductivity	k_H	W/m-°C	5.95E-01	5.96E-01
Stagnant Loop Initial Properties				
Density	ρ_L	kg/m^3	8.78E+02	8.77E+02
Absolute Viscosity	μ_L	kg/m-s	1.42E-03	1.41E-03
Thermal Conductivity	k_L	W/m-°C	6.69E-01	6.68E-01
HPI Residence Time	τ_R	s	4.41E+02	6.46E+02
Test Duration	t_f	s	2.34E+03	3.60E+03

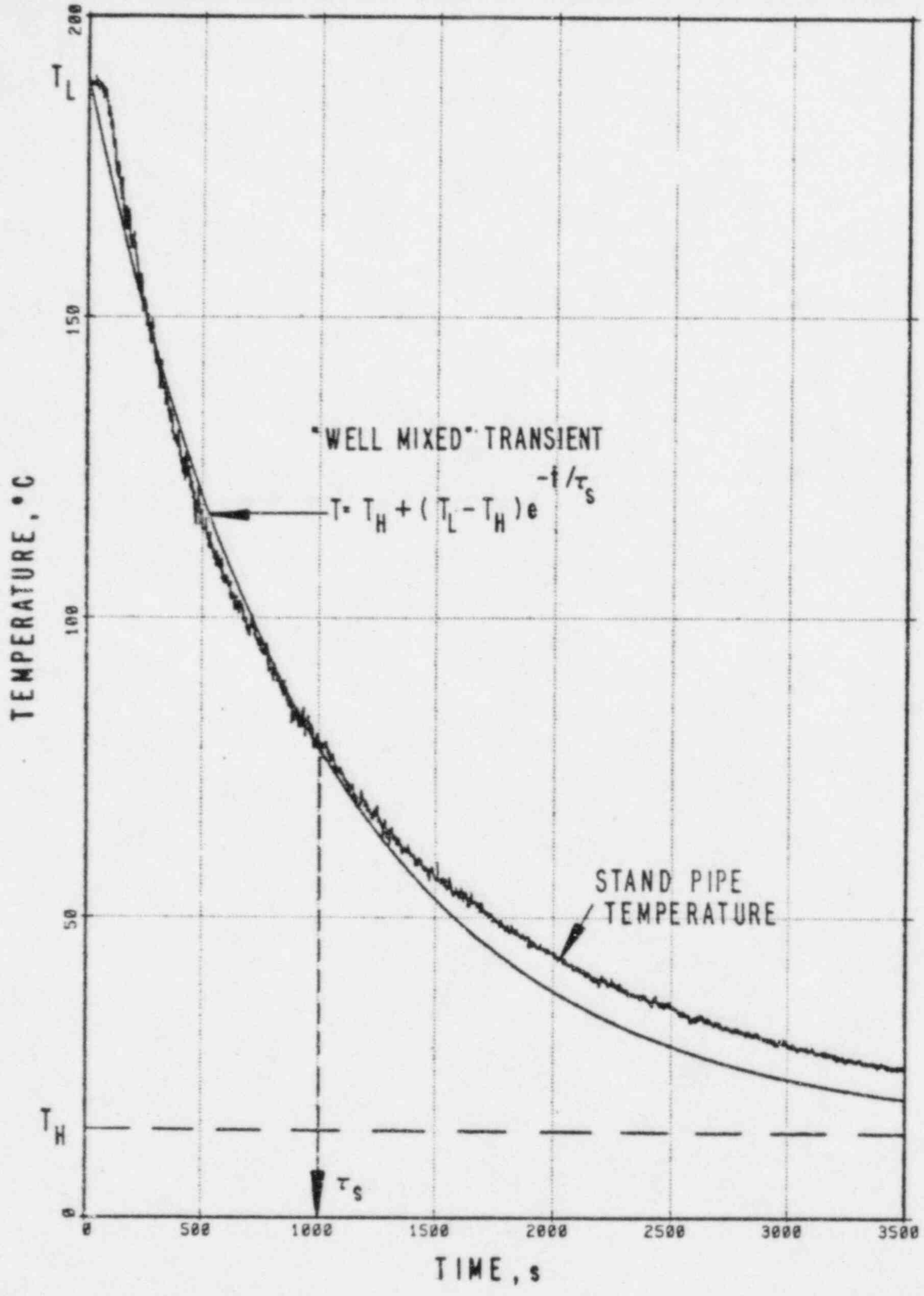


Figure 3-1. Standpipe Temperature Transient
F_{CL} = 0.052 (Test MAY106)

where Γ = effective thermal mixing volume
Q_T = total inlet volumetric flow ($Q_T = Q_H$ for transient cooldown tests)

The effective thermal mixing volume depends on the facility geometry and operating conditions.

As shown in Figure 3-2 and Table 3-2, Equation (3.2) also describes the 1/2-scale data well. The effective mixing volume, Γ, has a value of 3.46 m^3 for the transient cooldown experiments. This value corresponds to 93 percent of the effective thermal mixing volume one would predict under the assumption that all the active regions of the facility are at a uniform temperature throughout the transient. (By active regions we mean the entire facility with the exception of the loop seal riser and the downcomer region above the cold leg nozzle. Those two regions are stably stratified and do not cool appreciably during the transient.) The uniform temperature effective thermal mixing volume, V_E, is given by:

$$V_E = V_F + V_M\ ((\rho_M\ C_M/(\rho_{F,AV}C_{F,AV})) = 3.71\ m^3 \qquad (3.3)$$

where V_F = active fluid volume (2.28 m^3)
V_M = active metal volume (1.47 m^3)
ρ_M = metal density (7.85E+03 kg/m^3)
C_M = metal specific heat (486 J/kg-C)
ρ_F, A_V = fluid average density (939 kg/m^3)
C_F, A_V = fluid average specific heat (4.19E+03 J/kg-C)

In the 1/2-scale facility, the metal walls represent about one-third of the thermal capacity of the system. Since the thermal time constant of the wall (100 to 200 seconds) is significantly shorter than τ_s, a large fraction (about 85%) of the wall thermal capacity contributes to increase the effective thermal mixing volume and thus increase τ_s.

In a full scale vessel, the walls are approximately 25 cm thick and represent more than half the thermal capacity of the system. However, the thermal time constant of the walls increases by a factor of 13 in going from model to prototype while Froude number scaling implies that the characteristic mixing time, τ_s, remains about the same (14). Hence the wall thermal time constant will be several times longer than the characteristic mixing time, and a smaller fraction of the wall thermal capacity will contribute to the effective thermal mixing volume of a full scale vessel.

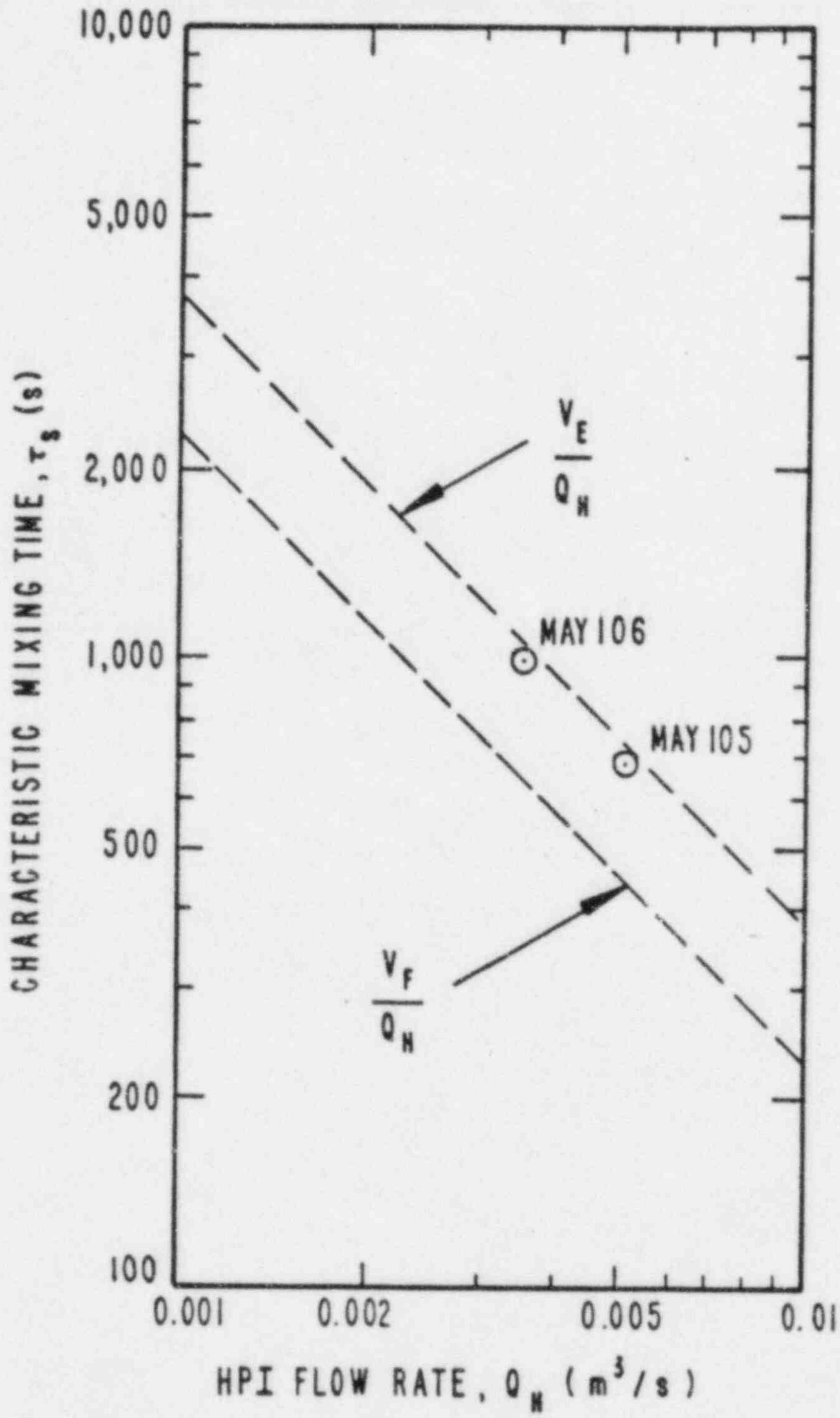


Figure 3-2. Characteristic Mixing Times

TABLE 3-2

CHARACTERISTIC MIXING TIMES

Parameter	Symbol	Units	MAY105	MAY106
Standpipe Mixing Time	τ_s	s	666	987
Downcomer Mixing Time[1]	τ_{DC}	s	589	854
HPI Flow Residence Time[2]	τ_R	s	441	646
Effective Thermal Mixing Volume	Γ	m^3	3.44	3.48
Dimensionless Standpipe Mixing Time	τ_s/τ_R	-	1.51	1.53
Dimensionless Downcomer Mixing Time	τ_{DC}/τ_R	-	1.34	1.32
Dimensionless Effective Thermal Mixing Volume	Γ/V_E	-	0.93	0.94

[1] 0.41 m below cold leg centerline (probe V57CTC)

[2] $R = V_F/Q_H$

3.2.2 Local Mixing Characteristics

Although the global mixing characteristics closely resemble those of a perfectly mixed facility, the local temperature distributions show some degree of stratification. Of special interest to the analysis of PTS is the degree of temperature stratification in the downcomer.

DOWNCOMER TEMPERATURE TRANSIENT

Figure 3-3 shows typical transient temperature data for tests MAY105 and MAY106. Temperature traces at three locations are shown: the standpipe (trace A) and two locations in the downcomer below the cold leg nozzle, one 2.8 cm away from the vessel wall (trace B) and the other 2.0 cm away from the core barrel wall (trace C). Temperatures are nondimensionalized with respect to the loop-to-HPI temperature difference according to:

$$T^* = (T - T_H)/(T_L - T_H) \quad (3.4)$$

where T_H = HPI temperature
T_L = Stagnant loop initial temperature

and the time scale is normalized with respect to the characteristic mixing time, τ_s. To facilitate comparison between the various temperature traces, high frequency fluctuations were removed by filtering the temperatures through a zero-phase-shift digital filter with a cutoff period equal to 0.1 τ_s.

The downcomer fluid temperatures shown in Figure 3-3 correspond to the coldest temperatures measured on the vessel and core sides of the downcomer. Therefore the temperature differences shown in those figures represent an upper bound for the degree of stratification in the downcomer.

These results show that even for a Froude number of 0.075, the largest temperature deviation from the perfectly mixed response in the downcomer is no more than 20 percent of the available temperature difference ($T_L - T_H$). Moreover, the vessel side of the downcomer is consistently warmer that the core barrel side; the vessel side temperatures deviate by less than 10 percent from the perfectly mixed response. These results are important because they confirm once again that equations (3.1) and (3.2) provide a simple yet accurate representation of the fluid temperature transient in the vicinity of the vessel wall.

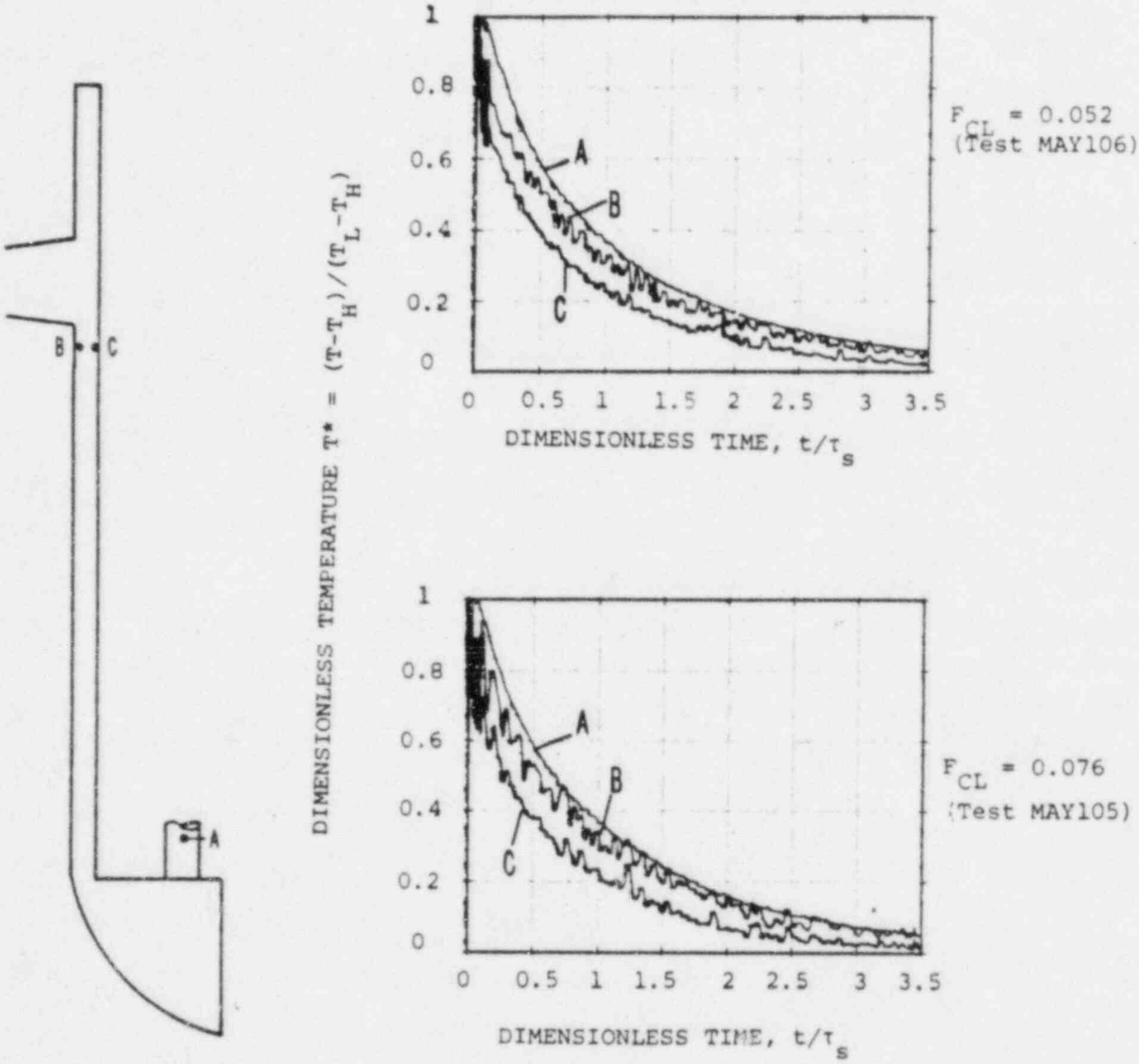


Figure 3-3. Downcomer Temperature Transient Near Cold Leg Nozzle

The temperature stratification in the downcomer is not a strong function of the Froude number for the range tested. A fifty percent increase in the cold leg Froude number resulted in only a modest increase in the temperature difference. More tests are needed to verify this observation over a wider range of test conditions, especially at lower values of Froude number more typical of values calculated for reactors during the loop flow stagnation. Nevertheless, the results shown here already provide an upper bound to the degree of temperature stratification expected during the cooling transients of interest to PTS calculations.

TEMPERATURE PROFILES

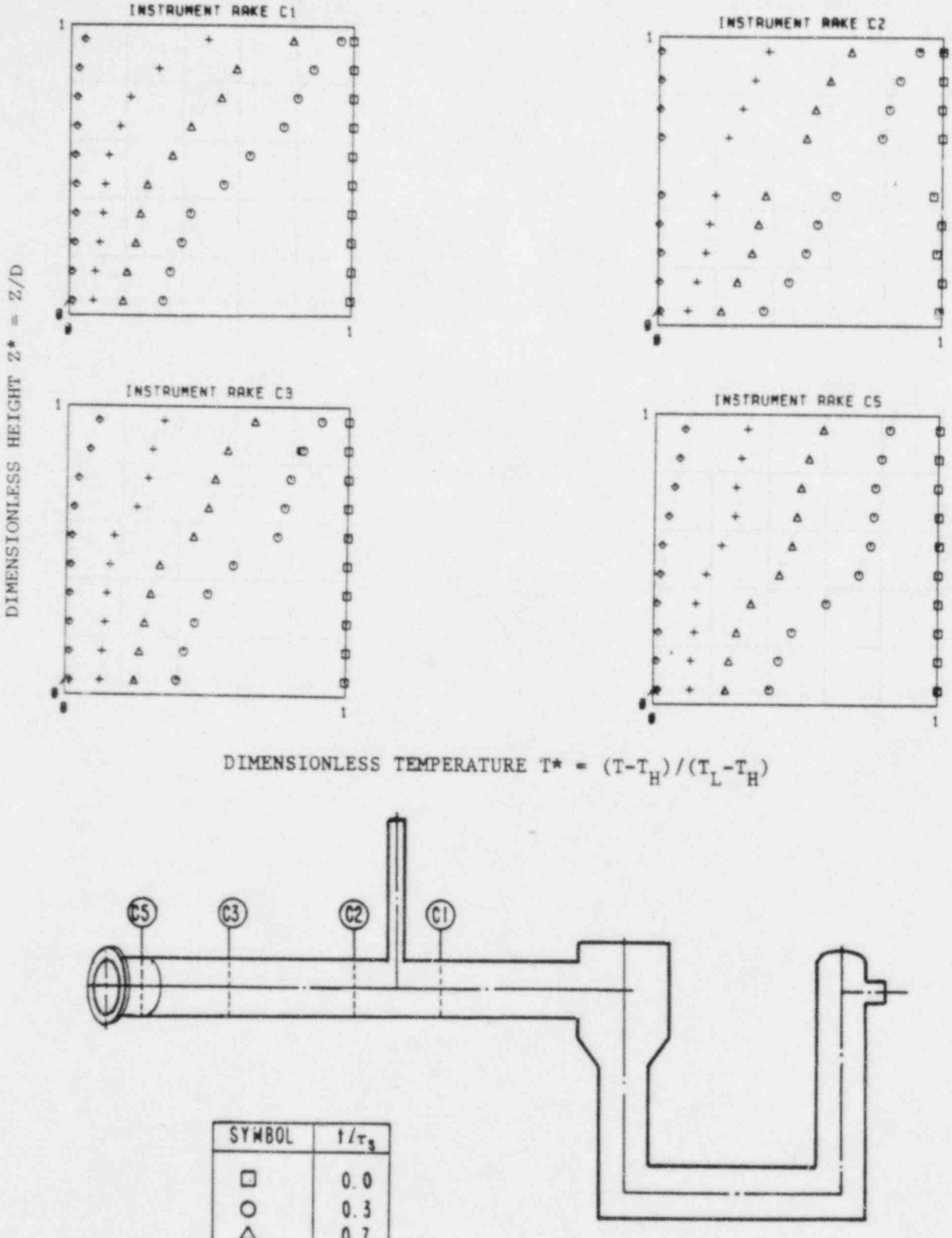
Temperature profiles in different regions of the facility are shown in Figures 3-4 through 3-10. Five profiles are shown at each location: one at the beginning of the test, one at the end, and three at intermediate times. These intermediate times were chosen in such a way that an exponentially decaying temperature would decrease by 25 percent of its initial value between each profile. Hence the dimensionless temperatures, T*, in a well mixed facility would have values of 0.75, 0.5, and 0.25 at the three intermediate times. This choice of plotting intervals allows for easy comparison between the actual temperature distribution and that of a well mixed facility.

Figures 3-4 and 3-5 show the temperature profiles in the cold leg. The flow is clearly stratified with the colder region occupying approximately one-half of the pipe diameter. The temperature difference between the top and bottom of the cold leg is largest near the injector and decreases towards the cold leg nozzle. At the nozzle, the maximum degree of stratification is about 40 percent of the available temperature difference ($T_L - T_H$). Dimensionless temperature profiles in the cold leg are very similar for both tests.

Figure 3-6 shows the temperature profiles at the cold leg nozzle for Test MAY106. Profiles are shown at three locations: the nozzle centerline, and approximately 1/4 diameter to either side of it. In spite of the 30 degree bend upstream of the nozzle, the temperature profile remains approximately two-dimensional. Warm layer temperatures are the same across the pipe and cold layer temperatures show a slightly colder region near the pipe centerline.

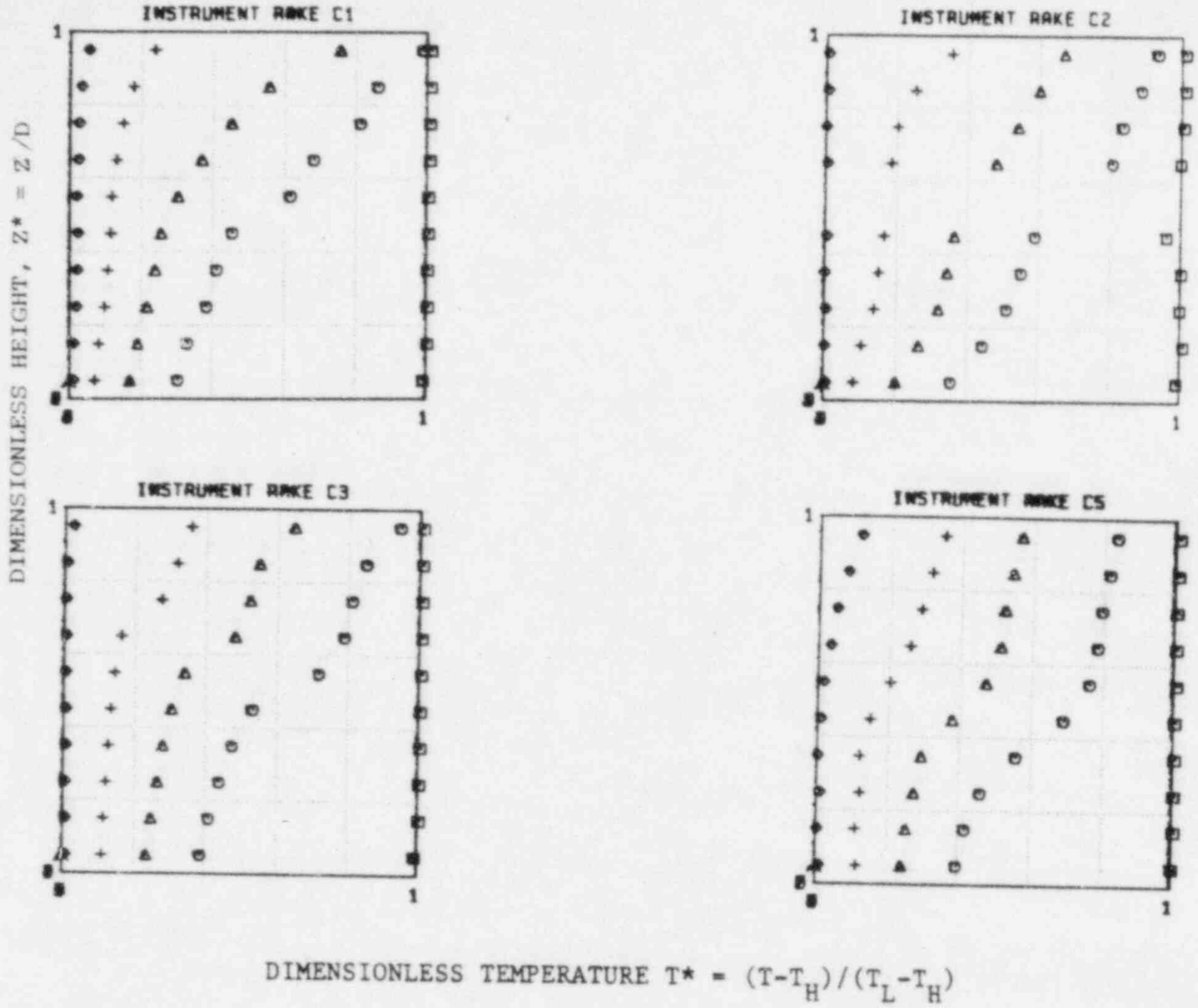
Figure 3-7 shows the temperature distribution in the cold leg outfall region. The temperature profiles at rakes 2 and 3 clearly show the cold layer "jumping the gap".

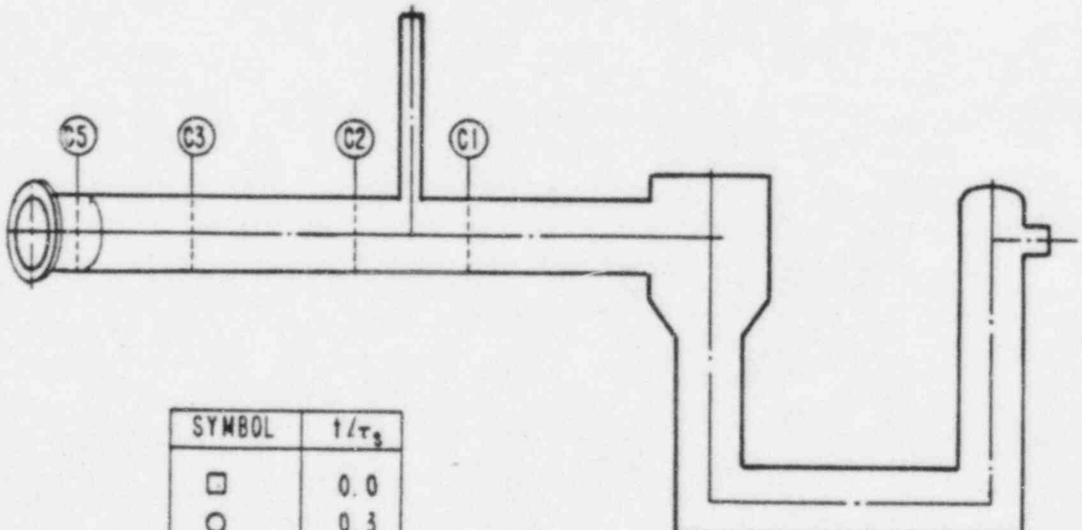
Figures 3-8 and 3-9 show horizontal temperature profiles in the downcomer at two different heights: 0.4 m and 1.5 m below the cold leg nozzle respectively (instrument rows 5 and 8 in Figure 2-3). The core



SYMBOL	t/τ_s
□	0.0
○	0.3
△	0.7
✚	1.4
◇	3.5

Figure 3-4. Cold Leg Temperature Profiles.
F_{CL} = 0.052 (Test MAY106)





SYMBOL	t/τ_s
□	0.0
○	0.3
△	0.7
✢	1.4
◇	3.5

Figure 3-5. Cold Leg Temperature Profiles
F_{CL} = 0.076 (Test MAY105)

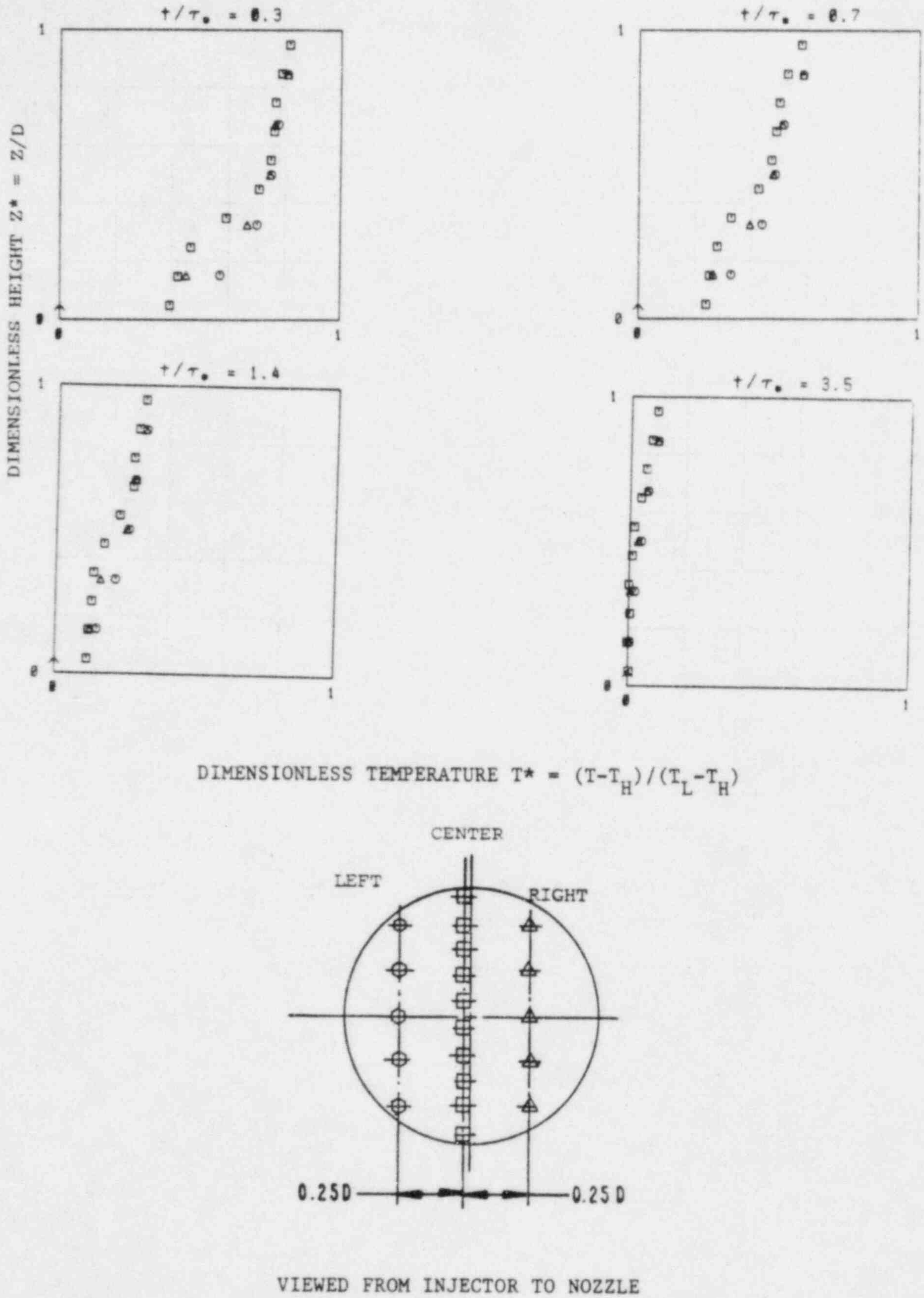


Figure 3-6. Cold Leg Nozzle Temperature Distribution.
F_{CL} = 0.052 (Test MAY106)

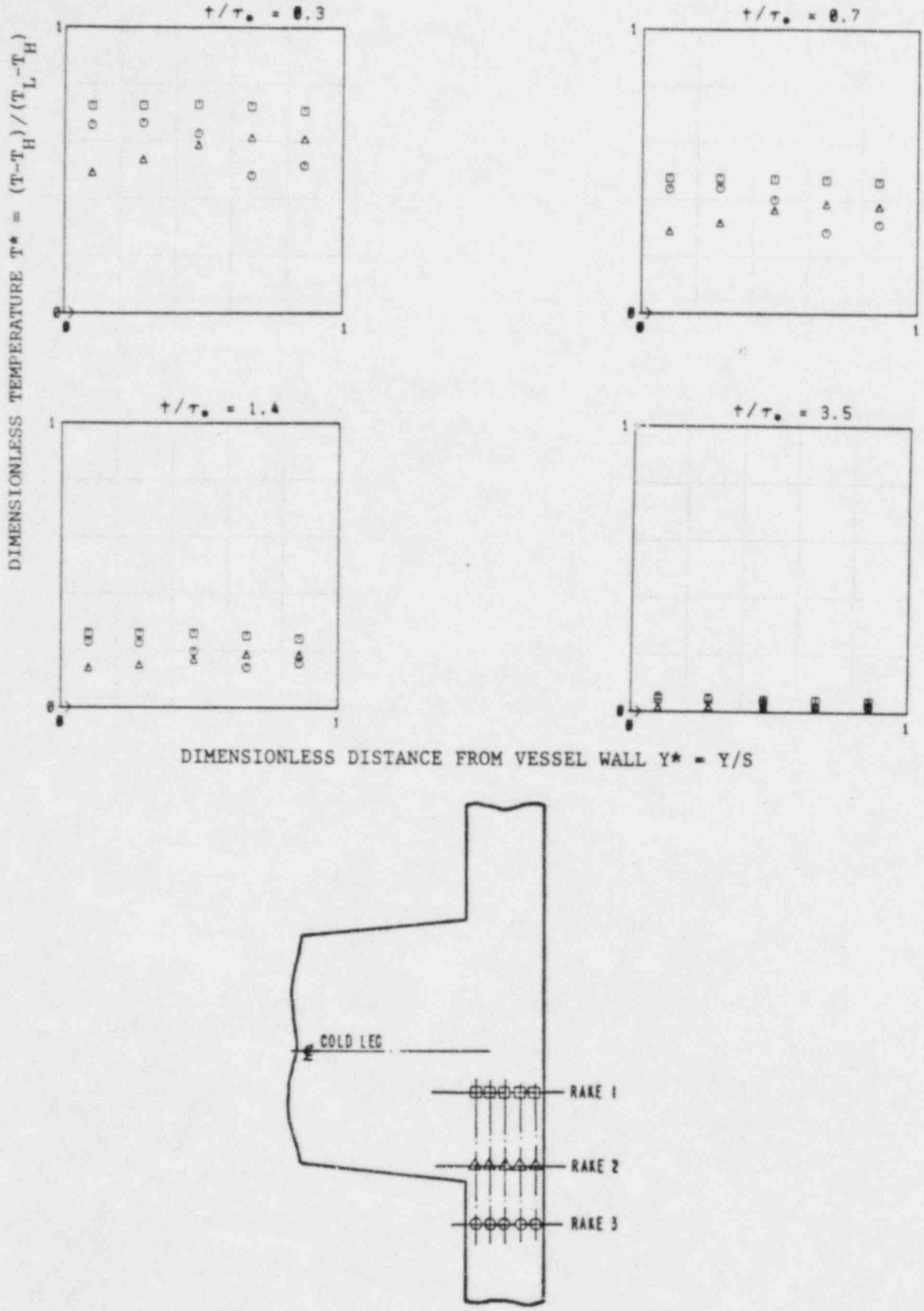


Figure 3-7. Nozzle Gap Temperature Distribution
F_{CL} = 0.052 (Test MAY106)

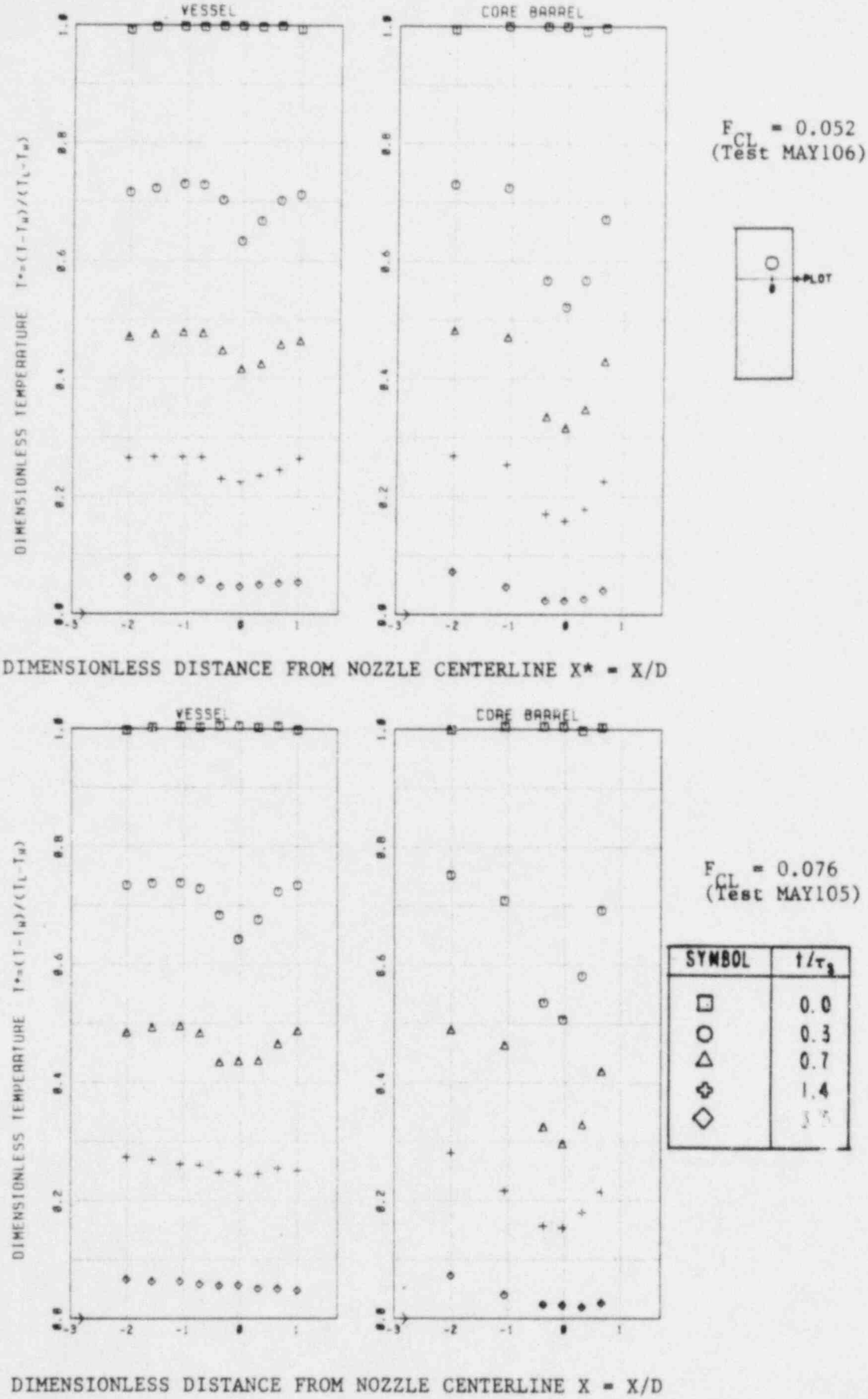
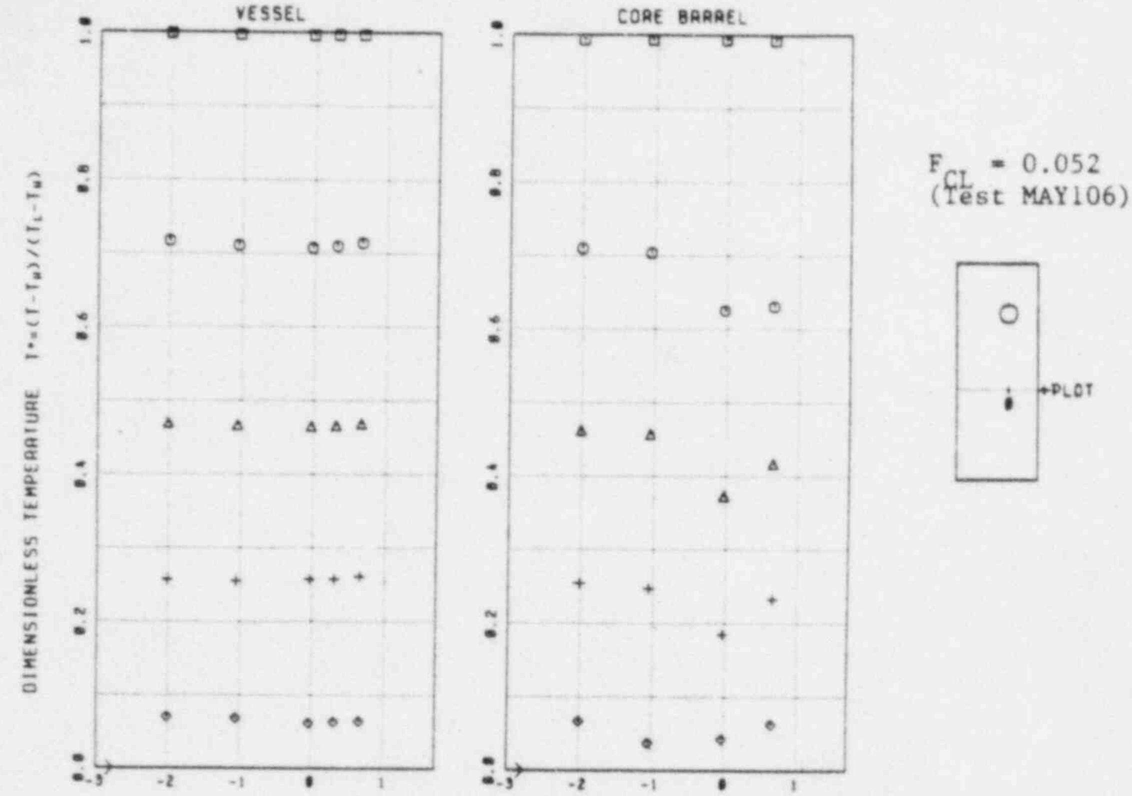
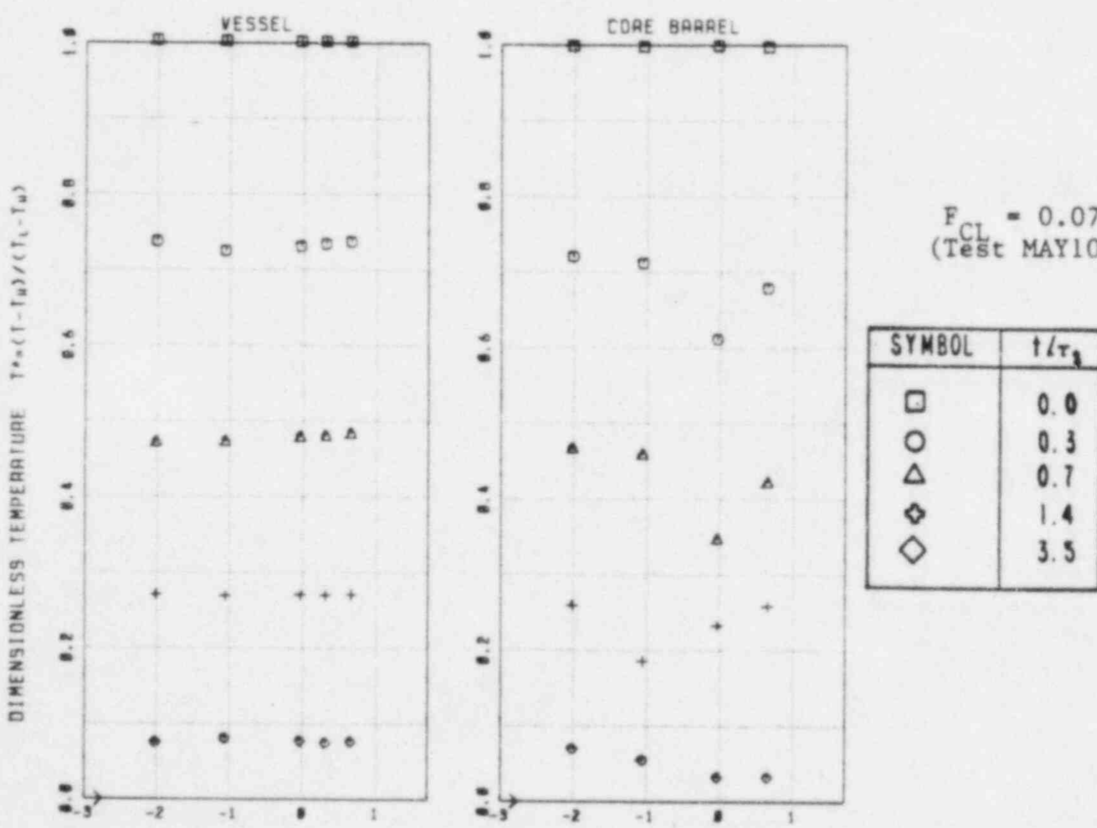


Figure 3-8. Downcomer Horizontal Temperature Profile 0.4 m Below Cold Leg Nozzle



DIMENSIONLESS DISTANCE FROM NOZZLE CENTERLINE X* = X/D



DIMENSIONLESS DISTANCE FROM NOZZLE CENTERLINE X* = X/D

Figure 3-9. Downcomer Horizontal Temperature Profile 1.5 m Below Cold Leg Nozzle

barrel side shows a pronounced plume in the upper region of the downcomer (Figure 3-8). Halfway down the downcomer (Figure 3-9) this plume has already decayed to about one-third of its initial strength. The vessel side also shows evidence of a cold plume near the cold leg nozzle. However, the strength of this plume is far less and it is completely dissipated halfway down the downcomer. Even near the cold leg nozzle, the vessel side plume is only 10 percent colder than the perfectly mixed temperature. Again there is little difference between the dimensionless temperature profiles of the two tests.

Figure 3-10 shows the vertical temperature profile in the downcomer below the cold leg nozzle. The core barrel temperatures are significantly lower than the vessel side temperatures. The vessel side temperatures are practically uniform, with the exception of a small region below the cold leg nozzle which is somewhat colder during the early part of the transient. This region does not extend more than one cold leg diameter to either side of the cold leg centerline and 2 cold leg diameters below the cold leg centerline.

In summary, the temperature measurements throughout the facility indicate a large degree of mixing. The overall response of the facility is very close to that of a well mixed vessel. Local temperature distributions show some degree of stratification, especially in the cold leg and core barrel side of the downcomer. However, fluid temperatures near the vessel wall deviate by less than 10 percent from the perfectly mixed response. At lower values of the cold leg Froude number, the temperatures will be even more uniform. Therefore, a simple mixing cup model, (Equation 3.1) describes well the fluid temperature transient in the vicinity of the vessel wall.

3.3 VELOCITIES

Flow velocities were measured at rake C2 in the cold leg and at four locations in the downcomer, two below the cold leg nozzle (location V67 and C67) and two near the bottom of the downcomer (locations V92 and V97). The quench front velocity in the cold leg was also computed from the difference in quench front arrival time between a temperature probe located immediately below the injector and another probe located at the cold leg nozzle (1).

Table 3-3 shows the initial velocities at the various locations. Also shown in the table are the superficial velocities in the cold leg and downcomer. These results clearly show that the flow is buoyancy dominated since local velocities are an order of magnitude larger than the superficial velocities. Moreover, as the velocity ratios show, the local velocities are not proportional to the superficial velocities. As discussed below, the velocities depend on the specific buoyancy. Near the injector the initial velocity along the bottom of the cold leg is about 50 percent higher than the quench front velocity.

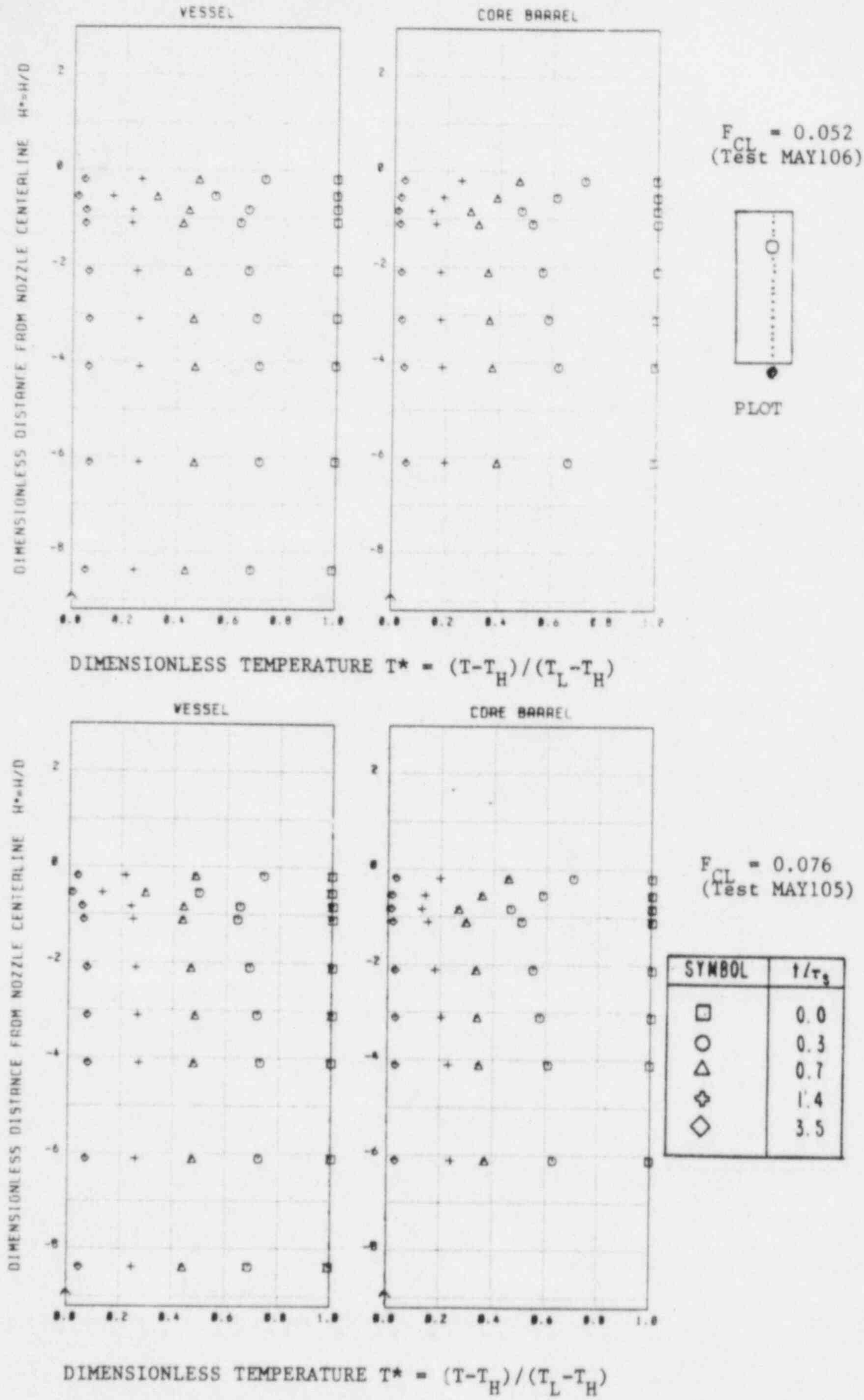


Figure 3-10. Downcomer Vertical Temperature Profile

TABLE 3-3 INITIAL VELOCITIES		
LOCATION	TEST	
	MAY105	MAY106
Cold Leg Velocities, m/s		
Superficial	0.050	0.034
Quench Front	0.314	0.251
Bottom Probe (VCLC21)*	0.475	0.374
Cold Leg Velocity Ratios		
Quench Front/Superficial	6.28	7.38
Bottom Probe/Superficial	9.50	11.00
Bottom Probe/Quench Front	1.51	1.49
Downcomer Velocities, m/s		
Superficial (Thermal Shield Region)	0.032	0.022
Below Nozzle (Core Barrel Side, C67V)*	0.675	0.616
Downcomer Velocity Ratio		
Below Nozzle/Superficial	21.1	28.0

* See Table 2-3 for description of instrument identification code

Figure 3-11 shows the transient velocity measurements at the top and bottom of the cold leg, 36 cm downstream from the injector. The velocities are normalized with respect to the cold leg superficial velocity and the time is normalized with respect to the characteristic mixing time. The velocities at the top of the cold leg are very small, below the measuring range of the instruments (about 0.1 m/s). The velocities at the bottom of the cold leg are initially about 10 times the superficial velocity and then decay to about 3 times the superficial velocity towards the end of the test as buoyancy effects decay.

Figure 3-12 shows the transient velocity measurements in the downcomer 77 cm below the cold leg nozzle. Velocities are normalized with respect to the downcomer superficial velocity in the thermal shield region (Table 3-3).

The plume is much stronger, and steadier, on the core barrel side. The initial velocity is about 20 to 30 times the superficial velocity and decays to about 4 to 6 times the superficial velocity towards the end of the test. On the vessel side, the velocity fluctuates between periods of high downward velocity (comparable to the core barrel side velocity) and periods of upward velocity. The value of the upward velocity is about 50 percent smaller than that of the downward velocity. These velocity fluctuations are also observed, at a somewhat reduced scale, at the probe located 2.22 meters below the cold leg nozzle (see Figures 3-2.c in Appendices A and B). This is evidence of a strongly meandering plume on the vessel side, in agreement with earlier flow visualization studies in the 1/5-scale facility (8).

These velocity results are also consistent with the temperature measurements described in Section 3.2. A weaker but strongly meandering plume results in more uniform and higher temperatures on the vessel side of the thermal shield. The cooler fluid coming along the bottom of the cold leg "jumps the gap" and falls preferentially along the core barrel wall.

The plume in the downcomer can be characterized as a planar plume. The centerline velocity of unconstrained planar plumes is given in Reference 20 as:

$$v_p = 1.66\ B^{1/3} \qquad (3.5)$$

where B is the specific buoyancy flux.

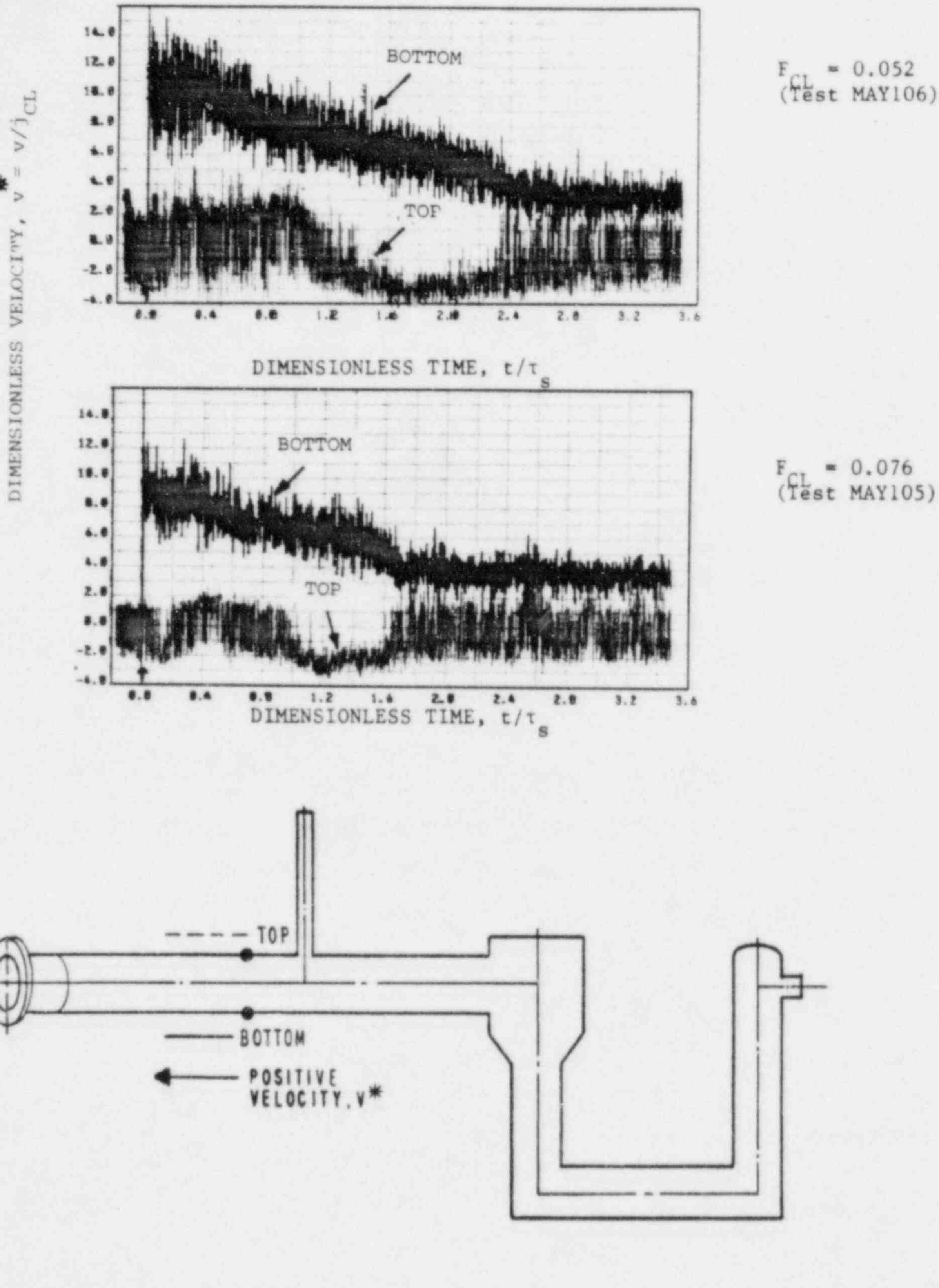


Figure 3-11. Cold Leg Velocity Transient Downstream of Injector

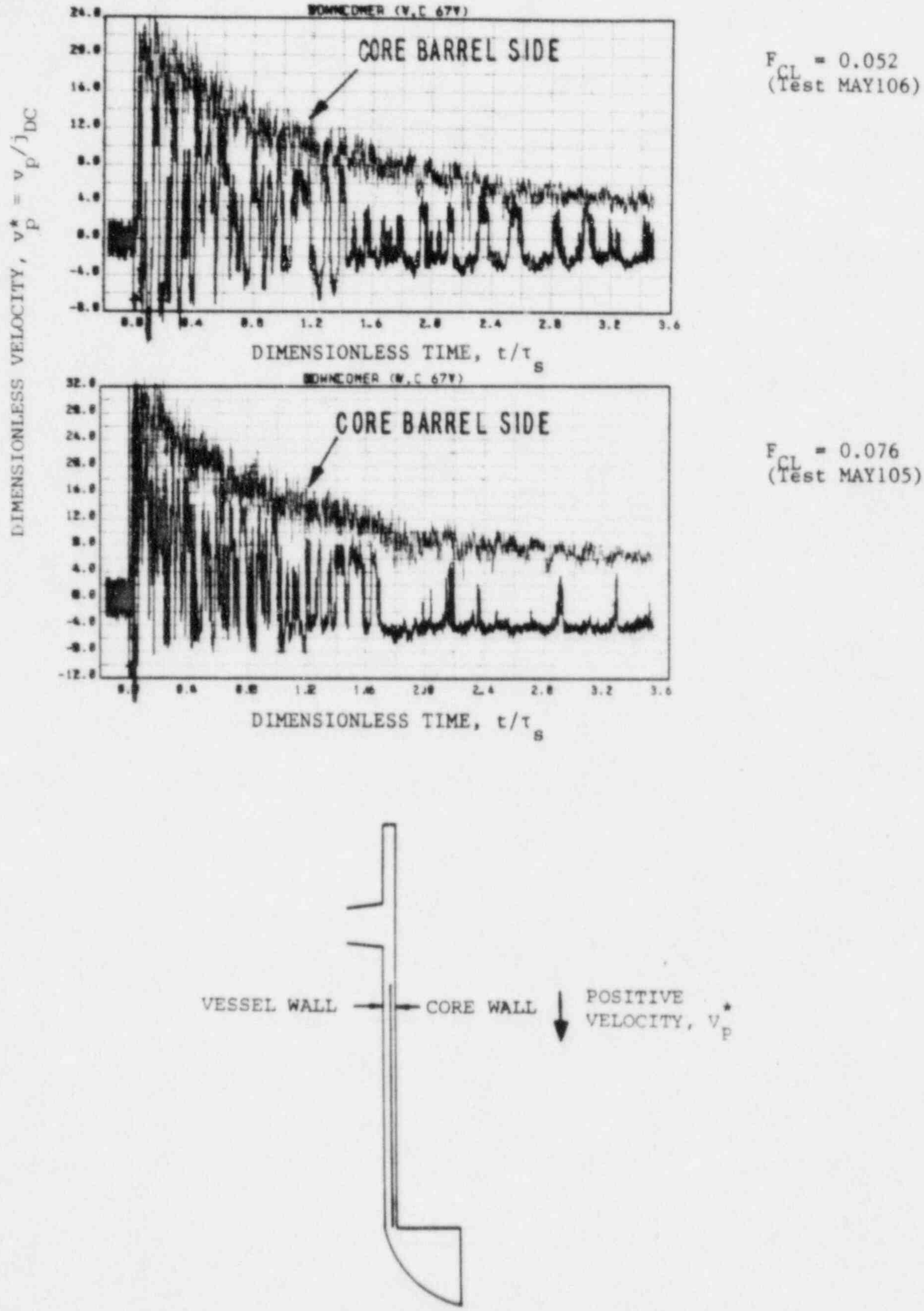


Figure 3-12. Downcomer Velocity Transient Below Cold Leg Nozzle

For the downcomer plume the specific bouyancy flux can be approximated as:

$$B = g(Q_H/S)\ (\rho_H - \rho_a)/\rho_a \tag{3.6}$$

where g = acceleration of gravity
Q_H = HPI volumetric flow rate
S = downcomer gap width (thermal shield region)
ρ_H = HPI density
ρ_a = ambient fluid density

The actual buoyancy flux will be somewhat smaller than predicted by Equation (3.6) because part of the HPI coolant flows towards the pump simulator rather than toward the downcomer. However, the volume of the pump simulator and associated loop seal and cold leg piping represents less than 15% of the effective thermal mixing volume of the facility (Equation (3.3)). Therefore, 85 to 90 percent of the HPI coolant flows toward the downcomer since the loop seal and lower plenum cool at similar rates. Moreover, the plume velocity is proportional to the cube root of the buoyancy flux and a 15% variation in specific buoyancy flux represents only a 5% variation in plume velocity.

The measured plume velocity on the vessel side is compared to the unconstrained plume correlation in Figure 3-13. Plume velocities were obtained from Figure 3-12 at four dimensionless times: 0, 0.3, 0.7, and 1.5. The downcomer temperature measurements far from the plume (Figure 3-8) were used to compute the ambient density. This temperature is in good agreement (within a few degrees) with the perfectly mixed exponential decay model of Equation (3.1). The velocity range shown at each point corresponds to the range of small scale velocity fluctuations observed in Figure 3-12.

Although the downcomer plume is not an unconstrained plume, Figure 3-13 shows that its centerline velocity near the cold leg nozzle is well correlated by the results for unconstrained planar plumes. Hence Equation (3.5) in conjunction with an exponential ambient temperature decay (Equation (3.1)) can be used to predict the maximum plume velocity on the core barrel side throughout the test duration. Note also that the lower bound on the velocity range shown in Figure 3-13 corresponds to the peak plume velocities on the vessel side.

Using the definition of Froude number (Equation (1.1)), Equation (3.5) can be rearranged to express the plume velocity as:

$$v_p/j_{DC} = 3.65\ F_{CL,a}^{-2/3} \tag{3.7}$$

where j_{DC} = downcomer superficial velocity
$F_{CL,a}$ = instantaneous Froude number based on $(\rho_H-\rho_a)/\rho_a$

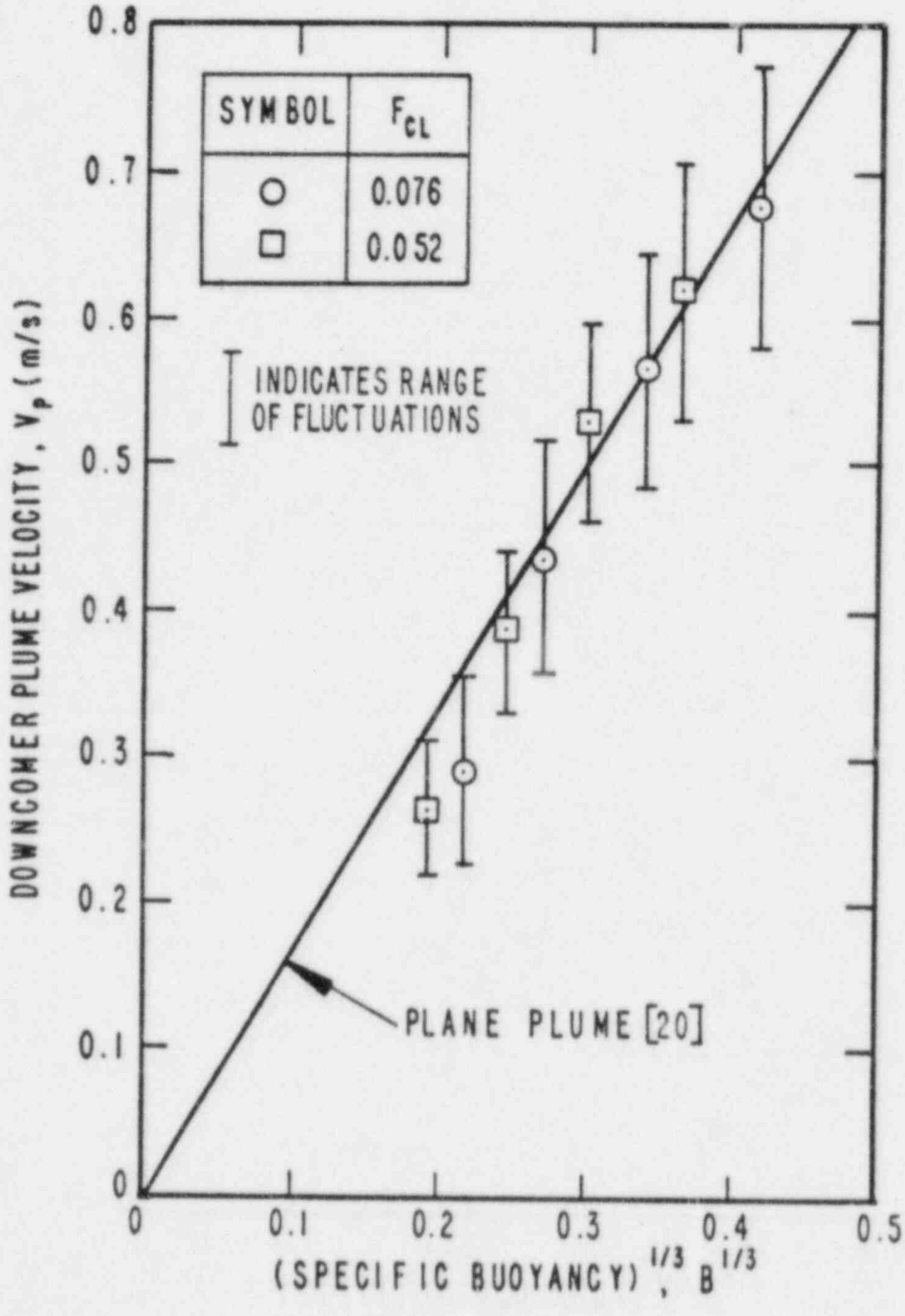


Figure 3-13. Downcome Plume Velocity (Core Bar el Side)

The ratio of the local plume velocity to the superficial velocity is a measure of the ratio of the characteristic mixing time of the facility (flow residence time) to the internal mixing time of the recirculating flow. Therefore, the higher this ratio, the shorter the internal mixing time as compared to the overall mixing time and hence the closer the system is to a perfectly mixed system.

The result expressed in Equation (3.7) supports the Froude number scaling rationale. It indicates that the degree to which the system response approaches that of a perfectly mixed vessel depends primarily on the Froude number. Since the Froude number in Equation (3.7) is raised to a negative power, the larger the Froude number, the less uniform the temperature distribution in the facility, in agreement with experimental observation.

3.4 HEAT TRANSFER COEFFICIENT

Heat flux rates and heat transfer coefficients were calculated from the measurements of the wall surface temperature transient and the fluid temperature transient at various locations. The fluid temperature was measured at the center of the gap and one third of the gap width away from the wall. The temperatures were very similar at both locations, indicating a flat temperature profile. Hence the temperature used in the computation of the heat transfer coefficient represents the bulk flow temperature at that location. Although temperatures were measured every second, heat fluxes and heat transfer coefficients were calculated every five seconds.

Figure 3-14 shows the fluid temperature, wall heat flux, and fluid-to-wall heat transfer coefficients at the two downcomer locations closest to the cold leg nozzle (locations C57 and V57) for Test MAY106 (F_{CL} = 0.052). The solid line corresponds to the vessel side measurements and the dashed line to core barrel side measurements. Temperatures are normalized with respect to the HPI temperature and the stagnant loop initial temperature (Equation 3.4). The heat flux is normalized with respect to the heat flux which would exist at the wall if the outside temperature remained at T_L and the inside temperature remained at T_H:

$$q^* = q/[k_M\ (T_L - T_H)/W] \qquad (3.8)$$

where:
- k_M = thermal conductivity of wall (50.1 W/m-C)
- T_L = stagnant loop initial temperature
- T_H = HPI temperature
- W = wall nominal thickness (5.08 cm)

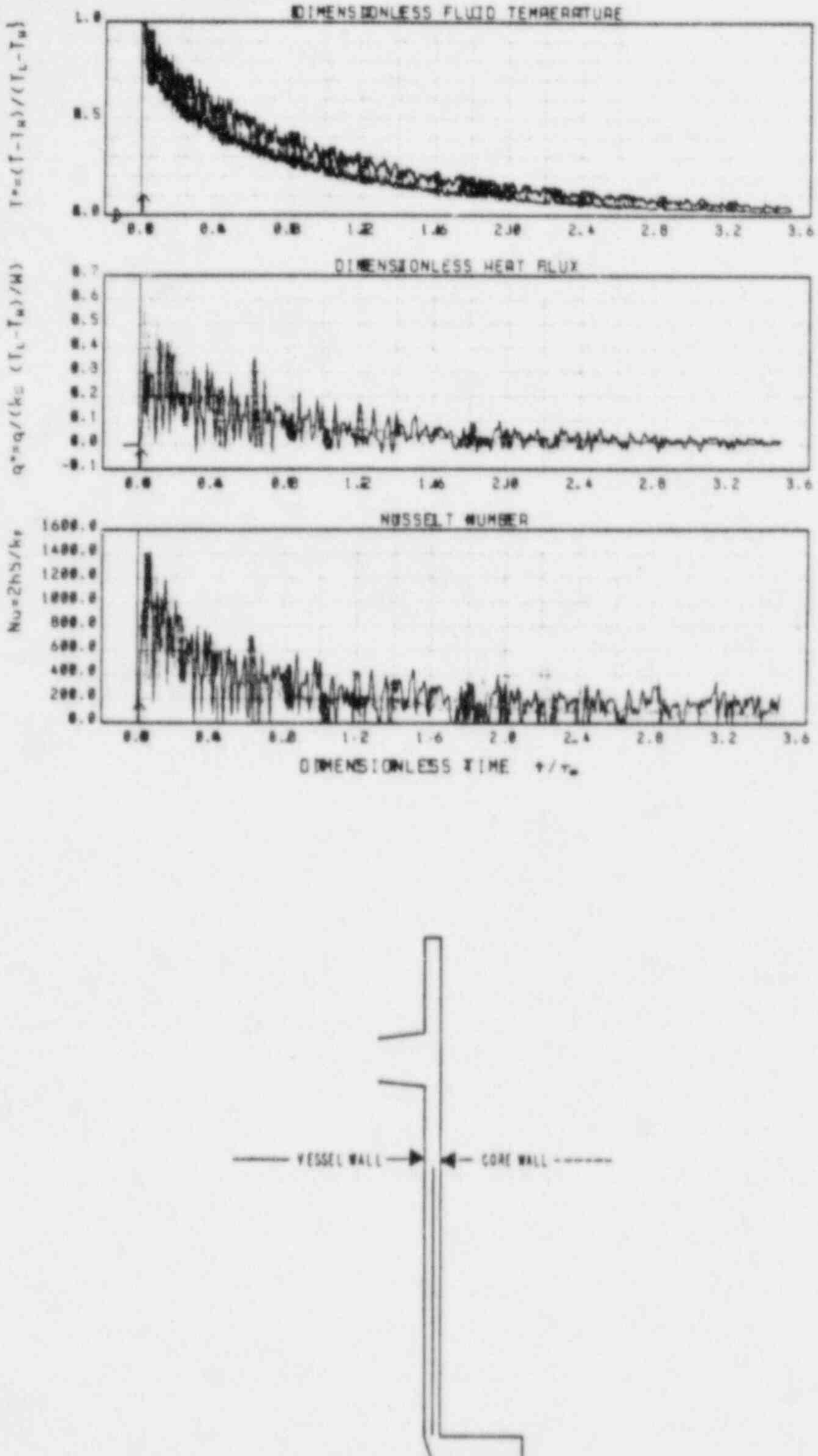


Figure 3-14. Transient Temperature, Heat Flux, and Heat Transfer Coefficient in Downcomer 0.4 m Below Cold Leg Nozzle
F_{CL} = 0.052 (Test MAY106)

The heat transfer coefficient, h, is expressed as a Nusselt number based on the hydraulic diameter of the downcomer gap in the thermal shield region:

$$Nu = h\ (2\ S)/k_F \qquad (3.9)$$

where: S = gap width (5.9 cm on vessel side, 4.1 cm on core barrel side)

k_f = fluid thermal conductivity at local temperature (0.6 to 0.7 W/m-°C)

(The Nusselt number on the vessel side has approximately the same numerical value as the heat transfer coefficient expressed in British units (Btu/ft^2-hr-°F).)

The Nusselt number increases rapidly at the beginning of the test, reaches a maximum value of about 1,400 around $t/\tau_s = 0.1$, and then decreases gradually with time. For times later than one characteristic mixing time, the Nusselt number remains below 400. Heat fluxes and heat transfer coefficients exhibit large scale fluctuations with periods in the order of 20 to 40 seconds. Detailed inspection of the transient data reveals close correlation between the temperature, velocity, heat flux, and heat transfer coefficient fluctuations. (The appendices include plots with an expanded time scale where this correlation can be clearly seen.)

Figures 3-15 and 3-16 show heat flux and heat transfer coefficient profiles on the vessel wall. Figure 3-15 shows the horizontal profiles 0.4 m below the cold leg nozzle centerline and Figure 3-16 shows the vertical profiles below the cold leg centerline. Each point on a profile represents data averaged over $0.1\ \tau_s$. This averaging period is not much longer than the period of the large scale fluctuations in the transients (Figure 3-14) and that explains some of the scatter observed on the profile plots. The averaging period was made short in order to not obscure the overall transient which has a characteristic time τ_s.

The heat flux is fairly uniform throughout the downcomer. This is not surprising since the integrated heat flux over the duration of the test is approximately the same at each location (see Appendix A in Volume 1 of this report (1) for a discussion of two-dimensional heat conduction effects). The difference in heat transfer coefficients at various locations is accommodated by a change in the fluid-to-wall temperature difference.

As expected, heat transfer coefficients are highest in the plume region below the cold leg nozzle. Not only are velocities higher there but, in addition, the flow is not fully developed in that

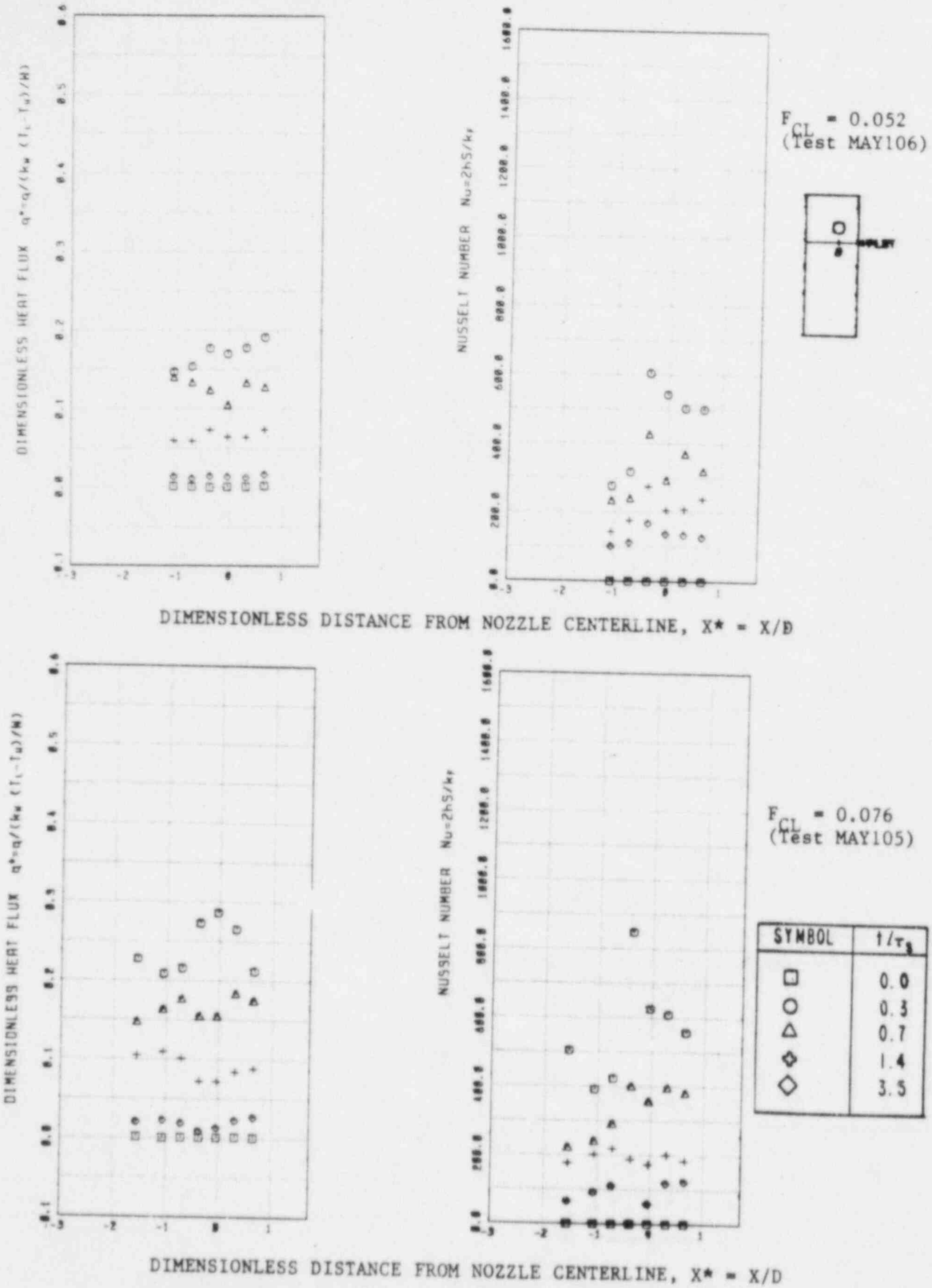


Figure 3-15. Downcomer Horizontal Heat Flux and Heat Transfer Coefficient Profiles 0.4 m Below Cold Leg Nozzle. Vessel Side

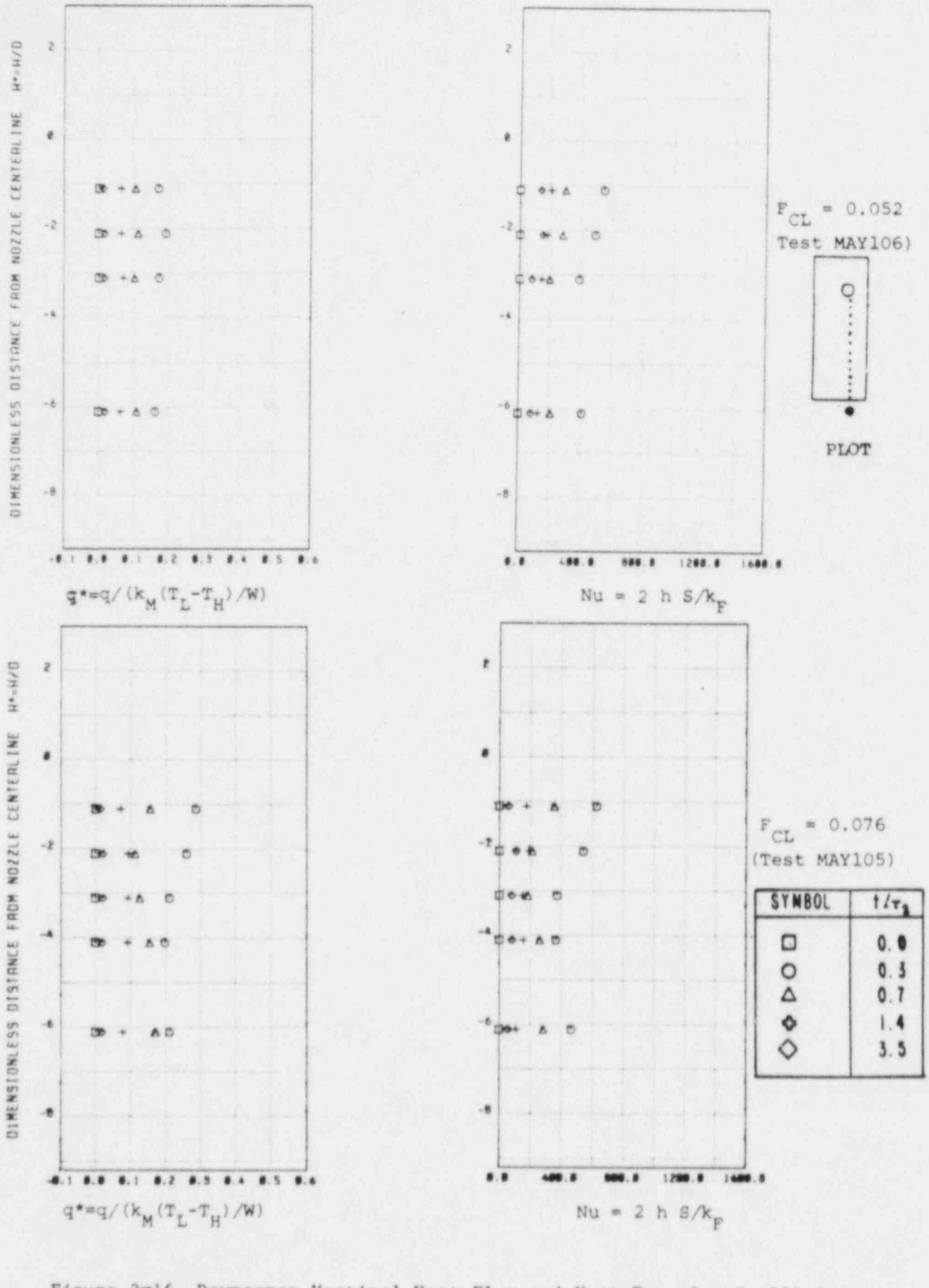


Figure 3-16. Downcomer Vertical Heat Flux and Heat Transfer Coefficient Profiles. Vessel Side

region. Heat transfer coefficients in the entrance regions of ducts, or following bends, are normally significantly higher than for fully developed flow conditions.

The local velocities measured at locations V67 and C67 were used to correlate the heat transfer data at those locations. Nusselt numbers and fluid temperatures were taken directly from the profile plots and velocities were obtained from the transient velocity plots. Reynolds numbers and Prandtl numbers were computed using the fluid properties at the local fluid temperature.

Figure 3-17 and Table 3-4 show a comparison between the experimental data and the well known Dittus Boelter heat transfer correlation for fully developed flow in ducts:

$$Nu = 0.023\ Re^{0.8}\ Pr^{0.4} \tag{3.10}$$

The Reynolds number was computed using the local plume velocity, u_p and the appropriate gap S on the core and vessel side of the thermal shield.

The measured heat transfer coefficients are proportional to the local Reynolds number raised to the 0.8 power, in agreement with the Dittus Boelter correlation. However, the measured values are between 50 and 80 percent higher than those computed from Equation 3.10. These relatively higher heat transfer coefficients are possibly due to entrance effects neglected in the Dittus Boelter correlation. The measuring location is 28 cm below the top of the thermal shield and that distance corresponds to only 3.4 hydraulic diameters on the core barrel side and 2.4 diameters on the vessel side. As shown in Figure 3-18, the increase in the local Nusselt number observed in these experiments is comparable with those reported in Reference 21 for the combined thermal and hydrodynamic entrance region of round tubes.

Further evidence of the existence of entrance effects is provided by the heat transfer coefficient measured on the vessel side during a period of upflow 50 seconds after the beginning of the test (see Figure 3-4.b in Appendix B for an expanded plot of the early part of the test). As shown in Figure 3-17, the measured Nusselt number is in excellent agreement with the correlation for fully developed flow.

We also considered the possibility that the relatively higher heat transfer coefficients during periods of downflow could be due to mixed convection effects. However, existing correlations for mixed convection (22) predict a heat transfer coefficient enhancement of less than 5 percent for the conditions prevailing in the downcomer.

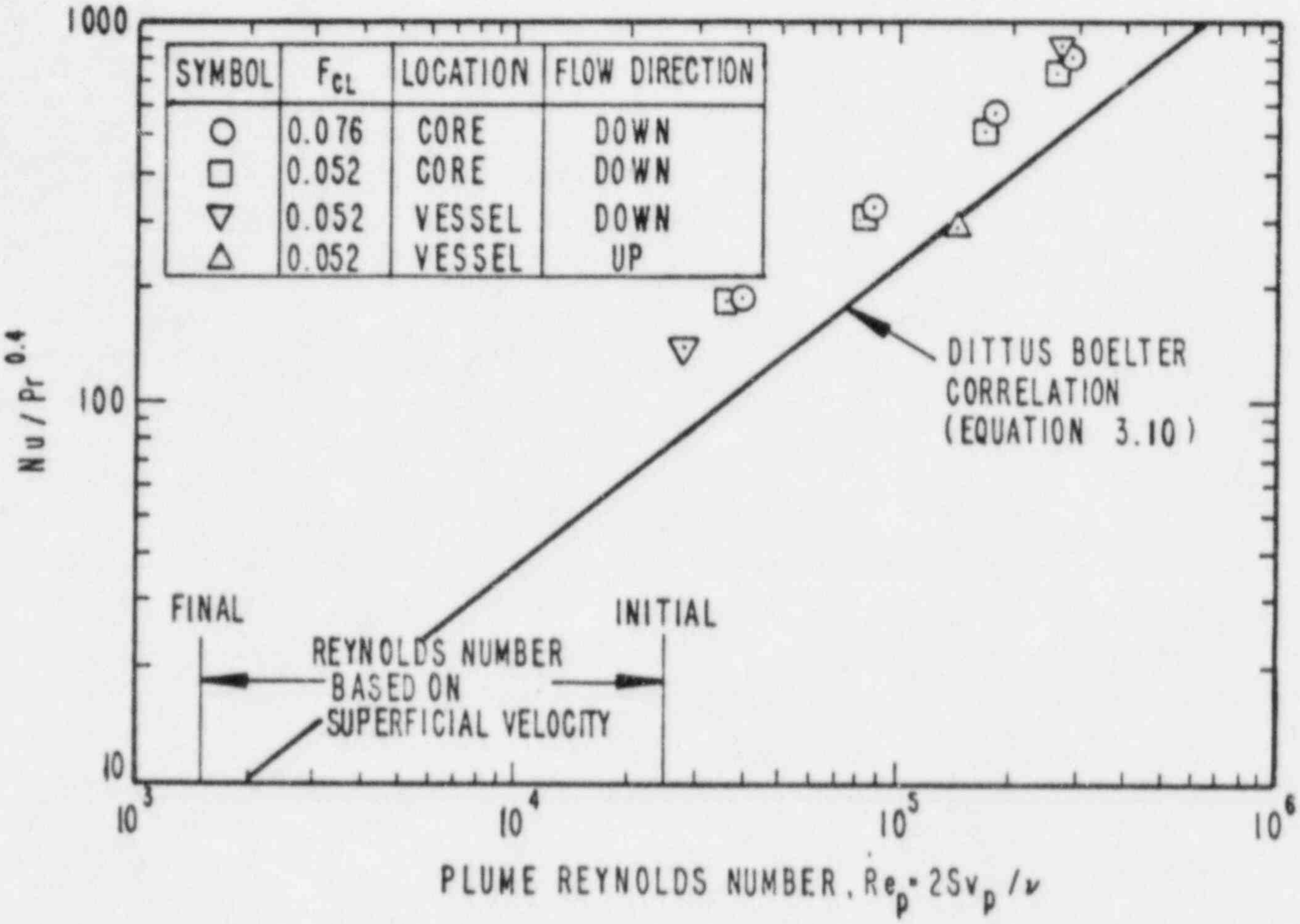


Figure 3-17. Downcomer Nusselt Number Correlation, Locations V67 and C67

TABLE 3-4

DOWNCOMER HEAT TRANSFER COEFFICIENTS AT LOCATIONS V67 AND C67

Test	Side	Flow Direction	t/τ_s	v_p (m/s)	T_p (°C)	Pr	Re_p	Nu_{DB}	Nu_{ex}	Nu_{ex}/Nu_{DB}
MAY 106	Core	Down	0.1	0.616	141	1.27	2.6E+05	544	800	1.47
			0.3	0.529	114	1.57	1.7E+05	421	615	1.46
			0.7	0.385	76	2.38	8.2E+04	276	430	1.56
			1.5	0.264	46	3.80	3.6E+04	172	315	1.83
MAY 106	Vessel	Down	0.12	0.440	141	1.27	2.7E+05	557	950	1.71
			1.55	0.137	50	3.55	2.7E+04	136	230	1.70
MAY 106	Vessel	Up	0.05	-0.198	181	1.12	1.5E+05	325	300	0.92
MAY 105	Core	Down	0.1	0.675	142	1.27	2.9E+05	585	900	1.54
			0.3	0.564	110	1.62	1.8E+05	445	700	1.57
			0.7	0.435	72	2.57	8.6E+04	298	475	1.59
			1.5	0.290	46	3.00	4.0E+04	187	320	1.71

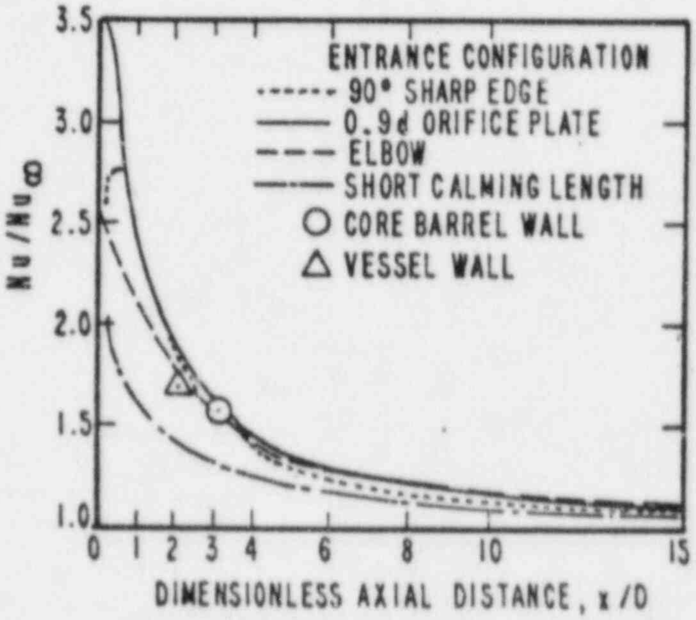


Figure 3-18. Local Nusselt Number in a Combined Thermal and Hydrodynamic Entrance Region [21]

Therefore, mixed convection effects are not significant at these high local Reynolds numbers. Mixed convection will be even less important at full scale since the Reynolds numbers will be six times larger than in these experiments.

As shown in Figure 3-17, the heat transfer coefficients in the downcomer are an order of magnitude larger than one would calculate using the downcomer superficial velocity. It is therefore essential to know the local velocities in order to predict heat transfer coefficients. With knowledge of the local velocities, conventional heat transfer correlations for duct flows can be used to predict the heat transfer coefficients. Entrance effects must be considered in the upper downcomer region. For the critical region below the cold leg nozzle, one can use the plane plume velocity correlation described in Section 3.3 (Equations 3.5 or 3.7). That correlation is valid on the core barrel side and during periods of downflow on the vessel side. The effective heat transfer coefficient on the vessel side will be 20 to 40 percent lower than predicted using the planar plume velocity because of the strong plume meandering.

These results also provide the scaling laws for the heat transfer coefficient. The Nusselt number varies with the plume Reynolds number which can be expressed in terms of the superficial Reynolds number as:

$$Re_p = (v_p/j_{DC})\ Re_j \qquad (3.11)$$

where: Re_j = Reynolds number based on superficial velocity
v_p = plume instantaneous velocity
j_{DC} = downcomer superficial velocity

As shown in Section 3.3, the ratio of the plume velocity to the superficial velocity depends only on the instantaneous cold leg Froude number (Equation 3.7). Therefore, for equal Froude number, the Nusselt number will scale with the facility Reynolds number. The full scale Reynolds number is about 6.5 times larger than the 1/2-scale Reynolds number (size and $\Delta\rho/\rho$ increase by a factor of 2 and kinematic viscosity decreases by a factor of 1.6). Therefore the full scale Nusselt number will be approximately four times larger than measured in these experiments, and the heat transfer coefficient will be about twice as large.

A Froude number of 0.05 is at the upper end of the expected Froude number range in PWRs during cooling transients with PTS potential. However, reducing the Froude number does not have a large effect on the heat transfer coefficient. If the Froude number is reduced by a factor of 5, to F_{CL} = 0.01, by reducing the HPI flow rate while maintaining the same $\Delta\rho/\rho$, the Reynolds number will also be reduced by a factor of 5. The plume Reynolds number will only be reduced by a

factor of 1.7 ($5/5^{0.67}$) and the Nusselt number and heat transfer coefficient by a factor of 1.55 ($1.7^{0.8}$). Hence, reducing the Froude number by a factor of five results in only a 35 percent decrease in the heat transfer coefficient.

4. COMPARISON WITH 1/5-SCALE DATA

This section presents a comparison between the results of the 1/2-scale tests described in Section 3 and the results of the 1/5-scale tests performed earlier in a transparent facility (7, 8).

In this data report, we have limited our comparison to the 1/5-scale tests performed at Creare in a geometrically similar facility. Other thermal mixing experiments have been performed at SAI (10) in a facility with a rectangular cold leg of prototypical height, and are currently being performed at Purdue University (11) in a 1/2-scale transparent facility with a modified downcomer. Since these two facilities are not geometrically similar to Creare's 1/5-scale and 1/2-scale facilities, a direct comparison of results for verification of scaling principles cannot be made. The results in the different geometry facilities are most valuable for the verification of phenomenological models developed by analysts and for the assessment of three-dimensional, numerical simulations of the thermal mixing process.

Figure 4-1 shows a schematic of the 1/5-scale test facility. The principal components of this facility (loop seal, cold leg, and downcomer) are geometrically similar to those in the 1/2-scale facility. The pump simulator and the lower plenum have the appropriately scaled volumes but are of somewhat simpler geometry, and the HPI injector is at a 60 degree angle with respect to the cold leg rather than perpendicular to it. However, the results of the 1/5-scale tests have shown that the pump simulator geometry and the injector geometry do not significantly affect the thermal mixing characteristics of the facility. Therefore, in spite of these minor geometric differences, a comparison between the 1/2-scale and 1/5-scale tests is meaningful.

Table 4-1 shows the test conditions for the 1/5-scale transient cool-down tests. The 1/2-scale test conditions are also included for comparison. Most of the 1/5-scale tests were performed in the CE configuration, which corresponds to the configuration shown in Figure 4-1. The W configuration differs only in the connection between the loop seal and the pump simulator. The first elbow in the loop seal is removed and the loop seal is connected to the bottom flange of the pump simulator. With the exception of test 105, all other 1/5-scale tests used the "near 60" HPI injector. That is the 5 cm diameter injector located closest to the downcomer and inclined 60 degrees with respect to the horizontal. Test 105 used the 0.7 cm diameter injector located 10 cm upstream of the "near 60" injector.

The main purpose of this comparison is to assess Froude number scaling. This is be done by comparing the the degree of temperature stratification in the downcomer (deviation from perfectly mixed

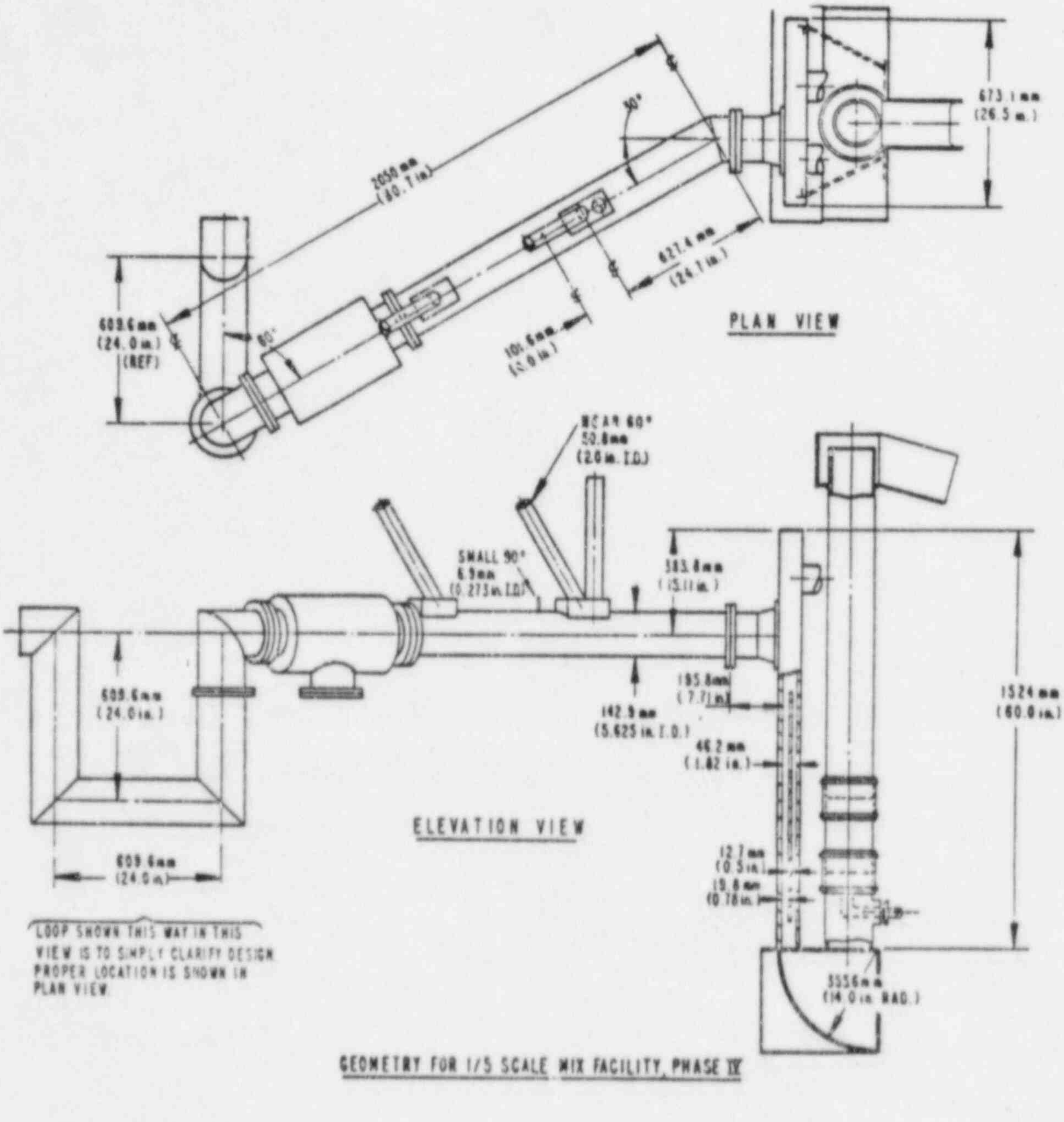


Figure 4-1. Schematic of 1/5-Scale MIX4 Facility

TABLE 4-1

COMPARISON BETWEEN 1/2-SCALE AND 1/5-SCALE TEST CONDITIONS

Scale	Test	Geometry	Injector	F_{CL}	$\Delta\rho/\rho$	Re_{CL}
1/5	100	CE	Near 60	0.051	0.157*	5.3E+03
	101	CE	Near 60	0.045	0.019	1.6E+03
	103	CE	Near 60	0.017	0.161*	1.8E+03
	104	W	Near 60	0.050	0.161*	5.3E+03
	105	W	Small 90	0.025	0.158*	2.6E+03
	FV+	CE	Near 60	0.038	0.160*	2.3E+03
1/2	MAY 105	W	Near 90	0.076	0.122	6.4E+04
	MAY 106	W	Near 90	0.052	0.121	4.4E+04

* Tests with salt solution to increase HPI density
\+ Flow Visualization Tests [8]

response) and comparing the velocities in the cold leg and downcomer. The 1/5-scale facility had plastic walls and hence no heat transfer measurements were made. While the Froude number range in the 1/2-scale and 1/5 scale tests are comparable, the 1/2-scale Reynolds numbers are an order of magnitude larger than those of the 1/5-scale tests, as shown in Table 4-1. Therefore, discrimination between Froude number and Reynolds number scaling of hydrodynamic phenomena should be straightforward.

4.1 DOWNCOMER TEMPERATURE DISTRIBUTION

Figure 4-2 shows the degree of temperature stratification in the downcomer for the 1/5-scale tests. In each plot, the standpipe temperature is compared to the downcomer temperatures below the cold leg nozzle. These regions are the coldest in the downcomer and the standpipe temperature is essentially the same as that of the warm fluid circulating back from the lower plenum into the downcomer. Therefore, the plots in Figure 4-2 represent an upper bound for the temperature differences in the downcomer.

The plots in Figure 4-2 are arranged in order of increasing Froude number. These results clearly indicate that increasing the Froude number increases the temperature differences in the facility. To better quantify the Froude number dependence, the difference between the standpipe and core barrel temperatures (curves A and C in Figure 4-2) were averaged over the first characteristic mixing time. As shown in Figure 4-3, the downcomer temperature differences vary approximately linearly with the cold leg Froude number, within the Froude number range tested.

The 1/2-scale data are also included in Figure 4-3 and Figure 4-4 shows a comparison between the 1/2-scale and 1/5-scale downcomer temperature transients at the same Froude number. The data at the two scales are in good agreement. For equal Froude number tests at the two scales, the magnitudes of the dimensionless temperature differences in the downcomer agree within 20%. Also, as shown in Figure 4-3, the 1/2-scale data follow the Froude number dependence established by the 1/5-scale data. More 1/2-scale tests at a lower Froude number would be useful for reinforcing this comparison.

There are some minor differences between the 1/2-scale and 1/5-scale temperature transients. In particular, the temperature on the vessel side of the thermal shield is significantly warmer than on the core barrel side for the 1/2-scale tests. Both temperatures are about the same in the 1/5-scale tests. Therefore, the cold plume has a greater tendency to "jump the gap" in the 1/2-scale facility than in the 1/5-scale facility.

Reynolds number has negligible effect on the mixing hydrodynamics. For example, tests 103 and 101 have the same Reynolds number and yet the temperature differences in test 101 are twice as large as in test

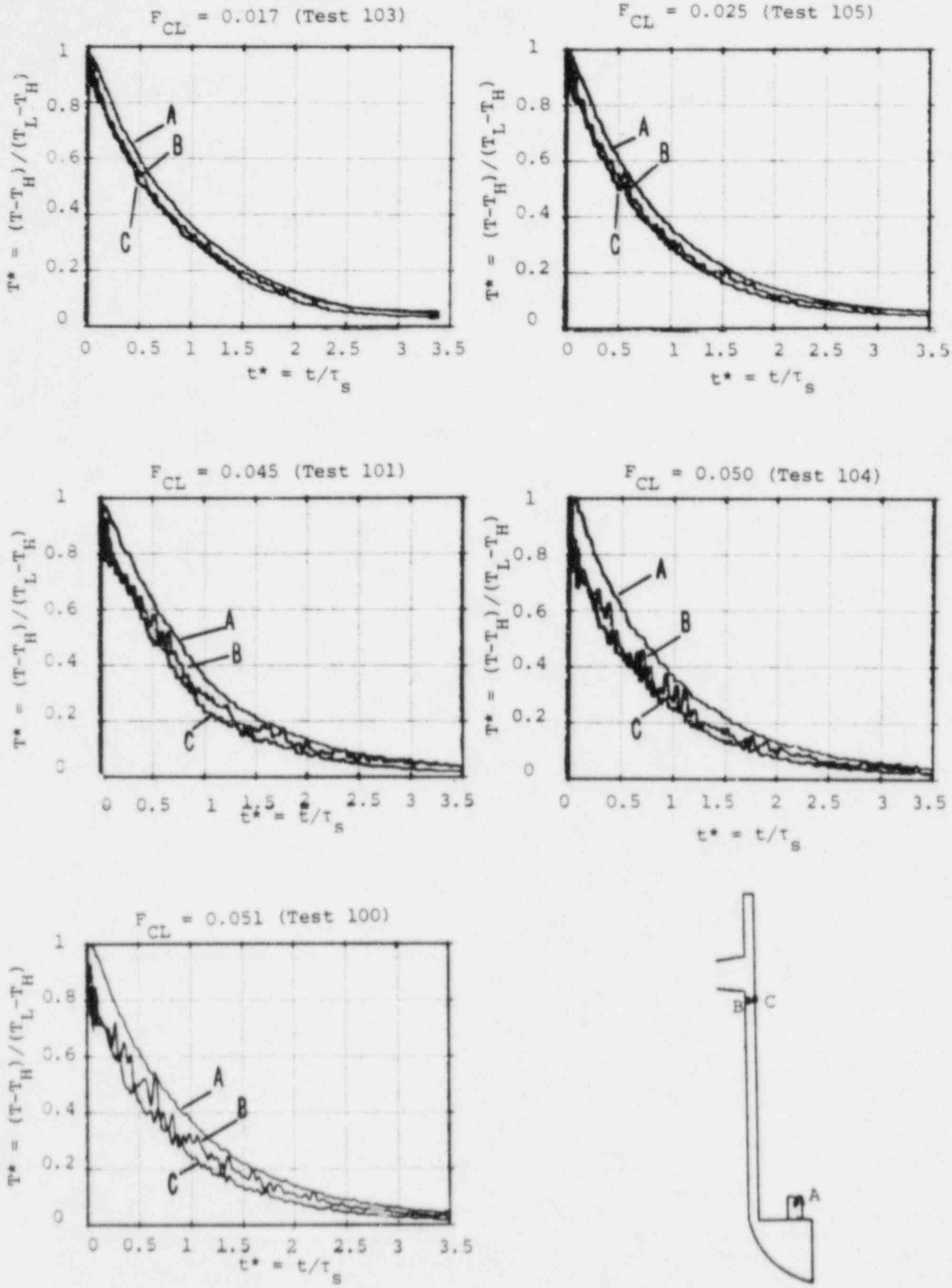


Figure 4-2. 1/5-Scale Transient Cooldown Tests

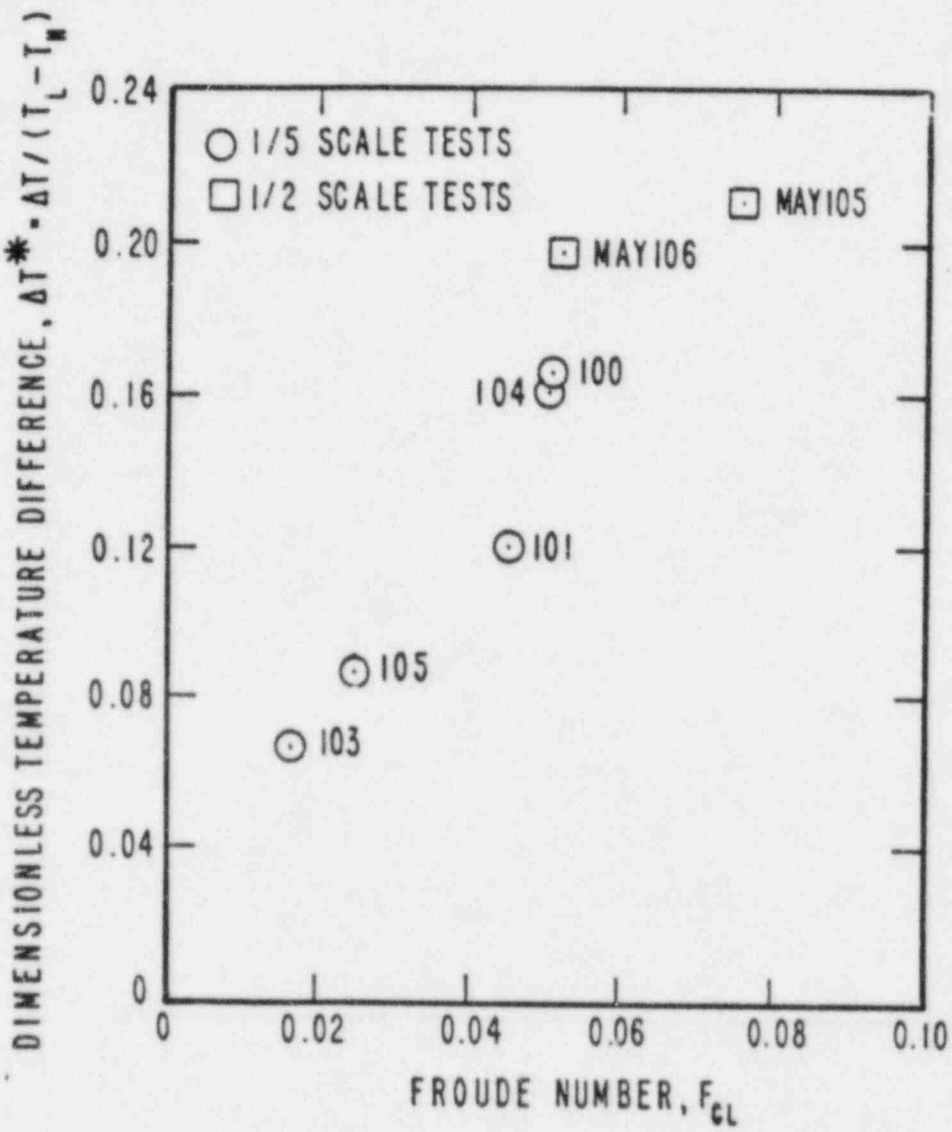


Figure 4-3. Comparison of 1/2-Scale and 1/5-Scale Temperature Difference Between Standpipe and Coldest Region in Downcomer Averaged Over the First Characteristic Mixing Time.

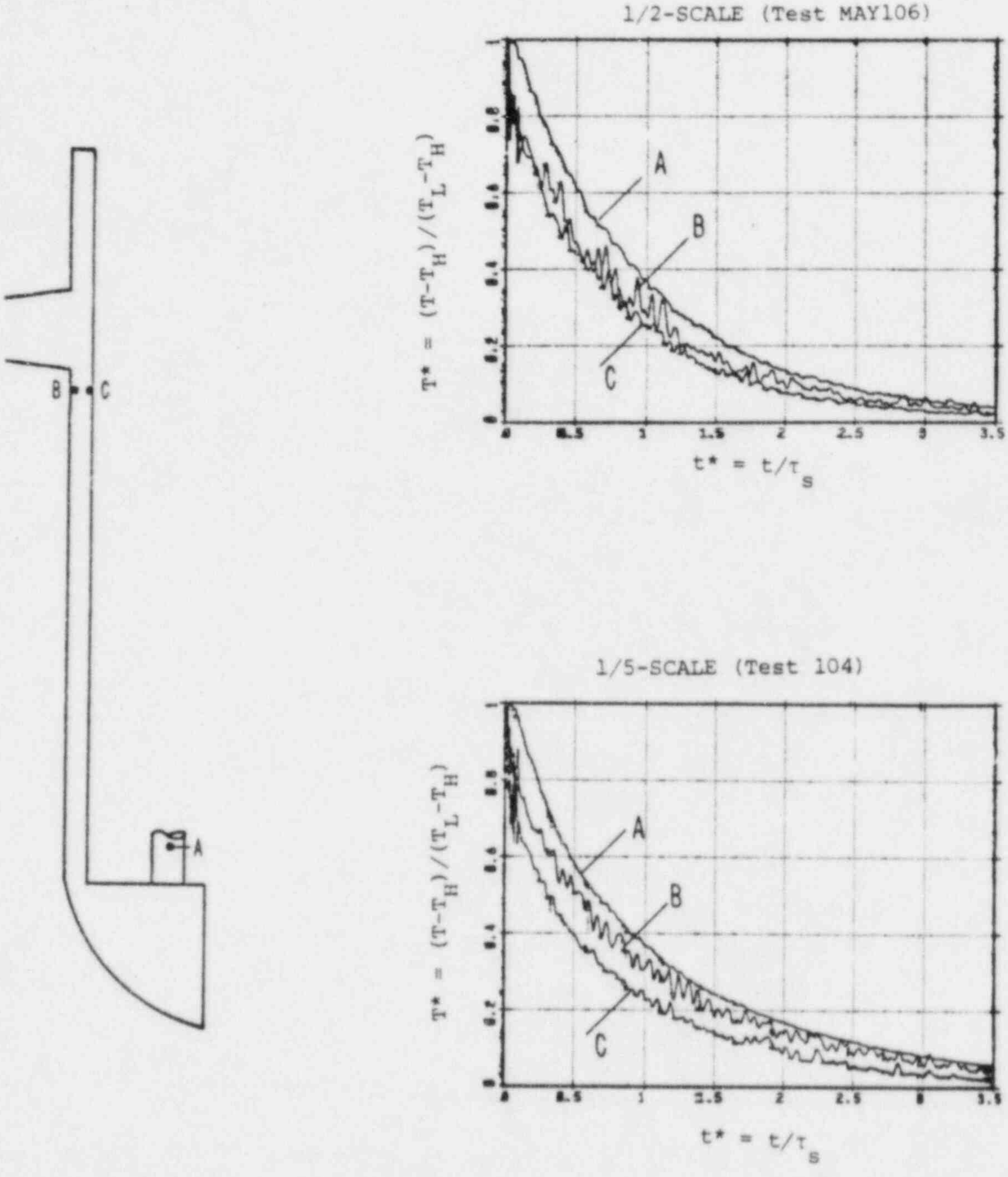


Figure 4-4. Comparison Between 1/2-Scale and 1/5-Scale Temperature Nonuniformity in Downcomer. $F_{CL} = 0.05$

103 (Figure 4-3). Conversely, the Reynolds number for test 100 is a factor of 3 larger than for test 101 and yet the higher Reynolds number does not contribute to increased mixing. On the contrary, the measured temperature differences are somewhat larger for test 100. Finally, the two 1/2-scale tests have Reynolds numbers which are an order of magnitude larger than the 1/5-scale tests and yet the degree of mixing has a similar Froude number dependence at both scales. Therefore, the hydrodynamics in these experiments are dominated by bouyancy effects.

The injector geometry is also not very important in the range of conditions tested. Test 105 was performed with the "small 90" injector which has a diameter 7.3 times smaller than the "near 60" injector. For equal cold leg Froude numbers, the injector velocities are about 50 times larger in the "small 90" injector than in the "near 60" injector. Yet, as shown in Figure 4-3, the degree of temperature stratification in the downcomer is in good agreement with that observed for the tests with the larger injector.

The observed insensitivity to a factor of 7 reduction in the injector diameter suggests that the the fluid recirculation rate in the facility is not limited by the entrainment characteristics of the HPI jet. If the local mixing induced by the HPI jet is sufficiently intense, the backflow of warm water from the downcomer into the cold leg will depend primarily on the balance between the shear forces at the cold/warm fluid interface and the pressure forces resulting from the hydrostatic gradients at each end of the cold leg. Under those conditions, the actual value of the entrainment rate into the HPI jet is not important, as long as it is sufficiently high.

4.2 VELOCITIES

Figure 4-5 shows a comparison between the cold leg quench front velocities measured in the 1/2-scale facility and the 1/5-scale facility. The velocities are nondimensionalized in the form of a Froude number, and are plotted as a function of the cold leg Froude number. Although there is some scatter in the data, the results at the two scales are in good agreement.

Figure 4-6 shows a comparison between the downcomer plume velocities (core barrel side) at the two scales. The velocities are normalized with respect to the downcomer superficial velocity and are plotted as a function of dimensionless time $t^* = t/\tau_s$. The velocities at the two scales are comparable. One would not expect exact agreement because the Froude numbers are somewhat different (27% lower for the 1/5-scale test).

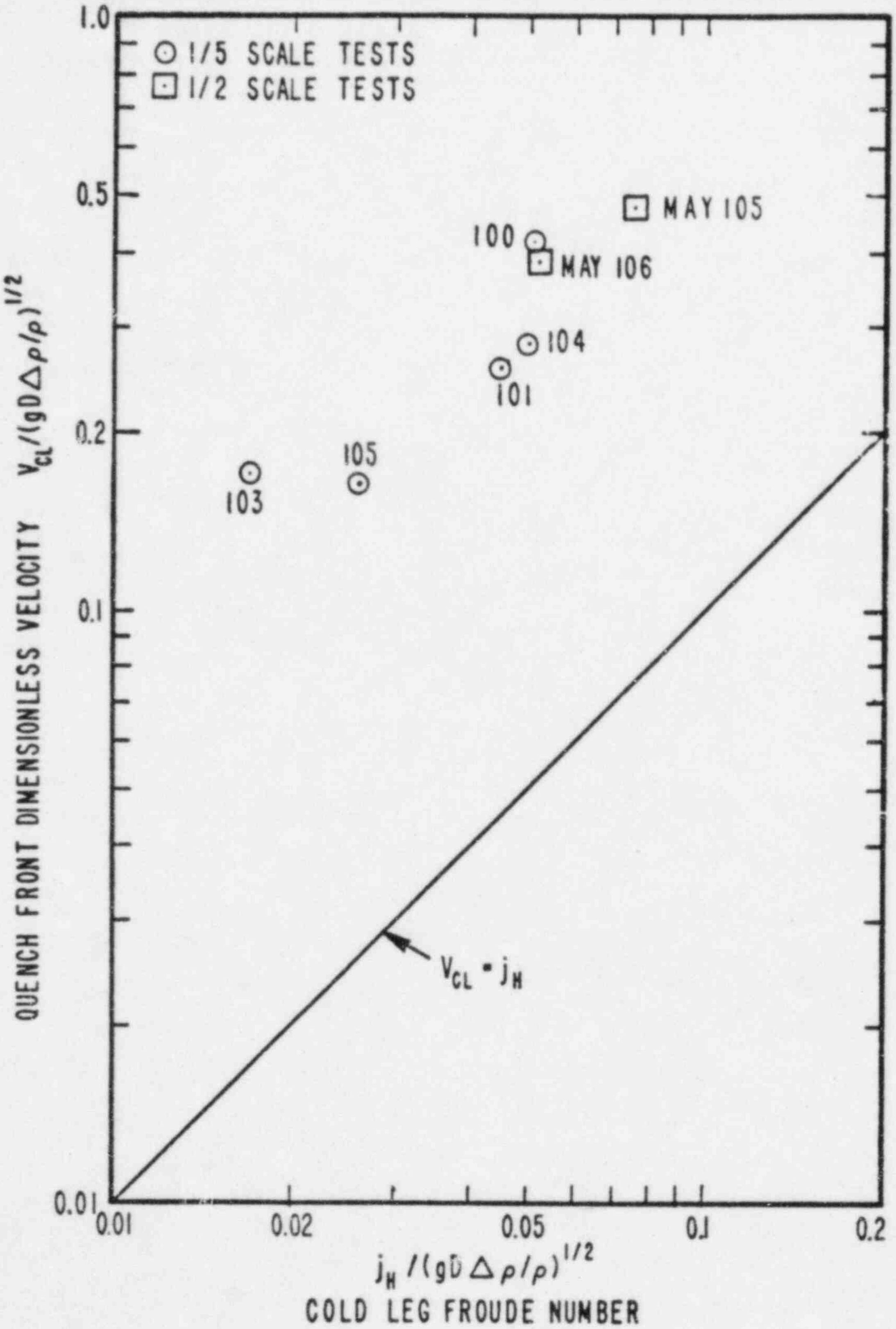


Figure 4-5. Comparison of 1/2-Scale and 1/5-Scale Cold Leg Quench Front Velocities

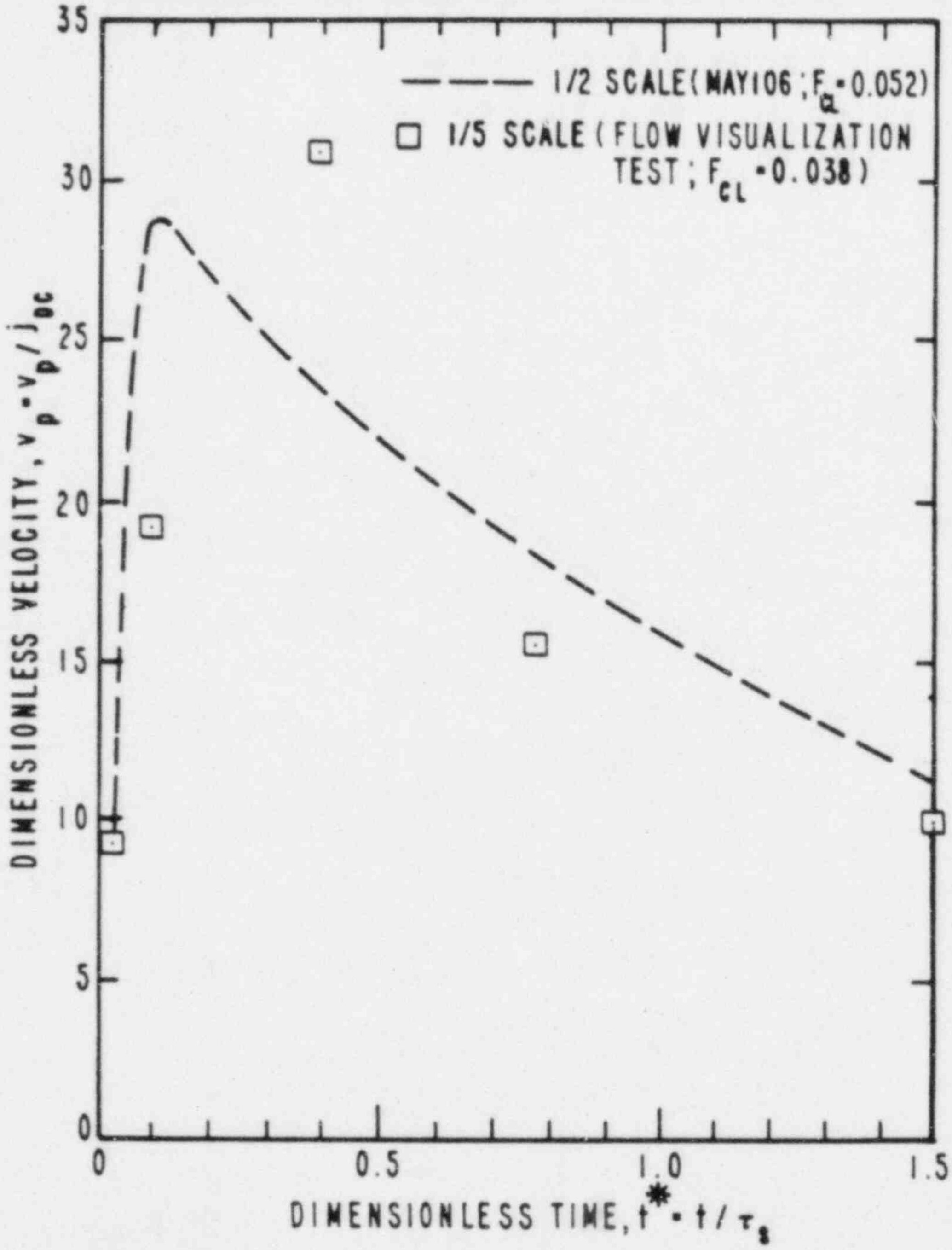


Figure 4-6. Comparison of 1/2-Scale and 1/5-Scale Downcomer Plume Velocity (Core Barrel Side)

4.3 SCALING ASSESSMENT

The data obtained in the 1/5-scale and 1/2-scale facilities strongly support Froude number scaling of the mixing hydrodynamics. As discussed in Section 4.1, 1/5-scale tests with similar Froude numbers, but a factor of 3 different Reynolds numbers, have similar downcomer temperatures distributions. In contrast, 1/5-scale tests with similar Reynolds numbers, but a factor of 2.5 different Froude numbers, have different temperature distributions. Similarly, as described in Section 3.3, the plume velocity in the 1/2-scale facility is a function of the instantaneous Froude number (Froude number based on ambient density.) Although the two 1/2-scale tests have different Reynolds numbers, the plume velocities are also the same when the instantaneous Froude numbers are the same. Moreover, comparison of the 1/5-scale and 1/2-scale data in Sections 4.1 and 4.2 shows that the temperatures and velocities at the two scales correlate well as a function of Froude number, in spite of an order of magnitude difference in Reynolds number. Therefore these tests indicate that Froude number is the principal scaling parameter and Reynolds number has a negligible effect on the thermal mixing hydrodynamics.

While the thermal mixing hydrodynamics depend primarily on the Froude number, the heat transfer between the fluid and the vessel walls depends on both the Froude number and the Reynolds number, as described in Section 3.4. The 1/2-scale experiments were performed at prototypical Froude numbers but a factor of 6.5 lower than prototypical Reynolds number. Because of this difference in Reynolds number, prototypical heat transfer coefficients are expected to be twice as large as those measured in the 1/2-scale facility.

5. CONCLUSIONS

Analysis of the 1/2-scale test results and comparison of these results with the previous 1/5-scale tests lead to the following conclusions:

1. The overall response of the facility during a simulated overcooling transient closely approximates that of a well mixed vessel. The temperature at the exit of the facility follows an exponential decay with a characteristic mixing time which can be predicted in terms of the facility geometry and flow rates.

2. The thermal capacity of the walls represents a significant fraction of the overall thermal capacity of the facility and contributes to an increase in the characteristic mixing time as compared to the flow residence time. For the 1/2-scale facility this increase is approximately 50 percent and for the prototype this increase is expected to be 100 percent or more.

3. The fluid temperatures near the vessel wall are practically uniform, with the exception of a small region near the cold leg nozzle which is somewhat colder during the early part of the transient. Even this colder region does not deviate by more than 10 percent from the well mixed temperature response.

4. Measured heat transfer coefficients at the downcomer vessel wall range between 1700 and 6000 $W/m^2{}^\circ C$ (300 to 1100 $Btu/ft^2\text{-}hr\text{-}^\circ F$) during the first characteristic mixing time.

5. Heat transfer coefficients in the downcomer are in good agreement with well accepted heat transfer correlations if the Reynolds number is based on the plume velocity and correction is made for entrance effects.

6. For equal Froude number, the Nusselt number is proportional to Reynolds number raised to the power of 0.8. Therefore, prototypical heat transfer coefficients are expected to be twice as large as those measured in these experiments.

7. The sealing analysis shows that the heat transfer coefficient is not very sensitive to the value of the Froude number. Decreasing the Froude number from 0.05 to 0.01 would result in only a 35 percent decrease in the heat transfer coefficient.

8. Plume velocities in the downcomer are in good agreement with existing correlations for planar plumes.

9. The results from 1/2-scale experiments and 1/5-scale experiments performed at equal Froude number but at an order of magnitude different Reynolds number are in good agreement.

Therefore, Froude number scaling is the correct approach to simulating the hydraulics of thermal mixing phenomena at different scales and fluid properties.

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APPENDIX A

DATA FOR TEST MAY105

TEST CONDITIONS

HPI Cold Leg Froude Number, F_{CL} . . . . .: 0.076

Loop Flow Ratio, Q_L/Q_H . . . .: 0

Vent Flow Ratio, Q_V/Q_H . . . .: 0

Density Ratio, $\Delta\rho/\rho$ . . . .: 0.122

NOMENCLATURE FOR APPENDICES A AND B

D	Diameter, m
F	Froude number
H	Vertical distance along downcomer, measured from cold leg centerline, m
h	Heat transfer coefficient, W/m^2-°C
j	Superficial velocity, m/s
k	Thermal conductivity, W/m-°C
Nu	Nusselt number
Q	Volumetric flow rate, m^3/s
q	Heat flux, W/m^2
S	Downcomer gap width, m
T	Temperature, °C
t	Time, s
V	Velocity, m/s
W	Width, m
X	Horizontal distance along downcomer, measured from cold leg centerline, m
Y	Horizontal distance across downcomer, measured from vessel wall, m
Z	Vertical distance measured from bottom of cold leg, m

Subscripts

CL	Cold leg
DC	Downcomer
F	Fluid
H	HPI
L	Loop
M	Mixed mean
s	Standpipe
T	Total
V	Vent
W	Wall

Superscripts

*	Dimensionless

Greek Symbols

ρ	Density, Kg/m^3
τ	Mixing time, s

TABLE 1 - TEST MAY105
GEOMETRIC CONFIGURATION

TEST SETUP		
COLD LEG :	horizontal 2	
HPI INJECTOR :	D	
THERMAL SHIELD :	in place	
LOWER PLENUM FLOW SKIRT :	not in place	
VOLUMES, m^3 (ft^3)		
LOOP SEAL - RISER	0.219	(7.73)
- HORIZONTAL	0.202	(7.13)
- PUMP LINK	0.081	(2.86)
PUMP	0.272	(9.60)
COLD LEG - UPSTREAM INJ.	0.131	(4.62)
- DOWNSTREAM INJ.	0.276	(9.73)
DOWNCOMER - ABOVE NOZZLE	0.242	(8.54)
- BELOW NOZZLE	0.592	(20.91)
LOWER PLENUM	0.605	(21.35)
STAND PIPE	0.120	(4.24)
TOTAL	2.740	(96.71)
DIMENSIONS, m (ft)		
COLD LEG DIAMETER (ID)	0.363	(1.192)
DOWNCOMER WIDTH	1.618	(5.308)
DOWNCOMER GAP - VESSEL	0.059	(0.192)
- CORE	0.041	(0.133)
- THERMAL SHIELD	0.038	(0.125)

TABLE 2 - TEST MAY105
TEST CONDITIONS

PARAMETER	NOMINAL	ACTUAL	
		MEAN	ST. DEV.
FLOWS, m^3/s (ft^3/s)			
HPI, Q_H	0.517E-02 (0.183E+00)	0.517E-02 (0.183E+00)	0.161E-03 (0.569E-02)
LOOP, Q_L	0.000E+00 (0.000E+00)	0.000E+00 (0.000E+00)	0.000E+00 (0.000E+00)
VENT, Q_V	0.000E+00 (0.000E+00)	0.000E+00 (0.000E+00)	0.000E+00 (0.000E+00)
TOTAL, Q_T	0.517E-02 (0.183E+00)	0.517E-02 (0.183E+00)	0.161E-03 (0.569E-02)
TEMPERATURES, °C (°F)			
HPI, T_H	0.267E+02 (0.800E+02)	0.142E+02 (0.576E+02)	0.209E+00 (0.376E+00)
LOOP, T_L	0.193E+03 (0.380E+03)	0.189E+03 (0.371E+03)	0.180E+01 (0.323E+01)
VENT, T_V	---	---	---
MIXED MEAN, T_M	0.267E+02 (0.800E+02)	0.142E+02 (0.575E+02)	0.273E+00 (0.491E+00)
SYSTEM PRESS., MPa (psia)	0.138E+01 (0.200E+03)	0.142E+01 (0.206E+03)	0.217E-01 (0.314E+01)
DIMENSIONLESS PARAMETERS			
COLD LEG FROUDE #, F_{CL}	0.750E-01	0.755E-01	0.227E-02
DENSITY RATIO, $\Delta\rho/\rho$	0.124E+00	0.122E+00	0.209E-02
FLOW RATIOS :			
Q_L/Q_H	0.000E+00	0.000E+00	0.000E+00
Q_V/Q_H	0.000E+00	0.000E+00	0.000E+00
$(Q_L+Q_V)/Q_H$	0.000E+00	0.000E+00	0.000E+00

TABLE 3 - TEST MAY105
FLUID PROPERTIES

FLOW	TEMPERATURE °C (°F)	DENSITY Kg/m³ (lbm/ft³)	K VISCOSITY Kg/m-s (lbm/ft-s)	ENTHALPY J/Kg (Btu/lbm)	CONDUCTIVITY W/m-°C (Btu/ft-hr-°F)
HPI	0.142E+02 (0.576E+02)	0.100E+04 (0.624E+02)	0.117E-02 (0.784E-03)	0.608E+05 (0.261E+02)	0.595E+00 (0.344E+00)
LOOP	0.189E+03 (0.371E+03)	0.878E+03 (0.548E+02)	0.142E-03 (0.957E-04)	0.801E+06 (0.344E+03)	0.669E+00 (0.387E+00)
VENT	---	---	---	---	---
MIXED MEAN	0.142E+02 (0.575E+02)	0.100E+04 (0.624E+02)	0.117E-02 (0.784E-03)	0.608E+05 (0.261E+02)	0.595E+00 (0.344E+00)

TABLE 4 - TEST MAY105
GLOBAL RESULTS

MIXING TIMES, s		
DOWNCOMER[1]	588.8	
STANDPIPE	666.0	
COLD LEG VELOCITIES, m/s (ft/s)		
SUPERFICIAL	0.498E-01	(0.164E+00)
QUENCH FRONT	0.289E+00	(0.947E+00)
DOWNCOMER SUPERFICIAL VELOCITIES, m/s (ft/s)		
ABOVE THERMAL SHIELD	0.233E-01	(0.764E-01)
THERMAL SHIELD REGION	0.322E-01	(0.106E+00)

1. 0.41 m (16") below cold leg centerline (VS7CTC)

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
TCLS1	0	Deg C Deg F	0.190E+03 0.375E+03	0.241E+00 0.433E+00	0.285E+02 0.834E+02	0.397E+00 0.714E+00	0.276E+02 0.816E+02	0.191E+03 0.375E+03	0
TCLS2	0	Deg C Deg F	0.190E+03 0.374E+03	0.355E+00 0.640E+00	0.282E+02 0.827E+02	0.177E+00 0.319E+00	0.277E+02 0.819E+02	0.190E+03 0.375E+03	0
TCLS3	0	Deg C Deg F	0.190E+03 0.375E+03	0.209E+00 0.375E+00	0.985E+02 0.209E+03	0.138E+01 0.248E+01	0.961E+02 0.205E+03	0.191E+03 0.375E+03	0
TCLS4	0	Deg C Deg F	0.188E+03 0.370E+03	0.472E+00 0.850E+00	0.255E+02 0.779E+02	0.214E+00 0.385E+00	0.251E+02 0.772E+02	0.189E+03 0.371E+03	0
TCLS5	0	Deg C Deg F	0.188E+03 0.370E+03	0.251E+00 0.451E+00	0.255E+02 0.779E+02	0.195E+00 0.351E+00	0.250E+02 0.769E+02	0.188E+03 0.371E+03	0
TCLS6	0	Deg C Deg F	0.188E+03 0.370E+03	0.678E+00 0.122E+01	0.257E+02 0.782E+02	0.190E+00 0.341E+00	0.251E+02 0.772E+02	0.189E+03 0.372E+03	0
TCPS1	0	Deg C Deg F	0.190E+03 0.373E+03	0.229E+00 0.412E+00	0.216E+02 0.710E+02	0.242E+00 0.436E+00	0.209E+02 0.696E+02	0.190E+03 0.374E+03	0
TCPS2	0	Deg C Deg F	0.190E+03 0.373E+03	0.188E+00 0.338E+00	0.217E+02 0.711E+02	0.345E+00 0.621E+00	0.209E+02 0.697E+02	0.190E+03 0.374E+03	0
TCPS3	0	Deg C Deg F	0.190E+03 0.373E+03	0.188E+00 0.338E+00	0.229E+02 0.732E-02	0.987E+00 0.178E+01	0.207E+02 0.692E+02	0.190E+03 0.374E+03	0
TCPS4	0	Deg C Deg F	0.190E+03 0.374E+03	0.101E+00 0.182E+00	0.440E+02 0.111E+03	0.193E+01 0.347E+01	0.381E+02 0.101E+03	0.190E+03 0.375E+03	0
TCCL1	0	Deg C Deg F	0.189E+03 0.373E+03	0.175E+00 0.315E+00	0.431E+02 0.110E+03	0.311E+01 0.560E+01	0.357E+02 0.962E+02	0.190E+03 0.373E+03	0
TCCL2	N								
TCCL3	0	Deg C Deg F	0.190E+03 0.373E+03	0.433E-01 0.779E-01	0.289E+02 0.841E+02	0.786E+01 0.141E+02	0.166E+02 0.619E+02	0.190E+03 0.374E+03	0
TCCL4	0	Deg C Deg F	0.189E+03 0.373E+03	0.248E+00 0.446E+00	0.158E+02 0.604E+02	0.229E+00 0.411E+00	0.153E+02 0.595E+02	0.190E+03 0.374E+03	0
TCCL5	N								
TCCL6	0	Deg C Deg F	0.190E+03 0.374E+03	0.123E+00 0.221E+00	0.159E+02 0.605E+02	0.260E+00 0.468E+00	0.153E+02 0.595E+02	0.190E+03 0.374E+03	0
TCCL7	0	Deg C Deg F	0.190E+03 0.374E+03	0.191E+00 0.343E+00	0.176E+02 0.637E+02	0.933E+00 0.168E+01	0.165E+02 0.618E+02	0.190E+03 0.375E+03	0
TCCL8	0	Deg C Deg F	0.190E+03 0.374E+03	0.147E+00 0.264E+00	0.296E+02 0.853E+02	0.549E+01 0.989E+01	0.173E+02 0.631E+02	0.190E+03 0.375E+03	0
TCCL9	0	Deg C Deg F	0.190E+03 0.374E+03	0.188E+00 0.338E+00	0.465E+02 0.116E+03	0.268E+01 0.483E+01	0.329E+02 0.912E+02	0.190E+03 0.375E+03	0
TCCL10	0	Deg C Deg F	0.186E+03 0.368E+03	0.301E+00 0.541E+00	0.161E+02 0.610E+02	0.277E+00 0.498E+00	0.155E+02 0.600E-02	0.187E+03 0.369E+03	0

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
TCCL11	N								
TCCL12	O	Deg C Deg F	0.186E+03 0.367E+03	0.262E+00 0.472E+00	0.160E+02 0.608E+02	0.201E+00 0.363E+00	0.155E+02 0.600E+02	0.187E+03 0.368E+03	0
TCCL13	O	Deg C Deg F	0.186E+03 0.368E+03	0.289E+00 0.521E+00	0.158E+02 0.605E+02	0.212E+00 0.382E+00	0.152E+02 0.594E+02	0.187E+03 0.368E+03	0
TCCL14	O	Deg C Deg F	0.186E+03 0.367E+03	0.431E+00 0.777E+00	0.158E+02 0.605E+02	0.248E+00 0.446E+00	0.153E+02 0.596E+02	0.187E+03 0.368E+03	0
TCCL15	O	Deg C Deg F	0.187E+03 0.368E+03	0.594E+00 0.107E+01	0.156E+02 0.600E+02	0.220E+00 0.397E+00	0.149E+02 0.588E+02	0.188E+03 0.370E+03	0
TCCL16	O	Deg C Deg F	0.187E+03 0.368E+03	0.463E+00 0.834E+00	0.157E+02 0.603E+02	0.262E+00 0.472E+00	0.151E+02 0.592E+02	0.188E+03 0.370E+03	0
TCCL17	O	Deg C Deg F	0.186E+03 0.368E+03	0.291E+00 0.524E+00	0.169E+02 0.624E+02	0.330E+00 0.595E+00	0.160E+02 0.608E+02	0.187E+03 0.369E+03	0
TCCL18	O	Deg C Deg F	0.187E+03 0.368E+03	0.300E+00 0.540E+00	0.175E+02 0.636E+02	0.255E+00 0.460E+00	0.169E+02 0.625E+02	0.187E+03 0.369E+03	0
TCLC11	O	Deg C Deg F	0.188E+03 0.370E+03	0.407E+00 0.732E+00	0.165E+02 0.617E+02	0.415E+00 0.746E+00	0.155E+02 0.599E+02	0.189E+03 0.372E+03	0
TCLC12	O	Deg C Deg F	0.190E+03 0.373E+03	0.142E+00 0.256E+00	0.164E+02 0.615E+02	0.505E+00 0.909E+00	0.152E+02 0.594E+02	0.190E+03 0.374E+03	0
TCLC13	O	Deg C Deg F	0.190E+03 0.374E+03	0.218E+00 0.392E+00	0.178E+02 0.641E+02	0.538E+00 0.968E+00	0.164E+02 0.616E+02	0.190E+03 0.374E+03	0
TCLC14	O	Deg C Deg F	0.190E+03 0.374E+03	0.207E+00 0.372E+00	0.184E+02 0.651E+02	0.724E+00 0.130E+01	0.167E+02 0.620E+02	0.190E+03 0.375E+03	0
TCLC15	O	Deg C Deg F	0.190E+03 0.374E+03	0.240E+00 0.432E+00	0.187E+02 0.656E+02	0.794E+00 0.143E+01	0.168E+02 0.622E+02	0.191E+03 0.375E+03	0
TCLC16	O	Deg C Deg F	0.190E+03 0.374E+03	0.231E+00 0.416E+00	0.179E+02 0.642E+02	0.870E+00 0.157E+01	0.162E+02 0.612E+02	0.191E+03 0.375E+03	0
TCLC17	O	Deg C Deg F	0.191E+03 0.375E+03	0.181E+00 0.325E+00	0.187E+02 0.657E+02	0.109E+01 0.197E+01	0.169E+02 0.624E+02	0.191E+03 0.376E+03	0
TCLC18	O	Deg C Deg F	0.191E+03 0.375E+03	0.160E+00 0.287E+00	0.195E+02 0.670E+02	0.172E+01 0.309E+01	0.165E+02 0.618E+02	0.191E+03 0.376E+03	0
TCLC19	O	Deg C Deg F	0.191E+03 0.376E+03	0.148E+00 0.267E+00	0.205E+02 0.689E+02	0.250E+01 0.451E+01	0.169E+02 0.624E+02	0.191E+03 0.376E+03	0
TCLC110	O	Deg C Deg F	0.191E+03 0.376E+03	0.134E+00 0.240E+00	0.237E+02 0.746E+02	0.534E+01 0.962E+01	0.168E+02 0.622E+02	0.191E+03 0.376E+03	0
TCLC21	O	Deg C Deg F	0.187E+03 0.369E+03	0.613E+00 0.110E+01	0.156E+02 0.601E+02	0.261E+00 0.470E+00	0.150E+02 0.589E+02	0.189E+03 0.372E+03	0
TCLC22	O	Deg C Deg F	0.190E+03 0.375E+03	0.386E+00 0.694E+00	0.150E+02 0.590E+02	0.244E+00 0.439E+00	0.144E+02 0.578E+02	0.191E+03 0.376E+03	0

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
TCLC23	O	Deg C	0.188E+03	0.351E+00	0.158E+02	0.222E+00	0.153E+02	0.190E+03	0
		Deg F	0.371E+03	0.631E+00	0.604E+02	0.400E+00	0.595E+02	0.373E+03	
TCLC24	O	Deg C	0.189E+03	0.578E+00	3.148E+02	0.244E+00	0.142E+02	0.190E+03	0
		Deg F	0.373E+03	0.104E+01	0.587E+02	0.439E+00	0.576E+02	0.374E+03	
TCLC25	O	Deg C	0.183E+03	0.221E+01	0.159E+02	0.212E+00	0.153E+02	0.188E+03	0
		Deg F	0.361E+03	0.398E+01	0.606E+02	0.381E+00	0.595E+02	0.370E+03	
TCLC26	B Ø	Deg C	0.656E+02	0.706E+00	0.177E+02	0.131E+00	0.173E+02	0.671E+02	0
		Deg F	0.150E+03	0.127E+01	0.639E+02	0.235E+00	0.632E+02	0.153E+03	
TCLC27	O	Deg C	0.189E+03	0.650E+00	0.158E+02	0.208E+00	0.153E+02	0.190E+03	0
		Deg F	0.372E+03	0.117E+01	0.604E+02	0.374E+00	0.595E+02	0.374E+03	
TCLC28	O	Deg C	0.190E+03	0.226E+00	0.149E+02	0.203E+00	0.140E+02	0.191E+03	0
		Deg F	0.374E+03	0.408E+00	0.588E+02	0.365E+00	0.573E+02	0.375E+03	
TCLC29	O	Deg C	0.191E+03	0.151E+00	0.157E+02	0.204E+00	0.151E+02	0.191E+03	0
		Deg F	0.375E+03	0.273E+00	0.602E+02	0.367E+00	0.591E+02	0.376E+03	
TCLC210	O	Deg C	0.191E+03	0.435E-01	0.157E+02	0.172E+00	0.152E+02	0.191E+03	0
		Deg F	0.375E+03	0.784E-01	0.603E+02	0.310E+00	0.593E+02	0.376E+03	
TCLC31	O	Deg C	0.188E+03	0.299E+00	0.158E+02	0.239E+00	0.154E+02	0.188E+03	0
		Deg F	0.370E+03	0.538E+00	0.605E+02	0.430E+00	0.597E+02	0.371E+03	
TCLC32	O	Deg C	0.190E+03	0.143E+00	0.158E+02	0.191E+00	0.153E+02	0.190E+03	0
		Deg F	0.373E+03	0.257E+00	0.604E+02	0.344E+00	0.595E+02	0.374E+03	
TCLC33	O	Deg C	0.190E+03	0.187E+00	0.157E+02	0.206E+00	0.152E+02	0.190E+03	0
		Deg F	0.374E+03	0.336E+00	0.602E+02	0.360E+00	0.593E+02	0.375E+03	
TCLC34	O	Deg C	0.190E+03	0.854E-01	0.158E+02	0.207E+00	0.154E+02	0.190E+03	0
		Deg F	0.374E+03	0.154E+00	0.604E+02	0.373E+00	0.597E+02	0.375E+03	
TCLC35	O	Deg C	0.190E+03	0.114E+00	0.158E+02	0.169E+00	0.154E+02	0.190E+03	0
		Deg F	0.374E+03	0.206E+00	0.605E+02	0.304E+00	0.597E+02	0.375E+03	
TCLC36	O	Deg C	0.190E+03	0.112E+00	0.158E+02	0.202E+00	0.154E+02	0.191E+03	0
		Deg F	0.374E-03	0.202E+00	0.604E+02	0.364E+00	0.597E+02	0.375E+03	
TCLC37	O	Deg C	0.190E+03	0.147E+00	0.156E+02	0.177E+00	0.153E+02	0.191E+03	0
		Deg F	0.374E+03	0.265E+00	0.601E+02	0.319E+00	0.595E+02	0.375E+03	
TCLC38	O	Deg C	0.190E+03	0.156E+00	0.157E+02	0.194E+00	0.153E+02	0.191E+03	0
		Deg F	0.375E+03	0.281E+00	0.602E+02	0.349E+00	0.595E+02	0.375E+03	
TCLC39	O	Deg C	0.190E+03	0.692E-01	0.158E+02	0.228E+00	0.152E+02	0.191E+03	0
		Deg F	0.375E+03	0.125E+00	0.605E+02	0.410E+00	0.594E+02	0.375E+03	
TCLC310	O	Deg C	0.190E+03	0.426E-01	0.168E+02	0.214E+01	0.152E+02	0.191E+C3	0
		Deg F	0.375E+03	0.767E-01	0.623E+02	0.386E+01	0.594E+02	0.375E+03	
TCLC41	N								
TCLC42	N								

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
TCLC43	N								
TCLC44	N								
TCLC45	N								
TCLC46	N								
TCLC47	N								
TCLC48	N								
TCLC49	N								
TCLC410	N								
TCLC51	O	Deg C Deg F	0.189E+03 0.373E+03	0.405E+00 0.729E+00	0.162E+02 0.612E+02	0.345E+00 0.621E+00	0.157E+02 0.603E+02	0.190E+03 0.374E+03	0
TCLC52	O	Deg C Deg F	0.190E+03 0.374E+03	0.214E+00 0.385E+00	0.150E+02 0.590E+02	0.427E+00 0.769E+00	0.145E+02 0.580E+02	0.191E+03 0.375E+03	0
TCLC53	O	Deg C Deg F	0.190E+03 0.374E+03	0.206E+00 0.370E+00	0.161E+02 0.609E+02	0.339E+00 0.611E+00	0.154E+02 0.597E+02	0.190E+03 0.375E+03	0
TCLC54	O	Deg C Deg F	0.190E+03 0.374E+03	0.149E+00 0.268E+00	0.150E+02 0.591E+02	0.694E+00 0.125E+01	0.142E+02 0.576E+02	0.190E+03 0.374E+03	0
TCLC55	O	Deg C Deg F	0.190E+03 0.374E+03	0.869E-01 0.156E+00	0.165E+02 0.617E+02	0.114E+01 0.205E+01	0.154E+02 0.597E+02	0.191E+03 0.375E+03	0
TCLC56	O	Deg C Deg F	0.191E+03 0.375E+03	0.129E+00 0.232E+00	0.176E+02 0.636E+02	0.293E+01 0.527E+01	0.144E+02 0.579E+02	0.191E+03 0.376E+03	0
TCLC57	O	Deg C Deg F	0.190E+03 0.375E+03	0.211E+00 0.379E+00	0.204E+02 0.687E+02	0.228E+01 0.411E+01	0.158E+02 0.604E+02	0.191E+03 0.375E+03	0
TCLC58	O	Deg C Deg F	0.190E+03 0.374E+03	0.192E+00 0.346E+00	0.235E+02 0.743E+02	0.299E+01 0.538E+01	0.150E+02 0.591E+02	0.191E+03 0.375E+03	0
TCLC59	O	Deg C Deg F	0.190E+03 0.375E+03	0.104E+00 0.188E+00	0.285E+02 0.834E+02	0.124E+01 0.223E+01	0.260E+02 0.789E+02	0.191E+03 0.376E+03	0
TCLC510	O	Deg C Deg F	0.191E+03 0.376E+03	0.954E-01 0.172E+00	0.350E+02 0.950E+02	0.298E+01 0.536E+01	0.297E+02 0.854E+02	0.191E+03 0.376E+03	0
TCLC5R1	O	Deg C Deg F	0.190E+03 0.375E+03	0.185E+00 0.333E+00	0.342E+02 0.936E+02	0.459E+01 0.825E+01	0.265E+02 0.797E+02	0.191E+03 0.375E+03	0
TCLC5R2	O	Deg C Deg F	0.190E+03 0.374E+03	0.152E+00 0.274E+00	0.215E+02 0.707E+02	0.309E+01 0.556E+01	0.159E+02 0.607E+02	0.191E+03 0.375E+03	0

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
TCLC5R3	0	Deg C Deg F	0.190E+03 0.374E+03	0.178E+00 0.321E+00	0.164E+02 0.615E+02	0.120E+01 0.216E+01	0.155E+02 0.599E+02	0.191E+03 0.375E+03	0
TCLC5R4	0	Deg C Deg F	0.190E+03 0.374E+03	0.186E+00 0.335E+00	0.160E+02 0.609E+02	0.394E+00 0.710E+00	0.153E+02 0.595E+02	0.191E+03 0.375E+03	0
TCLC5R5	0	Deg C Deg F	0.190E+03 0.374E+03	0.102E+00 0.183E+00	0.160E+02 0.609E+02	0.330E+00 0.593E+00	0.155E+02 0.599E+02	0.190E+03 0.374E+03	0
TCLC5L1	0	Deg C Deg F	0.190E+03 0.374E+03	0.126E+00 0.227E+00	0.347E+02 0.944E+02	0.233E+01 0.420E+01	0.292E+02 0.846E+02	0.191E+03 0.375E+03	0
TCLC5L2	0	Deg C Deg F	0.190E+03 0.374E+03	0.156E+00 0.280E+00	0.259E+02 0.786E+02	0.143E+01 0.257E+01	0.225E+02 0.726E+02	0.190E+03 0.375E+03	0
TCLC5L3	0	Deg C Deg F	0.189E+03 0.373E+03	0.194E+00 0.350E+00	0.216E+02 0.709E+02	0.165E+01 0.297E+01	0.161E+02 0.609E+02	0.190E+03 0.374E+03	0
TCLC5L4	0	Deg C Deg F	0.190E+03 0.374E+03	0.183E+00 0.330E+00	0.183E+02 0.650E+02	0.187E+01 0.337E+01	0.157E+02 0.603E+02	0.190E+03 0.374E+03	0
TCLC5L5	0	Deg C Deg F	0.190E+03 0.374E+03	0.178E+00 0.320E+00	0.165E+02 0.618E+02	0.921E+00 0.166E+01	0.155E+02 0.599E+02	0.190E+03 0.375E+03	0
TCLC61	0	Deg C Deg F	0.188E+03 0.370E+03	0.254E+00 0.458E+00	0.158E+02 0.604E+02	0.201E+00 0.362E+00	0.153E+02 0.595E+02	0.188E+03 0.371E+03	0
TCLC63	0	Deg C Deg F	0.189E+03 0.373E+03	0.315E-01 0.567E-01	0.156E+02 0.601E+02	0.218E+00 0.392E+00	0.152E+02 0.593E+02	0.190E+03 0.374E+03	0
TCLC65	0	Deg C Deg F	0.190E+03 0.374E+03	0.195E+00 0.352E+00	0.156E+02 0.600E+02	0.212E+00 0.382E+00	0.149E+02 0.589E+02	0.190E+03 0.374E+03	0
TCLC67	0	Deg C Deg F	0.190E+03 0.373E+03	0.177E+00 0.319E+00	0.153E+02 0.596E+02	0.205E+00 0.368E+00	0.147E+02 0.584E+02	0.190E+03 0.374E+03	0
TCLC69	3 ~~0~~	Deg C Deg F	-.313E+03 -.532E+03	0.519E+00 0.935E+00	-.313E+03 -.531E+03	0.246E+00 0.442E+00	-.313E+03 -.532E+03	-.313E+03 -.531E+03	0
GAPJ11	0	Deg C Deg F	0.189E+03 0.372E+03	0.242E+00 0.436E+00	0.201E+02 0.682E+02	0.206E+01 0.371E+01	0.160E+02 0.608E+02	0.189E+03 0.373E+03	0
GAPJ12	0	Deg C Deg F	0.189E+03 0.372E+03	0.241E+00 0.433E+00	0.203E+02 0.685E+02	0.208E+01 0.374E+01	0.160E+02 0.608E+02	0.189E+03 0.373E+03	0
GAPJ13	0	Deg C Deg F	0.189E+03 0.372E+03	0.232E+00 0.418E+00	0.203E+02 0.685E+02	0.173E+01 0.312E+01	0.165E+02 0.616E+02	0.189E+03 0.373E+03	0
GAPJ14	0	Deg C Deg F	0.189E+03 0.372E+03	0.249E+00 0.448E+00	0.200E+02 0.681E+02	0.142E+01 0.256E+01	0.166E+02 0.619E+02	0.190E+03 0.373E+03	0
GAPJ15	0	Deg C Deg F	0.189E+03 0.372E+03	0.251E+00 0.452E+00	0.197E+02 0.674E+02	0.119E+01 0.215E+01	0.160E+02 0.608E+02	0.190E+03 0.373E+03	0
GAPJ21	0	Deg C Deg F	0.189E+03 0.372E+03	0.238E+00 0.428E+00	0.164E+02 0.615E+02	0.687E+00 0.124E+01	0.154E+02 0.597E+02	0.189E+03 0.373E+03	0
GAPJ22	0	Deg C Deg F	0.189E+03 0.372E+03	0.261E+00 0.470E+00	0.166E+02 0.619E+02	0.981E+00 0.177E+01	0.153E+02 0.595E+02	0.189E+03 0.373E+03	0

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
GAPJ23	0	Deg C	0.189E+03	0.237E+00	0.169E+02	0.120E+01	0.156E+02	0.189E+03	0
		Deg F	0.372E+03	0.427E+00	0.624E+02	0.216E+01	0.601E+02	0.373E+03	
GAPJ24	0	Deg C	0.189E+03	0.264E+00	0.175E+02	0.167E+01	0.157E+02	0.190E+03	0
		Deg F	0.372E+03	0.475E+00	0.635E+02	0.300E+01	0.603E+02	0.373E+03	
GAPJ25	0	Deg C	0.189E+03	0.241E+00	0.178E+02	0.164E+01	0.157E+02	0.190E+03	0
		Deg F	0.372E+03	0.434E+00	0.641E+02	0.295E+01	0.603E+02	0.373E+03	
GAPJ31	0	Deg C	0.189E+03	0.246E+00	0.241E+02	0.146E+01	0.198E+02	0.190E+03	0
		Deg F	0.372E+03	0.444E+00	0.753E+02	0.262E+01	0.676E+02	0.373E+03	
GAPJ32	0	Deg C	0.189E+03	0.192E+00	0.231E+02	0.161E+01	0.184E+02	0.190E+03	0
		Deg F	0.373E+03	0.346E+00	0.736E+02	0.291E+01	0.652E+02	0.373E+03	
GAPJ33	0	Deg C	0.189E+03	0.226E+00	0.192E+02	0.168E+01	0.272E+01	0.190E+03	0
		Deg F	0.373E+03	0.407E+00	0.666E+02	0.302E+01	0.369E+02	0.373E+03	
GAPJ34	0	Deg C	0.189E+03	0.202E+00	0.166E+02	0.964E+00	0.153E+02	0.190E+03	0
		Deg F	0.373E+03	0.363E+00	0.618E+02	0.174E+01	0.595E+02	0.374E+03	
GAPJ35	0	Deg C	0.189E+03	0.212E+00	0.170E+02	0.122E+01	0.156E+02	0.190E+03	0
		Deg F	0.373E+03	0.382E+00	0.627E+02	0.219E+01	0.600E+02	0.373E+03	
V51CTC	0	Deg C	0.200E+03	0.255E+00	0.200E+03	0.186E+00	0.200E+03	0.200E+03	0
		Deg F	0.391E+03	0.459E+00	0.392E+03	0.335E+00	0.391E+03	0.392E+03	
V52CTC	0	Deg C	0.188E+03	0.942E-01	0.261E+02	0.156E+01	0.234E+02	0.189E+03	0
		Deg F	0.371E+03	0.170E+00	0.790E+02	0.281E+01	0.742E+02	0.371E+03	
V53CTC	0	Deg C	0.189E+03	0.177E+00	0.254E+02	0.115E+01	0.236E+02	0.189E+03	0
		Deg F	0.372E+03	0.318E+00	0.777E+02	0.207E+01	0.745E+02	0.373E+03	
V53FTC	0	Deg C	0.188E+03	0.977E-01	0.251E+02	0.114E+01	0.227E+02	0.189E+03	0
		Deg F	0.371E+03	0.176E+00	0.772E+02	0.206E+01	0.729E+02	0.371E+03	
V53MTC	0	Deg C	0.190E+03	0.988E-01	0.359E+02	0.536E+00	0.352E+02	0.190E+03	0
		Deg F	0.373E+03	0.178E+00	0.967E+02	0.966E+00	0.953E+02	0.374E+03	
V54CTC	0	Deg C	0.189E+03	0.176E+00	0.251E+02	0.123E+01	0.230E+02	0.190E+03	0
		Deg F	0.373E+03	0.318E+00	0.772E+02	0.221E+01	0.735E+02	0.374E+03	
V54FTC	0	Deg C	0.188E+03	0.481E-01	0.243E+02	0.147E+01	0.213E+02	0.189E+03	0
		Deg F	0.371E+03	0.866E-01	0.757E+02	0.264E+01	0.704E+02	0.372E+03	
V54MTC	0	Deg C	0.190E+03	0.904E-01	0.328E+02	0.496E+00	0.319E+02	0.190E+03	0
		Deg F	0.373E+03	0.163E+00	0.911E+02	0.893E+00	0.895E+02	0.374E+03	
V55CTC	0	Deg C	0.189E+03	0.162E+00	0.233E+02	0.147E+01	0.198E+02	0.189E+03	0
		Deg F	0.372E+03	0.292E+00	0.739E+02	0.265E+01	0.677E+02	0.373E+03	
V55FTC	0	Deg C	0.188E+03	0.122E+00	0.234E+02	0.198E+01	0.189E+02	0.189E+03	0
		Deg F	0.371E+03	0.219E+00	0.741E+02	0.356E+01	0.661E+02	0.372E+03	
V55MTC	[illegible]	Deg C	0.190E+03	[illegible]	0.304E+02	0.541E+00	0.294E+02	0.190E+03	0
		Deg F	0.373E+03	0.124E+00	0.867E+02	0.973E+00	0.848E+02	0.374E+03	
V56CTC	0	Deg C	0.189E+03	0.170E+00	0.233E+02	0.171E+01	0.176E+02	0.192E+03	0
		Deg F	0.373E+03	0.306E+00	0.739E+02	0.307E+01	0.641E+02	0.374E+03	

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
V56FTC	0	Deg C	0.188E+03	0.109E+00	0.236E+02	0.155E+01	0.185E+02	0.189E+03	0
		Deg F	0.371E+03	0.196E+00	0.744E+02	0.279E+01	0.654E+02	0.372E+03	
V56MTC	0	Deg C	0.190E+03	0.159E+00	0.293E+02	0.379E+00	0.283E+02	0.190E+03	0
		Deg F	0.374E+03	0.286E+00	0.847E+02	0.683E+00	0.829E+02	0.374E+03	
V57CTC	0	Deg C	0.189E+03	0.162E+00	0.233E+02	0.996E+00	0.201E+02	0.190E+03	0
		Deg F	0.373E+03	0.291E+00	0.739E+02	0.179E+01	0.682E+02	0.374E+03	
V57FTC	0	Deg C	0.188E+03	0.115E+00	0.229E+02	0.146E+01	0.189E+02	0.189E+03	0
		Deg F	0.371E+03	0.207E+00	0.732E+02	0.263E+01	0.660E+02	0.372E+03	
V57MTC	0	Deg C	0.190E+03	0.889E-01	0.293E+02	0.227E+00	0.288E+02	0.190E+03	0
		Deg F	0.374E+03	0.160E+00	0.847E+02	0.409E+00	0.838E+02	0.374E+03	
V58CTC	0	Deg C	0.189E+03	0.143E+00	0.229E+02	0.160E+01	0.182E+02	0.189E+03	0
		Deg F	0.372E+03	0.257E+00	0.732E+02	0.288E+01	0.647E+02	0.373E+03	
V58FTC	0	Deg C	0.188E+03	0.170E+00	0.231E+02	0.220E+01	0.188E+02	0.189E+03	0
		Deg F	0.371E+03	0.307E+00	0.736E+02	0.396E+01	0.658E+02	0.372E+03	
V58MTC	0	Deg C	0.190E+03	0.139E+00	0.297E+02	0.336E+00	0.289E+02	0.190E+03	0
		Deg F	0.373E+03	0.250E+00	0.855E+02	0.606E+00	0.840E+02	0.374E+03	
V59CTC	0	Deg C	0.189E+03	0.201E+00	0.231E+02	0.164E+01	0.188E+02	0.190E+03	0
		Deg F	0.373E+03	0.362E+00	0.735E+02	0.296E+01	0.658E+02	0.374E+03	
V59FTC	0	Deg C	0.188E+03	0.156E+00	0.236E+02	0.201E+01	0.185E+02	0.189E+03	0
		Deg F	0.371E+03	0.280E+00	0.746E+02	0.363E+01	0.654E+02	0.372E+03	
V59MTC	0	Deg C	0.190E+03	0.755E-01	0.309E+02	0.206E+00	0.304E+02	0.190E+03	0
		Deg F	0.374E+03	0.136E+00	0.876E+02	0.370E+00	0.867E+02	0.374E+03	
V510CTC	0	Deg C	0.188E+03	0.134E+00	0.229E+02	0.108E+01	6.201E+02	0.189E+03	0
		Deg F	0.371E+03	0.241E+00	0.733E+02	0.195E+01	0.682E+02	0.372E+03	
V61CTC	0	Deg C	0.189E+03	0.153E+00	0.280E+02	0.335E+00	0.258E+02	0.190E+03	0
		Deg F	0.373E+03	0.275E+00	0.823E+02	0.603E+00	0.784E+02	0.374E+03	
V62CTC	0	Deg C	0.189E+03	0.168E+00	0.273E+02	0.852E+00	0.239E+02	0.190E+03	0
		Deg F	0.373E+03	0.303E+00	0.812E+02	0.153E+01	0.749E+02	0.374E+03	
V62FTC	0	Deg C	0.189E+03	0.177E+00	0.273E+02	0.000E+00	0.233E+02	0.189E+03	0
		Deg F	0.371E+03	0.318E+00	0.811E+02	0.000E+00	0.739E+02	0.372E+03	
V62MTC	0	Deg C	0.188E+03	0.231E+00	0.354E+02	0.393E+00	0.346E+02	0.188E+03	0
		Deg F	0.371E+03	0.416E+00	0.958E+02	0.707E+00	0.943E+02	0.371E+03	
V63CTC	0	Deg C	0.188E+03	0.191E+00	0.258E+02	0.141E+01	0.224E+02	0.189E+03	0
		Deg F	0.371E+03	0.344E+00	0.784E+02	0.254E+01	0.723E+02	0.372E+03	
V64CTC	0	Deg C	0.189E+03	0.168E+00	0.247E+02	0.186E+01	0.208E+02	0.190E+03	0
		Deg F	0.373E+03	0.302E+00	0.764E+02	0.335E+01	0.695E+02	0.374E+03	
V64FTC	0	Deg C	0.188E+03	0.174E+00	0.248E+02	0.197E+01	0.208E+02	0.189E+03	0
		Deg F	0.371E+03	0.314E+00	0.767E+02	0.354E+01	0.695E+02	0.372E+03	
V64MTC	0	Deg C	0.191E+03	0.175E+00	0.328E+02	0.601E+00	0.317E+02	0.191E+03	0
		Deg F	0.376E+03	0.314E+00	0.911E+02	0.108E+01	0.891E+02	0.377E+03	

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
V65CTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.130E+00 0.235E+00	0.241E+02 0.754E+02	0.182E+01 0.328E+01	0.204E+02 0.686E+02	0.189E+03 0.372E+03	0
V66CTC	0	Deg C Deg F	0.189E+03 0.372E+03	0.107E+00 0.192E+00	0.245E+02 0.760E+02	0.203E+01 0.365E+01	0.202E+02 0.684E+02	0.190E+03 0.373E+03	0
V66FTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.221E+00 0.399E+00	0.251E+02 0.772E+02	0.217E+01 0.391E+01	0.197E+02 0.675E+02	0.189E+03 0.373E+03	0
V66MTC	0	Deg C Deg F	0.191E+03 0.376E+03	0.163E+00 0.293E+00	0.334E+02 0.921E+02	0.551E+00 0.992E+00	0.323E+02 0.901E+02	0.191E+03 0.377E+03	0
V67CTC	0	Deg C Deg F	0.189E+03 0.373E+03	0.189E+00 0.340E+00	0.254E+02 0.777E+02	0.206E+01 0.371E+01	0.202E+02 0.684E+02	0.190E+03 0.374E+03	0
V67FTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.143E+00 0.257E+00	0.260E+02 0.788E+02	0.189E+01 0.341E+01	0.205E+02 0.688E+02	0.189E+03 0.372E+03	0
V67MTC	0	Deg C Deg F	0.191E+03 0.376E+03	0.144E+00 0.260E+00	0.345E+02 0.941E+02	0.533E+00 0.959E+00	0.336E+02 0.924E+02	0.191E+03 0.376E+03	0
V68CTC	0	Deg C Deg F	0.189E+03 0.373E+03	0.716E-01 0.129E+00	0.261E+02 0.790E+02	0.150E+01 0.271E+01	0.203E+02 0.686E+02	0.190E+03 0.373E+03	0
V68FTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.158E+00 0.284E+00	0.265E+02 0.797E+02	0.150E+01 0.270E+01	-.267E+02 -.161E+02	0.189E+03 0.372E+03	0
V68MTC	0	Deg C Deg F	0.191E+03 0.376E+03	0.146E+00 0.263E+00	0.355E+02 0.958E+02	0.494E+00 0.890E+00	0.345E+02 0.941E+02	0.191E+03 0.376E+03	0
V69CTC	0	Deg C Deg F	0.190E+03 9.373E+03	0.192E+00 0.346E+00	0.265E+02 0.797E+02	0.118E+01 0.212E+01	0.203E+02 0.686E+02	0.190E+03 0.374E+03	0
V69FTC	3 0	Deg C Deg F	0.657E+02 0.150E+03	0.170E+00 0.305E+00	0.191E+02 0.663E+02	0.372E+00 0.669E+00	0.172E+02 0.629E+02	0.660E+02 0.151E+03	0
V69MTC	0	Deg C Deg F	0.191E+03 0.376E+03	0.188E+00 0.338E+00	0.366E+02 0.978E+02	0.464E+00 0.836E+00	0.359E+02 0.966E+02	0.191E+03 0.377E+03	0
V610CTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.246E+00 0.443E+00	0.268E+02 0.803E+02	0.137E+01 0.247E+01	0.237E+02 0.747E+02	0.189E+03 0.372E+03	0
V71CTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.195E+00 0.352E+00	0.272E+02 0.809E+02	0.242E+00 0.436E+00	0.239E+02 0.751E+02	0.189E+03 0.372E+03	0
V72CTC	0	Deg C Deg F	0.189E+03 0.372E+03	0.660E-01 0.119E+00	0.277E+02 0.818E+02	0.280E+00 0.503E+00	0.233E+02 0.740E+02	0.189E+03 0.373E+03	0
V72FTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.155E+00 0:280E+00	0.274E+02 0.814E+02	0.474E+00 0.854E+00	0.225E+02 0.725E+02	0.189E+03 0.372E+03	0
V72MTC	0	Deg C Deg F	0.190E+03 0.374E+03	0.116E+00 0.208E+00	0.367E+02 0.981E+02	0.268E+00 0.482E+00	0.357E+02 0.962E+02	0.190E+03 0.375E+03	0
V73CTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.169E+00 0.305E+00	0.272E+02 0.809E+02	0.107E+01 0.193E+01	0.217E+02 0.710E+02	0.189E+03 0.372E+03	0
V74CTC	0	Deg C Deg F	0.189E+03 0.372E+03	0.684E-01 0.123E+00	0.264E+02 0.795E+02	0.164E+01 0.296E+01	0.226E+02 0.728E+02	0.189E+03 0.373E+03	0

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
V74FTC	0	Deg C	0.189E+03	0.174E+00	0.268E+02	0.195E+01	0.229E+02	0.189E+03	0
		Deg F	0.371E+03	0.313E+00	0.803E+02	0.350E+01	0.732E+02	0.372E+03	
V74MTC	0	Deg C	0.189E+03	0.109E+00	0.353E+02	0.804E+00	0.340E+02	0.189E+03	0
		Deg F	0.372E+03	0.197E+00	0.956E+02	0.145E+01	0.931E+02	0.373E+03	
V75CTC	0	Deg C	0.189E+03	0.251E+00	0.258E+02	0.197E+01	0.219E+02	0.189E+03	0
		Deg F	0.371E+03	0.451E+00	0.78[illegible]E+02	0.354E+01	0.714E+02	0.372E+03	
V76CTC	0	Deg C	0.189E+03	0.137E+00	0.256E+02	0.221E+01	0.210E+02	0.190E+03	0
		Deg F	0.373E+03	0.246E+00	0.780E+02	0.398E+01	0.698E+02	0.373E+03	
V76FTC	0	Deg C	0.189E+03	0.208E+00	0.257E+02	0.218E+01	0.209E+02	0.189E+03	0
		Deg F	0.371E+03	0.374E+00	0.783E+02	0.392E+01	0.696E+02	0.372E+03	
V76MTC	0	Deg C	0.189E+03	0.111E+00	0.349E+02	0.978E+00	0.335E+02	0.189E+03	0
		Deg F	0.372E+03	0.201E+00	0.947E+02	0.176E+01	0.923E+02	0.373E+03	
V77CTC	0	Deg C	0.190E+03	0.114E+00	0.258E+02	0.186E+01	0.211E+02	0.190E+03	0
		Deg F	0.373E+03	0.206E+00	0.784E+02	0.334E+01	0.700E+02	0.374E+03	
V77FTC	0	Deg C	0.189E+03	0.203E+00	0.263E+02	0.176E+01	0.213E+02	0.189E+03	0
		Deg F	0.371E+03	0.365E+00	0.794E+02	0.317E+01	0.703E+02	0.372E+03	
V77MTC	0	Deg C	0.189E+03	0.614E-01	0.357E+02	0.733E+00	0.342E+02	0.189E+03	0
		Deg F	0.372E+03	0.111E+00	0.962E+02	0.132E+01	0.936E+02	0.373E+03	
V78CTC	0	Deg C	0.189E+03	0.152E+00	0.266E+02	0.136E+01	0.220E+02	0.190E+03	0
		Deg F	0.373E+03	0.274E+00	0.800E+02	0.245E+01	0.716E+02	0.373E+03	
V78FTC	0	Deg C	0.189E+03	0.247E+00	0.269E+02	0.145E+01	0.221E+02	0.189E+03	0
		Deg F	0.371E+03	0.444E+00	0.805E+02	0.261E+01	0.718E+02	0.372E+03	
V78MTC	0	Deg C	0.189E+03	0.130E+00	0.363E+02	0.804E+00	0.349E+02	0.189E+03	0
		Deg F	0.372E+03	0.234E+00	0.973E+02	0.145E+01	0.948E+02	0.373E+03	
V79CTC	0	Deg C	0.190E+03	0.560E-01	0.268E+02	0.125E+01	0.223E+02	0.190E+03	0
		Deg F	0.373E+03	0.101E+00	0.803E+02	0.225E+01	0.721E+02	0.374E+03	
V79FTC	0	Deg C	0.189E+03	0.248E+00	0.271E+02	0.154E+01	0.230E+02	0.189E+03	0
		Deg F	0.372E+03	0.446E+00	0.808E+02	0.278E+01	0.734E+02	0.372E+03	
V79MTC	0	Deg C	0.189E+03	0.791E-01	0.371E+02	0.527E+00	0.362E+02	0.189E+03	0
		Deg F	0.372E+03	0.142E+00	0.988E+02	0.948E+00	0.972E+02	0.373E+03	
V710CTC	0	Deg C	0.189E+03	0.211E+00	0.272E+02	0.165E+01	0.232E+02	0.189E+03	0
		Deg F	0.371E+03	0.379E+00	0.810E+02	0.298E+01	0.738E+02	0.372E+03	
V82CTC	0	Deg C	0.189E+03	0.158E+00	0.273E+02	0.218E+00	0.239E+02	0.190E+03	0
		Deg F	0.373E+03	0.285E+00	0.811E+02	0.392E+00	0.750E+02	0.373E+03	
V82FTC	0	Deg C	0.189E+03	0.226E+00	0.275E+02	0.440E+00	0.240E+02	0.189E+03	0
		Deg F	0.371E+03	0.408E+00	0.815E+02	0.791E+00	0.752E+02	0.372E+03	
V82MTC	0	Deg C	0.189E+03	0.154E+00	0.372E+02	0.347E+00	0.360E+02	0.190E+03	0
		Deg F	0.373E+03	0.278E+00	0.990E+02	0.625E+00	0.968E+02	0.373E+03	
V84CTC	0	Deg C	0.189E+03	0.132E+00	0.279E+02	0.429E+00	0.242E+02	0.190E+03	0
		Deg F	0.373E+03	0.237E+00	0.823E+02	0.773E+00	0.756E+02	0.373E+03	

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
V84FTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.202E+00 0.364E+00	0.279E+02 0.822E+02	0.530E+00 0.955E+00	0.242E+02 0.755E+02	0.189E+03 0.372E+03	0
V84MTC	0	Deg C Deg F	0.189E+03 0.373E+03	0.137E+00 0.246E+00	0.360E+02 0.968E+02	0.428E+00 0.770E+00	0.348E+02 0.946E+02	0.190E+03 0.374E+03	0
V86DTC	ØN								
V86FTC	BØ	Deg C Deg F	0.202E+02 0.684E+02	0.131E+02 0.236E+02	0.110E+02 0.519E+02	0.273E+01 0.491E+01	-.120E+02 0.104E+02	0.437E+02 0.111E+03	0
V86MTC	0	Deg C Deg F	0.190E+03 0.374E+03	0.177E+00 0.318E+00	0.367E+02 0.980E+02	0.893E+00 0.161E+01	0.353E+02 0.955E+02	0.191E+03 0.375E+03	0
V86DT	0	******** VOLTS	0.000E+00 0.830E-04	0.000E+00 0.153E-04	0.000E+00 0.553E-03	0.000E+00 0.638E-04	0.000E+00 0.483E-04	0.000E+00 0.268E-02	0
V87CTC	0	Deg C Deg F	0.189E+03 0.372E+03	0.120E+00 0.217E+00	0.270E+02 0.806E+02	0.157E+01 0.283E+01	0.218E+02 0.712E+02	0.190E+03 0.373E+03	0
V87FTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.154E+00 0.277E+00	0.273E+02 0.812E+02	0.158E+01 0.285E+01	0.225E+02 0.725E+02	0.189E+03 0.372E+03	0
V87MTC	0	Deg C Deg F	0.189E+03 0.372E+03	0.170E+00 0.306E+00	0.359E+02 0.967E+02	0.867E+00 0.156E+01	0.344E+02 0.940E+02	0.190E+03 0.373E+03	0
V88CTC	0	Deg C Deg F	0.189E+03 0.372E+03	0.000E+00 0.000E+00	0.266E+02 0.799E+02	0.181E+01 0.326E+01	0.221E+02 0.719E+02	0.189E+03 0.373E-03	0
V88FTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.119E+00 0.215E+00	0.270E+02 0.805E+02	0.208E+01 0.375E+01	0.215E+02 0.707E+02	0.189E+03 0.372E+03	0
V88MTC	0	Deg C Deg F	0.189E+03 0.373E+03	0.158E+00 0.284E+00	0.359E+02 0.966E+02	0.999E+00 0.180E+01	0.343E+02 0.938E+02	0.190E+03 0.373E+03	0
V89CTC	0	Deg C Deg F	0.189E+03 0.372E+03	0.830E-01 0.149E+00	0.268E+02 0.802E+02	0.171E+01 0.308E+01	0.231E+02 0.737E+02	0.189E+03 0.373E+03	0
V89FTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.191E+00 0.344E+00	0.273E+02 0.811E+02	0.146E+01 0.264E-01	0.229E+02 0.732E+02	0.189E+03 0.372E+03	0
V89MTC	0	Deg C Deg F	0.190E+03 0.373E+03	0.181E+00 0.326E+00	0.362E+02 0.971E+02	0.105E+01 0.189E+01	0.341E+02 0.934E+02	0.190E+03 0.374E+03	0
V92CTC	0	Deg C Deg F	0.189E+03 0.373E+03	0.162E+00 0.291E+00	0.261E+02 0.791E+02	0.487E+00 0.876E+00	0.253E+02 0.775E+02	0.190E+03 0.373E+03	0
V92FTC	0	Deg C Deg F	0.189E+03 0.372E+03	0.145E+00 0.261E-00	0.262E+02 0.792E+02	0.557E+00 0.100E+01	0.252E+02 0.773E+02	0.189E+03 0.373E+03	0
V92MTC	0	Deg C Deg F	0.189E+03 0.371E+03	0.159E+00 0.286E+00	0.376E+02 0.997E+02	0.273E+00 0.491E+00	0.369E+02 0.985E+02	0.189E+03 0.372E+03	0
V93CTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.100E+00 0.180E+00	0.261E+02 0.790E+02	0.333E+00 0.600E+00	0.248E+02 0.766E+02	0.189E+03 0.371E+03	0
V95CTC	0	Deg C Deg F	0.188E+03 0.371E+03	0.128E+00 0.231E+00	0.262E+02 0.791E+02	0.356E+00 0.641E+00	0.250E+02 0.771E+02	0.189E+03 0.372E+03	0

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
V97CTC	O	Deg C	0.189E+03	0.645E-01	0.260E+02	0.494E+00	0.247E+02	0.190E+03	0
		Deg F	0.372E+03	0.116E+00	0.787E+02	0.889E+00	0.764E+02	0.373E+03	
V97FTC	O	Deg C	0.188E+03	0.144E+00	0.260E+02	0.878E+00	0.247E+02	0.188E+03	0
		Deg F	0.371E+03	0.260E+00	0.787E+02	0.158E+01	0.764E+02	0.371E+03	
V97MTC	O	Deg C	0.188E+03	0.630E-01	0.373E+02	0.377E+00	0.365E+02	0.189E+03	0
		Deg F	0.371E+03	0.113E+00	0.992E+02	0.679E+00	0.976E+02	0.372E+03	
V99CTC	O	Deg C	0.189E+03	0.187E+00	0.255E+02	0.698E+00	0.244E+02	0.189E+03	0
		Deg F	0.372E+03	0.336E+00	0.779E+02	0.126E+01	0.760E+02	0.373E+03	
V99FTC	O	Deg C	0.188E+03	0.138E+00	0.256E+02	0.728E+00	0.244E+02	0.188E+03	0
		Deg F	0.371E+03	0.248E+00	0.780E+02	0.131E+01	0.760E+02	0.371E+03	
V99MTC	O	Deg C	0.188E+03	0.191E+00	0.372E+02	0.470E+00	0.360E+02	0.188E+03	0
		Deg F	0.371E+03	0.345E+00	0.989E+02	0.845E+00	0.968E+02	0.371E+03	
V101CTC	O	Deg C	0.188E+03	0.168E+00	0.248E+02	0.553E+00	0.238E+02	0.188E+03	0
		Deg F	0.371E+03	0.302E+00	0.767E+02	0.996E+00	0.748E+02	0.371E+03	
V105CTC	O	Deg C	0.188E+03	0.164E+00	0.242E+02	0.992E+00	0.215E+02	0.188E+03	0
		Deg F	0.370E+03	0.296E+00	0.755E+02	0.179E+01	0.707E+02	0.371E+03	
V107CTC	O	Deg C	0.188E+03	0.174E+00	0.230E+02	0.165E+01	0.206E+02	0.188E+03	0
		Deg F	0.370E+03	0.313E+00	0.734E+02	0.298E+01	0.690E+02	0.371E+03	
V1010CTC	O	Deg C	0.188E+03	0.188E+00	0.239E+02	0.605E+00	0.228E+02	0.189E+03	0
		Deg F	0.371E+03	0.338E+00	0.750E+02	0.109E+01	0.731E-02	0.372E+03	
C52CTC	O	Deg C	0.189E+03	0.114E+00	0.281E+02	0.827E+00	0.239E+02	0.189E+03	0
		Deg F	0.371E+03	0.206E+00	0.827E+02	0.149E+01	0.750E+02	0.372E+03	
C54CTC	O	Deg C	0.189E+03	0.103E+00	0.214E+02	0.163E+01	0.175E+02	0.190E+03	0
		Deg F	0.373E+03	0.186E+00	0.705E+02	0.294E+01	0.635E+02	0.374E+03	
C54FTC	O	Deg C	0.189E+03	0.729E-01	0.216E+02	0.207E+01	0.172E+02	0.189E+03	0
		Deg F	0.371E+03	0.131E+00	0.709E+02	0.373E+01	0.630E+02	0.372E+03	
C54MTC	O	Deg C	0.189E+03	0.226E+00	0.240E+02	0.575E+00	0.228E+02	0.190E+03	0
		Deg F	0.373E+03	0.408E+00	0.752E+02	0.104E+01	0.731E+02	0.374E+03	
C56CTC	O	Deg C	0.190E+03	0.225E+00	0.181E+02	0.146E+01	0.159E+02	0.190E+03	0
		Deg F	0.373E+03	0.405E+00	0.646E+02	0.264E+01	0.605E+02	0.374E+03	
C56FTC	O	Deg C	0.189E+03	0.127E+00	0.178E+02	0.137E+01	0.159E+02	0.189E+03	0
		Deg F	0.371E+03	0.229E+00	0.641E+02	0.246E+01	0.605E+02	0.373E+03	
C56MTC	O	Deg C	0.189E+03	0.147E+00	0.202E+02	0.456E+00	0.191E+02	0.190E+03	0
		Deg F	0.372E+03	0.264E+00	0.683E+02	0.821E+00	0.664E+02	0.373E+03	
C57CTC	O	Deg C	0.190E+03	0.187E+00	0.179E+02	0.124E+01	0.160E+02	0.190E+03	0
		Deg F	0.373E+03	0.336E+00	0.642E+02	0.223E-01	0.608E+02	0.374E+03	
C57FTC	O	Deg C	0.188E+03	0.119E+00	0.176E+02	0.137E+01	0.157E+02	0.189E+03	0
		Deg F	0.371E+03	0.213E+00	0.637E+02	0.246E+01	0.603E-02	0.372E+03	
C57MTC	O	Deg C	0.189E+03	0.175E+00	0.208E+02	0.238E+00	0.202E+02	0.189E-03	0
		Deg F	0.372E+03	0.315E+00	0.694E+02	0.429E+00	0.684E+02	0.373E-03	

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
C58CTC	0	Deg C	0.188E+03	0.146E+00	0.175E+02	0.119E+01	0.156E+02	0.189E+03	0
		Deg F	0.371E+03	0.262E+00	0.634E+02	0.213E+01	0.601E+02	0.372E+03	
C59CTC	0	Deg C	0.189E+03	0.251E+00	0.184E+02	0.204E+01	0.157E+02	0.190E+03	0
		Deg F	0.372E+03	0.453E+00	0.652E+02	0.367E+01	0.603E+02	0.373E+03	
C59FTC	0	Deg C	0.188E+03	0.911E-01	0.177E+02	0.166E+01	0.156E+02	0.188E+03	0
		Deg F	0.371E+03	0.164E+00	0.638E+02	0.300E+01	0.601E+02	0.371E+03	
C59MTC	0	Deg C	0.189E+03	0.161E+00	0.220E+02	0.224E+00	0.216E+02	0.189E+03	0
		Deg F	0.371E+03	0.290E+00	0.717E+02	0.404E+00	0.708E+02	0.372E+03	
C62CTC	0	Deg C	0.189E+03	0.166E+00	0.281E+02	0.891E+00	0.220E+02	0.190E+03	0
		Deg F	0.373E+03	0.300E+00	0.827E+02	0.160E+01	0.716E+02	0.373E+03	
C62FTC	0	Deg C	0.188E+03	0.935E-01	0.289E+02	0.818E+00	0.235E+02	0.189E+03	0
		Deg F	0.371E+03	0.168E+00	0.840E+02	0.147E+01	0.744E+02	0.372E+03	
C62MTC	3Ø	Deg C	0.663E+02	0.190E+00	0.185E+02	0.172E+00	0.181E+02	0.667E+02	0
		Deg F	0.151E+03	0.341E+00	0.653E+02	0.310E+00	0.646E+02	0.152E+03	
C64CTC	0	Deg C	0.190E+03	0.230E+00	0.212E+02	0.166E+01	0.178E+02	0.190E+03	0
		Deg F	0.373E+03	0.414E+00	0.702E+02	0.299E+01	0.641E+02	0.374E+03	
C64FTC	0	Deg C	0.189E+03	0.149E+00	0.217E+02	0.210E+01	0.176E+02	0.189E+03	0
		Deg F	0.371E+03	0.269E+00	0.711E+02	0.378E+01	0.637E+02	0.372E+03	
C64MTC	0	Deg C	0.190E+03	0.901E-01	0.248E+02	0.325E+00	0.241E+02	0.190E+03	0
		Deg F	0.374E+03	0.162E+00	0.766E+02	0.585E+00	0.754E+02	0.375E+03	
C67CTC	0	Deg C	0.190E+03	0.162E+00	0.191E+02	0.111E+01	0.169E+02	0.190E+03	0
		Deg F	0.373E+03	0.292E+00	0.664E+02	0.199E+01	0.623E+02	0.374E+03	
C67FTC	0	Deg C	0.189E+03	0.217E-01	0.193E+02	0.114E+01	0.166E+02	0.189E+03	0
		Deg F	0.372E+03	0.390E-01	0.667E+02	0.205E+01	0.619E+02	0.373E+03	
C67MTC	0	Deg C	0.190E+03	0.389E-01	0.213E+02	0.192E+00	0.209E+02	0.190E+03	0
		Deg F	0.374E+03	0.700E-01	0.704E+02	0.345E+00	0.697E+02	0.375E+03	
C69CTC	0	Deg C	0.189E+03	0.188E+00	0.191E+02	0.183E+01	0.162E+02	0.190E+03	0
		Deg F	0.373E+03	0.339E+00	0.663E+02	0.329E+01	0.612E+02	0.374E+03	
C69FTC	0	Deg C	0.189E+03	0.128E+00	0.189E+02	0.170E+01	0.161E+02	0.189E+03	0
		Deg F	0.372E+03	0.231E+00	0.660E+02	0.306E+01	0.610E+02	0.372E+03	
C69MTC	0	Deg C	0.190E+03	0.163E+00	0.224E+02	0.259E+00	0.217E+02	0.190E+03	0
		Deg F	0.374E+03	0.294E+00	0.723E+02	0.465E+00	0.710E+02	0.374E+03	
C72CTC	0	Deg C	0.189E+03	0.170E+00	0.266E+02	0.868E+00	0.236E+02	0.189E+03	0
		Deg F	0.372E+03	0.307E+00	0.798E+02	0.156E+01	0.744E+02	0.373E+03	
C72FTC	0	Deg C	0.188E+03	0.222E+00	0.270E+02	0.840E+00	0.236E+02	0.189E+03	0
		Deg F	0.371E+03	0.400E+00	0.805E+02	0.151E+01	0.744E+02	0.372E+03	
C72MTC	0	Deg C	0.189E+03	0.105E+00	0.347E+02	0.194E+00	0.337E+02	0.189E+03	0
		Deg F	0.372E+03	0.190E+00	0.945E+02	0.350E+00	0.926E+02	0.372E+03	
C74CTC	0	Deg C	0.189E+03	0.173E+00	0.237E+02	0.254E+01	0.186E+02	0.189E+03	0
		Deg F	0.372E+03	0.312E+00	0.747E+02	0.458E+01	0.655E+02	0.373E+03	

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
C74FTC	0	Deg C	0.188E+03	0.207E+00	0.242E+02	0.261E+01	0.187E+02	0.189E+03	0
		Deg F	0.371E+03	0.372E+00	0.755E+02	0.469E+01	0.657E+02	0.372E+03	
C74MTC	0	Deg C	0.189E+03	0.231E+00	0.276E+02	0.366E+00	0.264E+02	0.190E+03	0
		Deg F	0.372E+03	0.417E+00	0.817E+02	0.659E+00	0.795E+02	0.373E+03	
C77CTC	0	Deg C	0.189E+03	0.186E+00	0.194E+02	0.812E+00	0.174E+02	0.189E+03	0
		Deg F	0.372E+03	0.335E+00	0.669E+02	0.146E+01	0.633E+02	0.373E+03	
C77FTC	0	Deg C	0.188E+03	0.174E+00	0.197E+02	0.882E+00	0.175E+02	0.189E+03	0
		Deg F	0.371E+03	0.313E+00	0.674E+02	0.159E+01	0.635E+02	0.372E+03	
C77MTC	0	Deg C	0.189E+03	0.182E+00	0.238E+02	0.212E+00	0.233E+02	0.190E+03	0
		Deg F	0.372E+03	0.328E+00	0.748E+02	0.381E+00	0.739E+02	0.373E+03	
C79CTC	0	Deg C	0.189E+03	0.131E+00	0.194E+02	0.164E+01	0.171E+02	0.189E+03	0
		Deg F	0.372E+03	0.236E+00	0.669E+02	0.295E+01	0.628E+02	0.373E+03	
C79FTC	0	Deg C	0.188E+03	0.149E+00	0.193E+02	0.155E+01	0.169E+02	0.189E+03	0
		Deg F	0.371E+03	0.268E+00	0.667E+02	0.279E+01	0.624E+02	0.372E+03	
C79MTC	0	Deg C	0.189E+03	0.172E+00	0.253E+02	0.337E+00	0.245E+02	0.189E+03	0
		Deg F	0.372E+03	0.310E+00	0.776E+02	0.607E+00	0.761E+02	0.373E+03	
C82CTC	0	Deg C	0.188E+03	0.142E+00	0.261E+02	0.883E+00	0.222E+02	0.189E+03	0
		Deg F	0.371E+03	0.256E+00	0.791E+02	0.159E+01	0.720E+02	0.372E+03	
C84CTC	0	Deg C	0.188E+03	0.202E+00	0.247E+02	0.237E+01	0.191E+02	0.189E+03	0
		Deg F	0.371E+03	0.363E+00	0.764E+02	0.427E+01	0.663E+02	0.372E+03	
C87CTC	0	Deg C	0.188E+03	0.177E+00	0.196E+02	0.737E+00	0.175E+02	0.189E+03	0
		Deg F	0.371E+03	0.319E+00	0.673E+02	0.133E+01	0.635E+02	0.372E+03	
C89CTC	0	Deg C	0.188E+03	0.141E+00	0.192E+02	0.128E+01	0.176E+02	0.189E+03	0
		Deg F	0.371E+03	0.253E+00	0.666E+02	0.231E+01	0.637E+02	0.372E+03	
C92CTC	0	Deg C	0.189E+03	0.112E+00	0.251E+02	0.130E+01	0.215E+02	0.189E+03	0
		Deg F	0.371E+03	0.202E+00	0.772E+02	0.233E+01	0.707E+02	0.372E+03	
C94CTC	0	Deg C	0.189E+03	0.119E+00	0.241E+02	0.194E+01	0.184E+02	0.189E+03	0
		Deg F	0.372E+03	0.214E+00	0.754E+02	0.348E+01	0.652E+02	0.373E+03	
C97CTC	0	Deg C	0.188E+03	0.150E+00	0.198E+02	0.165E+01	0.177E+02	0.189E+03	0
		Deg F	0.371E+03	0.269E+00	0.677E+02	0.297E+01	0.639E+02	0.372E+03	
C99CTC	0	Deg C	0.188E+03	0.150E+00	0.195E+02	0.910E+00	0.177E+02	0.188E+03	0
		Deg F	0.370E+03	0.269E+00	0.671E+02	0.164E+01	0.639E+02	0.371E+03	
C102CTC	0	Deg C	0.188E+03	0.218E+00	0.243E+02	0.590E+00	0.197E+02	0.188E+03	0
		Deg F	0.370E+03	0.392E+00	0.758E+02	0.106E+01	0.674E+02	0.371E+03	
C104CTC	0	Deg C	0.188E+03	0.196E+00	0.236E+02	0.150E+01	0.182E+02	0.188E+03	0
		Deg F	0.370E+03	0.353E+00	0.744E+02	0.270E+01	0.647E+02	0.371E+03	
C106CTC	0	Deg C	0.188E+03	0.167E+00	0.204E+02	0.199E+01	0.177E+02	0.188E+03	0
		Deg F	0.370E+03	0.300E+00	0.687E+02	0.357E+01	0.639E+02	0.370E+03	
C108CTC	0	Deg C	0.188E+03	0.150E+00	0.199E+02	0.172E+01	0.181E+02	0.188E+03	0
		Deg F	0.371E+03	0.270E+00	0.679E+02	0.309E+01	0.645E+02	0.371E+03	

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
V57VWTC	0	Deg C	0.186E+03	0.966E-01	0.349E+02	0.327E+00	0.343E+02	0.186E+03	0
		Deg F	0.366E+03	0.174E+00	0.949E+02	0.588E+00	0.937E+02	0.367E+03	
V72VWTC	N								
V97VWTC	0	Deg C	0.186E+03	0.165E+00	0.436E+02	0.372E+00	0.429E+02	0.186E+03	0
		Deg F	0.367E+03	0.298E+00	0.110E+03	0.670E+00	0.109E+03	0.367E+03	
C57VWTC	0	Deg C	0.185E+03	0.175E+00	0.264E+02	0.223E+00	0.260E+02	0.185E+03	0
		Deg F	0.364E+03	0.314E+00	0.795E+02	0.401E+00	0.788E+02	0.365E+03	
C72VWTC	0	Deg C	0.186E+03	0.195E+00	0.379E+02	0.340E+00	0.372E+02	0.186E+03	0
		Deg F	0.367E+03	0.351E+00	0.100E+03	0.612E+00	0.989E+02	0.368E+03	
C97VWTC	0	Deg C	0.186E+03	0.149E+00	0.309E+02	0.274E+00	0.301E+02	0.187E+03	0
		Deg F	0.367E+03	0.269E+00	0.876E+02	0.492E+00	0.862E+02	0.368E+03	
V57PWTC	0	Deg C	0.187E+03	0.493E-01	0.329E+02	0.219E+00	0.325E+02	0.187E+03	0
		Deg F	0.368E+03	0.887E-01	0.912E+02	0.395E+00	0.905E+02	0.369E+03	
V62PWTC	F Ø	Deg C	0.140E+03	0.155E+00	0.321E+02	0.209E+00	0.316E+02	0.141E+03	0
		Deg F	0.285E+03	0.279E+00	0.898E+02	0.377E+00	0.889E+02	0.286E+03	
V64PWTC	0	Deg C	0.189E+03	0.691E-01	0.363E+02	0.276E+00	0.354E+02	0.189E+03	0
		Deg F	0.371E+03	0.124E+00	0.973E+02	0.497E+00	0.956E+02	0.372E+03	
V67PWTC	0	Deg C	0.189E+03	0.352E-01	0.379E+02	0.298E+00	0.373E+02	0.189E+03	0
		Deg F	0.372E+03	0.634E-01	0.100E+03	0.536E+00	0.991E+02	0.372E+03	
V610PWTC	0	Deg C	0.189E+03	0.540E-01	0.420E+02	0.308E+00	0.413E+02	0.189E+03	0
		Deg F	0.371E+03	0.973E-01	0.108E+03	0.555E+00	0.106E+03	0.372E+03	
V77PWTC	0	Deg C	0.187E+03	0.173E+00	0.404E+02	0.276E+00	0.398E+02	0.187E+03	0
		Deg F	0.368E+03	0.311E+00	0.105E+03	0.497E+00	0.104E+03	0.369E+03	
V86PWTC	0	Deg C	0.188E+03	0.440E-01	0.422E+02	0.320E+00	0.414E+02	0.188E+03	0
		Deg F	0.370E+03	0.791E-01	0.108E+03	0.576E+00	0.107E+03	0.371E+03	
V97PWTC	0	Deg C	0.186E+03	0.180E+00	0.428E+02	0.302E+00	0.421E+02	0.187E+03	0
		Deg F	0.367E+03	0.324E+00	0.109E+03	0.543E+00	0.108E+03	0.368E+03	
LP1	0	Deg C	0.189E+03	0.199E+00	0.232E+02	0.235E+00	0.227E+02	0.190E+03	0
		Deg F	0.372E+03	0.358E+00	0.737E+02	0.423E+00	0.728E+02	0.373E+03	
LP2	0	Deg C	0.188E+03	0.490E-01	0.223E+02	0.284E+00	0.218E+02	0.188E+03	0
		Deg F	0.370E+03	0.882E-01	0.721E+02	0.510E+00	0.712E+02	0.371E+03	
LP3	0	Deg C	0.188E+03	0.998E-01	0.222E+02	0.338E+00	0.211E+02	0.188E+03	0
		Deg F	0.370E+03	0.180E+00	0.720E+02	0.609E+00	0.699E+02	0.371E+03	
LP4	0	Deg C	0.188E+03	0.375E-01	0.219E+02	0.579E+00	0.204E+02	0.189E+03	0
		Deg F	0.371E+03	0.675E-01	0.713E+02	0.104E+01	0.688E+02	0.372E+03	
LP5	0	Deg C	0.189E+03	0.179E+00	0.230E+02	0.334E+00	0.221E+02	0.189E+03	0
		Deg F	0.372E+03	0.322E+00	0.735E+02	0.602E+00	0.717E+02	0.372E+03	
SPWT	0	Deg C	0.187E+03	0.153E+00	0.237E+02	0.343E+00	0.229E+02	0.189E+03	0
		Deg F	0.368E+03	0.275E+00	0.746E+02	0.617E+00	0.733E+02	0.372E+03	

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
SPWTC2	0	Deg C	0.173E+03	0.146E+01	0.240E+02	0.294E+00	0.233E+02	0.188E+03	0
		Deg F	0.344E+03	0.263E+01	0.751E+02	0.530E+00	0.739E+02	0.371E+03	
SPWTC3	0	Deg C	0.187E+03	0.109E+00	0.249E+02	0.321E+00	0.243E+02	0.187E+03	0
		Deg F	0.369E+03	0.197E+00	0.769E+02	0.577E+00	0.757E+02	0.369E+03	
VLC21	0	m/sec	-.422E-01	0.334E-01	0.174E+00	0.289E-01	-.883E-01	0.627E+00	0
		ft/sec	-.139E+00	0.110E+00	0.572E+00	0.948E-01	-.290E+00	0.206E+01	
VLC23	0	m/sec	0.146E-01	0.443E-01	0.343E-01	0.397E-01	-.127E+00	0.238E+00	0
		ft/sec	0.479E-01	0.145E+00	0.113E+00	0.130E+00	-.417E+00	0.782E+00	
VLC25	0	m/sec	0.321E-01	0.344E-01	0.889E-01	0.192E-01	-.108E+00	0.159E+00	0
		ft/sec	0.105E+00	0.113E+00	0.292E+00	0.630E-01	-.354E+00	0.522E+00	
VLC27	0	m/sec	0.125E+00	0.900E-02	0.216E-01	0.511E-01	-.143E+00	0.179E+00	0
		ft/sec	0.409E+00	0.295E-01	0.709E-01	0.168E+00	-.470E+00	0.588E+00	
VLC29	0	m/sec	-.439E-01	0.661E-01	-.337E-01	0.683E-01	-.182E+00	0.182E+00	0
		ft/sec	-.144E+00	0.217E+00	-.111E+00	0.224E+00	-.596E+00	0.597E+00	
V67V	0	m/sec	-.609E-01	0.192E-01	-.629E-01	0.393E-01	-.379E+00	0.560E+00	0
		ft/sec	-.200E+00	0.629E-01	-.206E+00	0.129E+00	-.124E+01	0.184E+01	
V92V	0	m/sec	-.213E-01	0.378E-01	-.270E-01	0.348E-01	-.412E+00	0.628E+00	0
		ft/sec	-.700E-01	0.124E+00	-.886E-01	0.114E+00	-.135E+01	0.206E+01	
V97V	0	m/sec	-.525E-01	0.255E-01	-.484E-01	0.180E-01	-.406E+00	0.305E+00	0
		ft/sec	-.172E+00	0.838E-01	-.159E+00	0.591E-01	-.133E+01	0.100E+01	
C67V	0	m/sec	0.119E+00	0.986E-02	0.185E+00	0.153E-01	0.952E-01	0.821E+00	0
		ft/sec	0.391E+00	0.324E-01	0.607E+00	0.503E-01	0.312E+00	0.269E+01	
V53HF	0	W/m2	-.264E+04	0.274E+03	0.132E+05	0.260E+04	-.522E+04	0.849E+05	0
		B/hr-f+2	-.836E+03	0.868E+02	0.418E+04	0.824E+03	-.165E+04	0.269E+05	
V54HF	0	W/m2	-.361E+04	0.359E+03	0.821E+04	0.195E+04	-.441E+04	0.942E+05	0
		B/hr-f+2	-.115E+04	0.114E+03	0.260E+04	0.618E+03	-.140E+04	0.299E+05	
V55HF	0	W/m2	-.362E+04	0.398E+03	0.146E+05	0.355E+04	-.704E+04	0.169E+06	0
		B/hr-f+2	-.115E+04	0.126E+03	0.464E+04	0.112E+04	-.223E+04	0.534E+05	
V56HF	0	W/m2	-.176E+04	0.220E+03	0.667E+04	[illegible]	-.348E+04	0.125E+06	0
		B/hr-f+2	-.558E+03	0.697E+02	0.211E+04	[illegible]	-.110E+04	0.397E+05	
V57HF	0	W/m2	-.141E+04	0.150E+03	[illegible]	[illegible]	-.186E+04	0.124E+06	0
		B/hr-f+2	-.446E+03	0.474E+02	[illegible]	[illegible]	-.589E+03	0.392E+05	
V58HF	0	W/m2	-.233E+04	0.231E+03	0.679E+04	0.206E+04	-.298E+04	0.127E+06	0
		B/hr-f+2	-.739E+03	0.732E+02	0.215E+04	0.654E+03	-.945E+03	0.402E+05	
V59HF	0	W/m2	-.249E+04	0.220E+03	0.796E+04	0.133E+04	-.553E+04	0.119E+06	0
		B/hr-f+2	-.788E+03	0.697E+02	0.252E+04	0.420E+03	-.175E+04	0.378E+05	
V62HF	0	W/m2	-.539E+03	0.172E+03	0.587E+04	0.141E+04	-.941E+03	0.854E+05	0
		B/hr-f+2	-.171E+03	0.545E+02	0.186E+04	0.448E+03	-.298E+03	0.271E+05	
V64HF	0	W/m2	-.215E+03	0.219E+03	0.105E+05	0.217E+04	-.976E+03	0.867E+05	0
		B/hr-f+2	-.681E+02	0.694E+02	0.332E+04	0.689E+03	-.309E+03	0.275E+05	

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
V66HF	O	W/m2 B/hr-ft2	-.637E+02 -.202E+02	0.140E+03 0.443E+02	0.637E+04 0.202E+04	0.137E+04 0.435E+03	-.141E+05 -.447E+04	0.147E+06 0.466E+05	0
V67HF	O	W/m2 B/hr-ft2	-.494E+03 -.157E+03	0.151E+03 0.477E+02	0.620E+04 0.197E+04	0.146E+04 0.462E+03	-.146E+04 -.463E+03	0.126E+06 0.399E+05	0
V68HF	O	W/m2 B/hr-ft2	-.117E+04 -.370E+03	0.250E+03 0.791E+02	0.714E+04 0.226E+04	0.218E+04 0.690E+03	-.278E+04 -.882E+03	0.114E+06 0.360E+05	0
V69HF	O	W/m2 B/hr-ft2	-.288E+03 -.914E+02	0.232E+03 0.736E+02	0.780E+04 0.247E+04	0.230E+04 0.729E+03	-.119E+04 -.377E+03	0.116E+06 0.367E+05	0
V72HF	O	W/m2 B/hr-ft2	0.141E+05 0.447E+04	0.353E+03 0.112E+03	-.100E+05 -.317E+04	0.127E+04 0.403E+03	-.126E+06 -.401E+05	0.156E+05 0.493E+04	0
V74HF	O	W/m2 B/hr-ft2	-.110E+04 -.349E+03	0.269E+03 0.853E+02	0.658E+04 0.209E+04	0.239E+04 0.757E+03	-.188E+04 -.596E+03	0.106E+06 0.335E+05	0
V76HF	O	W/m2 B/hr-ft2	-.890E+03 -.282E+03	0.158E+03 0.501E+02	0.840E+04 0.266E+04	0.253E+04 0.803E+03	-.141E+04 -.446E+03	0.132E+06 0.419E+05	0
V77HF	O	W/m2 B/hr-ft2	-.288E+03 -.912E+02	0.181E+03 0.573E+02	0.902E+04 0.286E+04	0.166E+04 0.525E+03	-.716E+03 -.227E+03	0.995E+05 0.315E+05	0
V78HF	O	W/m2 B/hr-ft2	-.105E+04 -.333E+03	0.129E+03 0.409E+02	0.616E+04 0.195E+04	0.151E+04 0.478E+03	-.144E+04 -.457E+03	0.958E+05 0.304E+05	0
V79HF	O	W/m2 B/hr-ft2	-.127E+04 -.402E+03	0.199E+03 0.631E+02	0.543E+04 0.172E+04	0.131E+04 0.415E+03	-.271E+04 -.860E+03	0.636E+05 0.202E+05	0
V82HF	O	W/m2 B/hr-ft2	-.130E+04 -.412E+03	0.253E+03 0.801E+02	0.862E+04 0.273E+04	0.133E+04 0.422E+03	-.207E+04 -.657E+03	0.114E+06 0.362E+05	0
V84HF	O	W/m2 B/hr-ft2	-.764E+03 -.242E+03	0.196E+03 0.622E+02	0.608E+04 0.193E+04	0.140E+04 0.444E+03	-.134E+04 -.426E+03	0.112E+06 0.355E+05	0
V86HF	N								
V87HF	O	W/m2 B/hr-ft2	-.769E+03 -.244E+03	0.194E+03 0.615E+02	0.703E+04 0.223E+04	0.219E+04 0.693E+03	-.139E+04 -.440E+03	0.952E+05 0.302E+05	0
V88HF	O	W/m2 B/hr-ft2	-.683E+03 -.217E+03	0.130E+03 0.413E+02	0.846E+04 0.268E+04	0.223E+04 0.708E+03	-.894E+03 -.283E+03	0.921E+05 0.292E+05	0
V89HF	O	W/m2 B/hr-ft2	-.153E+04 -.486E+03	0.262E+03 0.832E+02	0.171E+05 0.542E+04	0.387E+04 0.123E+04	-.214E+04 -.678E+03	0.100E+06 0.318E+05	0
V92HF	O	W/m2 B/hr-ft2	-.730E+03 -.231E+03	0.438E+03 0.139E+03	0.950E+04 0.301E+04	0.106E+04 0.336E+03	-.183E+04 -.579E+03	0.762E+05 0.242E+05	0
V97HF	O	W/m2 B/hr-ft2	-.563E+03 -.178E+03	0.236E+03 0.747E+02	0.936E+04 0.297E+04	0.848E+03 0.269E+03	-.130E+04 -.411E+03	0.844E+05 0.268E+05	0
V99HF	O	W/m2 B/hr-ft2	-.178E+04 -.563E+03	0.392E+03 0.124E+03	0.671E+04 0.213E+04	0.128E+04 0.406E+03	-.273E+04 -.865E+03	0.752E+05 0.238E+05	0
C54HF	O	W/m2 B/hr-ft2	-.222E+04 -.704E+03	0.252E+03 0.800E+02	0.242E+04 0.768E+03	0.140E+04 0.444E+03	-.721E+04 -.228E+04	0.141E+06 0.446E+05	0

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

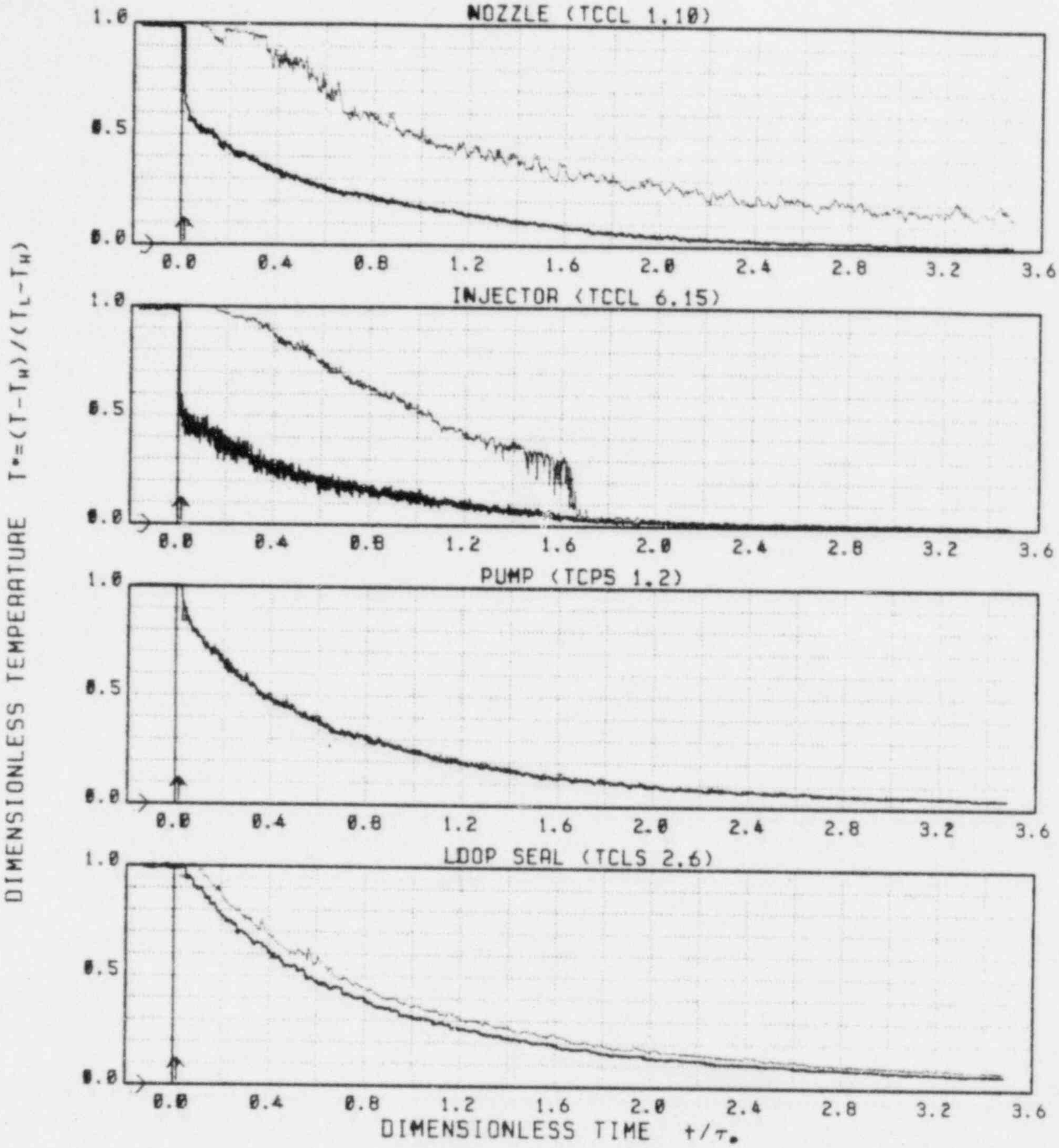
INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
C56HF	D	W/m2 B/hr-f+2	-.144E+04 -.456E+03	0.185E+03 0.586E+02	0.245E+04 0.776E+03	0.427E+03 0.135E+03	-.385E+05 -.122E+05	0.119E+06 0.376E+05	0
C57HF	D	W/m2 B/hr-f+2	-.127E+04 -.403E+03	0.132E+03 0.419E+02	0.441E+04 0.140E+04	0.855E+03 0.271E+03	-.344E+05 -.109E+05	0.146E+06 0.463E+05	0
C59HF	D	W/m2 B/hr-f+2	-.231E+04 -.732E+03	0.195E+03 0.620E+02	0.395E+04 0.125E+04	0.552E+03 0.175E+03	-.811E+04 -.257E+04	0.147E+06 0.467E+05	0
C62HF	D	W/m2 B/hr-f+2	-.843E+03 -.267E+03	0.221E+03 0.702E+02	0.535E+04 0.170E+04	0.158E+04 0.501E+03	-.141E+04 -.446E+03	0.116E+06 0.367E+05	0
C64HF	D	W/m2 B/hr-f+2	-.476E+03 -.151E+03	0.150E+03 0.476E+02	0.157E+04 0.497E+03	0.939E+03 0.298E+03	-.978E+03 -.310E+03	0.949E+05 0.301E+05	0
C67HF	D	W/m2 B/hr-f+2	-.502E+03 -.159E+03	0.142E+03 0.449E+02	0.207E+04 0.656E+03	0.707E+03 0.224E+03	-.222E+05 -.705E+04	0.130E+06 0.414E+05	0
C69HF	D	W/m2 B/hr-f+2	0.325E+01 0.103E+01	0.172E+03 0.546E+02	0.400E+04 0.127E+04	0.119E+04 0.378E+03	-.669E+03 -.212E+03	0.138E+06 0.439E+05	0
C72HF	D	W/m2 B/hr-f+2	0.137E+03 0.433E+02	0.244E+03 0.774E+02	0.610E+04 0.193E+04	0.949E+03 0.301E+03	-.281E+04 -.891E+03	0.934E+05 0.296E+05	0
C74HF	D	W/m2 B/hr-f+2	-.432E+03 -.137E+03	0.299E+03 0.947E+02	0.388E+04 0.123E+04	0.304E+04 0.963E+03	-.101E+05 -.321E+04	0.168E+06 0.532E+05	0
C77HF	D	W/m2 B/hr-f+2	-.605E+03 -.192E+03	0.130E+03 0.413E+02	0.359E+04 0.114E+04	0.843E+03 0.267E+03	-.187E+05 -.594E+04	0.138E+06 0.437E+05	0
C79HF	D	W/m2 B/hr-f+2	-.439E+03 -.139E+03	0.366E+03 0.116E+03	0.457E+04 0.145E+04	0.166E+04 0.526E+03	-.889E+04 -.282E+04	0.162E+06 0.513E+05	0
HWTRC	N								
HWUTC	D	Deg C Deg F	0.189E+03 0.372E+03	0.131E+00 0.236E+00	0.617E+02 0.143E+03	0.729E+00 0.131E+01	0.603E+02 0.141E+03	0.189E+03 0.372E+03	0
HWBTC	D	Deg C Deg F	0.188E+03 0.371E+03	0.164E+00 0.296E+00	0.486E+02 0.120E+03	0.654E+00 0.118E+01	0.476E+02 0.118E+03	0.188E+03 0.371E+03	0
HWLTC	D	Deg C Deg F	0.188E+03 0.370E+03	0.439E-01 0.791E-01	0.476E+02 0.118E+03	0.754E+00 0.136E+01	0.461E+02 0.115E+03	0.188E+03 0.371E+03	0
HWETC	D	Deg C Deg F	0.146E+03 0.295E+03	0.116E+01 0.208E+01	0.462E+02 0.115E+03	0.404E+00 0.726E+00	0.455E+02 0.114E+03	0.187E+03 0.369E+03	0
CV1TC	D	Deg C Deg F	0.400E+02 0.104E+03	0.132E+01 0.237E+01	0.475E+02 0.118E+03	0.606E+00 0.109E+01	0.376E+02 0.996E+02	0.186E+03 0.367E+03	0
LOOPT	D	Deg C Deg F	0.193E+03 0.380E+03	0.203E+00 0.365E+00	0.186E+03 0.367E+03	0.655E-01 0.118E+00	0.186E+03 0.366E+03	0.194E+03 0.381E+03	0
LOOPT2	D	Deg C Deg F	0.190E+03 0.374E+03	0.244E+00 0.439E+00	0.185E+03 0.365E+03	0.673E-01 0.121E+00	0.185E+03 0.364E+03	0.190E+03 0.374E+03	0
HPISUPT1	D	Deg C Deg F	0.138E+02 0.569E+02	0.199E+00 0.357E+00	0.143E+02 0.577E+02	0.154E+00 0.277E+00	0.133E+02 0.559E+02	0.148E+02 0.587E+02	0

TABLE 5 - TEST MAY105

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
HPISUPT2	O	Deg C Deg F	0.138E+02 0.569E+02	0.185E+00 0.333E+00	0.142E+02 0.576E+02	0.149E+00 0.269E+00	0.134E+02 0.561E+02	0.147E+02 0.585E+02	0
VENTVALT	N								
TVP	O	MPa psia	0.142E+01 0.206E+03	0.118E-02 0.172E+00	0.144E+01 0.208E+03	0.141E-02 0.204E+00	0.134[illegible] 0.194E+03	0.148E+01 0.[illegible]5E+03	133
HWRDP	O	cm. H2O in. H2O	0.136E+02 0.537E+01	0.360E+00 0.142E+00	0.665E+02 0.262E+02	0.963E+00 0.379E+00	0.128E+02 0.503E+01	0.867E+02 0.341E+02	0
HPICLDP	O	******** psi	0.000E+00 0.316E+01	0.000E+00 0.940E-01	0.000E+00 0.381E+00	0.000E+00 0.281E-01	0.000E+00 0.210E+00	0.000E+00 0.333E+01	0
LOOPFLOW	O	cm. H2O in. H2O	-.881E+00 -.347E+00	0.354E+00 0.139E+00	-.674E+00 -.265E+00	0.317E+00 0.125E+00	-.214E+01 -.842E+00	0.176E+00 0.694E-01	0
HPIFLOW	O	cm. H2O in. H2O	0.253E+03 0.996E+02	0.198E+01 0.779E+00	0.235E+03 0.924E+02	0.193E+01 0.761E+00	0.201E+03 0.789E+02	0.314E+03 0.124E+03	0
SPHWFLO	0	cm. H2O in. H2O	0.539E-01 0.212E-01	P.534E-01 0.210E-01	0.398E+02 0.157E+02	0.546E+00 0.215E+00	-.101E+00 -.400E-01	0.481E+02 0.189E+02	0
VVALFLO	N								
CLCPS	Ø N								
DDP6	Ø N								

1. Status: O = Operational; N = Not in place; B = Broken
2. Over 99 second interval prior to HPI
3. Over 59 second interval at the end of test (0.1τ.)
4. Number of times instrument output exceded range of measurment



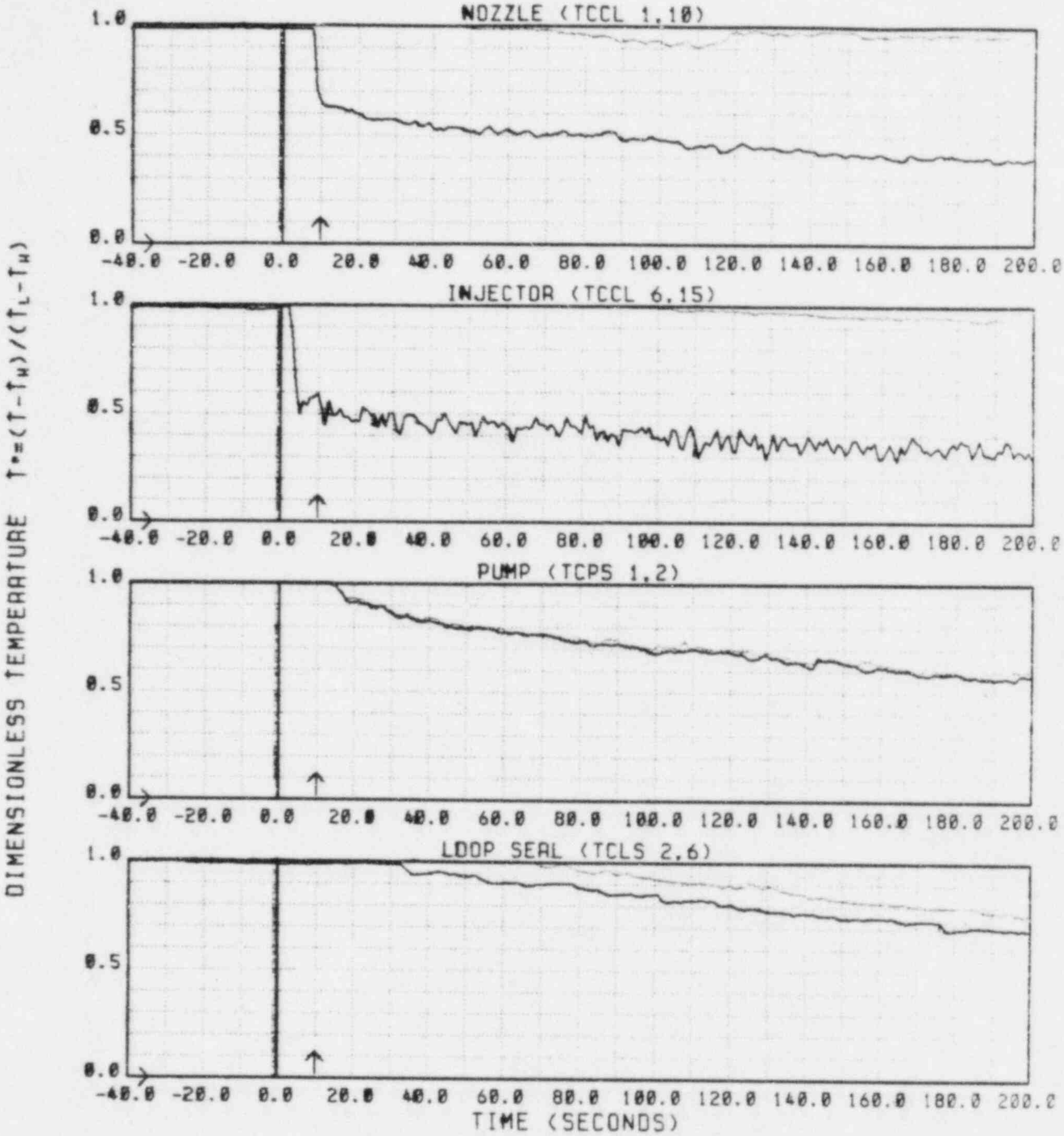
POSITION	NORMALIZING FACTORS
——— BOTTOM	τ_* = 666 sec T_H = 14.2 °C (57.6 °F)
······ TOP	T_L = 188.6 °C (371.4 °F)

FIGURE 3.1.o TEST MAY105

TRANSIENT COLD LEG TEMPERATURES

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



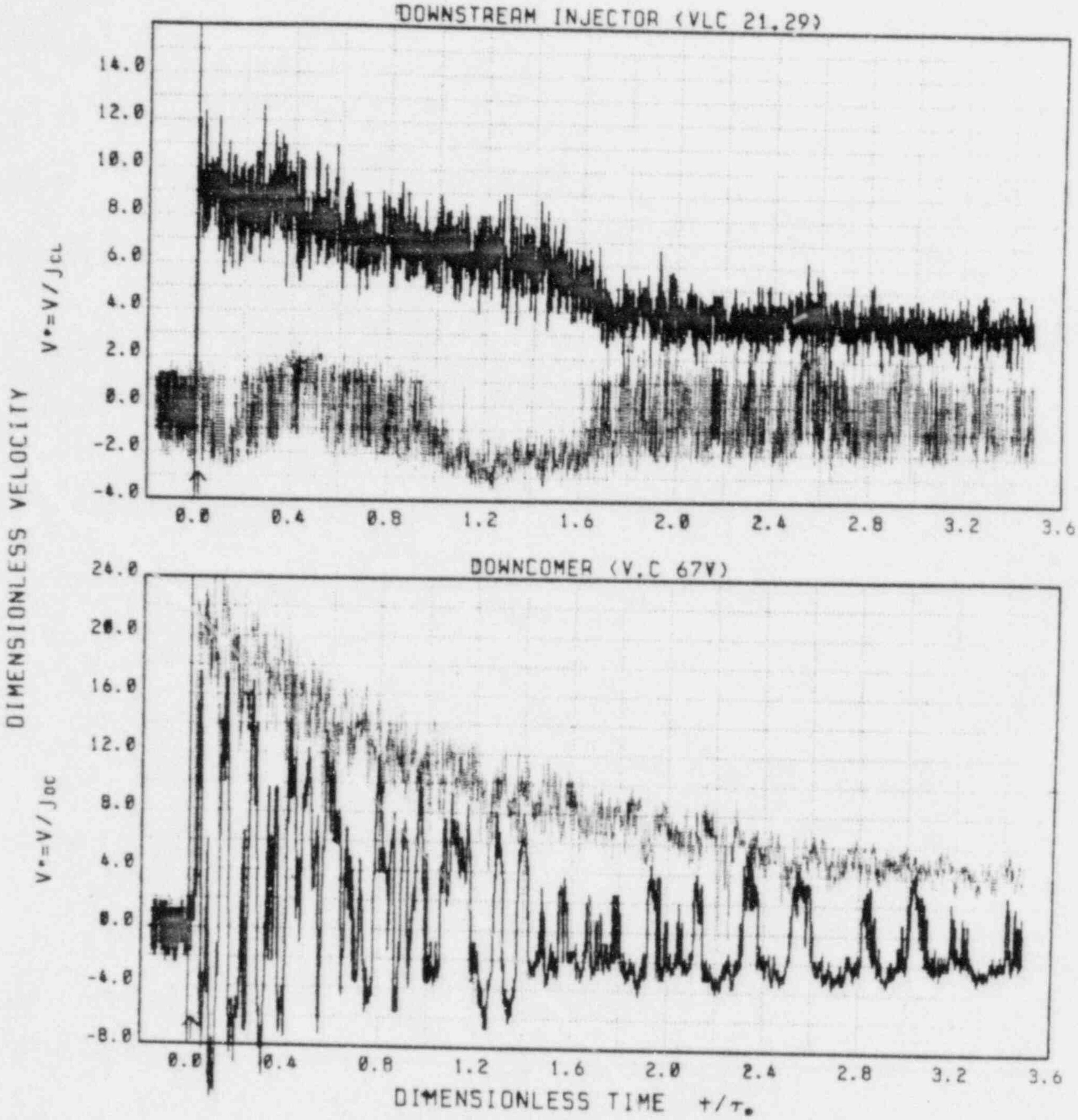
POSITION	NORMALIZING FACTORS
—— BOTTOM ---- TOP	τ_0 = 666 sec T_H = 14.2 °C (57.6 °F) T_L = 188.6 °C (371.4 °F)

FIGURE 3.1.6 TEST MAY105

TRANSIENT COLD LEG TEMPERATURES

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer

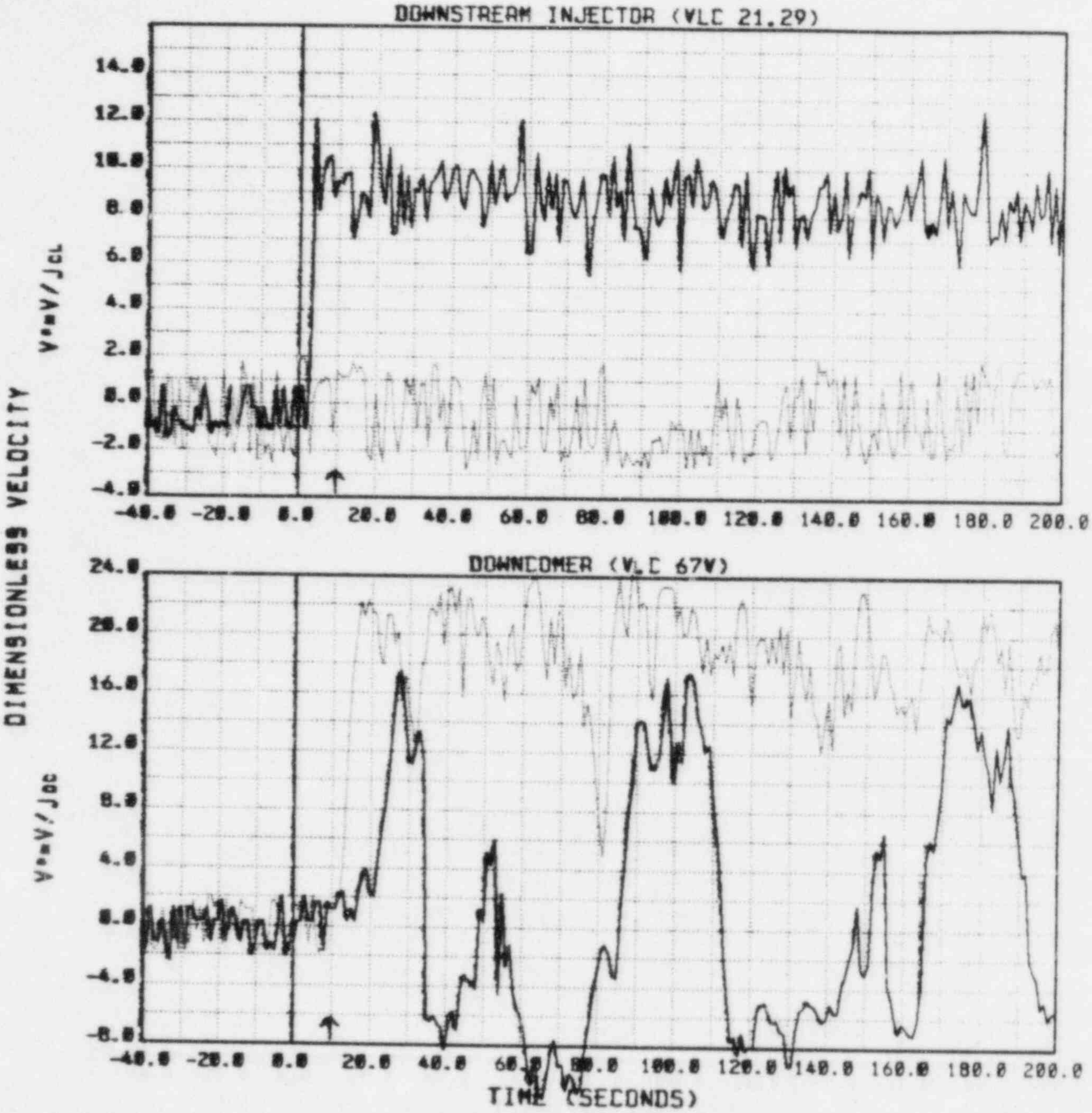


POSITION	NORMALIZING FACTORS
—— BOTTOM: VESSEL TOP: CORE	τ_0= 666 sec J_{CL}=0.05 m/s (0.16 ft/s) J_{DC}=0.03 m/s (0.11 ft/s)

FIGURE 3.2.o TEST MAY105

TRANSIENT COLD LEG AND DOWNCOMER VELOCITIES

Time 0 indicates HPI: Arrow indicate HPI at downcomer

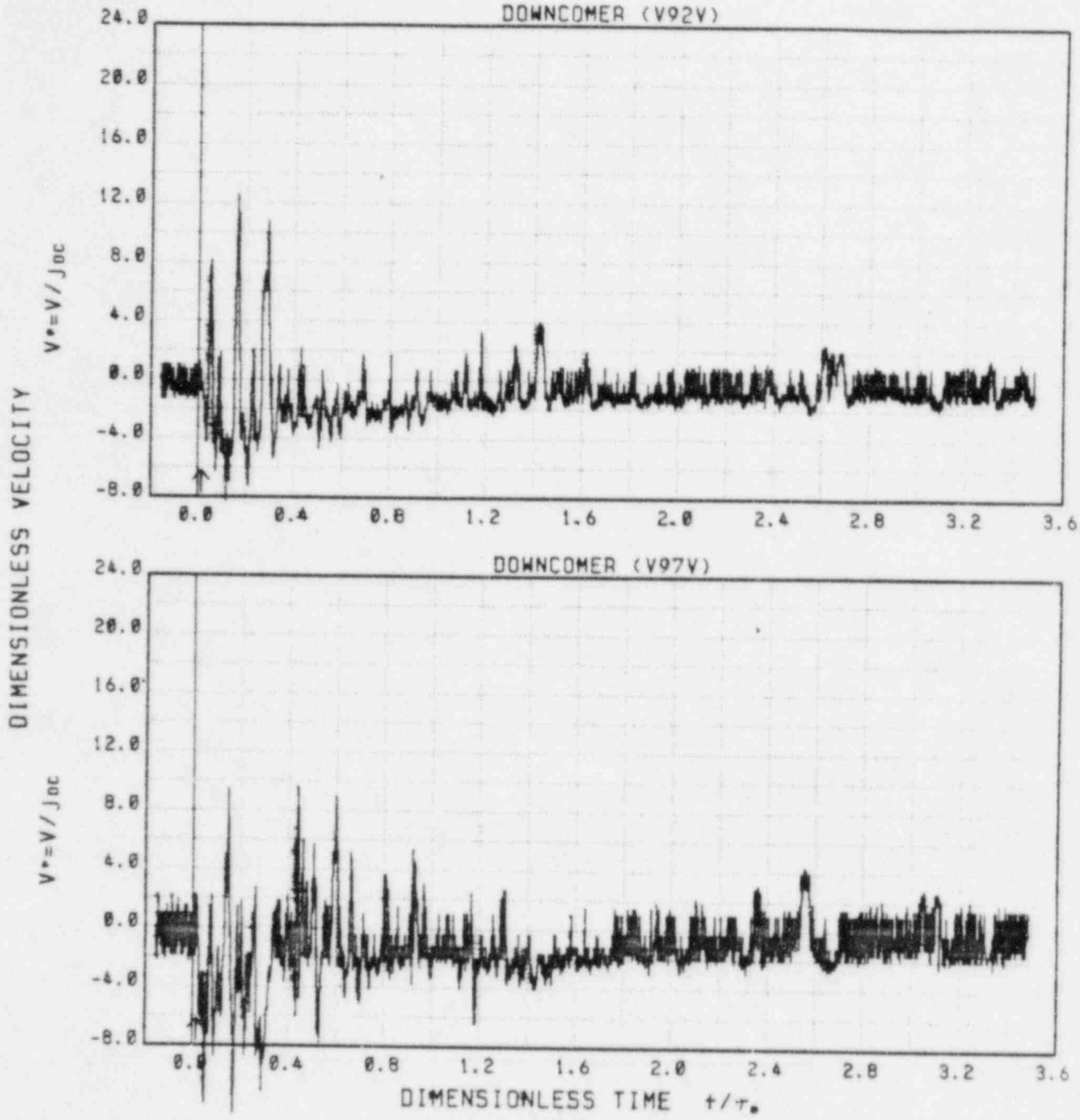


POSITION	NORMALIZING FACTORS
—— BOTTOM: VESSEL	τ_c= 666 sec J_{CL}=0.05 m/s (0.16 ft/s)
--- TOP: CORE	J_{DC}=0.03 m/s (0.11 ft/s)

FIGURE 3.2.b TEST MAY105

TRANSIENT COLD LEG AND DOWNCOMER VELOCITIES

Time 0 indicates HPI: Arrow indicate HPI at downcomer

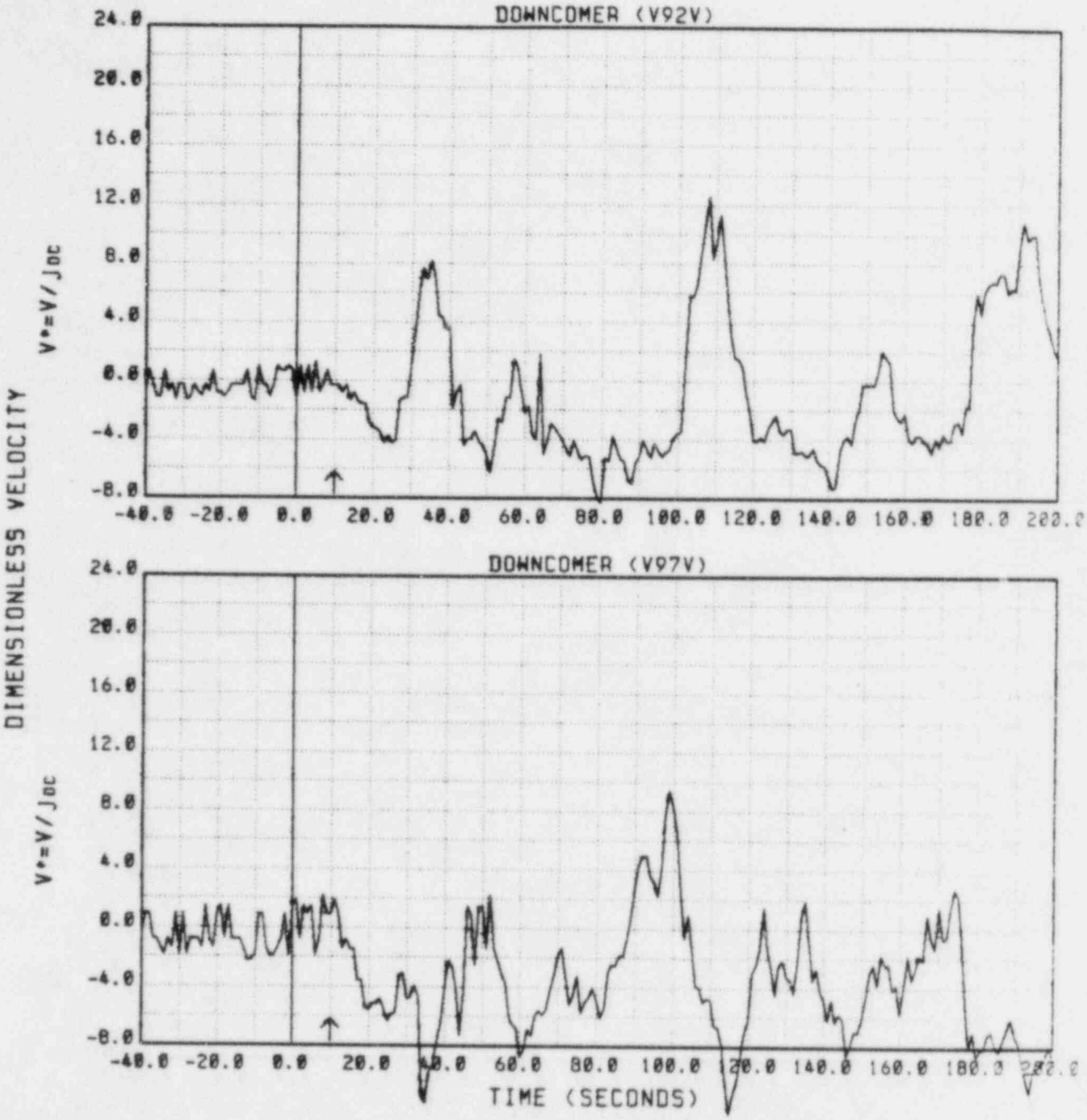


POSITION	NORMALIZING FACTORS
—— VESSEL	$\tau_* = 666$ sec $J_{DC} = 0.03$ m/s (0.11 ft/s)

FIGURE 3.2.c TEST MAY105

TRANSIENT DOWNCOMER VELOCITIES

Time 0 indicates HPI: Arrow indicate HPI at downcomer

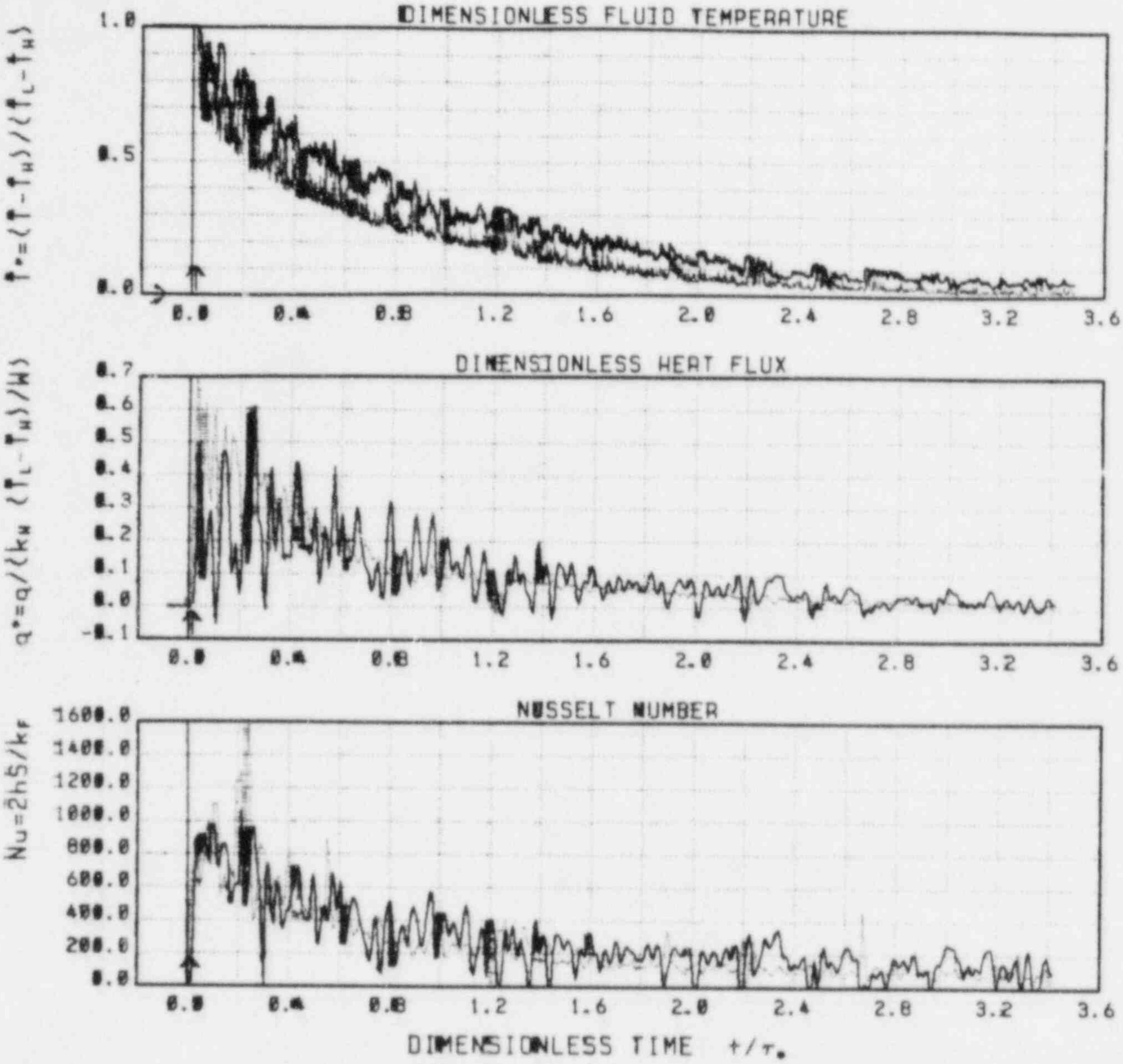


POSITION	NORMALIZING FACTORS
—— VESSEL	τ_o= 666 sec J_{DC}=0.03 m/s (0.11 ft/s)

FIGURE 3.2.d TEST MAY105

TRANSIENT DOWNCOMER VELOCITIES

Time 0 indicates HPI: Arrow indicate HPI at downcomer



POSITION	NORMALIZING FACTORS
—— VESSEL - - - CORE	τ_o = 666 msec T_H = 14.2 °C (57.6 °F) T_L=188.6 °C (371.4 °F) H=5.1 cm (2.0 in) K_w=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_f=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

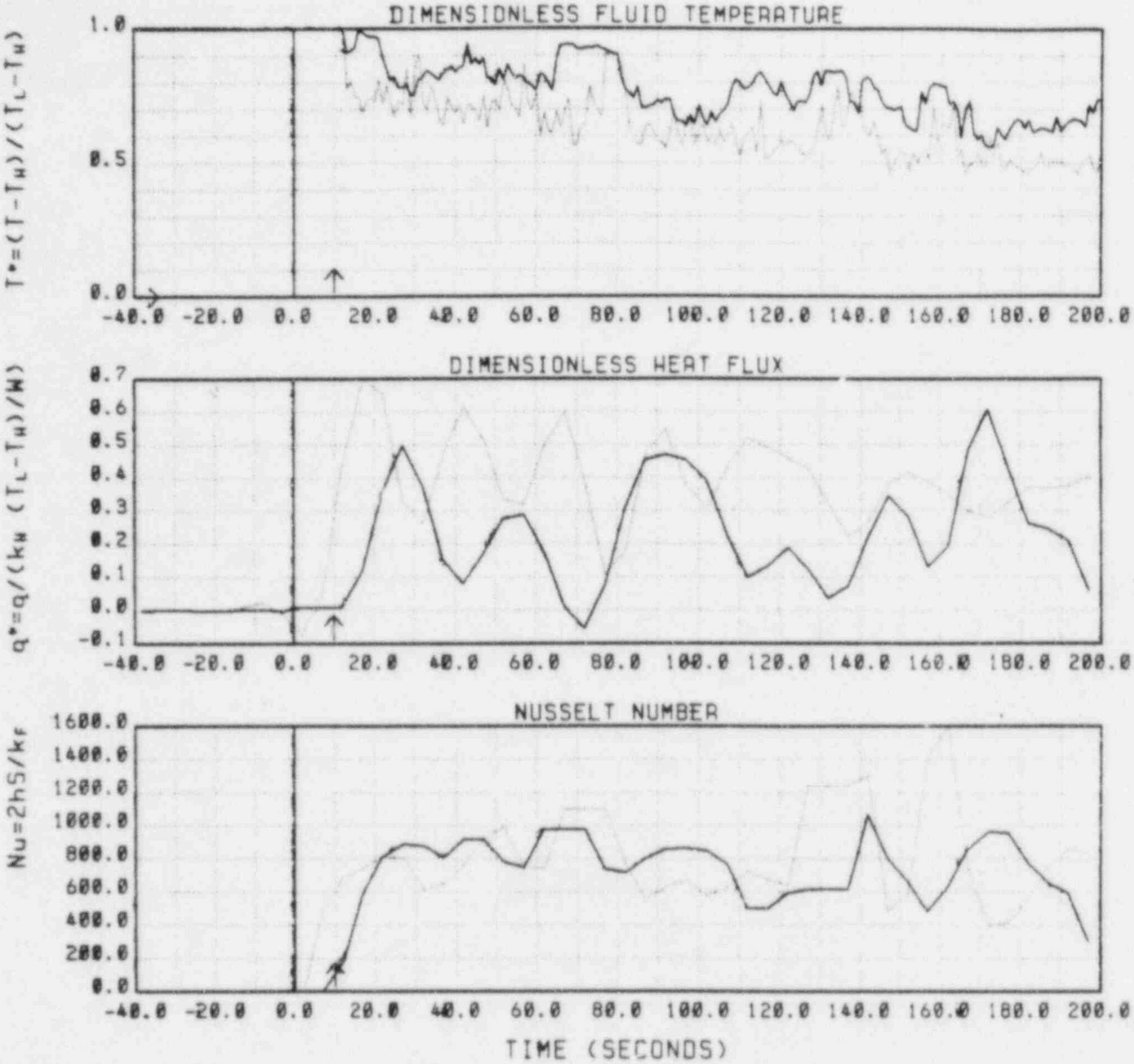
FIGURE 3.3.o TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 57

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer

640



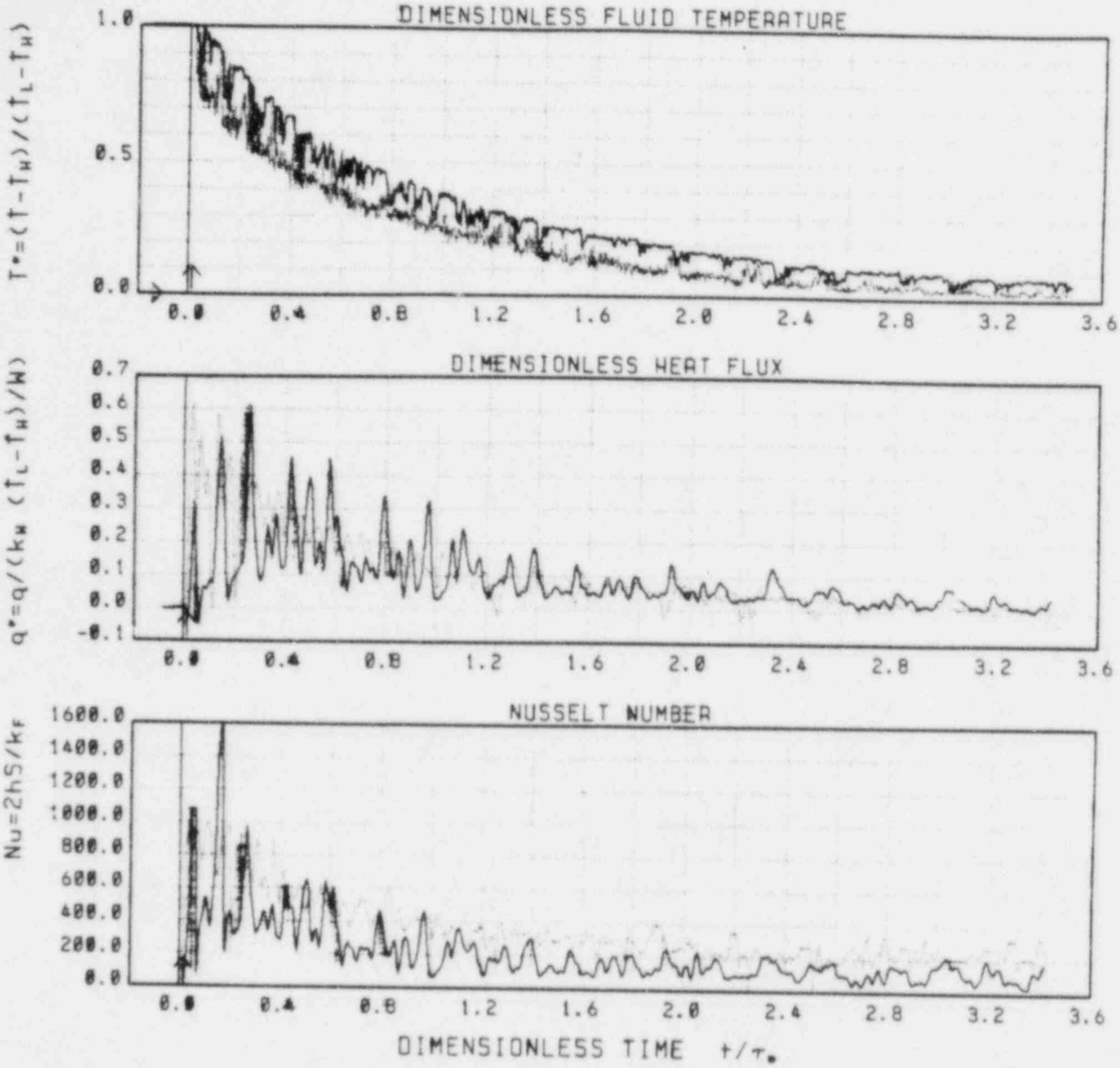
POSITION	NORMALIZING FACTORS
—— VESSEL —— CORE	τ_*= 666 sec T_W= 14.2 ·C (57.6 ·F) T_L=188.6 ·C (371.4 ·F) W=5.1 cm (2.0 in) K_W=50.1 W/m-·C (28.95 Btu/ft-hr-·F) K_F=0.61-0.69 W/m-·C (0.35-0.40 Btu/ft-hr-·F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.3.b TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 57

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



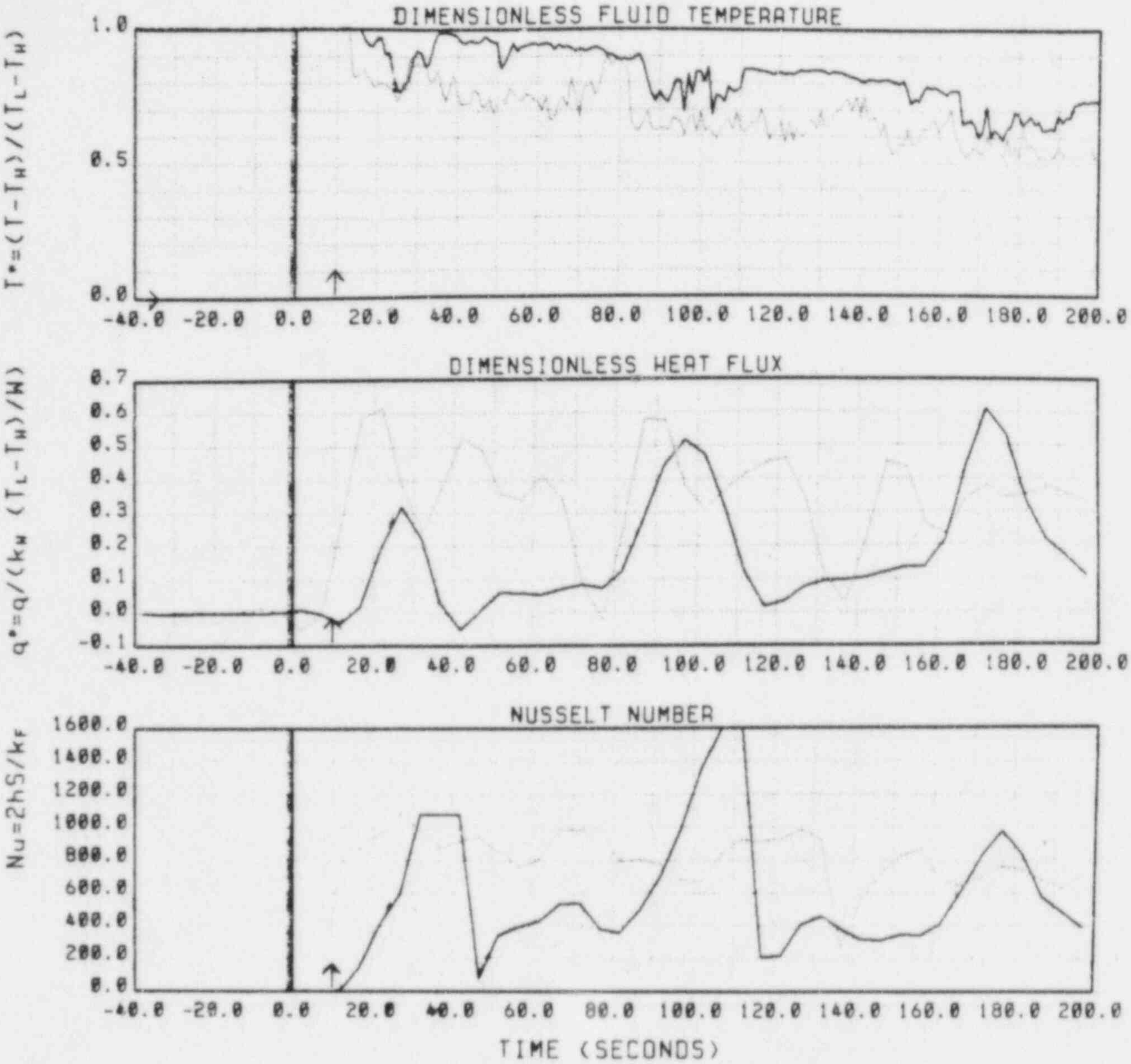
POSITION	NORMALIZING FACTORS
—— VESSEL - - - CORE	τ_o= 666 sec T_W= 14.2 ·C (57.6 ·F) T_L=188.6 ·C (371.4 ·F) W=5.1 cm (2.0 in) K_W=50.1 W/m-·C (28.95 Btu/ft-hr-·F) K_F=0.61-0.69 W/m-·C (0.35-0.40 Btu/ft-hr-·F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.4.o TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 67

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



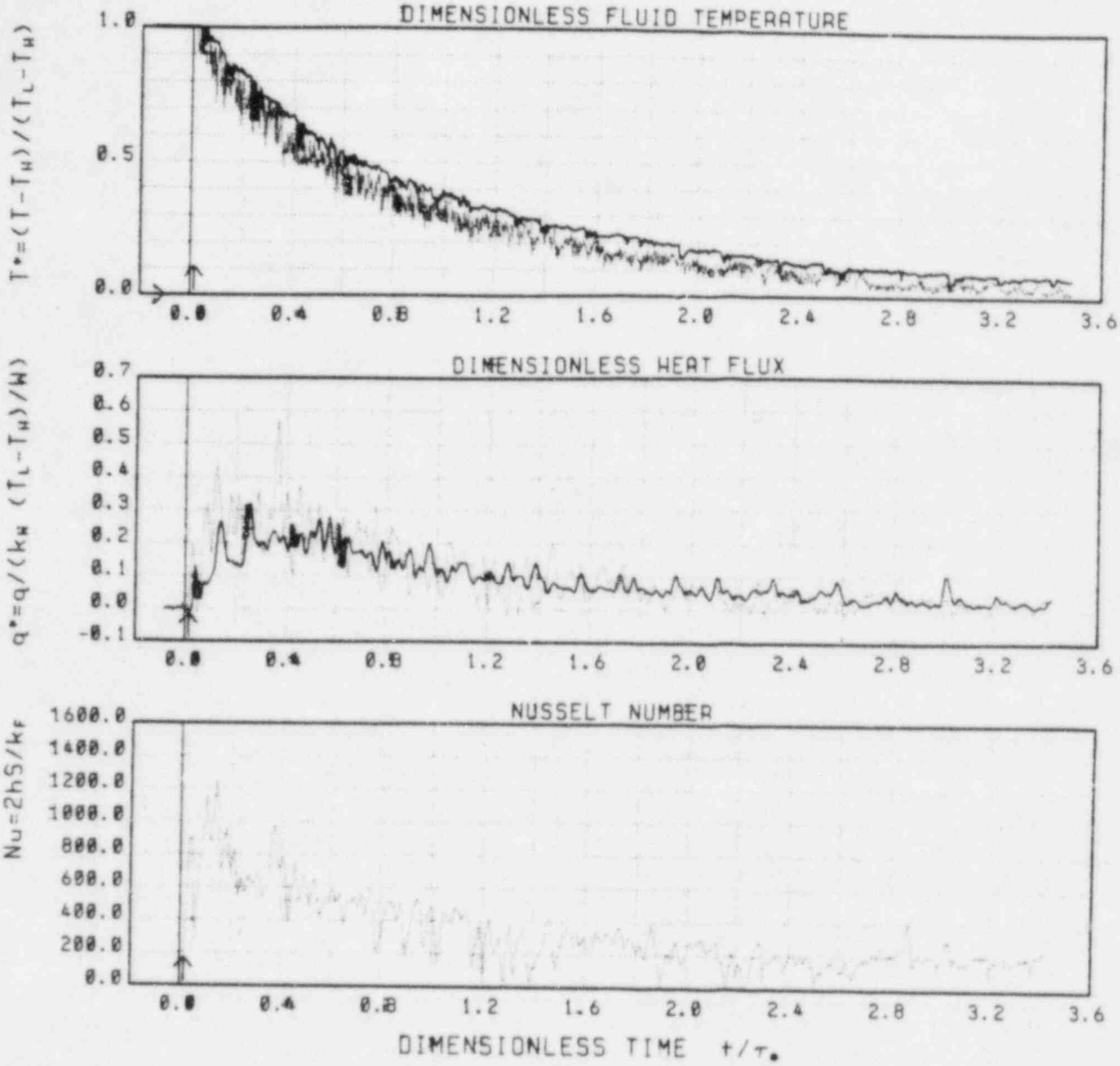
POSITION	NORMALIZING FACTORS
—— VESSEL CORE	τ_0= 666 sec T_H= 14.2 °C (57.6 °F) T_L=188.6 °C (371.4 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.4.b TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 67

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



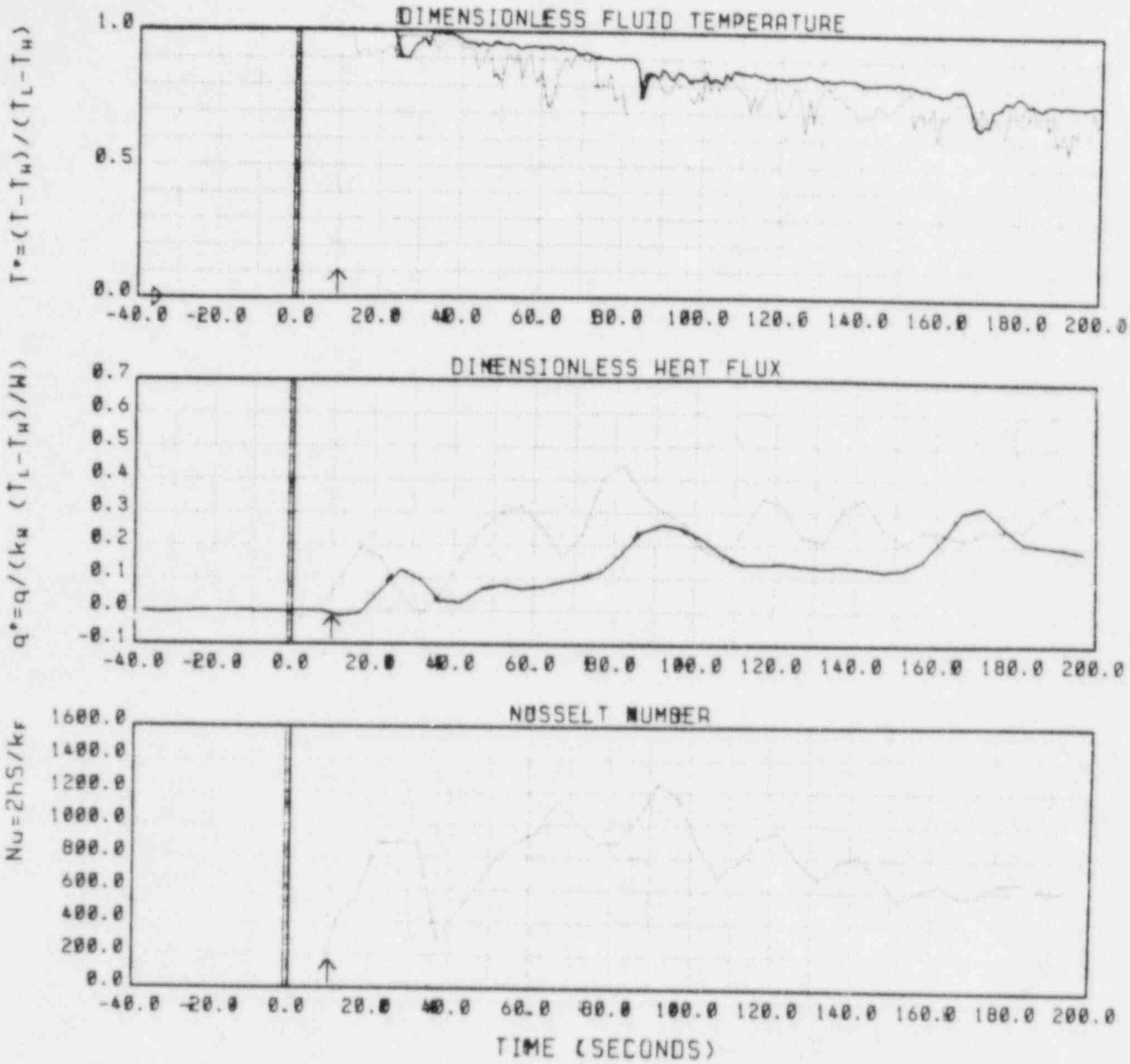
POSITION	NORMALIZING FACTORS
—— VESSEL - - - CORE	τ_0= 666 sec T_H= 14.2 °C (57.6 °F) T_L=188.6 °C (371.4 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.5.o TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 69

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



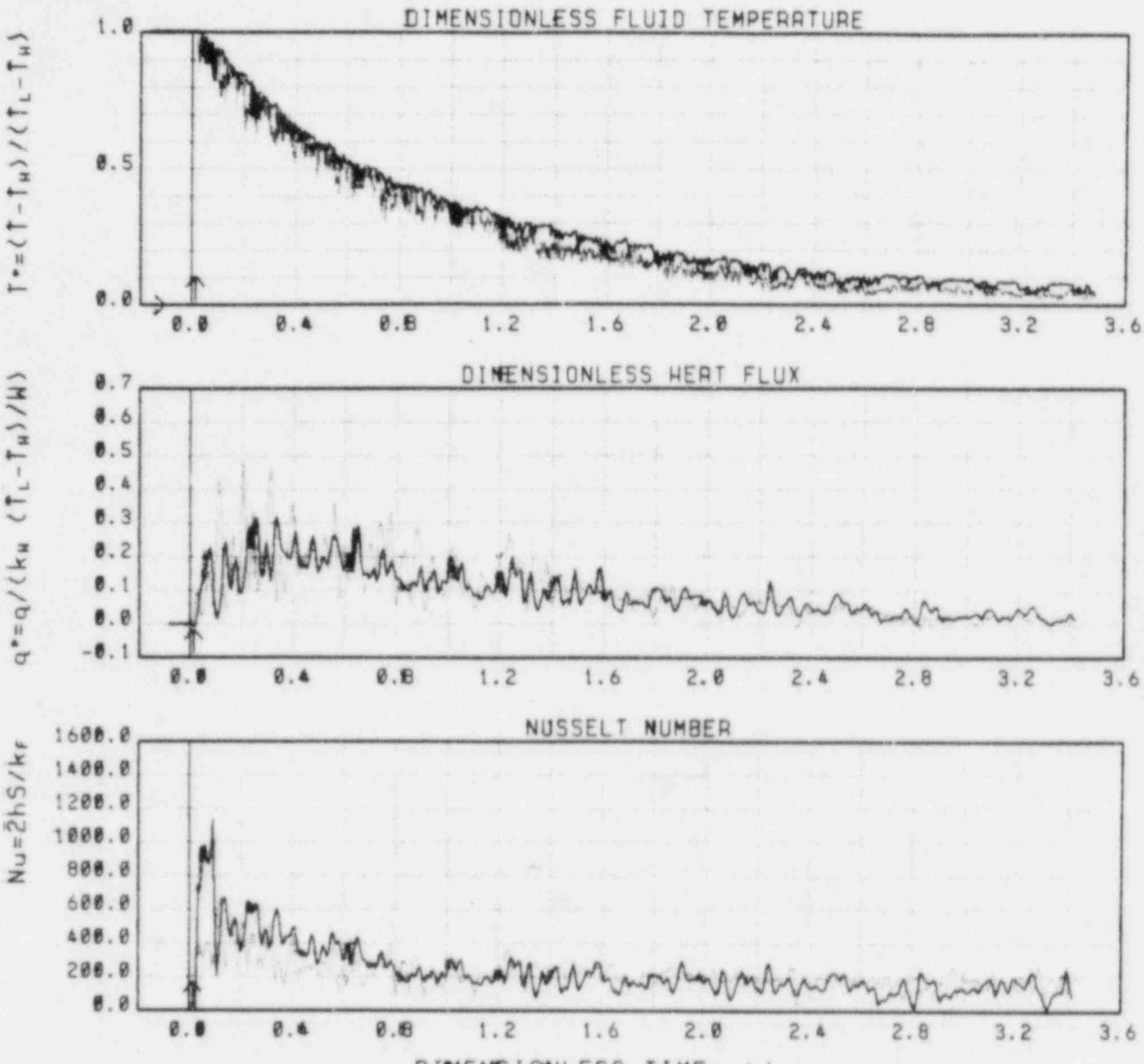
POSITION	NORMALIZING FACTORS
—— VESSEL - - - CORE	τ_o= 666 sec T_W= 14.2 °C (57.6 °F) T_L=188.6 °C (371.4 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.5.b TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 69

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



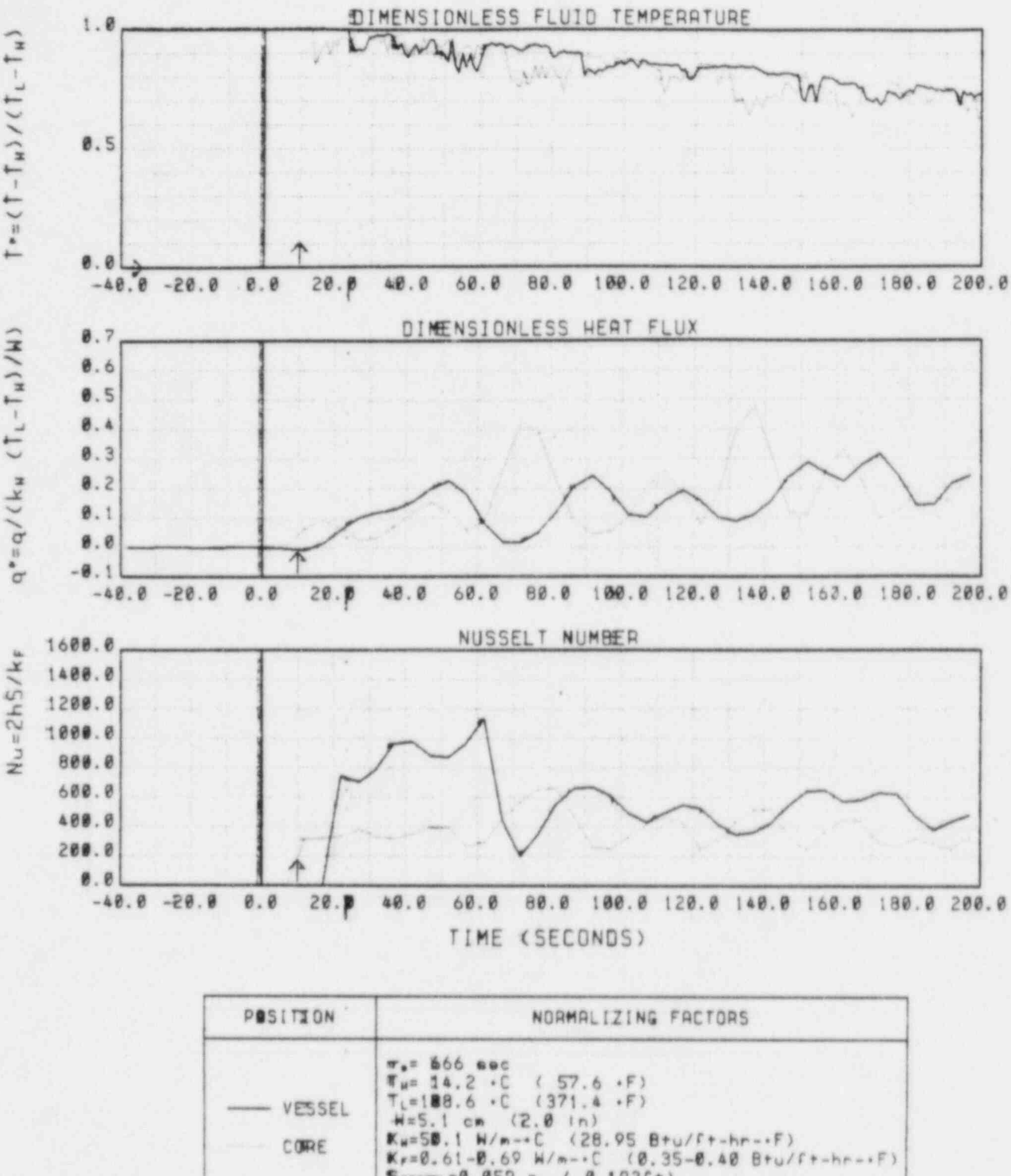
POSITION	NORMALIZING FACTORS
—— VESSEL ······ CORE	τ_o = 666 sec T_H = 14.2 °C (57.6 °F) T_L = 188.6 °C (371.4 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.6.o TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 64

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



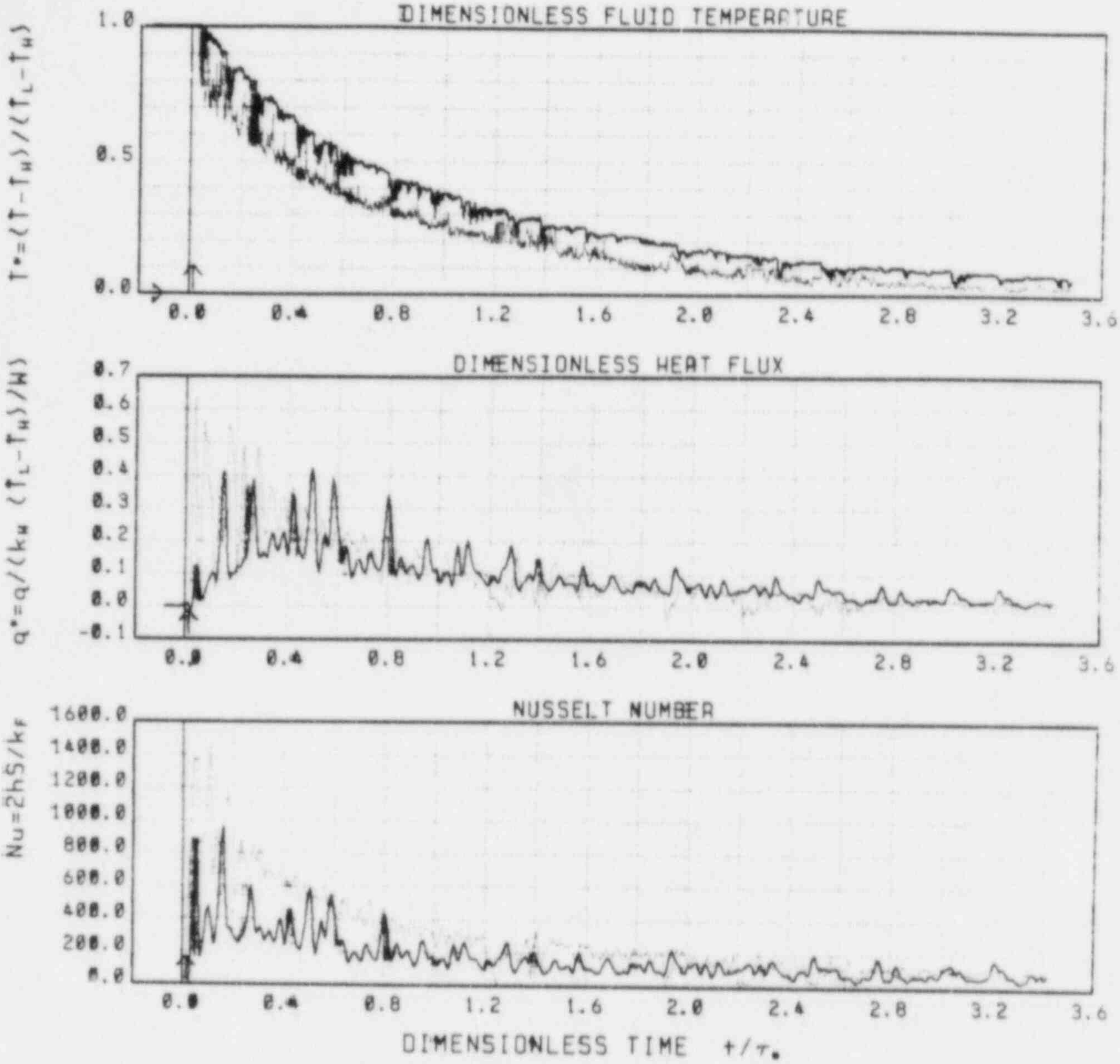
POSITION	NORMALIZING FACTORS
—— VESSEL - - - CORE	τ_0= 666 sec T_H= 14.2 °C (57.6 °F) T_L=188.6 °C (371.4 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.6.b TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 64

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



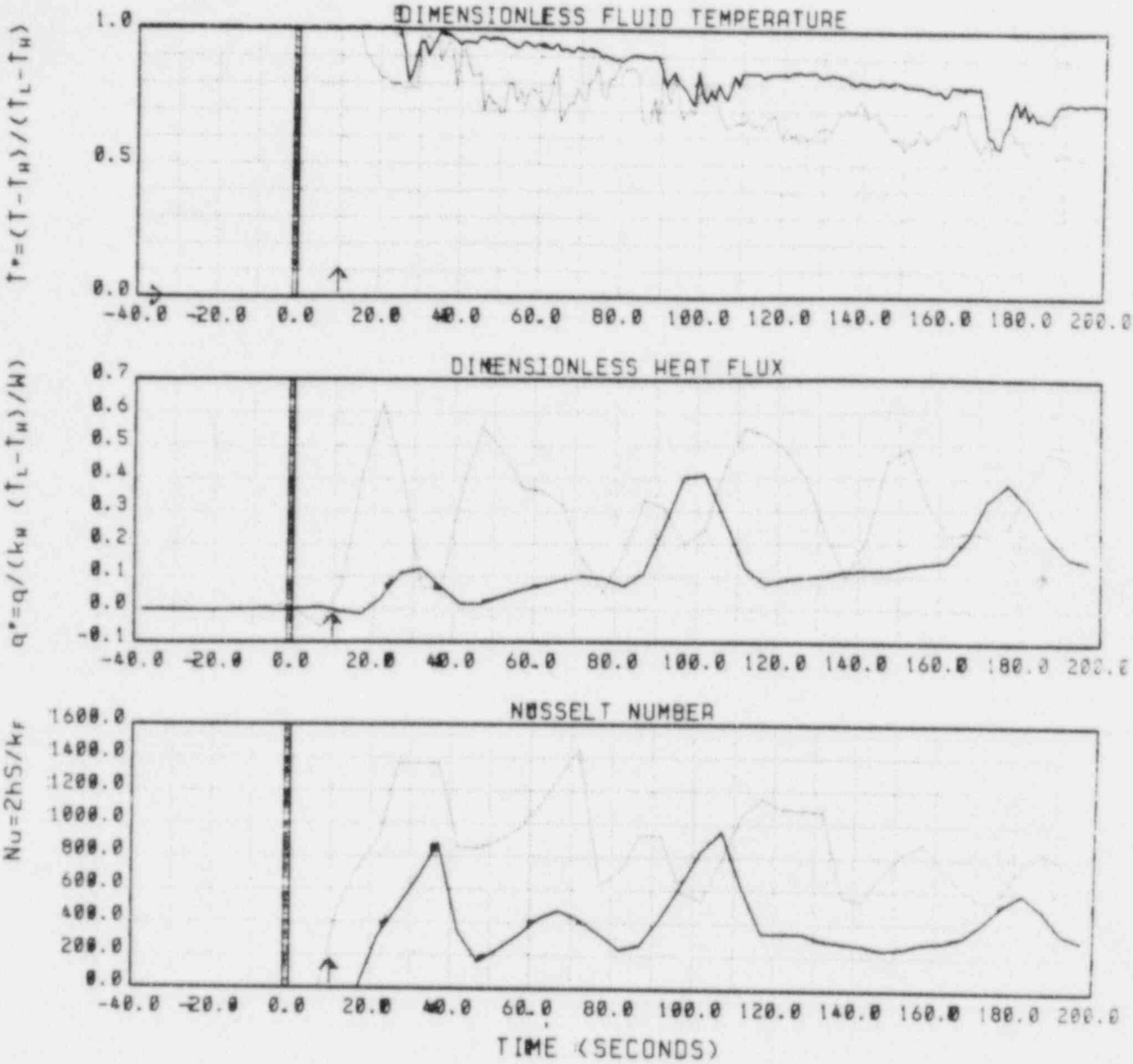
POSITION	NORMALIZING FACTORS
—— VESSEL CORE	τ_0= 666 sec T_W= 14.2 °C (57.6 °F) T_L=188.6 °C (371.4 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.7.o TEST MAY105

TRANSIENT DOWNCOMER DATA AT LOCATION 77

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



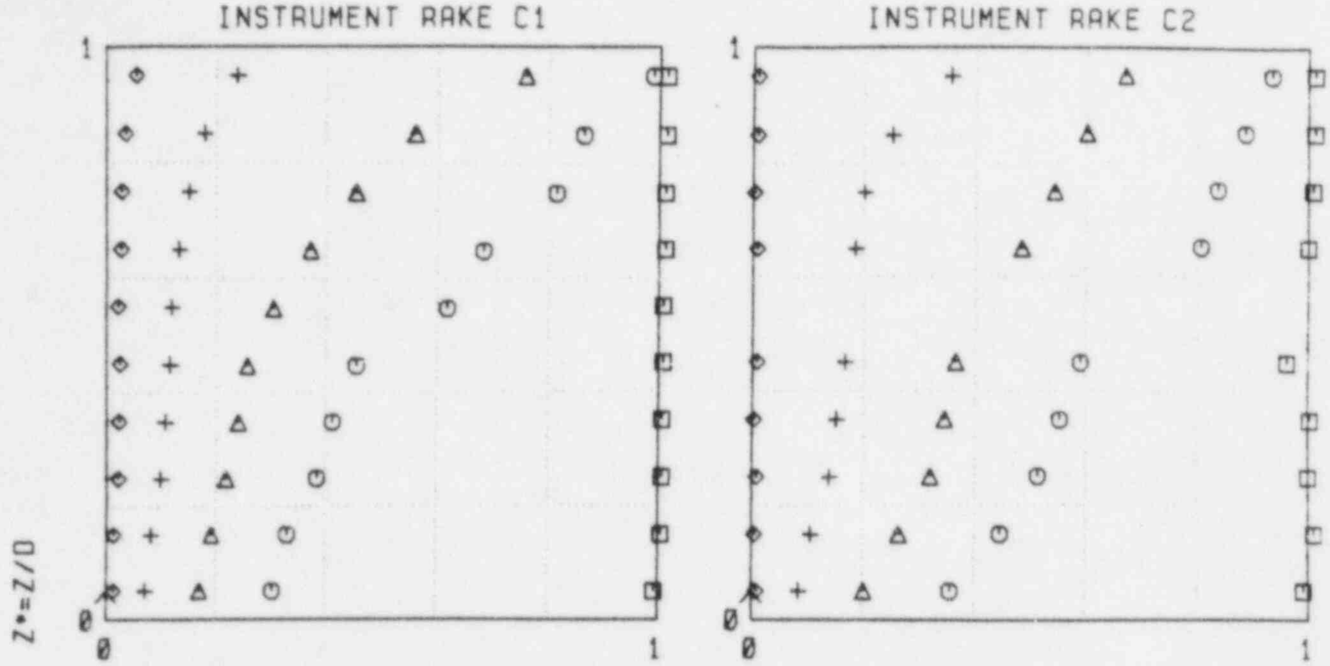
POSITION	NORMALIZING FACTORS
—— VESSEL - - CORE	τ_*= 666 msec T_H= 14.2 °C (57.6 °F) T_L=188.6 °C (371.4 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.7.b TEST MAY105

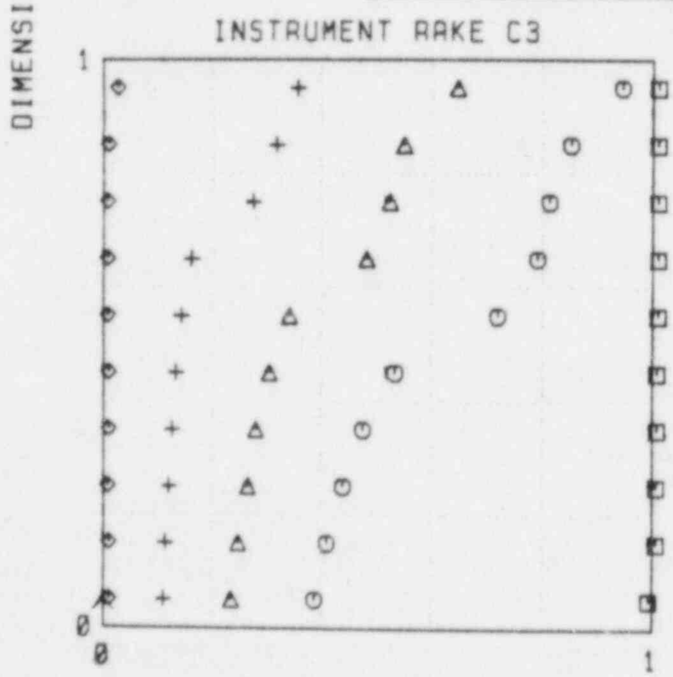
TRANSIENT DOWNCOMER DATA AT LOCATION 77

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer

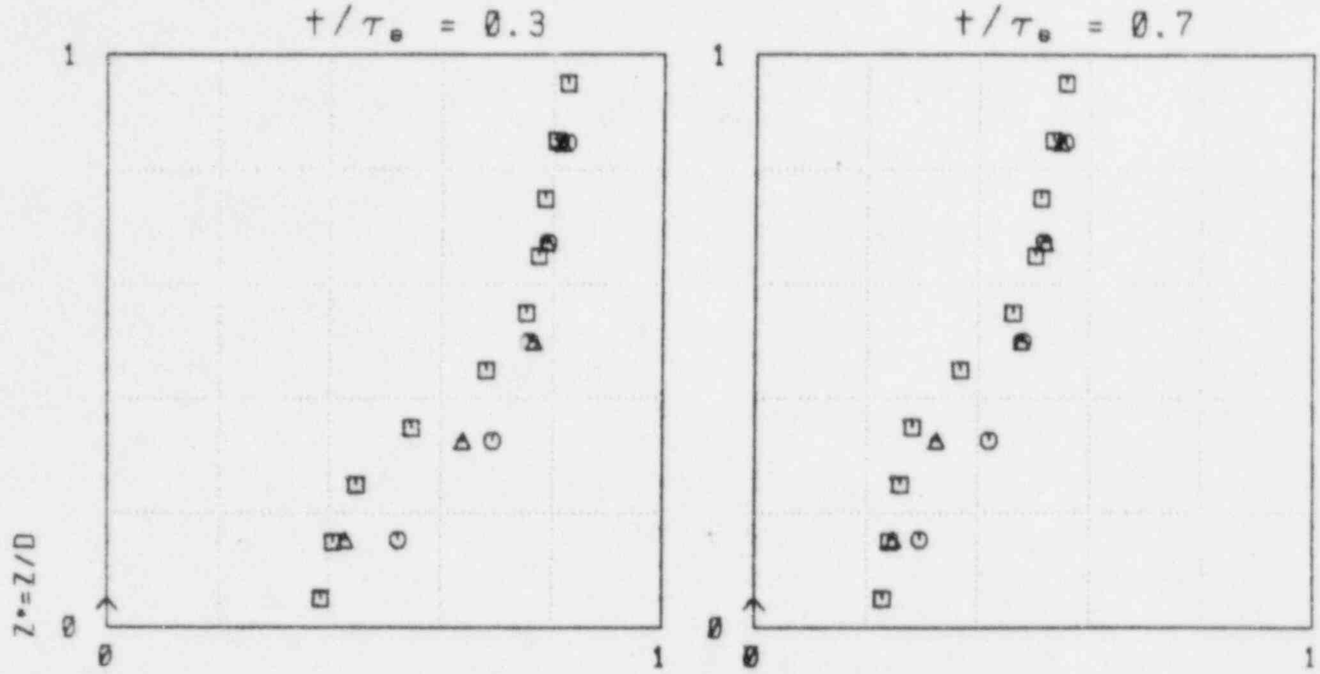


SYMBOL	t/τ_e	t (sec)	NORMALIZING FACTORS
□	0.0	99	T_H= 14.2 °C (57.6 °F)
○	0.3	192	
△	0.7	462	T_L=188.6 °C (371.4 °F)
+	1.4	923	
◇	3.5	2400	D= 36.3 cm. (14.3 in.)



DIMENSIONLESS TEMPERATURE $T^*=(T-T_H)/(T_L-T_H)$

FIGURE 4.1.o TEST MAY105
COLD LEG VERTICAL TEMPERATURE PROFILES
Arrow indicates Mixed Mean Temperature



SYMBOL	LOCATION	t/τ_e	t(sec)	NORMALIZING FACTORS
⊡	TCLC5	0.3	192	T_H= 14.2 °C (57.6 °F)
△	TCLC5R	0.7	462	T_L=188.6 °C (371.4 °F)
⊙	TCLC5L	1.4	923	D= 36.3 cm (14.3 in)
		3.5	2400	

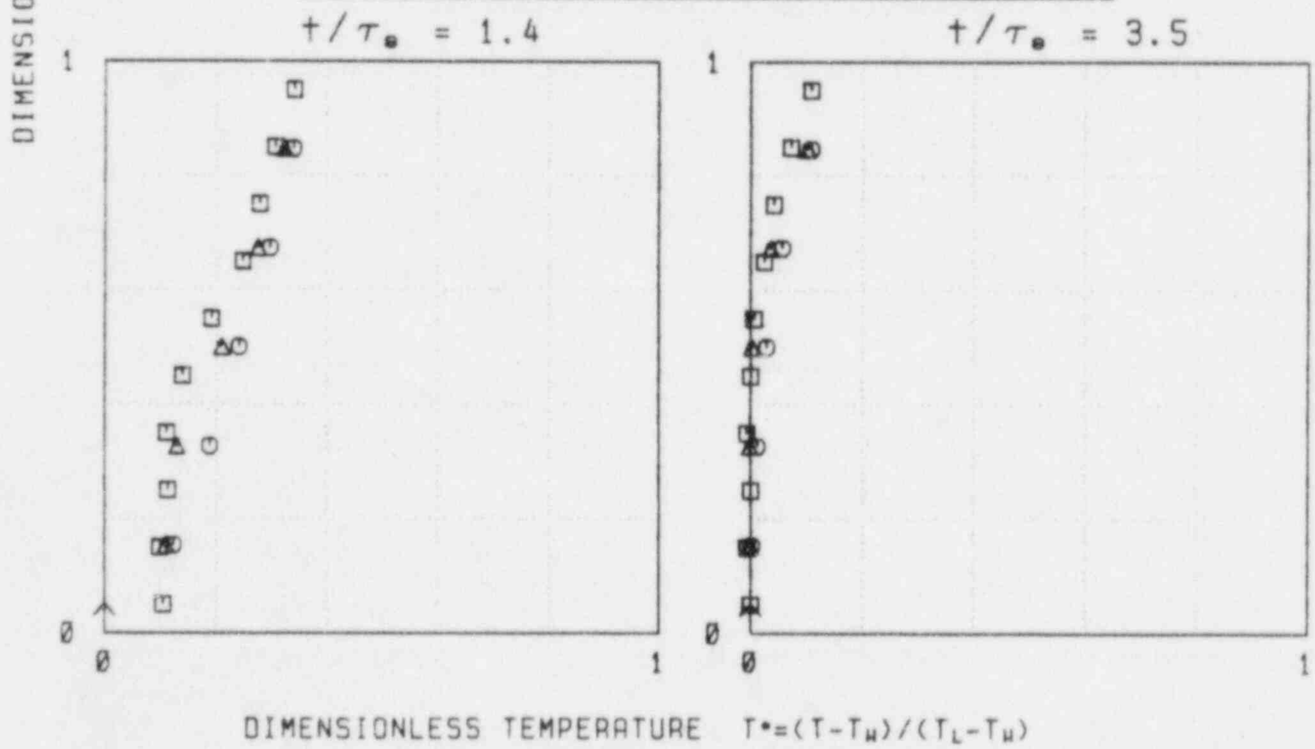
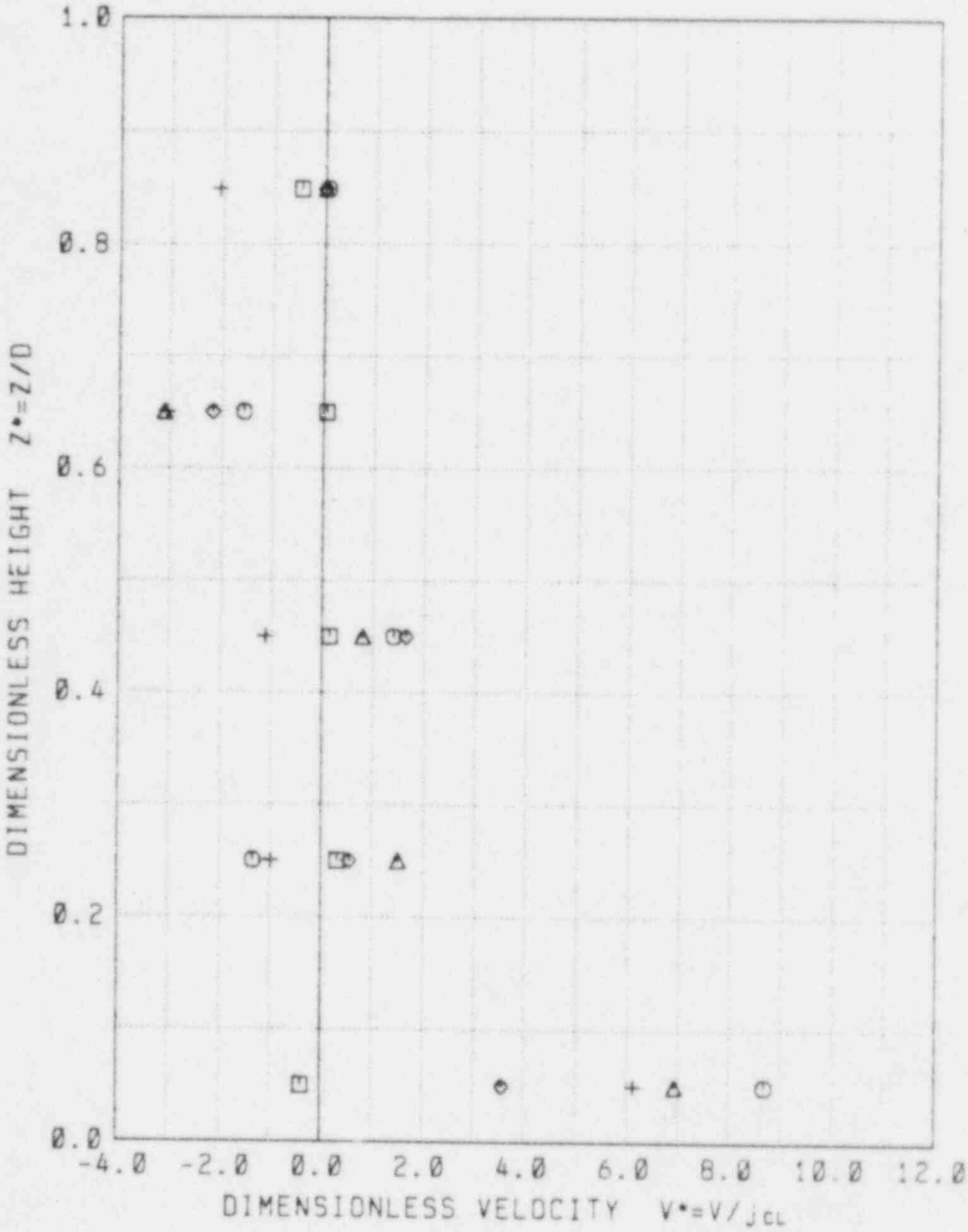


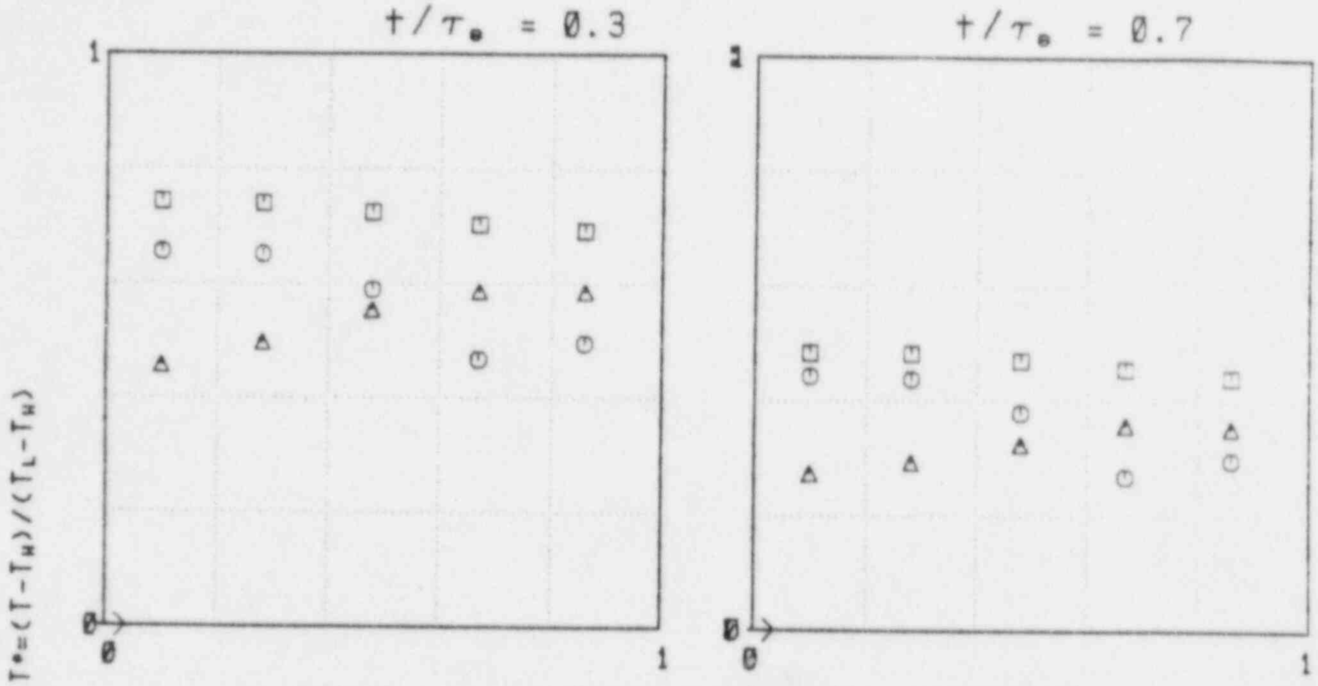
FIGURE 4.2 TEST MAY105
NOZZLE TEMPERATURE DISTRIBUT!
Arrow indicates Mixed Mean Temperature



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	99	j_{CL}=0.05 m/s
⊙	0.3	192	(0.16 ft/s)
Δ	0.7	462	
+	1.4	923	D= 36.3 cm.
◇	3.5	2400	(14.3 in.)

FIGURE 4.3 TEST MAY105

COLD LEG VERTICAL VELOCITY PROFILE (INST. RAKE C2)



SYMBOL	LOCATION	t/τ_e	t(sec)	NORMALIZING FACTORS
⊡	GAPJ1	0.3	192	T_W= 14.2 °C (57.6 °F)
△	GAPJ2	0.7	462	T_L=188.6 °C (371.4 °F)
⊙	GAPJ3	1.4	923	S=0.138 m (0.451 ft)
		3.5	2400	

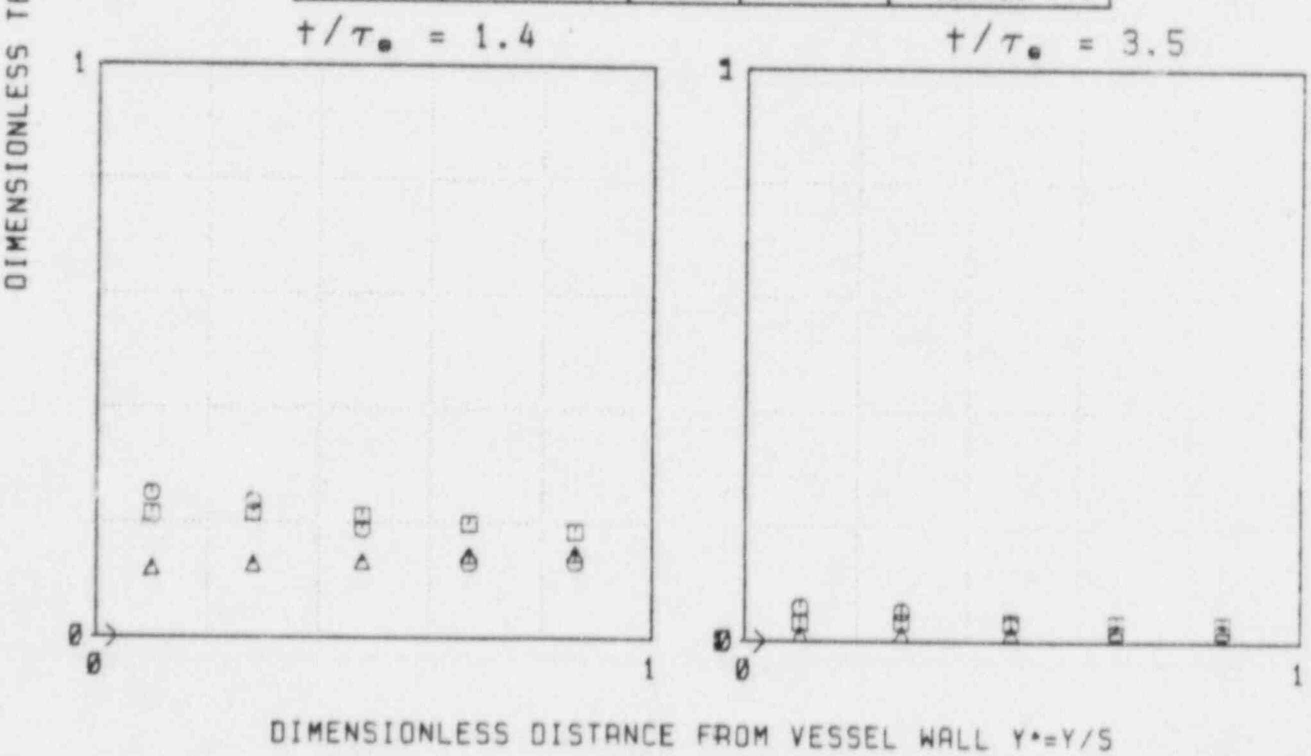
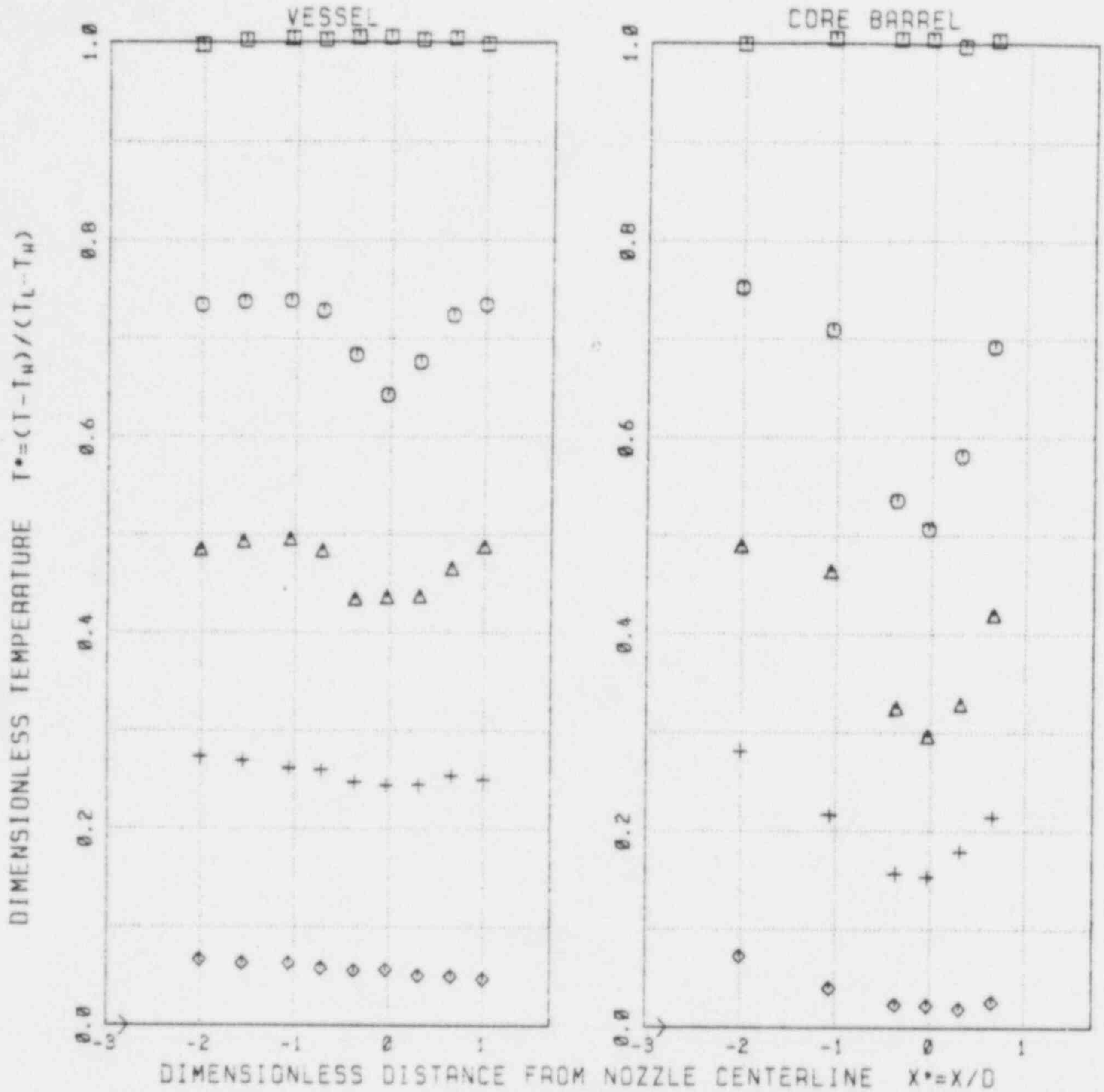


FIGURE 4.4 TEST MAY105
DOWNCOMER GAP TEMPERATURE DISTRIBUTION
Arrow indicates Mixed Mean Temperature



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊞	0.0	99	T_H= 14.2 °C
⊖	0.3	192	(57.6 °F)
△	0.7	462	T_L=188.6 °C
+	1.4	923	(371.4 °F)
◇	3.5	2400	D= 36.3 cm.
			(14.3 in.)

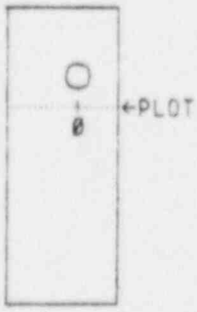
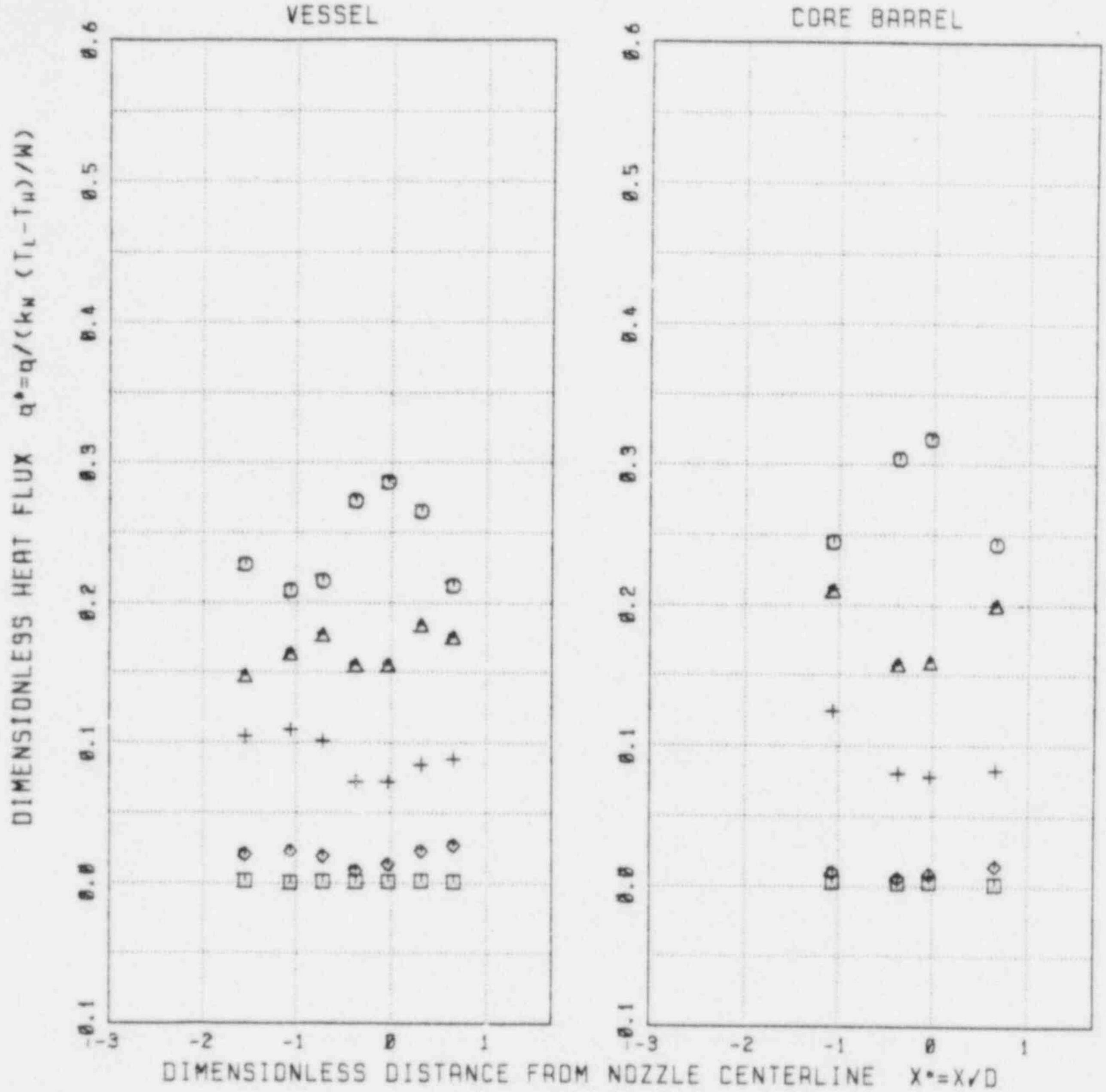


FIGURE 4.5.o TEST MAY105
DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES
(INSTRUMENT ROW 5: 0.41 m. BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_a	t (sec)	NORMALIZING FACTORS
⊡	0.0	99	T_L=188.6 C (371.4 F)
⊙	0.3	192	T_W= 14.2 C (57.6 F)
△	0.7	462	K_W=50.10 W/m - C
+	1.4	923	(28.95 Btu/ft-hr- F)
◇	3.5	2400	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

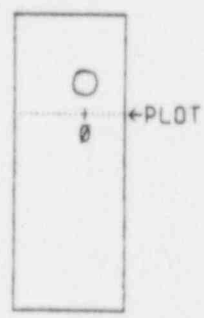
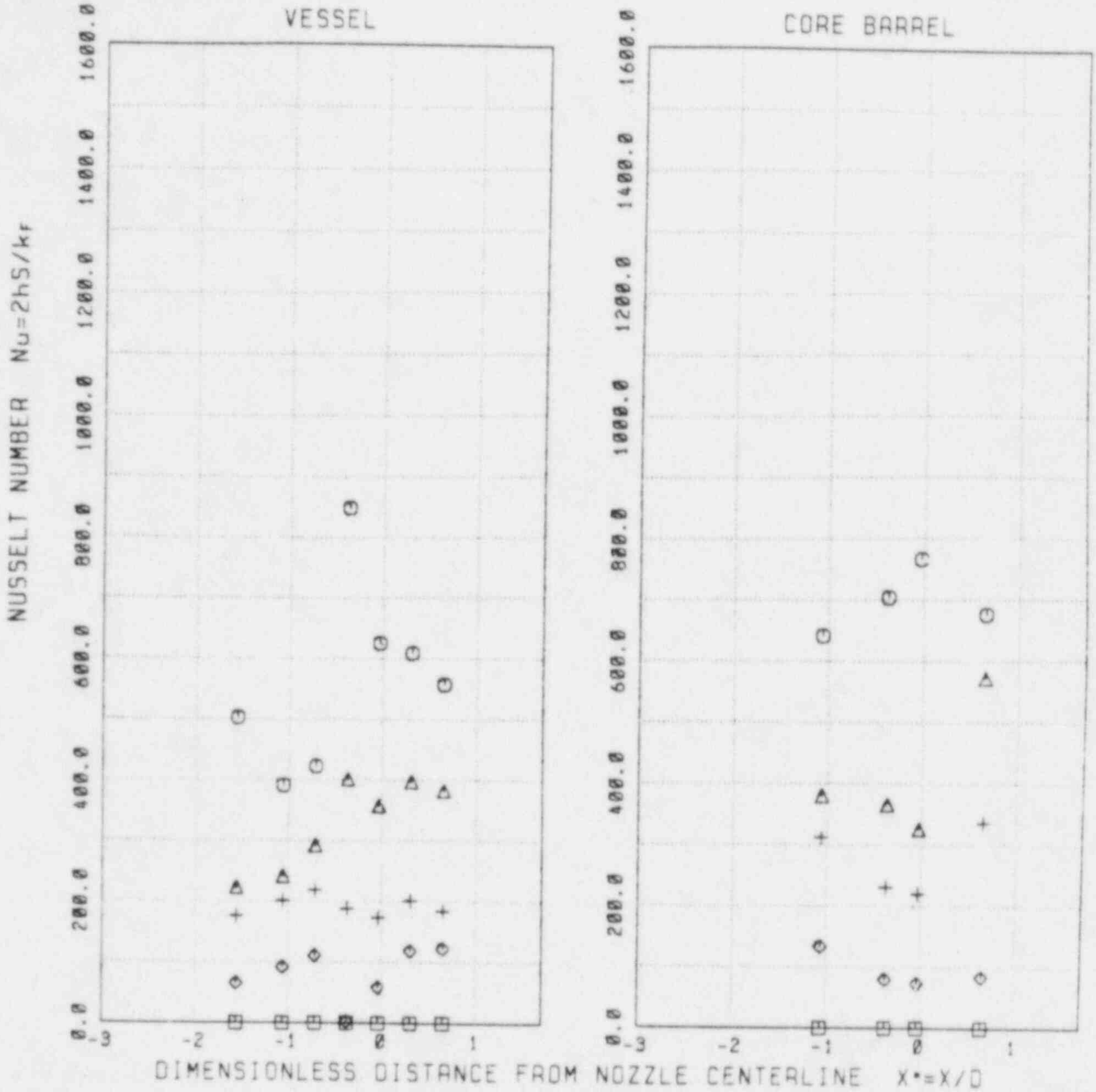


FIGURE 4.5.b TEST MAY105
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 5: 0.41 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_m	t (sec)	NORMALIZING FACTORS
⊟	0.0	99	D =36.3 cm(14.3 in)
⊖	0.3	192	K_f=0.61 -0.69 W/m- C
Δ	0.7	462	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	923	S_{Vessel}= 0.059 m (0.192 ft)
⌀	3.5	2400	S_{Core} = 0.041 m (0.133 ft)

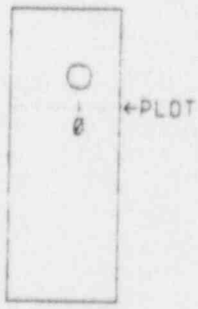
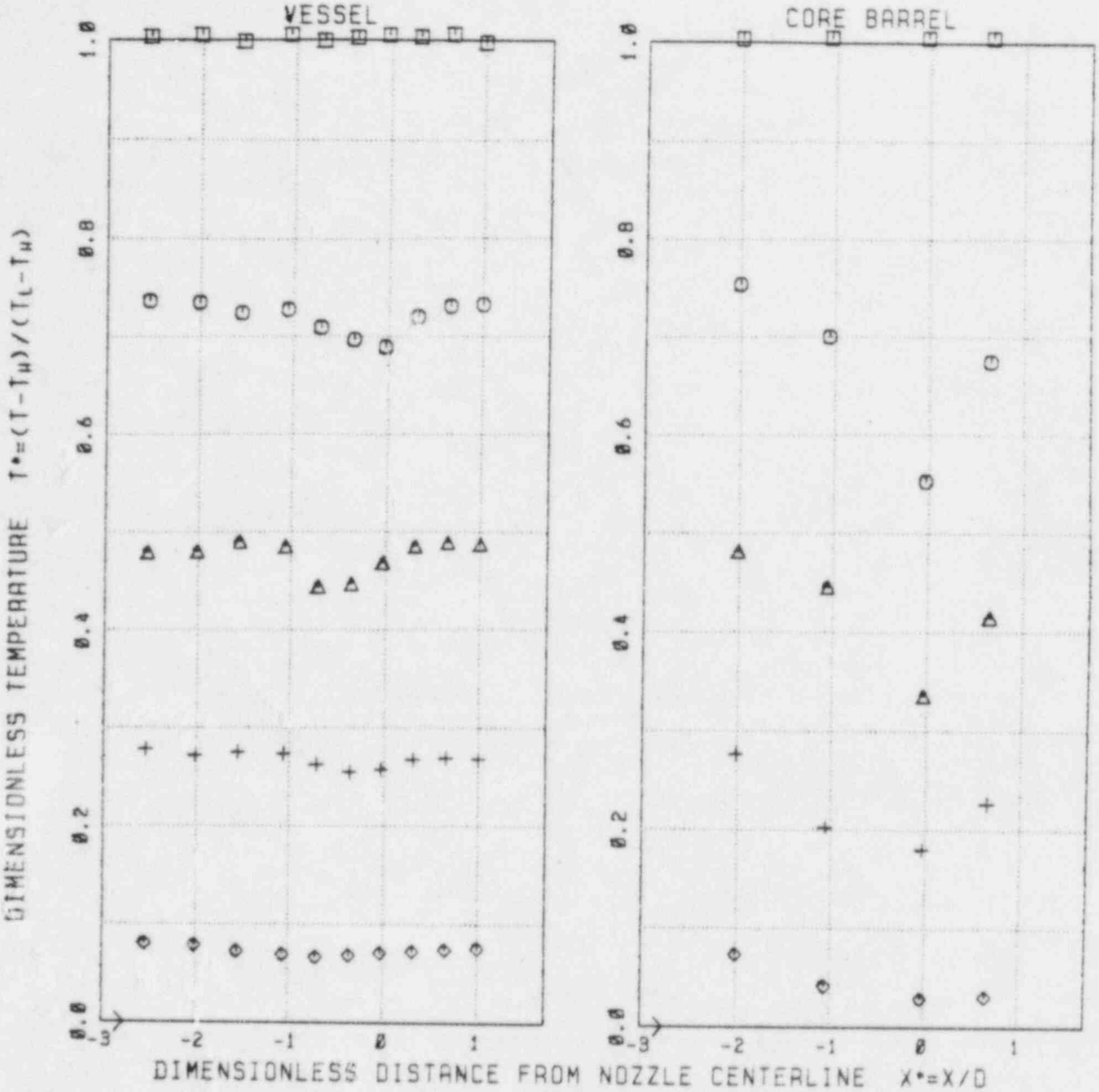


FIGURE 4.5.c TEST MAY105
DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES
(INSTRUMENT ROW 5: 0.41 m. BELOW NOZZLE CENTERLINE)

684



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊟	0.0	99	T_L= 14.2 °C
⊙	0.3	192	(57.6 °F)
Δ	0.7	462	T_L=188.6 °C
+	1.4	923	(371.4 °F)
◇	3.5	2400	D= 36.3 cm.
			(14.3 in.)

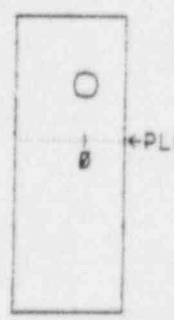
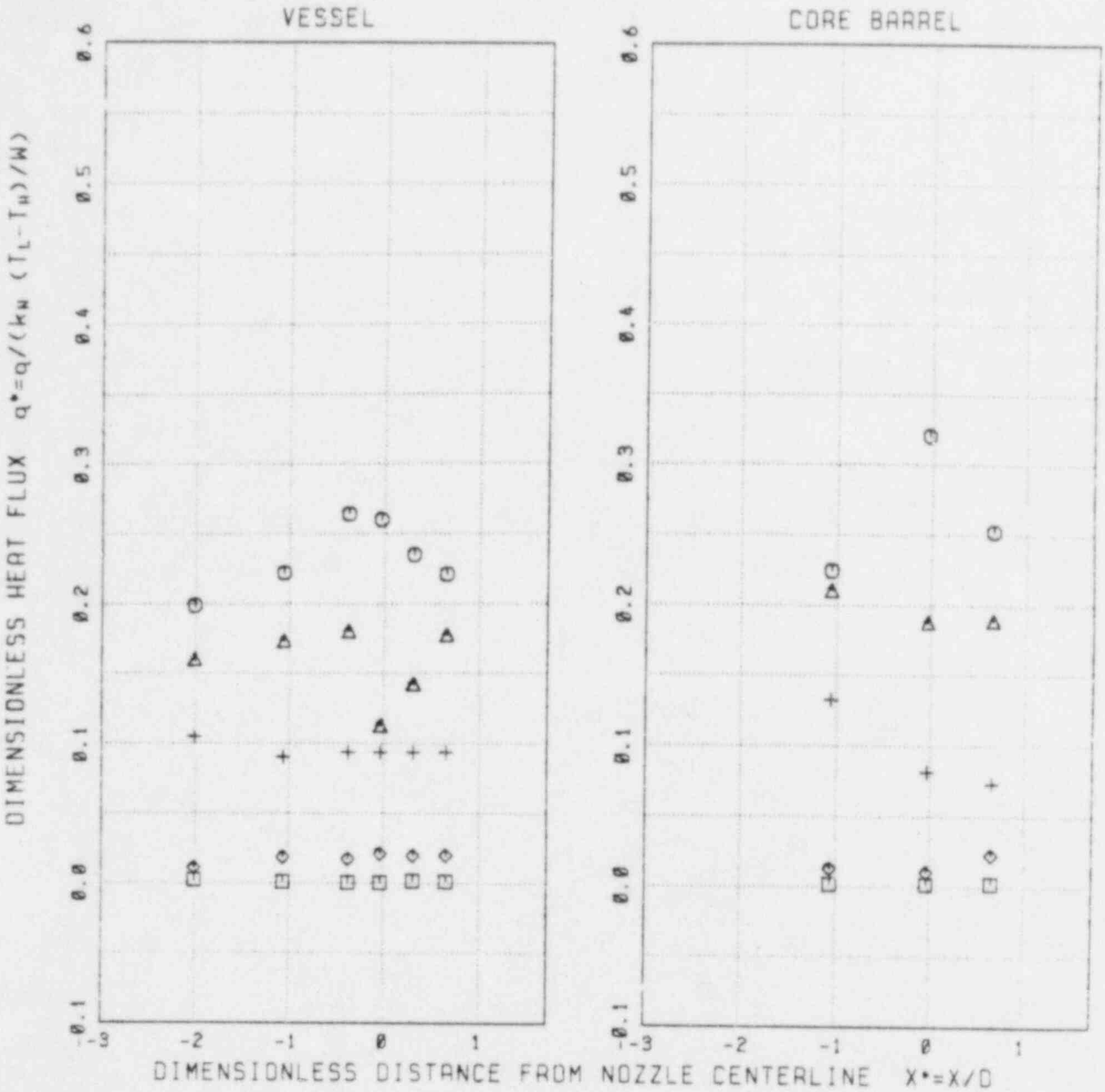


FIGURE 4.6.o TEST MAY105
DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES
(INSTRUMENT ROW 6: 0.77 m. BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_m	t (sec)	NORMALIZING FACTORS
⊡	0.0	99	T_L=188.6 C (371.4 F)
⊙	0.3	192	T_w= 14.2 C (57.6 F)
△	0.7	462	K_w=50.10 W/m - C
+	1.4	923	(28.95 Btu/ft-hr- F)
◇	3.5	2400	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

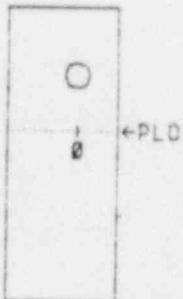
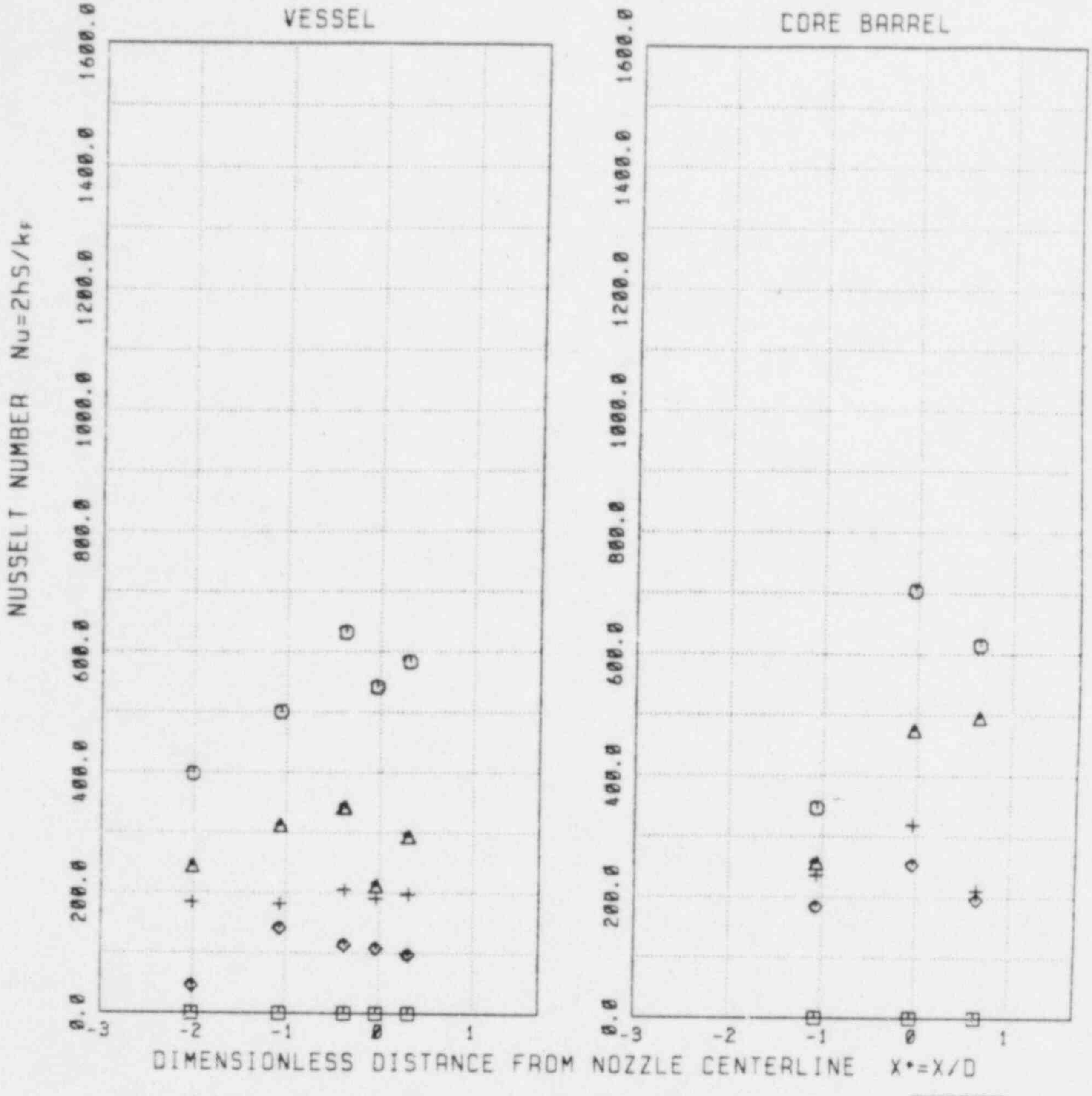


FIGURE 4.6.b TEST MAY105
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 6: 0.77 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_B	t (sec)	NORMALIZING FACTORS
⊡	0.0	99	D =36.3 cm(14.3 in)
⊖	0.3	192	K_f=0.61 -0.69 W/m-C
Δ	0.7	462	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	923	S_{vessel}=0.059 m (0.192 ft)
◇	3.5	2400	S_{core} =0.041 m (0.133 ft)

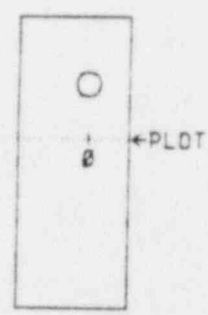
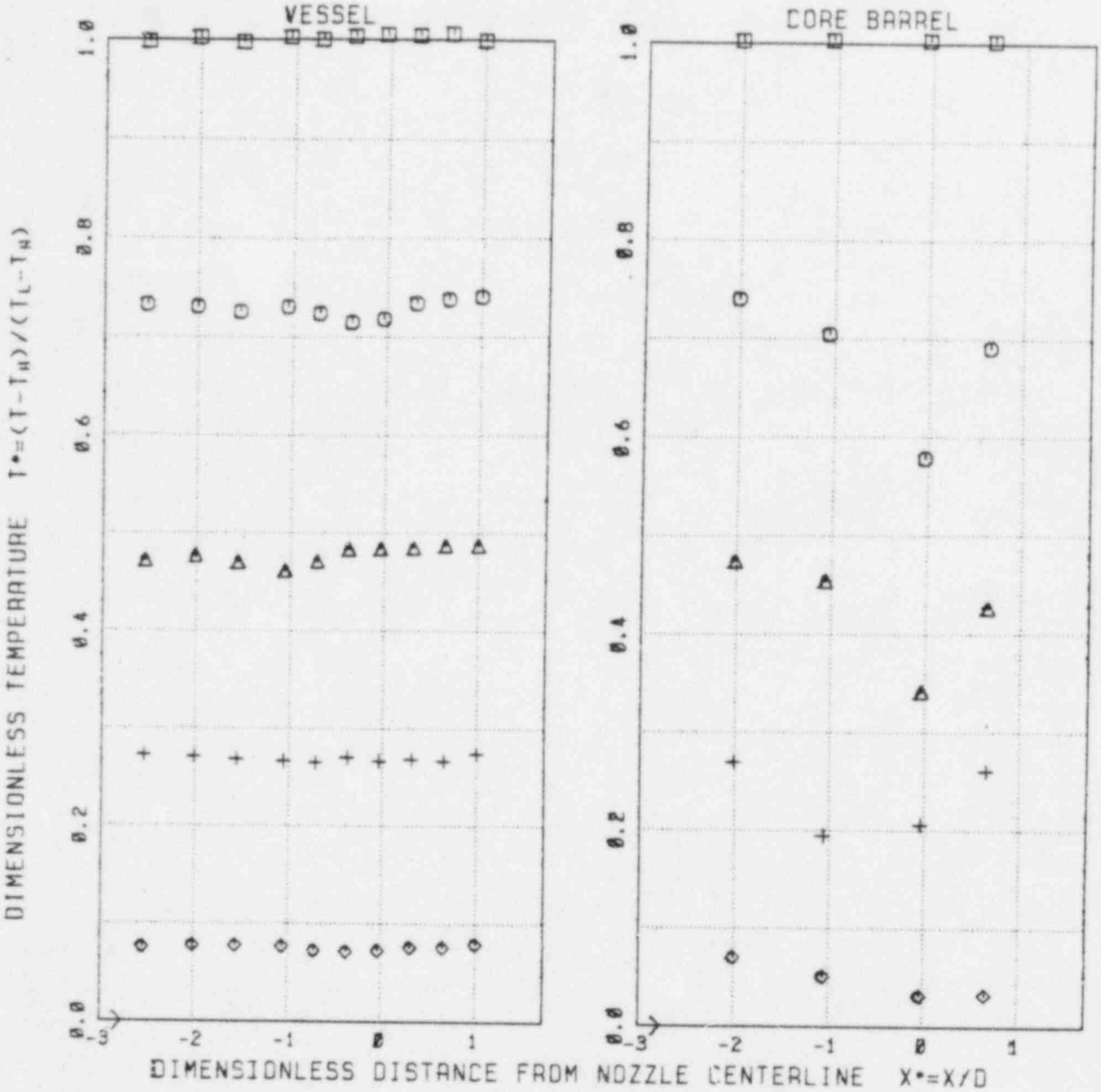


FIGURE 4.6.c TEST MAY105
DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES
(INSTRUMENT ROW 6: 0.77 m. BELOW NOZZLE CENTERLINE)

332



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	99	T_L= 14.2 °C
⊙	0.3	192	(57.6 °F)
Δ	0.7	462	T_L=188.6 °C
+	1.4	923	(371.4 °F)
◇	3.5	2400	D= 36.3 cm.
			(14.3 in.)

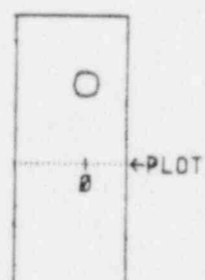
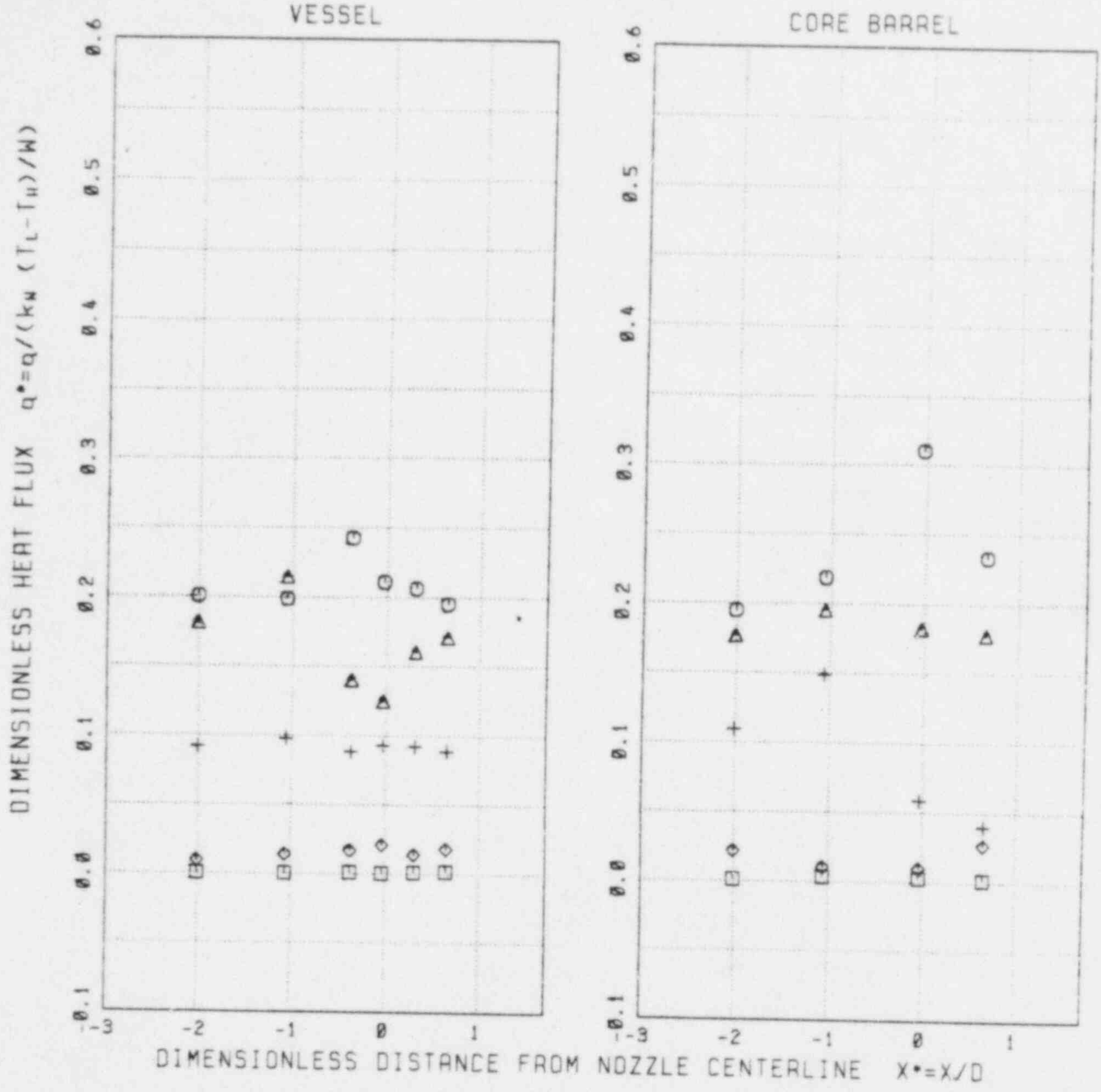


FIGURE 4.7.o TEST MAY105

DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES

(INSTRUMENT ROW 7: 1.13 m. BELOW NOZZLE CENTERLINE)

Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	99	T_L=188.6 C (371.4 F)
⊙	0.3	192	T_W= 14.2 C (57.6 F)
Δ	0.7	462	K_W=50.10 W/m - C
+	1.4	923	(28.95 Btu/ft-hr- F)
◇	3.5	2400	W = 5.00 cm(2.00in)
			D =36.35 cm(14.31in)

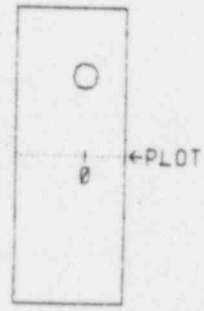
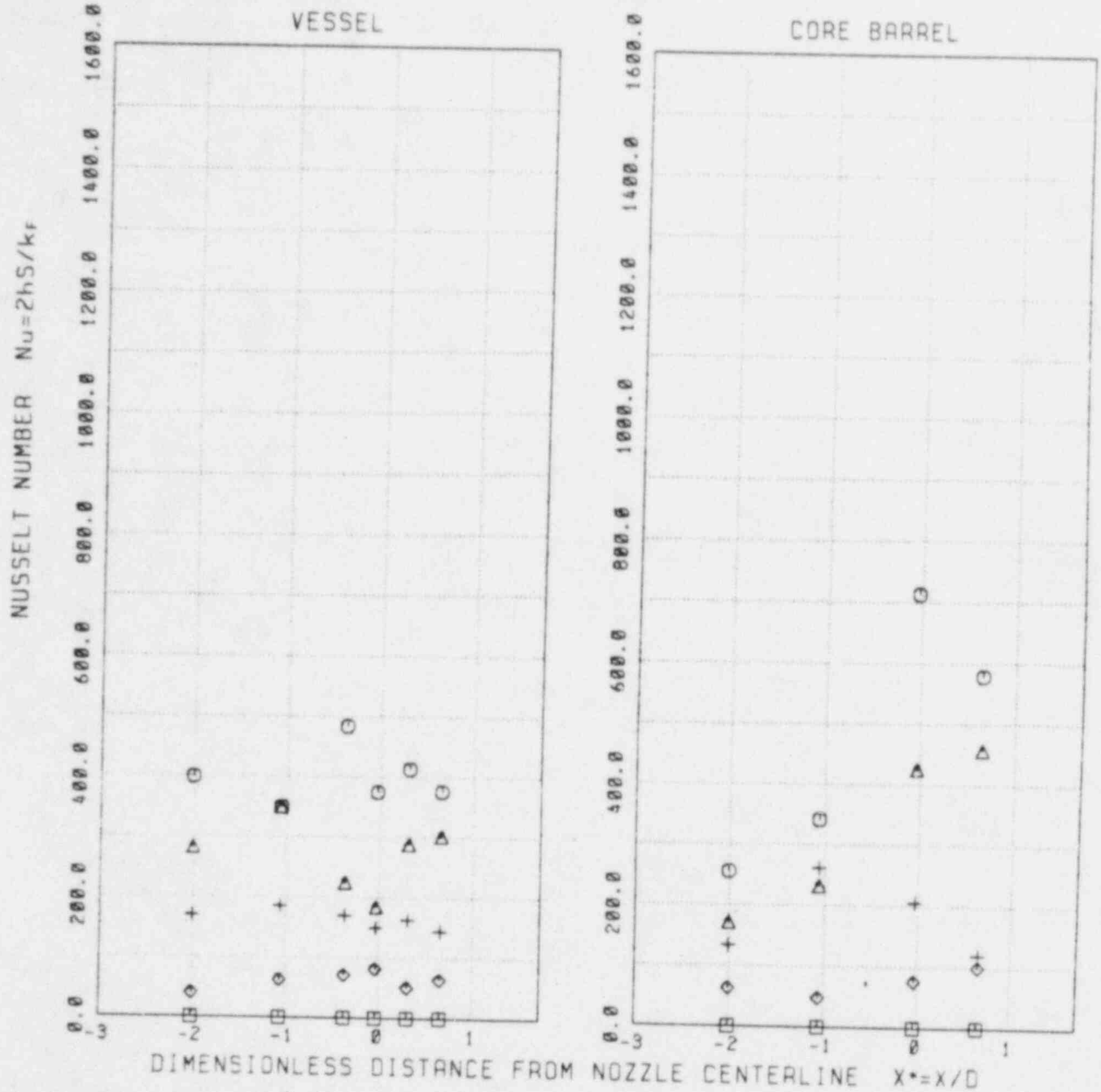


FIGURE 4.7.b TEST MAY105
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 7: 1.13 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_m	t (sec)	NORMALIZING FACTORS
⊞	0.0	99	D =36.3 cm(14.3 in)
⊖	0.3	192	K_F=0.61 -0.69 W/m- C
△	0.7	462	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	923	S_{Vessel}=0.059 m (0.192 ft)
◇	3.5	2400	S_{Core} =0.041 m (0.133 ft)

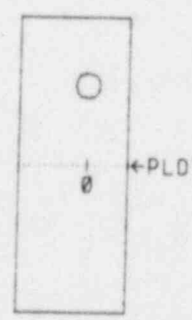
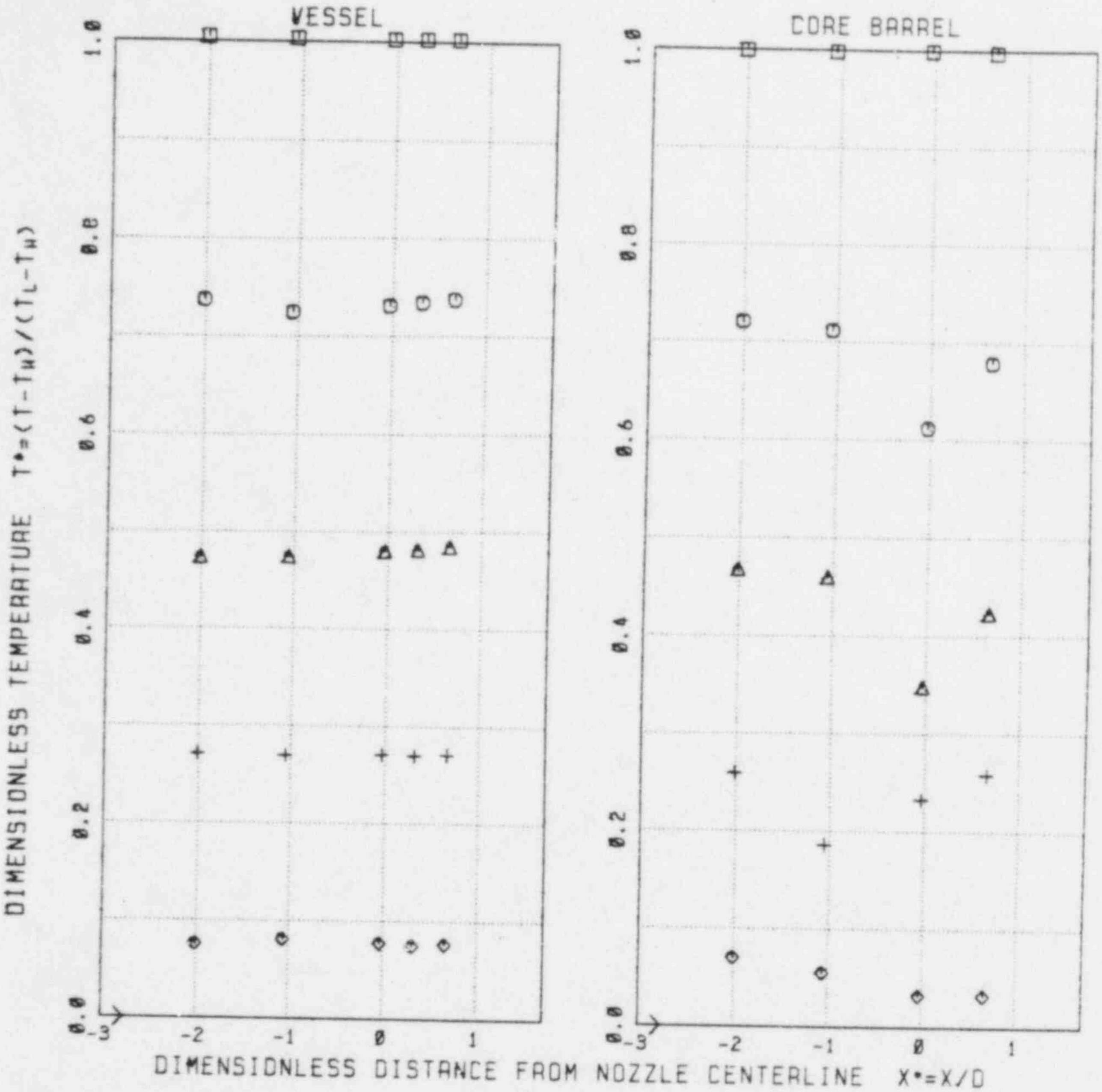


FIGURE 4.7.c TEST MAY105
DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES
(INSTRUMENT ROW 7: 1.13 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊟	0.0	99	T_L= 14.2 °C
⊖	0.3	192	(57.6 °F)
Δ	0.7	462	T_L=188.6 °C
+	1.4	923	(371.4 °F)
⊘	3.5	2400	D= 36.3 cm.
			(14.3 in.)

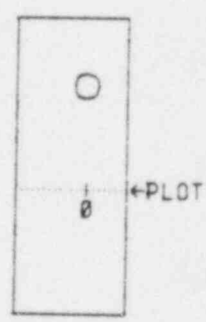
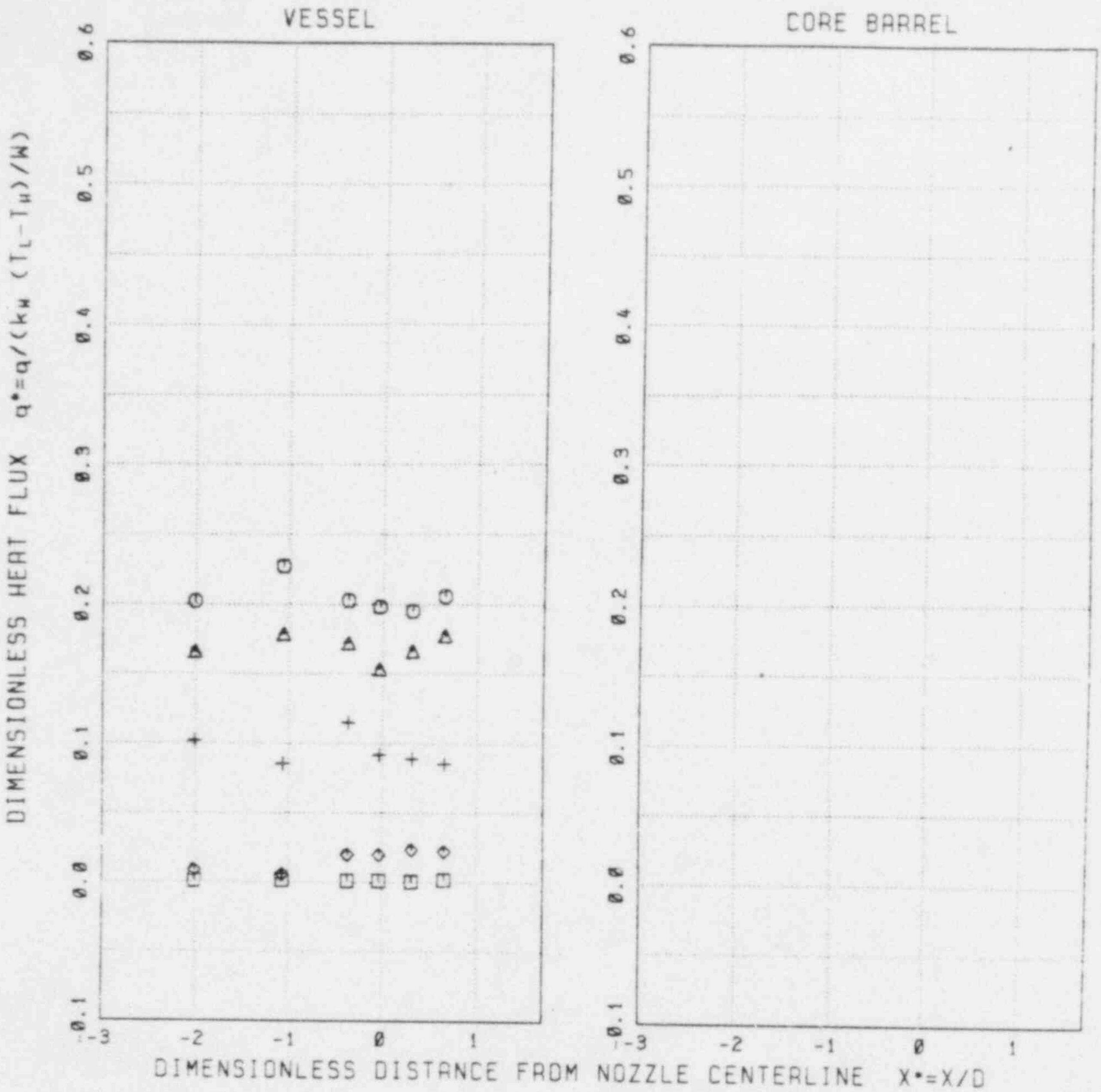


FIGURE 4.8.o TEST MAY105
DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES
(INSTRUMENT ROW B: 1.49 m. BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_e	t (sec)	NORMALIZING FACTORS
⊟	0.0	99	T_L=188.6 C (371.4 F)
⦶	0.3	192	T_W= 14.2 C (57.6 F)
Δ	0.7	462	K_W=50.10 W/m - C
+	1.4	923	(28.95 Btu/ft-hr- F)
◇	3.5	2400	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

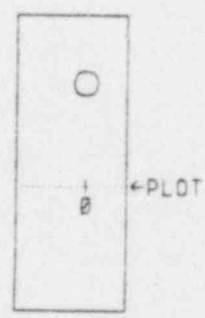
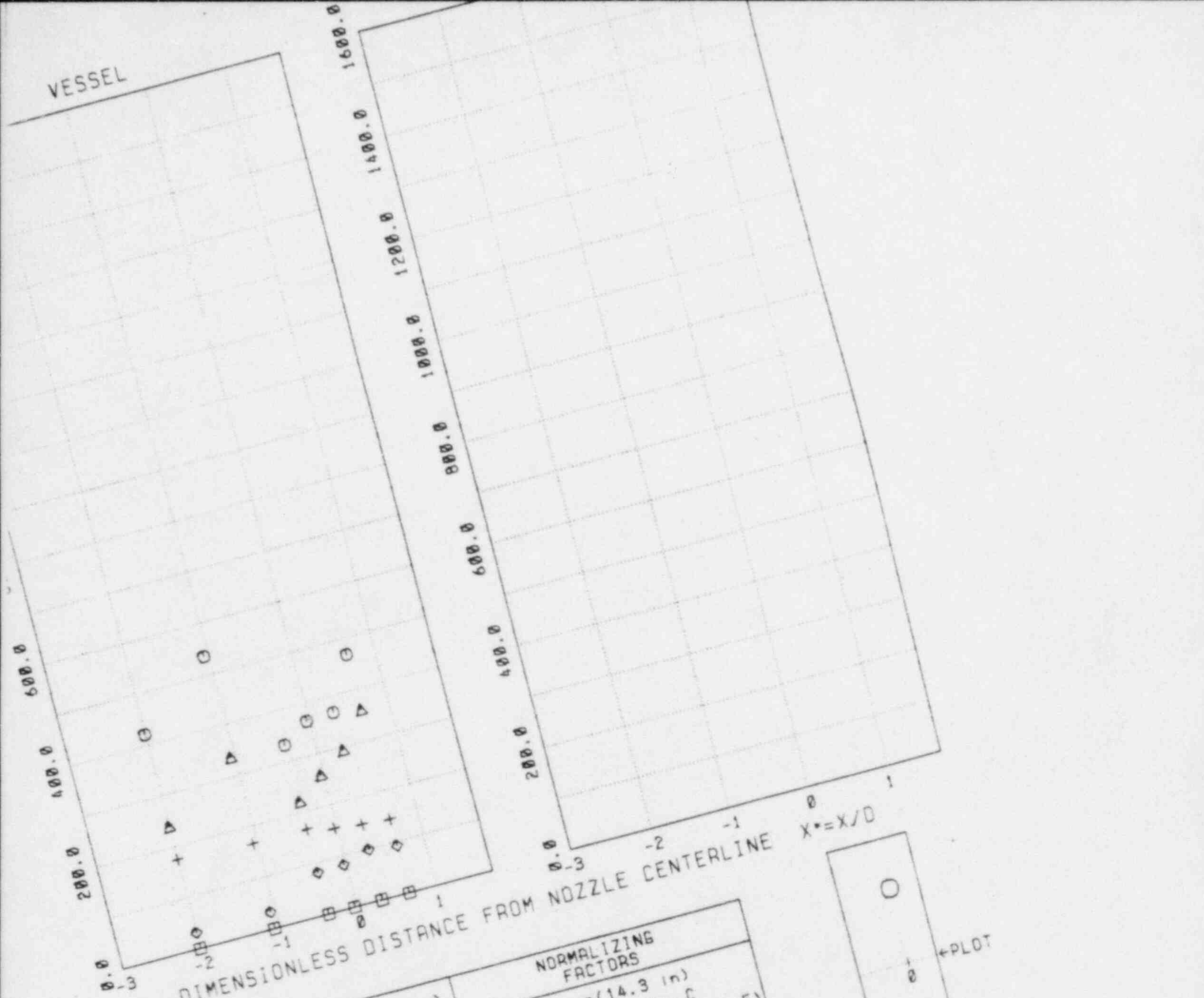


FIGURE 4.8.b TEST MAY105
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 8: 1.49 m. BELOW NOZZLE CENTERLINE)

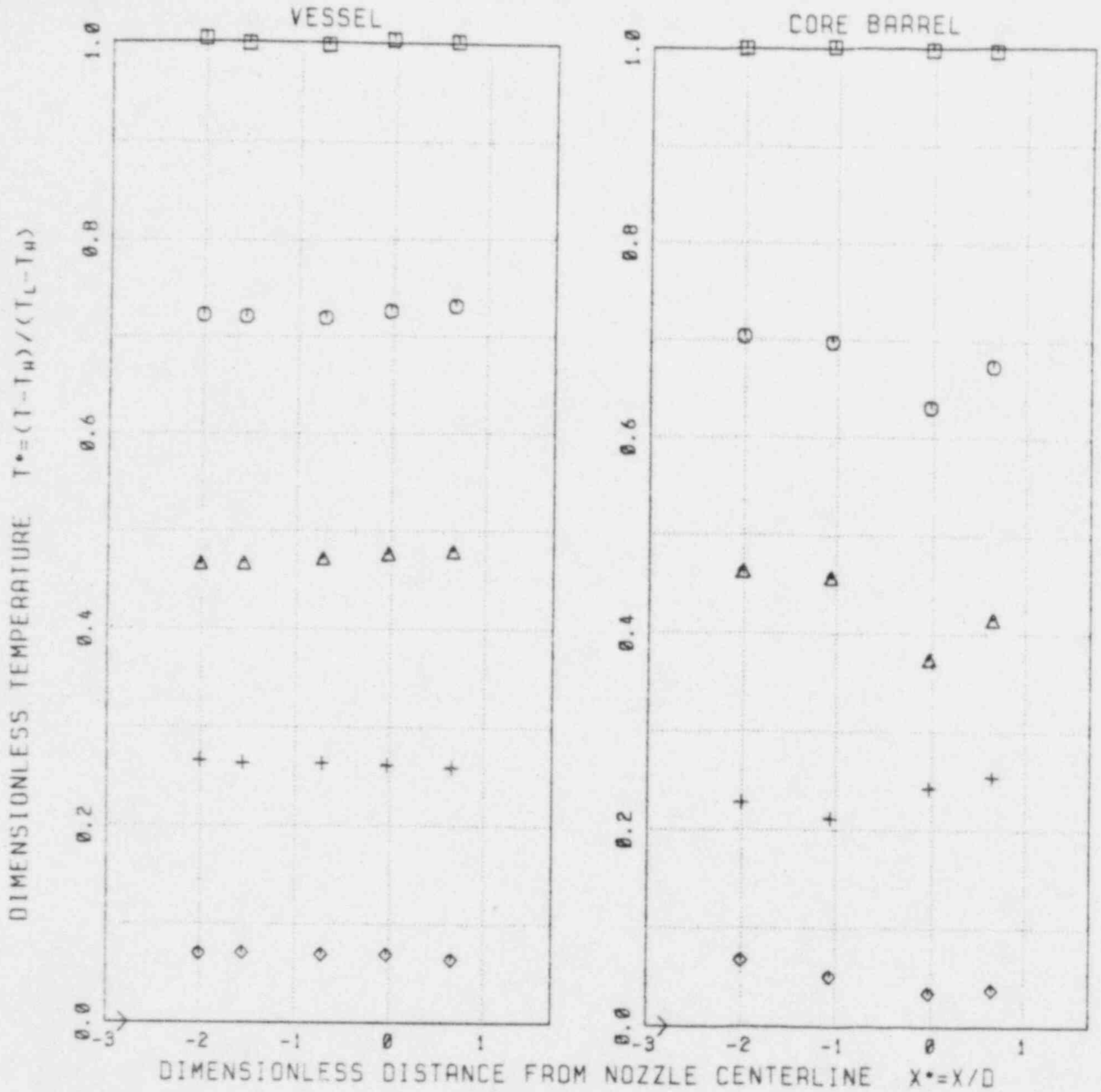


SYMBOL	t/τ_e	t (sec)	NORMALIZING FACTORS
□	0.0	99	D =36.3 cm(14.3 in) K_f=0.61 -0.69 W/m- C (0.35 -0.40 Btu/ft-hr-F) S_{vessel}=0.059 m (0.192 ft) S_{core} =0.041 m (0.133 ft)
Θ	0.3	192	
Δ	0.7	462	
+	1.4	923	
◇	3.5	2400	

FIGURE 4.8.c TEST MAY105

DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES

(INSTRUMENT ROW 8: 1.49 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊞	0.0	99	T_L= 14.2 °C
⊙	0.3	192	(57.6 °F)
△	0.7	462	T_L=188.6 °C
+	1.4	923	(371.4 °F)
◇	3.5	2400	D= 36.3 cm.
			(14.3 in.)

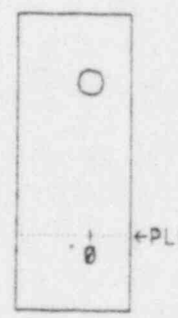
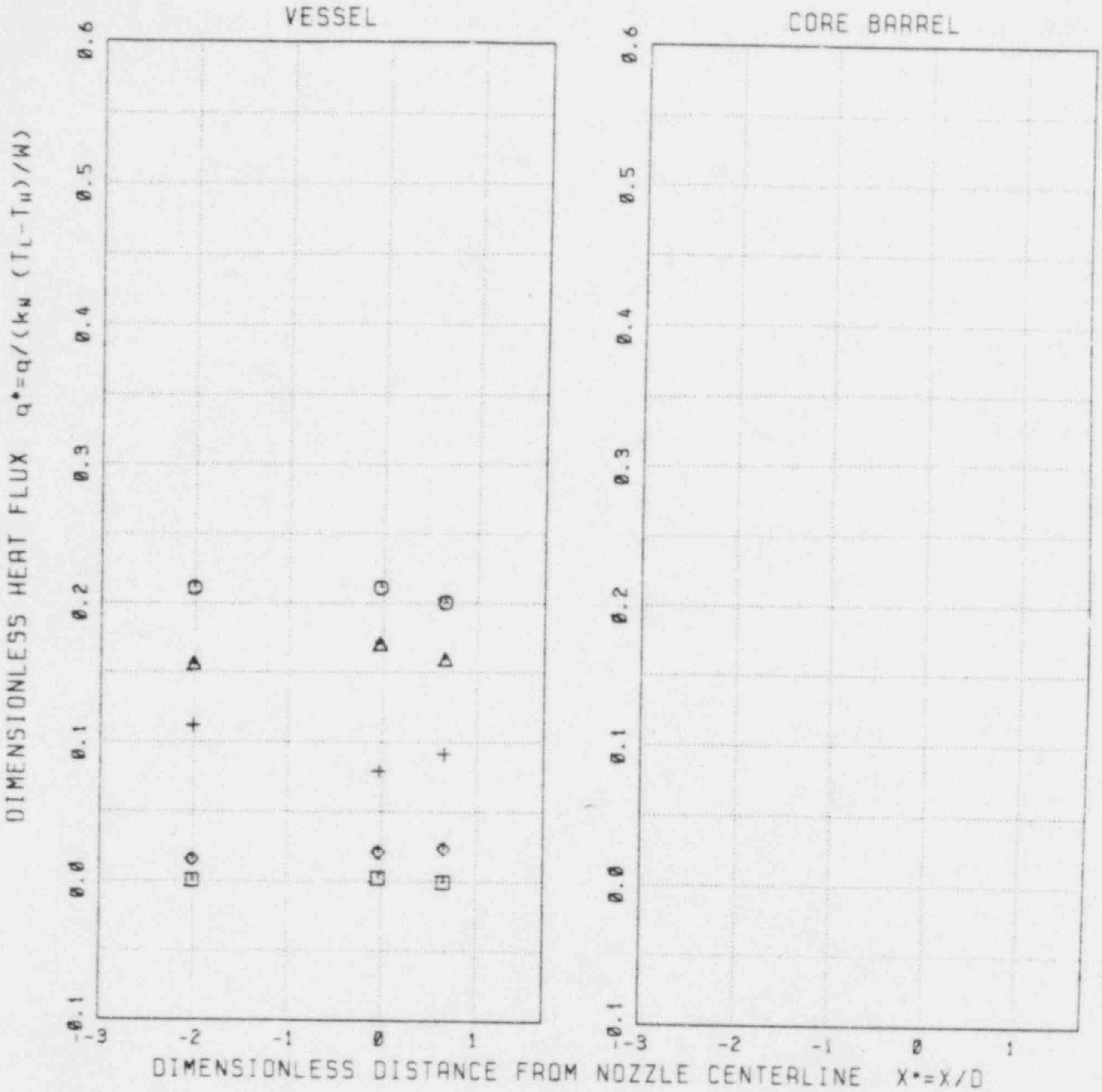


FIGURE 4.9.a TEST MAY105

DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES

(INSTRUMENT ROW 9: 2.22 m. BELOW NOZZLE CENTERLINE)

Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊟	0.0	99	T_L=188.6 C (371.4 F)
⊖	0.3	192	T_W= 14.2 C (57.6 F)
△	0.7	462	K_W=50.10 W/m - C
+	1.4	923	(28.95 Btu/ft-hr- F)
◇	3.5	2400	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

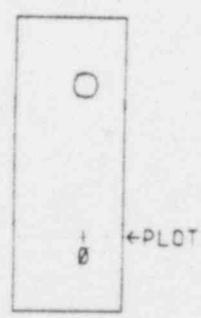
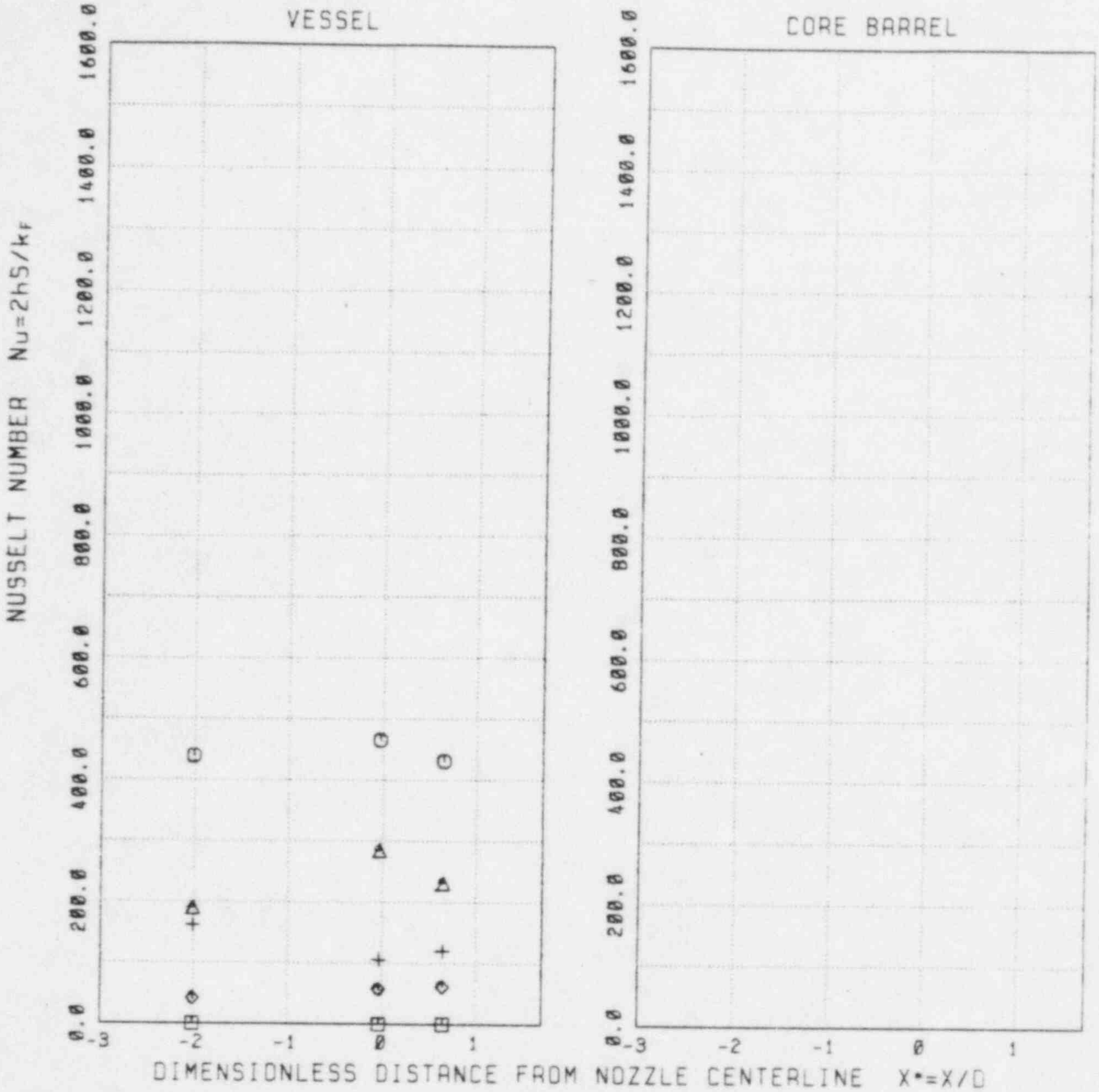


FIGURE 4.9.b TEST MAY105
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 9: 2.22 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊞	0.0	99	D =36.3 cm(14.3 in)
⊖	0.3	192	K_F=0.61 -0.69 W/m- C
△	0.7	462	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	923	S_{vessel}=0.059 m (0.192 ft)
◇	3.5	2400	S_{core} =0.041 m (0.133 ft)

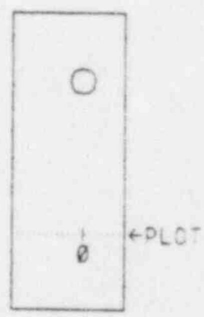
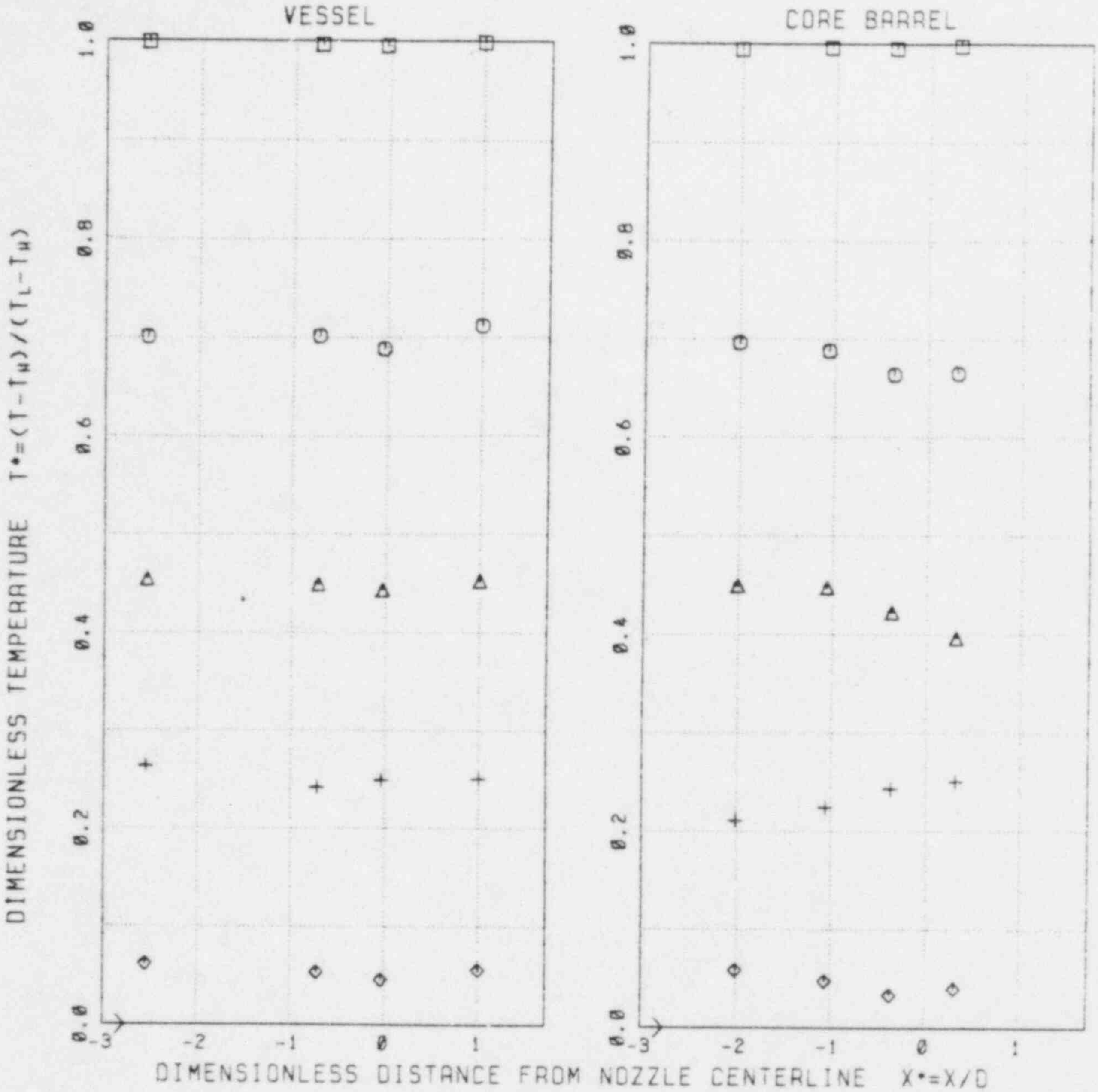


FIGURE 4.9.c TEST MAY105

DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES

(INSTRUMENT ROW 9: 2.22 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	99	T_L= 14.2 °C
⊙	0.3	192	(57.6 °F)
△	0.7	462	T_L=188.6 °C
+	1.4	923	(371.4 °F)
◇	3.5	2400	D= 36.3 cm.
			(14.3 in.)

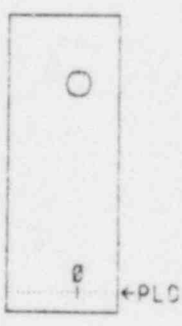
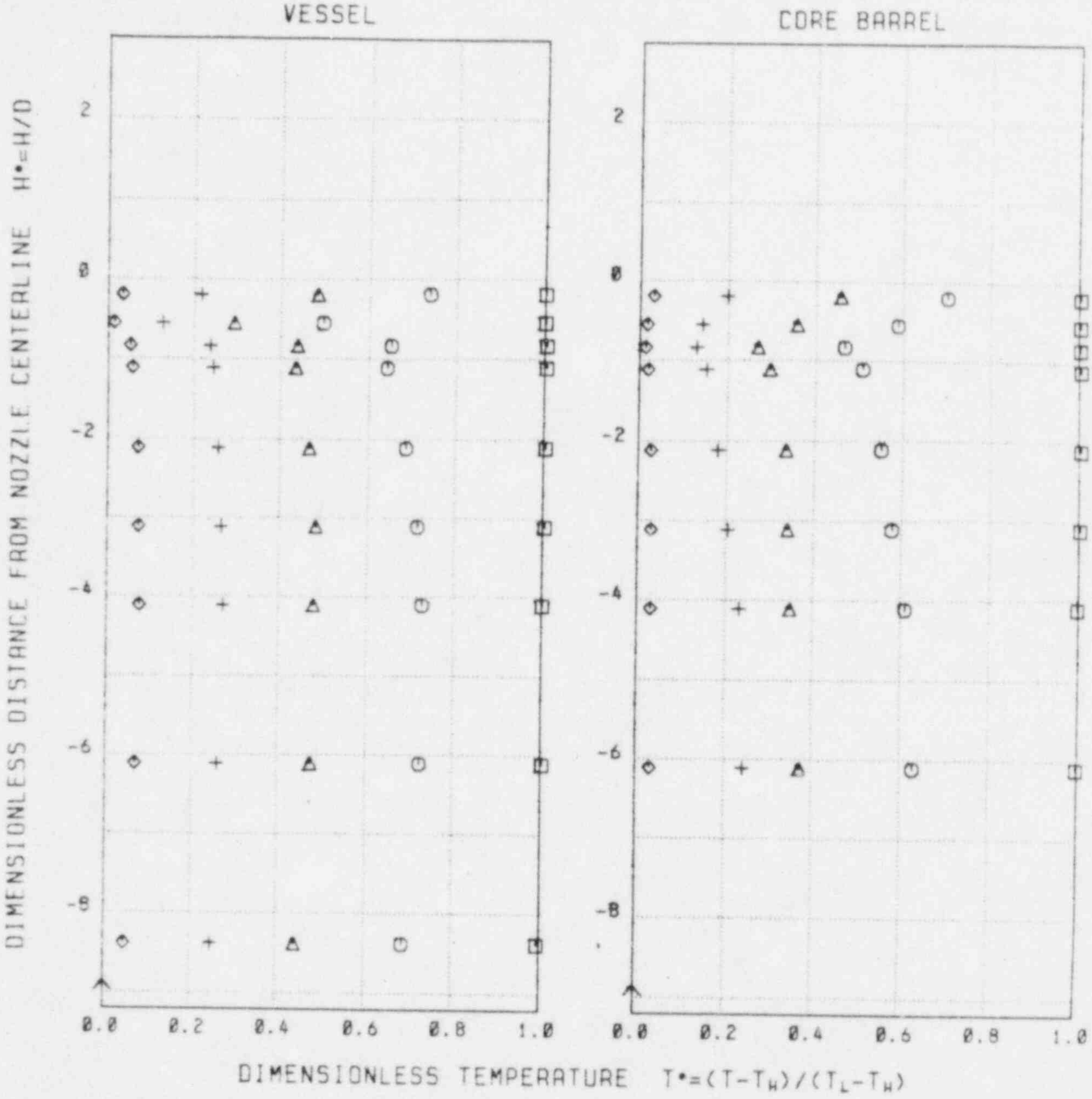


FIGURE 4.10 TEST MAY105

DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES

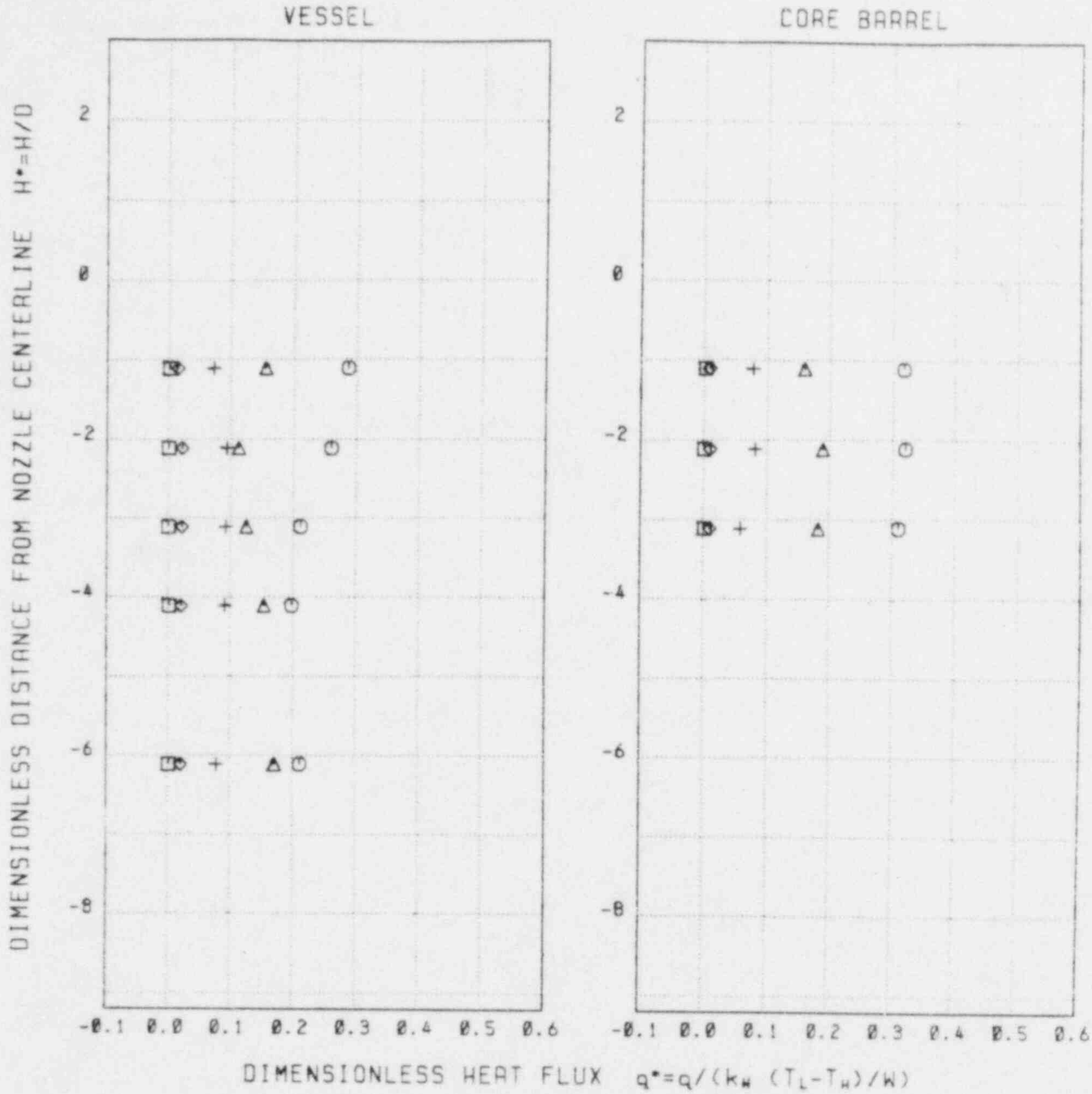
(INSTRUMENT ROW 10 3.05 m. BELOW NOZZLE CENTERLINE)

Arrow Indicates Mixed Mean Temperature



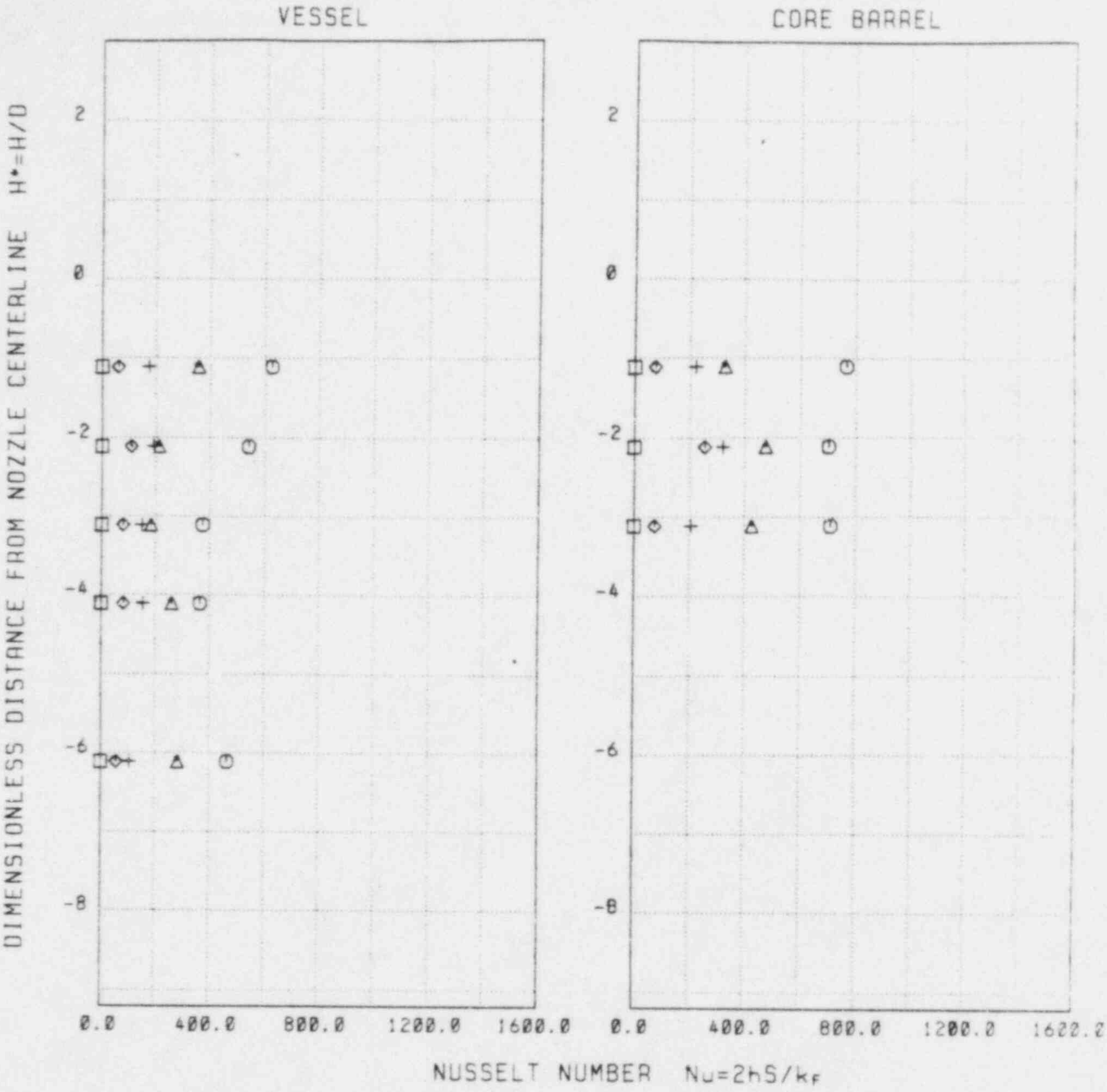
SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
□	0.0	99	T_H= 14.2 °C (57.6 °F)
⊙	0.3	192	T_L=188.6 °C (371.4 °F)
△	0.7	462	D= 36.3 cm (14.3 in.)
+	1.4	923	
◇	3.5	2400	

FIGURE 4.11.a TEST MAY105
DOWNCOMER VERTICAL FLUID TEMPERATURE PROFILES
(INSTRUMENT COLUMN 7 : BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	99	T_L=188.6 C (371.4 F)
⊙	0.3	192	T_w= 14.2 C (57.6 F)
△	0.7	462	K_w=50.10 W/m - C
+	1.4	923	(28.95 Btu/ft-hr- F)
◇	3.5	2400	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

FIGURE 4.11.b TEST MAY105
DOWNCOMER VERTICAL HEAT FLUX PROFILES
(INSTRUMENT COLUMN 7 : BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	τ (sec)	NORMALIZING FACTORS
⊟	0.0	99	D =36.3 cm(14.3 in)
⊖	0.3	192	K_f=0.61 -0.69 W/m- C
Δ	0.7	462	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	923	S_{Vessel} - see Table 1
◇	3.5	2400	S_{Core} - see Table 1

FIGURE 4.11.c TEST MAY105
DOWNCOMER VERTICAL NUSSELT NUMBER PROFILES
(INSTRUMENT COLUMN 7 : BELOW NOZZLE CENTERLINE)

APPENDIX B

DATA FOR TEST MAY106

TEST CONDITIONS

HPI Cold Leg Froude Number, F_{CL} . . . . . .: 0.052

Loop Flow Ratio, Q_L/Q_H . . . .: 0

Vent Flow Ratio, Q_V/Q_H . . . .: 0

Density Ratio, $\Delta\rho/\rho$ . . . .: 0.121

NOMENCLATURE FOR APPENDICES A AND B

D	Diameter, m
F	Froude number
H	Vertical distance along downcomer, measured from cold leg centerline, m
h	Heat transfer coefficient, W/m^2-°C
j	Superficial velocity, m/s
k	Thermal conductivity, W/m-°C
Nu	Nusselt number
Q	Volumetric flow rate, m^3/s
q	Heat flux, W/m^2
S	Downcomer gap width, m
T	Temperature, °C
t	Time, s
V	Velocity, m/s
W	Width, m
X	Horizontal distance along downcomer, measured from cold leg centerline, m
Y	Horizontal distance across downcomer, measured from vessel wall, m
Z	Vertical distance measured from bottom of cold leg, m

Subscripts

CL	Cold leg
DC	Downcomer
F	Fluid
H	HPI
L	Loop
M	Mixed mean
s	Standpipe
T	Total
V	Vent
W	Wall

Superscripts

*	Dimensionless

Greek Symbols

ρ	Density, Kg/m^3
τ	Mixing time, s

TABLE 1 - TEST MAY106

GEOMETRIC CONFIGURATION

TEST SETUP	
COLD LEG :	horizontal 2
HPI INJECTOR :	D
THERMAL SHIELD :	in place
LOWER PLENUM FLOW SKIRT :	not in place

VOLUMES, m^3 (ft^3)		
LOOP SEAL - RISER	0.219	(7.73)
- HORIZONTAL	0.202	(7.13)
- PUMP LINK	0.081	(2.86)
PUMP	0.272	(9.60)
COLD LEG - UPSTREAM INJ.	0.131	(4.62)
- DOWNSTREAM INJ.	0.276	(9.73)
DOWNCOMER - ABOVE NOZZLE	0.242	(8.54)
- BELOW NOZZLE	0.592	(20.91)
LOWER PLENUM	0.605	(21.35)
STAND PIPE	0.120	(4.24)
TOTAL	2.740	(96.71)

DIMENSIONS, m (ft)		
COLD LEG DIAMETER (ID)	0.363	(1.192)
DOWNCOMER WIDTH	1.618	(5.308)
DOWNCOMER GAP - VESSEL	0.059	(0.192)
- CORE	0.041	(0.133)
- THERMAL SHIELD	0.038	(0.125)

TABLE 2 - TEST MAY106
TEST CONDITIONS

PARAMETER	NOMINAL	ACTUAL	
		MEAN	ST. DEV.
FLOWS, m^3/s (ft^3/s)			
HPI, Q_H	0.345E-02 (0.122E+00)	0.353E-02 (0.125E+00)	0.154E-03 (0.543E-02)
LOOP, Q_L	0.000E+00 (0.000E+00)	0.000E+00 (0.000E+00)	0.000E+00 (0.000E+00)
VENT, Q_V	0.000E+00 (0.000E+00)	0.000E+00 (0.000E+00)	0.000E+00 (0.000E+00)
TOTAL, Q_T	0.345E-02 (0.122E+00)	0.353E-02 (0.125E+00)	0.154E-03 (0.543E-02)
TEMPERATURES, °C (°F)			
HPI, T_H	0.267E+02 (0.800E+02)	0.148E+02 (0.587E+02)	0.391E+00 (0.703E+00)
LOOP, T_L	0193E+3 (0.374E+3)	0.190E+03 (0.369E+03)	0.171E+01 (0.308E+01)
VENT, T_V	---	---	---
MIXED MEAN, T_M	0.267E+02 (0.800E+02)	0.148E+02 (0.587E+02)	0.362E+00 (0.652E+00)
SYSTEM PRESS., MPa (psia)	0.138E+01 (0.200E+03)	0.144E+01 (0.209E+03)	0.255E-01 (0.370E+01)
DIMENSIONLESS PARAMETERS			
COLD LEG FROUDE #, F_{CL}	0.500E-01	0.519E-01	0.215E-02
DENSITY RATIO, $\Delta\rho/\rho$	0.124E+00	0.121E+00	0.151E-02
FLOW RATIOS :			
Q_L/Q_H	0.000E+00	0.000E+00	0.000E+00
Q_V/Q_H	0.000E+00	0.000E+00	0.000E+00
$(Q_L+Q_V)/Q_H$	0.000E+00	0.000E+00	0.000E-00

TABLE 3 - TEST MAY106

FLUID PROPERTIES

FLOW	TEMPERATURE °C (°F)	DENSITY Kg/m³ (lbm/ft³)	K VISCOSITY Kg/m-s (lbm/ft-s)	ENTHALPY J/Kg (Btu/lbm)	CONDUCTIVITY W/m-°C (Btu/ft-hr-°F)
HPI	0.148E+02 (0.587E+02)	0.100E+04 (0.624E+02)	0.115E-02 (0.771E-03)	0.634E+05 (0.273E+02)	0.596E+00 (0.344E+00)
LOOP	0.190E+03 (0.374E+03)	0.877E+03 (0.547E+02)	0.141E-03 (0.949E-04)	0.807E+06 (0.347E+03)	0.668E+00 (0.386E+00)
VENT	---	---	---	---	---
MIXED MEAN	0.148E+02 (0.587E+02)	0.100E+04 (0.624E+02)	0.115E-02 (0.771E-03)	0.634E+05 (0.273E+02)	0.596E+00 (0.344E+00)

TABLE 4 - TEST MAY1Ø6 GLOBAL RESULTS		
MIXING TIMES, s		
DOWNCOMER[1]	853.9	
STANDPIPE	986.7	
COLD LEG VELOCITIES, m/s (ft/s)		
SUPERFICIAL	Ø.34ØE-Ø1	(Ø.112E+ØØ)
QUENCH FRONT	0.231E+00	(0.759E+00)
DOWNCOMER SUPERFICIAL VELOCITIES, m/s (ft/s)		
ABOVE THERMAL SHIELD	Ø.159E-Ø1	(Ø.522E-Ø1)
THERMAL SHIELD REGION	Ø.22ØE-Ø1	(Ø.721E-Ø1)
1. Ø.41 m (16") below cold leg centerline (V57CTC)		

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
TCLS1	O	Deg C	0.189E+03	0.239E+00	0.250E+02	0.300E+00	0.241E+02	0.191E+03	0
		Deg F	0.373E+03	0.430E+00	0.770E+02	0.540E+00	0.754E+02	0.375E+03	
TCLS2	O	Deg C	0.189E+03	0.418E+00	0.252E+02	0.332E+00	0.245E+02	0.191E+03	0
		Deg F	0.372E+03	0.752E+00	0.773E+02	0.597E+00	0.761E+02	0.375E+03	
TCLS3	O	Deg C	0.189E+03	0.125E+00	0.603E+02	0.111E+01	0.582E+02	0.191E+03	0
		Deg F	0.373E+03	0.226E+00	0.141E+03	0.200E+01	0.137E+03	0.376E+03	
TCLS4	O	Deg C	0.189E+03	0.425E+00	0.229E+02	0.274E+00	0.222E+02	0.189E+03	0
		Deg F	0.372E+03	0.765E+00	0.732E+02	0.493E+00	0.720E+02	0.373E+03	
TCLS5	O	Deg C	0.189E+03	0.392E+00	0.230E+02	0.297E+00	0.222E+02	0.190E+03	0
		Deg F	0.372E+03	0.706E+00	0.733E+02	0.534E+00	0.719E+02	0.373E+03	
TCLS6	O	Deg C	0.189E+03	0.281E+00	0.232E+02	0.221E+00	0.225E+02	0.190E+03	0
		Deg F	0.373E+03	0.506E+00	0.737E+02	0.398E+00	0.726E+02	0.374E+03	
TCPS1	O	Deg C	0.189E+03	0.155E+00	0.207E+02	0.209E+00	0.202E+02	0.190E+03	0
		Deg F	0.373E+03	0.279E+00	0.692E+02	0.376E+00	0.683E+02	0.375E+03	
TCPS2	O	Deg C	0.189E+03	0.208E+00	0.208E+02	0.263E+00	0.202E+02	0.190E+03	0
		Deg F	0.373E+03	0.374E+00	0.695E+02	0.474E+00	0.683E+02	0.374E+03	
TCPS3	O	Deg C	0.189E+03	0.257E+00	0.213E+02	0.612E+00	0.196E+02	0.191E+03	0
		Deg F	0.373E+03	0.463E+00	0.703E+02	0.110E+01	0.674E+02	0.376E+03	
TCPS4	O	Deg C	0.189E+03	0.272E+00	0.415E+02	0.168E+01	0.351E+02	0.191E+03	0
		Deg F	0.373E+03	0.489E+00	0.107E+03	0.303E+01	0.952E+02	0.376E+03	
TCCL1	O	Deg C	0.189E+03	0.210E+00	0.392E+02	0.269E+01	0.349E+02	0.190E+03	0
		Deg F	0.373E+03	0.378E+00	0.103E+03	0.485E+01	0.948E+02	0.374E+03	
TCCL2	N								
TCCL3	O	Deg C	0.189E+03	0.270E+00	0.367E+02	0.140E+01	0.339E+02	0.190E+03	0
		Deg F	0.373E+03	0.486E+00	0.981E+02	0.252E+01	0.930E+02	0.374E+03	
TCCL4	O	Deg C	0.189E+03	0.329E+00	0.365E+02	0.135E+01	0.334E+02	0.191E+03	0
		Deg F	0.373E+03	0.592E+00	0.978E+02	0.243E+01	0.921E+02	0.375E+03	
TCCL5	N								
TCCL6	O	Deg C	0.189E+03	0.119E+00	0.164E+02	0.233E+00	0.159E+02	0.190E+03	0
		Deg F	0.372E+03	0.215E+00	0.615E+02	0.420E+00	0.606E+02	0.374E+03	
TCCL7	O	Deg C	0.189E+03	0.232E+00	0.180E+02	0.911E+00	0.166E+02	0.191E+03	0
		Deg F	0.373E+03	0.417E+00	0.644E+02	0.164E+01	0.618E+02	0.375E+03	
TCCL8	O	Deg C	0.189E+03	0.257E+00	0.329E+02	0.293E+01	0.201E+02	0.191E+03	0
		Deg F	0.373E+03	0.462E+00	0.912E+02	0.528E+01	0.682E+02	0.376E+03	
TCCL9	O	Deg C	0.189E+03	0.257E+00	0.399E+02	0.160E+01	0.354E+02	0.190E+03	0
		Deg F	0.373E+03	0.463E+00	0.104E+03	0.288E+01	0.958E+02	0.375E+03	
TCCL10	O	Deg C	0.189E+03	0.568E+00	0.174E+02	0.228E+00	0.166E+02	0.190E+03	0
		Deg F	0.372E+03	0.102E+01	0.633E+02	0.410E+00	0.620E+02	0.373E+03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
TCCL11	N								
TCCL12	O	Deg C	0.189E+03	0.761E+00	0.174E+02	0.351E+00	0.166E+02	0.190E+03	0
		Deg F	0.372E+03	0.137E+01	0.633E+02	0.631E+00	0.618E+02	0.373E+03	
TCCL13	O	Deg C	0.188E+03	0.926E+00	0.170E+02	0.376E+00	0.164E+02	0.190E+03	0
		Deg F	0.371E+03	0.167E+01	0.626E+02	0.677E+00	0.614E+02	0.373E+03	
TCCL14	O	Deg C	0.187E+03	0.105E+01	0.164E+02	0.180E+00	0.160E+02	0.189E+03	0
		Deg F	0.369E+03	0.189E+01	0.616E+02	0.324E+00	0.608E+02	0.372E+03	
TCCL15	O	Deg C	0.187E+03	0.117E+01	0.162E+02	0.207E+00	0.156E+02	0.189E+03	0
		Deg F	0.369E+03	0.210E+01	0.612E+02	0.373E+00	0.601E+02	0.373E+03	
TCCL16	O	Deg C	0.188E+03	0.356E+00	0.163E+02	0.298E+00	0.156E+02	0.189E+03	0
		Deg F	0.371E+03	0.641E+00	0.613E+02	0.536E+00	0.601E+02	0.373E+03	
TCCL17	O	Deg C	0.189E+03	0.370E+00	0.173E+02	0.243E+00	0.168E+02	0.189E+03	0
		Deg F	0.372E+03	0.667E+00	0.631E+02	0.438E+00	0.623E+02	0.373E+03	
TCCL18	O	Deg C	0.189E+03	0.470E+00	0.177E+02	0.215E+00	0.171E+02	0.189E+03	0
		Deg F	0.372E+03	0.846E+00	0.639E+02	0.386E+00	0.629E+02	0.373E+03	
TCLC11	O	Deg C	0.190E+03	0.425E+00	0.170E+02	0.409E+00	0.158E+02	0.191E+03	0
		Deg F	0.373E+03	0.766E+00	0.626E+02	0.737E+00	0.605E+02	0.375E+03	
TCLC12	O	Deg C	0.190E+03	0.325E+00	0.169E+02	0.488E+00	0.159E+02	0.190E+03	0
		Deg F	0.374E+03	0.586E+00	0.624E+02	0.878E+00	0.606E+02	0.375E+03	
TCLC13	O	Deg C	0.190E+03	0.187E+00	0.183E+02	0.441E+00	0.172E+02	0.191E+03	0
		Deg F	0.374E+03	0.337E+00	0.649E+02	0.794E+00	0.630E+02	0.375E+03	
TCLC14	O	Deg C	0.190E+03	0.150E+00	0.188E+02	0.464E+00	0.178E+02	0.191E+03	0
		Deg F	0.374E+03	0.270E+00	0.658E+02	0.835E+00	0.640E+02	0.375E+03	
TCLC15	O	Deg C	0.190E+03	0.656E-01	0.190E+02	0.587E+00	0.175E+02	0.191E+03	0
		Deg F	0.374E+03	0.118E+00	0.661E+02	0.106E+01	0.635E+02	0.376E+03	
TCLC16	O	Deg C	0.190E+03	0.165E+00	0.184E+02	0.868E+00	0.168E+02	0.191E+03	0
		Deg F	0.374E+03	0.297E+00	0.650E+02	0.156E+01	0.622E+02	0.375E+03	
TCLC17	O	Deg C	0.190E+03	0.159E+00	0.193E+02	0.107E+01	0.174E+02	0.191E+03	0
		Deg F	0.374E+03	0.287E+00	0.668E+02	0.192E+01	0.634E+02	0.376E+03	
TCLC18	O	Deg C	0.190E+03	0.174E+00	0.196E+02	0.147E+01	0.172E+02	0.191E+03	0
		Deg F	0.374E+03	0.312E+00	0.672E+02	0.265E+01	0.630E+02	0.376E+03	
TCLC19	O	Deg C	0.190E+03	0.248E+00	0.204E+02	0.250E+01	0.169E+02	0.191E+03	0
		Deg F	0.374E+03	0.447E+00	0.686E+02	0.449E+01	0.624E+02	0.377E+03	
TCLC110	O	Deg C	0.190E+03	0.233E+00	0.245E+02	0.483E+01	0.171E+02	0.191E+03	0
		Deg F	0.374E+03	0.419E+00	0.762E+02	0.869E+01	0.628E+02	0.376E+03	
TCLC21	O	Deg C	0.189E+03	0.439E+00	0.162E+02	0.216E+00	0.157E+02	0.190E+03	0
		Deg F	0.372E+03	0.790E+00	0.612E+02	0.389E+00	0.603E+02	0.374E+03	
TCLC22	O	Deg C	0.190E+03	0.535E+00	0.155E+02	0.220E+00	0.148E+02	0.191E+03	0
		Deg F	0.375E+03	0.963E+00	0.599E+02	0.396E+00	0.587E+02	0.377E+03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
TCLC23	O	Deg C	0.187E+03	0.113E+01	0.164E+02	0.171E+00	0.158E+02	0.189E-03	0
		Deg F	0.368E+03	0.204E+01	0.615E+02	0.307E+00	0.605E+02	0.372E-03	
TCLC24	O	Deg C	0.190E+03	0.283E+00	0.155E+02	0.252E+00	0.150E+02	0.191E+03	0
		Deg F	0.374E+03	0.509E+00	0.598E+02	0.453E+00	0.591E+02	0.375E+03	
TCLC25	O	Deg C	0.185E+03	0.215E+01	0.164E+02	0.198E+00	0.160E+02	0.189E+03	0
		Deg F	0.366E+03	0.387E+01	0.616E+02	0.356E+00	0.607E+02	0.372E+03	
TCLC26	3 O	Deg C	0.681E+02	0.705E+00	0.200E+02	0.148E+00	0.196E+02	0.694E+02	0
		Deg F	0.155E+03	0.127E+01	0.680E+02	0.267E+00	0.674E+02	0.157E+03	
TCLC27	O	Deg C	0.190E+03	0.334E+00	0.165E+02	0.347E+00	0.158E+02	0.191E+03	0
		Deg F	0.374E+03	0.602E+00	0.617E+02	0.624E+00	0.605E+02	0.376E+03	
TCLC28	O	Deg C	0.190E+03	0.132E+00	0.156E+02	0.425E+00	0.149E+02	0.192E+03	0
		Deg F	0.374E+03	0.238E+00	0.600E+02	0.766E+00	0.588E+02	0.377E+03	
TCLC29	O	Deg C	0.190E+03	0.152E+00	0.163E+02	0.189E+00	0.158E+02	0.192E+03	0
		Deg F	0.375E+03	0.274E+00	0.614E+02	0.340E+00	0.605E+02	0.377E+03	
TCLC210	O	Deg C	0.190E+03	0.223E+00	0.163E+02	0.197E+00	0.158E+02	0.192E+03	0
		Deg F	0.374E+03	0.401E+00	0.614E+02	0.354E+00	0.605E+02	0.377E+03	
TCLC31	O	Deg C	0.190E+03	0.748E+00	0.173E+02	0.419E+00	0.165E+02	0.191E+03	0
		Deg F	0.374E+03	0.135E+01	0.631E+02	0.754E+00	0.617E+02	0.375E+03	
TCLC32	O	Deg C	0.190E+03	0.296E+00	0.174E+02	0.414E+00	0.165E+02	0.191E+03	0
		Deg F	0.374E+03	0.533E+00	0.633E+02	0.745E+00	0.617E+02	0.376E+03	
TCLC33	O	Deg C	0.190E+03	0.222E+00	0.175E+02	0.518E+00	0.166E+02	0.191E+03	0
		Deg F	0.375E+03	0.399E+00	0.635E+02	0.932E+00	0.619E+02	0.375E+03	
TCLC34	O	Deg C	0.190E+03	0.163E+00	0.174E+02	0.491E+00	0.164E+02	0.191E+03	0
		Deg F	0.375E+03	0.294E+00	0.634E+02	0.884E+00	0.615E+02	0.375E+03	
TCLC35	O	Deg C	0.190E+03	0.151E+00	0.176E+02	0.695E+00	0.164E+02	0.191E+03	0
		Deg F	0.375E+03	0.272E+00	0.638E+02	0.125E+01	0.615E+02	0.376E+03	
TCLC36	O	Deg C	0.191E+03	0.155E+00	0.182E+02	0.949E+00	0.165E+02	0.191E+03	0
		Deg F	0.375E+03	0.279E+00	0.648E+02	0.171E+01	0.618E+02	0.376E+03	
TCLC37	O	Deg C	0.190E+03	0.126E+00	0.193E+02	0.102E+01	0.172E+02	0.192E-03	0
		Deg F	0.375E+03	0.227E+00	0.667E+02	0.183E+01	0.629E+02	0.378E+03	
TCLC38	O	Deg C	0.190E+03	0.153E+00	0.226E+02	0.183E+01	0.186E+02	0.193E+03	0
		Deg F	0.375F+03	0.276E+00	0.727E+02	0.329E+01	0.654E+02	0.379E+03	
TCLC39	O	Deg C	0.190E+03	0.251E+00	0.293E+02	0.724E+00	0.276E+02	0.191E+03	0
		Deg F	0.374E+03	0.451E+00	0.848E+02	0.130E+01	0.817E+02	0.377E+03	
TCLC310	O	Deg C	0.190E+03	0.258E+00	0.344E+02	0.150E+01	0.311E+02	0.191E+03	0
		Deg F	0.374E+03	0.465E+00	0.940E+02	0.271E+01	0.879E+02	0.376E+03	
TCLC41	N								
TCLC42	N								

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[5]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
TCLC43	N								
TCLC44	N								
TCLC45	N								
TCLC46	N								
TCLC47	N								
TCLC48	N								
TCLC49	N								
TCLC410	N								
TCLC51	O	Deg C Deg F	0.190E+03 0.374E+03	0.381E+00 0.686E+00	0.174E+02 0.633E+02	0.264E+00 0.475E+00	0.168E+02 0.622E+02	0.191E+03 0.375E-03	0
TCLC52	O	Deg C Deg F	0.190E+03 0.375E+03	0.203E+00 0.366E+00	0.163E+02 0.614E+02	0.329E+00 0.592E+00	0.155E+02 0.598E+02	0.191E+03 0.375E+03	0
TCLC53	O	Deg C Deg F	0.190E+03 0.375E+03	0.207E+00 0.373E+00	0.176E+02 0.637E+02	0.300E+00 0.540E+00	0.169E+02 0.624E+02	0.191E+03 0.375E+03	0
TCLC54	O	Deg C Deg F	0.190E+03 0.374E+03	0.174E+00 0.313E+00	0.167E+02 0.621E+02	0.542E+00 0.976E+00	0.155E+02 0.599E+02	0.191E+03 0.375E+03	0
TCLC55	O	Deg C Deg F	0.190E+03 0.375E+03	0.697E-01 0.125E+00	0.184E+02 0.652E+02	0.639E+00 0.115E-01	0.171E+02 0.627E+02	0.191E+03 0.376E+03	0
TCLC56	O	Deg C Deg F	0.191E+03 0.376E+03	0.165E+00 0.296E+00	0.197E+02 0.674E+02	0.140E+01 0.252E+01	0.167E+02 0.620E+02	0.192E+03 0.377E+03	0
TCLC57	O	Deg C Deg F	0.190E+03 0.375E+03	0.127E+00 0.229E+00	0.230E+02 0.735E+02	0.130E+01 0.233E+01	0.192E+02 0.665E+02	0.191E+03 0.376E+03	0
TCLC58	O	Deg C Deg F	0.190E+03 0.374E+03	0.992E-01 0.179E+00	0.263E+02 0.793E+02	0.215E+01 0.387E+01	0.184E+02 0.652E+02	0.191E+03 0.375E+03	0
TCLC59	O	Deg C Deg F	0.190E+03 0.375E+03	0.163E+00 0.294E+00	0.294E+02 0.849E+02	0.661E+00 0.119E+01	0.282E+02 0.827E+02	0.191E+03 0.376E+03	0
TCLC510	O	Deg C Deg F	0.191E+03 0.375E+03	0.149E+00 0.268E+00	0.331E+02 0.916E+02	0.244E+01 0.439E+01	0.295E+02 0.850E+02	0.192E+03 0.378E+03	0
TCLC5R1	O	Deg C Deg F	0.190E+03 0.374E+03	0.164E+00 0.294E+00	0.339E+02 0.930E+02	0.323E+01 0.582E+01	0.291E+02 0.844E+02	0.191E+03 0.377E+03	0
TCLC5R2	O	Deg C Deg F	0.190E+03 0.374E+03	0.108E+00 0.194E+00	0.274E+02 0.813E+02	0.127E+01 0.228E+01	0.220E+02 0.716E+02	0.191E+03 0.375E+03	0

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
TCLC5A3	0	Deg C	0.190E+03	0.144E-01	0.224E+02	0.222E+01	0.174E+02	0.191E+03	0
		Deg F	0.374E+03	0.258E-01	0.724E+02	0.400E+01	0.634E+02	0.376E+03	
TCLC5A4	0	Deg C	0.190E+03	0.125E+00	0.177E+02	0.602E+00	0.166E+02	0.191E+03	0
		Deg F	0.375E+03	0.224E+00	0.639E+02	0.108E+01	0.619E+02	0.375E+03	
TCLC5A5	0	Deg C	0.190E+03	0.181E+00	0.173E+02	0.366E+00	0.166E+02	0.192E+03	0
		Deg F	0.374E+03	0.325E+00	0.631E+02	0.659E+00	0.619E+02	0.377E+03	
TCLC5L1	0	Deg C	0.190E+03	0.126E+00	0.339E+02	0.225E+01	0.308E+02	0.192E+03	0
		Deg F	0.374E+03	0.227E+00	0.931E+02	0.406E+01	0.875E+02	0.377E+03	
TCLC5L2	0	Deg C	0.190E+03	0.213E-01	0.279E+02	0.960E+00	0.263E+02	0.191E+03	0
		Deg F	0.374E+03	0.383E-01	0.822E+02	0.173E+01	0.793E+02	0.375E+03	
TCLC5L3	0	Deg C	0.190E+03	0.166E+00	0.242E+02	0.839E+00	0.215E+02	0.191E+03	0
		Deg F	0.374E+03	0.299E+00	0.756E+02	0.151E+01	0.706E+02	0.376E+03	
TCLC5L4	0	Deg C	0.190E+03	0.116E+00	0.207E+02	0.133E+01	0.176E+02	0.191E+03	0
		Deg F	0.374E+03	0.208E+00	0.692E+02	0.239E+01	0.637E+02	0.375E+03	
TCLC5L5	0	Deg C	0.190E+03	0.737E-01	0.178E+02	0.376E+00	0.167E+02	0.191E+03	0
		Deg F	0.374E+03	0.133E+00	0.640E+02	0.677E+00	0.621E+02	0.375E+03	
TCLC61	0	Deg C	0.189E+03	0.753E+00	0.165E+02	0.231E+00	0.161E+02	0.191E+03	0
		Deg F	0.372E+03	0.136E+01	0.618E+02	0.415E+00	0.609E+02	0.375E+03	
TCLC63	0	Deg C	0.190E+03	0.272E+00	0.169E+02	0.509E+00	0.158E+02	0.190E+03	0
		Deg F	0.374E+03	0.490E+00	0.624E+02	0.916E+00	0.604E+02	0.375E+03	
TCLC65	0	Deg C	0.190E+03	0.146E+00	0.173E+02	0.588E+00	0.162E+02	0.190E+03	0
		Deg F	0.374E+03	0.263E+00	0.631E+02	0.106E+01	0.611E+02	0.375E+03	
TCLC67	0	Deg C	0.190E+03	0.163E+00	0.181E+02	0.112E+01	0.164E+02	0.191E+03	0
		Deg F	0.374E+03	0.293E+00	0.645E+02	0.202E+01	0.616E+02	0.376E+03	
TCLC69	0	Deg C	-.308E+03	0.677E+00	-.307E+03	0.398E+00	-.308E+03	-.307E+03	0
		Deg F	-.523E+03	0.122E+01	-.521E+03	0.717E+00	-.523E+03	-.521E+03	
GAPJ11	0	Deg C	0.189E+03	0.112E+00	0.224E+02	0.145E+01	0.189E+02	0.191E+03	0
		Deg F	0.373E+03	0.202E+00	0.723E+02	0.261E+01	0.661E+02	0.375E+03	
GAPJ12	0	Deg C	0.189E+03	0.491E-01	0.226E+02	0.140E+01	0.187E+02	0.190E+03	0
		Deg F	0.373E+03	0.883E-01	0.728E+02	0.251E+01	0.656E+02	0.374E+03	
GAPJ13	0	Deg C	0.109E+03	0.489E-01	0.225E+02	0.169E+01	0.197E+02	0.190E+03	0
		Deg F	0.373E+03	0.880E-01	0.725E+02	0.305E+01	0.674E+02	0.374E+03	
GAPJ14	0	Deg C	0.190E+03	0.703E-01	0.222E+02	0.196E+01	0.193E+02	0.190E+03	0
		Deg F	0.373E+03	0.127E+00	0.719E+02	0.353E+01	0.667E+02	0.374E+03	
GAPJ15	0	Deg C	0.190E+03	0.418E-01	0.218E+02	0.206E+01	0.184E+02	0.191E+03	0
		Deg F	0.373E+03	0.753E-01	0.712E+02	0.371E+01	0.652E+02	0.376E+03	
GAPJ21	0	Deg C	0.190E+03	0.974E-01	0.177E+02	0.313E+00	0.170E+02	0.190E+03	0
		Deg F	0.373E+03	0.175E+00	0.638E+02	0.564E+00	0.626E+02	0.374E+03	
GAPJ22	0	Deg C	0.190E+03	0.134E+00	0.180E+02	0.568E+00	0.172E+02	0.191E+03	0
		Deg F	0.373E+03	0.241E+00	0.643E+02	0.102E+01	0.630E+02	0.375E+03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
GAPJ23	0	Deg C	0.190E+03	0.218E-01	0.184E+02	0.103E+01	0.171E+02	0.190E-03	0
		Deg F	0.373E+03	0.392E-01	0.651E+02	0.186E+01	0.628E+02	0.374E-03	
GAPJ24	0	Deg C	0.190E+03	0.145E+00	0.192E+02	0.142E+01	0.173E+02	0.190E+03	0
		Deg F	0.373E+03	0.261E+00	0.665E+02	0.256E+01	0.632E+02	0.374E+03	
GAPJ25	0	Deg C	0.190E+03	0.120E+00	0.197E+02	0.126E+01	0.175E+02	0.190E+03	0
		Deg F	0.373E+03	0.215E+00	0.674E+02	0.226E+01	0.634E+02	0.374E-03	
GAPJ31	0	Deg C	0.190E+03	0.406E-01	0.235E+02	0.161E+01	0.201E+02	0.190E-03	0
		Deg F	0.373E+03	0.731E-01	0.742E+02	0.290E+01	0.682E+02	0.374E+03	
GAPJ32	0	Deg C	0.190E+03	0.204E+00	0.227E+02	0.130E+01	0.190E+02	0.190E+03	0
		Deg F	0.374E+03	0.368E+00	0.728E+02	0.235E+01	0.661E+02	0.374E+03	
GAPJ33	0	Deg C	0.190E+03	0.133E+00	0.194E+02	0.141E+01	0.171E+02	0.190E+03	0
		Deg F	0.373E+03	0.239E+00	0.670E+02	0.254E+01	0.628E+02	0.374E+03	
GAPJ34	0	Deg C	0.190E+03	0.229E+00	0.176E+02	0.301E+00	0.168E+02	0.190E-03	0
		Deg F	0.374E+03	0.412E+00	0.637E+02	0.542E+00	0.623E+02	0.374E-03	
GAPJ35	0	Deg C	0.190E+03	0.220E+00	0.184E+02	0.873E+00	0.171E+02	0.190E-03	0
		Deg F	0.374E+03	0.396E+00	0.652E+02	0.157E+01	0.628E+02	0.375E-03	
V51CTC	0	Deg C	0.201E+03	0.180E+00	0.202E+03	0.240E+00	0.201E+03	0.202E+03	0
		Deg F	0.394E+03	0.324E+00	0.395E+03	0.432E+00	0.394E+03	0.395E+03	
V52CTC	0	Deg C	0.189E+03	0.152E+00	0.261E+02	0.632E+00	0.245E+02	0.189E+03	0
		Deg F	0.372E+03	0.273E+00	0.789E+02	0.114E+01	0.762E+02	0.373E+03	
V53CTC	0	Deg C	0.190E+03	0.360E-01	0.259E+02	0.566E+00	0.246E+02	0.190E+03	0
		Deg F	0.373E+03	0.648E-01	0.787E+02	0.102E+01	0.764E+02	0.375E+03	
V53FTC	0	Deg C	0.189E+03	0.192E+00	0.257E+02	0.704E+00	0.238E+02	0.190E+03	0
		Deg F	0.372E+03	0.346E+00	0.782E+02	0.127E+01	0.749E+02	0.374E+03	
V53MTC	0	Deg C	0.190E+03	0.115E+00	0.332E+02	0.351E+00	0.327E+02	0.191E+03	0
		Deg F	0.374E+03	0.207E+00	0.918E+02	0.632E+00	0.908E+02	0.376E-03	
V54CTC	0	Deg C	0.190E+03	0.202E+00	0.258E+02	0.915E+00	0.224E+02	0.190E+03	0
		Deg F	0.374E+03	0.364E+00	0.785E+02	0.165E+01	0.722E+02	0.374E-03	
V54FTC	0	Deg C	0.189E+03	0.137E+00	0.259E+02	0.897E+00	0.231E+02	0.190E-03	0
		Deg F	0.372E+03	0.246E+00	0.786E+02	0.161E+01	0.735E+02	0.374E+03	
V54MTC	0	Deg C	0.190E+03	0.178E+00	0.312E+02	0.255E+00	0.306E+02	0.191E-03	0
		Deg F	0.374E+03	0.320E+00	0.882E+02	0.458E+00	0.871E+02	0.376E+03	
V55CTC	0	Deg C	0.190E+03	0.775E-01	0.251E+02	0.119E+01	0.220E+02	0.190E+03	0
		Deg F	0.373E+03	0.140E+00	0.772E+02	0.215E+01	0.716E+02	0.374E+03	
V55FTC	0	Deg C	0.189E+03	0.257E-01	0.248E+02	0.151E+01	0.199E+02	0.190E+03	0
		Deg F	0.372E+03	0.462E-01	0.767E+02	0.272E+01	0.679E+02	0.374E+03	
V55MTC	0	Deg C	0.190E+03	0.145E+00	0.294E+02	0.301E+00	0.286E+02	0.191E+03	0
		Deg F	0.374E+03	0.260E+00	0.849E+02	0.542E+00	0.835E+02	0.375E+03	
V56CTC	0	Deg C	0.190E+03	0.271E+00	0.227E+02	0.146E+01	0.201E+02	0.190E+03	0
		Deg F	0.374E+03	0.488E+00	0.728E+02	0.252E+01	0.681E+02	0.375E+03	

TABLE 5 - TEST MAY1Ø6

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUES[3] MEAN	FINAL VALUES[3] ST DEV	MIN	MAX	SAT[4]
V56FTC	0	Deg C	Ø.189E+Ø8	Ø.127E+ØØ	Ø.227E+Ø2	Ø.11ØE+Ø1	Ø.2Ø1E+Ø2	Ø.19ØE+Ø3	Ø
		Deg F	Ø.372E+Ø8	Ø.229E+ØØ	Ø.728E+Ø2	Ø.198E+Ø1	Ø.681E+Ø2	Ø.373E+Ø3	
V56MTC	0	Deg C	Ø.191E+Ø3	Ø.178E+ØØ	Ø.272E+Ø2	Ø.469E+ØØ	Ø.261E+Ø2	Ø.191E+Ø3	Ø
		Deg F	Ø.375E+Ø3	Ø.32ØE+ØØ	Ø.81ØE+Ø2	Ø.843E+ØØ	Ø.791E+Ø2	Ø.377E-Ø3	
V57CTC	0	Deg C	Ø.19ØE+Ø3	Ø.243E+ØØ	Ø.226E+Ø2	Ø.982E+ØØ	Ø.2Ø3E+Ø2	Ø.19ØE-Ø3	Ø
		Deg F	Ø.374E+Ø3	Ø.437E+ØØ	Ø.727E+Ø2	Ø.177E+Ø1	Ø.686E+Ø2	Ø.375E-Ø3	
V57FTC	0	Deg C	Ø.189E+Ø3	Ø.2Ø5E+ØØ	Ø.224E+Ø2	Ø.131E+Ø1	Ø.184E+Ø2	Ø.19ØE-Ø3	Ø
		Deg F	Ø.372E+Ø3	Ø.37ØE+ØØ	Ø.723E+Ø2	Ø.236E+Ø1	Ø.651E+Ø2	Ø.374E-Ø3	
V57MTC	0	Deg C	Ø.19ØE+Ø3	Ø.151E+ØØ	Ø.272E+Ø2	Ø.341E+ØØ	Ø.26ØE+Ø2	Ø.191E-Ø3	Ø
		Deg F	Ø.375E+Ø3	Ø.271E+ØØ	Ø.8Ø9E+Ø2	Ø.615E+ØØ	Ø.788E+Ø2	Ø.375E-Ø3	
V58CTC	0	Deg C	Ø.19ØE+Ø3	Ø.217E+ØØ	Ø.233E+Ø2	Ø.163E+Ø1	Ø.179E+Ø2	Ø.19ØE-Ø3	Ø
		Deg F	Ø.373E+Ø3	Ø.39ØE+ØØ	Ø.74ØE+Ø2	Ø.294E+Ø1	Ø.642E÷Ø2	Ø.374E-Ø3	
V58FTC	0	Deg C	Ø.189E+Ø3	Ø.157E+ØØ	Ø.235E+Ø2	Ø.165E+Ø1	Ø.192E+Ø2	Ø.189E-Ø3	Ø
		Deg F	Ø.372E+Ø3	Ø.282E+ØØ	Ø.743E+Ø2	Ø.297E+Ø1	Ø.666E+Ø2	Ø.373E-Ø5	
V58MTC	0	Deg C	Ø.19ØE+Ø3	Ø.141E+ØØ	Ø.28ØE+Ø2	Ø.487E+ØØ	Ø.265E+Ø2	Ø.191E+Ø3	Ø
		Deg F	Ø.374E+Ø3	Ø.253E+ØØ	Ø.824E+Ø2	Ø.877E+ØØ	Ø.797E+Ø2	Ø.376E+Ø3	
V59CTC	0	Deg C	Ø.19ØE+Ø3	Ø.2Ø9E+ØØ	Ø.242E+Ø2	Ø.15ØE+Ø1	Ø.218E+Ø2	Ø.19ØE+Ø3	Ø
		Deg F	Ø.374E+Ø3	Ø.377E+ØØ	Ø.755E+Ø2	Ø.27ØE+Ø1	Ø.713E+Ø2	Ø.375E-Ø3	
V59FTC	0	Deg C	Ø.189E+Ø3	Ø.157E+ØØ	Ø.242E+Ø2	Ø.173E+Ø1	Ø.211E+Ø2	Ø.19ØE-Ø3	Ø
		Deg F	Ø.372E+Ø3	Ø.283E+ØØ	Ø.756E+Ø2	Ø.311E+Ø1	Ø.7ØØE+Ø2	Ø.373E+Ø3	
V59MTC	0	Deg C	Ø.19ØE+Ø3	Ø.13ØE+ØØ	Ø.292E+Ø2	Ø.812E+ØØ	Ø.278E+Ø2	Ø.191E+Ø3	Ø
		Deg F	Ø.375E+Ø3	Ø.234E+ØØ	Ø.846E+Ø2	Ø.146E+Ø1	Ø.82ØE+Ø2	Ø.376E+Ø3	
V51ØCTC	0	Deg C	Ø.189E+Ø3	Ø.193E+ØØ	Ø.249E+Ø2	Ø.144E+Ø1	Ø.22ØE+Ø2	Ø.19ØE-Ø3	Ø
		Deg F	Ø.372E+Ø3	Ø.347E+ØØ	Ø.767E+Ø2	Ø.259E+Ø1	Ø.715E+Ø2	Ø.374E+Ø3	
V61CTC	0	Deg C	Ø.19ØE+Ø3	Ø.223E+ØØ	Ø.266E+Ø2	Ø.941E+ØØ	Ø.239E+Ø2	Ø.191E+Ø3	Ø
		Deg F	Ø.373E+Ø3	Ø.4Ø2E+ØØ	Ø.799E+Ø2	Ø.169E+Ø1	Ø.75ØE+Ø2	Ø.376E-Ø3	
V62CTC	0	Deg C	Ø.19ØE+Ø3	Ø.222E+ØØ	Ø.258E+Ø2	Ø.124E+Ø1	Ø.235E+Ø2	Ø.191E+Ø3	Ø
		Deg F	Ø.374E+Ø3	Ø.399E+ØØ	Ø.784E+Ø2	Ø.222E+Ø1	Ø.744E+Ø2	Ø.376E+Ø3	
V62FTC	0	Deg C	Ø.189E+Ø3	Ø.126E+ØØ	Ø.261E+Ø2	Ø.117E+Ø1	Ø.229E+Ø2	Ø.19ØE-Ø3	Ø
		Deg F	Ø.372E+Ø3	Ø.227E+ØØ	Ø.789E+Ø2	Ø.211E+Ø1	Ø.733E+Ø2	Ø.374E+Ø3	
V62MTC	0 B	Deg C	Ø.181E+Ø3	Ø.194E+ØØ	Ø.311E+Ø2	Ø.272E+ØØ	Ø.3Ø6E+Ø2	Ø.183E+Ø3	Ø
		Deg F	Ø.359E+Ø3	Ø.35ØE+ØØ	Ø.879E+Ø2	Ø.49ØE+ØØ	Ø.871E+Ø2	Ø.361E+Ø3	
V63CTC	0	Deg C	Ø.189E+Ø3	Ø.191E+ØØ	Ø.248E+Ø2	Ø.839E+ØØ	Ø.226E+Ø2	Ø.189E+Ø3	Ø
		Deg F	Ø.372E+Ø3	Ø.344E+ØØ	Ø.767E+Ø2	Ø.151E+Ø1	Ø.726E+Ø2	Ø.373E+Ø3	
V64CTC	0	Deg C	Ø.19ØE+Ø3	Ø.264E+ØØ	Ø.238E+Ø2	Ø.815E+ØØ	Ø.221E+Ø2	Ø.19ØE+Ø3	Ø
		Deg F	Ø.374E+Ø3	Ø.475E+ØØ	Ø.749E+Ø2	Ø.147E+Ø1	Ø.718E+Ø2	Ø.375E+Ø3	
V64FTC	0	Deg C	Ø.189E+Ø3	Ø.24ØE+ØØ	Ø.239E+Ø2	Ø.954E+ØØ	Ø.217E+Ø2	Ø.191E+Ø3	Ø
		Deg F	Ø.372E+Ø3	Ø.431E+ØØ	Ø.75ØE+Ø2	Ø.172E+Ø1	Ø.71ØE+Ø2	Ø.375E+Ø3	
V64MTC	0	Deg C	Ø.191E+Ø3	Ø.283E+ØØ	Ø.294E+Ø2	Ø.432E+ØØ	Ø.283E+Ø2	Ø.193E+Ø3	Ø
		Deg F	Ø.376E+Ø3	Ø.51ØE+ØØ	Ø.849E+Ø2	Ø.778E+ØØ	Ø.829E+Ø2	Ø.379E+Ø3	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
V65CTC	0	Deg C	0.189E+03	0.182E+00	0.230E+02	0.110E+01	0.208E+02	0.191E+03	0
		Deg F	0.372E+03	0.328E+00	0.735E+02	0.198E+01	0.695E+02	0.375E+03	
V66CTC	0	Deg C	0.190E+03	0.336E-01	0.237E+02	0.141E+01	0.216E+02	0.190E+03	0
		Deg F	0.373E+03	0.605E-01	0.746E+02	0.253E+01	0.708E+02	0.374E+03	
V66FTC	0	Deg C	0.189E+03	0.251E+00	0.239E+02	0.160E+01	0.211E+02	0.189E+03	0
		Deg F	0.372E+03	0.453E+00	0.750E+02	0.288E+01	0.700E+02	0.373E+03	
V66MTC	0	Deg C	0.191E+03	0.270E+00	0.299E+02	0.383E+00	0.292E+02	0.192E+03	0
		Deg F	0.376E+03	0.485E+00	0.858E+02	0.689E+00	0.845E+02	0.378E+03	
V67CTC	0	Deg C	0.190E+03	0.122E+00	0.251E+02	0.135E+01	0.217E+02	0.192E+03	0
		Deg F	0.374E+03	0.220E+00	0.771E+02	0.243E+01	0.711E+02	0.378E+03	
V67FTC	0	Deg C	0.189E+03	0.201E+00	0.255E+02	0.115E+01	0.221E+02	0.189E+03	0
		Deg F	0.372E+03	0.362E+00	0.779E+02	0.208E+01	0.718E+02	0.373E+03	
V67MTC	0	Deg C	0.191E+03	0.322E+00	0.312E+02	0.423E+00	0.304E+02	0.193E+03	0
		Deg F	0.376E+03	0.580E+00	0.882E+02	0.762E+00	0.866E+02	0.379E+03	
V68CTC	0	Deg C	0.190E+03	0.128E+00	0.257E+02	0.850E+00	0.229E+02	0.191E+03	0
		Deg F	0.374E+03	0.230E+00	0.783E+02	0.153E+01	0.732E+02	0.375E+03	
V68FTC	0	Deg C	0.189E+03	0.206E+00	0.260E+02	0.871E+00	0.227E+02	0.189E+03	0
		Deg F	0.372E+03	0.371E+00	0.788E+02	0.157E+01	0.729E+02	0.373E+03	
V68MTC	0	Deg C	0.191E+03	0.233E+00	0.321E+02	0.388E+00	0.311E+02	0.192E+03	0
		Deg F	0.376E+03	0.419E+00	0.897E+02	0.698E+00	0.879E+02	0.377E+03	
V69CTC	0	Deg C	0.190E+03	0.960E-01	0.260E+02	0.629E+00	0.238E+02	0.190E+03	0
		Deg F	0.374E+03	0.173E+00	0.788E+02	0.113E+01	0.748E+02	0.375E+03	
V69FTC	0 3	Deg C	0.673E+02	0.167E+00	0.209E+02	0.209E+00	0.201E+02	0.689E+02	0
		Deg F	0.153E+03	0.301E+00	0.696E+02	0.376E+00	0.681E+02	0.156E+03	
V69MTC	0	Deg C	0.191E+03	0.291E+00	0.330E+02	0.278E+00	0.324E+02	0.193E+03	0
		Deg F	0.376E+03	0.523E+00	0.914E+02	0.500E+00	0.904E+02	0.379E+03	
V610CTC	0	Deg C	0.189E+03	0.161E+00	0.258E+02	0.620E+00	0.246E+02	0.189E+03	0
		Deg F	0.372E+03	0.290E+00	0.784E+02	0.112E+01	0.763E+02	0.373E+03	
V71CTC	0	Deg C	0.189E+03	0.125E+00	0.260E+02	0.128E+01	0.228E+02	0.189E+03	0
		Deg F	0.372E+03	0.225E+00	0.788E+02	0.231E+01	0.730E+02	0.372E+03	
V72CTC	0	Deg C	0.190E+03	0.850E-01	0.259E+02	0.133E+01	0.228E+02	0.190E+03	0
		Deg F	0.373E+03	0.153E+00	0.787E+02	0.239E+01	0.730E+02	0.374E+03	
V72FTC	0	Deg C	0.189E+03	0.124E+00	0.258E+02	0.136E+01	0.225E+02	0.190E+03	0
		Deg F	0.372E+03	0.223E+00	0.784E+02	0.244E+01	0.726E+02	0.374E+03	
V72MTC	0	Deg C	0.190E+03	0.153E+00	0.329E+02	0.573E+00	0.316E+02	0.192E+03	0
		Deg F	0.375E+03	0.275E+00	0.911E+02	0.103E+01	0.889E+02	0.377E+03	
V73CTC	0	Deg C	0.189E+03	0.857E-01	0.251E+02	0.152E+01	0.223E+02	0.189E+03	0
		Deg F	0.372E+03	0.154E+00	0.772E+02	0.274E+01	0.721E+02	0.373E+03	
V74CTC	0	Deg C	0.190E+03	0.109E+00	0.244E+02	0.169E+01	0.212E+02	0.190E+03	0
		Deg F	0.373E+03	0.196E+00	0.759E+02	0.304E+01	0.702E+02	0.374E+03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
V74FTC	0	Deg C	0.189E+03	0.715E-01	0.248E+02	0.170E+01	0.217E+02	0.189E+03	0
		Deg F	0.372E+03	0.129E+00	0.766E+02	0.306E+01	0.710E+02	0.373E+03	
V74MTC	B/	Deg C	0.163E+03	0.263E+00	0.315E+02	0.483E+00	0.305E+02	0.163E+03	0
		Deg F	0.325E+03	0.473E+00	0.887E+02	0.869E+00	0.869E+02	0.326E+03	
V75CTC	0	Deg C	0.189E+03	0.126E+00	0.246E+02	0.119E+01	0.224E+02	0.190E+03	0
		Deg F	0.372E+03	0.228E+00	0.762E+02	0.214E+01	0.724E+02	0.375E+03	
V76CTC	0	Deg C	0.190E+03	0.309E+00	0.250E+02	0.902E+00	0.227E+02	0.190E+03	0
		Deg F	0.374E+03	0.556E+00	0.770E+02	0.162E+01	0.729E+02	0.375E+03	
V76FTC	0	Deg C	0.189E+03	0.148E+00	0.253E+02	0.105E+01	0.226E+02	0.191E+03	0
		Deg F	0.372E+03	0.266E+00	0.775E+02	0.189E+01	0.727E+02	0.375E+03	
V76MTC	0	Deg C	0.189E+03	0.266E+00	0.321E+02	0.295E+00	0.317E+02	0.190E+03	0
		Deg F	0.372E+03	0.480E+00	0.898E+02	0.531E+00	0.890E+02	0.373E+03	
V77CTC	0	Deg C	0.190E+03	0.158E+00	0.253E+02	0.103E+01	0.224E+02	0.191E+03	0
		Deg F	0.374E+03	0.285E+00	0.776E+02	0.185E+01	0.723E+02	0.375E-03	
V77FTC	0	Deg C	0.189E+03	0.190E+00	0.257E+02	0.899E+00	0.234E+02	0.190E+03	0
		Deg F	0.372E+03	0.343E+00	0.783E+02	0.162E+01	0.740E+02	0.373E+03	
V77MTC	0	Deg C	0.189E+03	0.208E+00	0.327E+02	0.253E+00	0.321E+02	0.190E+03	0
		Deg F	0.372E+03	0.374E+00	0.909E+02	0.456E+00	0.899E+02	0.373E-03	
V78CTC	0	Deg C	0.190E+03	0.260E+00	0.257E+02	0.861E+00	0.234E+02	0.191E+03	0
		Deg F	0.374E+03	0.468E+00	0.783E+02	0.155E+01	0.740E+02	0.375E+03	
V78FTC	0	Deg C	0.189E+03	0.212E+00	0.259E+02	0.771E+00	0.232E+02	0.190E+03	0
		Deg F	0.372E+03	0.382E+00	0.787E+02	0.139E+01	0.738E+02	0.373E+03	
V78MTC	0	Deg C	0.189E+03	0.272E+00	0.331E+02	0.285E+00	0.323E+02	0.191E-03	0
		Deg F	0.373E+03	0.489E+00	0.915E+02	0.512E+00	0.901E+02	0.375E+03	
V79CTC	0	Deg C	0.190E+03	0.217E+00	0.257E+02	0.667E+00	0.241E+02	0.191E+03	0
		Deg F	0.374E+03	0.390E+00	0.782E+02	0.120E+01	0.754E+02	0.376E+03	
V79FTC	0	Deg C	0.189E+03	0.204E+00	0.260E+02	0.635E+00	0.242E+02	0.190E+03	0
		Deg F	0.372E+03	0.367E+00	0.789E+02	0.114E+01	0.756E+02	0.375E+03	
V79MTC	0	Deg C	0.189E+03	0.286E+00	0.337E+02	0.348E+00	0.333E+02	0.190E+03	0
		Deg F	0.373E+03	0.515E+00	0.927E+02	0.627E+00	0.919E+02	0.374E+03	
V710CTC	0	Deg C	0.189E+03	0.899E-01	0.260E+02	0.704E+00	0.250E+02	0.190E+03	0
		Deg F	0.372E+03	0.162E+00	0.789E+02	0.127E+01	0.771E+02	0.373E-03	
V82CTC	0	Deg C	0.190E+03	0.253E+00	0.261E+02	0.138E+01	0.234E+02	0.190E+03	0
		Deg F	0.373E+03	0.456E+00	0.791E+02	0.249E+01	0.742E+02	0.375E+03	
V82FTC	0	Deg C	0.189E+03	0.272E+00	0.263E+02	0.136E+01	0.233E+02	0.189E+03	0
		Deg F	0.372E+03	0.490E+00	0.794E+02	0.244E+01	0.739E+02	0.373E+03	
V82MTC	0	Deg C	0.189E+03	0.240E+00	0.335E+02	0.749E+00	0.318E+02	0.190E+03	0
		Deg F	0.372E+03	0.433E+00	0.924E+02	0.135E+01	0.892E+02	0.374E+03	
V84CTC	0	Deg C	0.189E+03	0.200E+00	0.259E+02	0.147E+01	0.223E+02	0.190E+03	0
		Deg F	0.373E+03	0.360E+00	0.787E+02	0.264E+01	0.722E+02	0.374E-03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
V84FTC	0	Deg C	0.189E+03	0.288E+00	0.261E+02	0.142E+01	0.224E+02	0.190E+03	0
		Deg F	0.371E+03	0.519E+00	0.789E+02	0.256E+01	0.724E+02	0.373E+03	
V84MTC	0	Deg C	0.188E+03	0.167E+00	0.318E+02	0.654E+00	0.304E+02	0.189E-03	0
		Deg F	0.370E+03	0.301E+00	0.892E+02	0.118E+01	0.867E+02	0.371E-03	
V86CTC	N0								
V86FTC	B0	Deg C	0.298E+02	0.188E+01	0.177E+02	0.589E+00	0.160E+02	0.319E-02	0
		Deg F	0.857E+02	0.339E+01	0.639E+02	0.106E+01	0.607E+02	0.895E+02	
V86MTC	B0	Deg C	0.182E+03	0.172E+00	0.325E+02	0.459E+00	0.317E+02	0.183E+03	0
		Deg F	0.360E+03	0.310E+00	0.906E+02	0.826E+00	0.890E+02	0.362E+03	
V86DT	0	********	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E-20	0
		VOLTS	0.102E-01	0.123E-03	0.830E-03	0.458E-04	0.703E-03	0.106E-01	
V87CTC	0	Deg C	0.189E+03	0.923E-01	0.252E+02	0.972E+00	0.232E+02	0.191E-03	0
		Deg F	0.373E+03	0.166E+00	0.774E+02	0.175E+01	0.738E+02	0.376E-03	
V87FTC	0	Deg C	0.189E+03	0.299E+00	0.254E+02	0.103E+01	0.234E+02	0.190E-03	0
		Deg F	0.371E+03	0.539E+00	0.777E+02	0.186E+01	0.741E+02	0.373E+03	
V87MTC	30	Deg C	0.178E+03	0.229E+00	0.310E+02	0.368E+00	0.304E+02	0.178E+03	0
		Deg F	0.352E+03	0.412E+00	0.877E+02	0.663E+00	0.867E+02	0.353E+03	
V88CTC	0	Deg C	0.189E+03	0.576E-01	0.256E+02	0.661E+00	0.237E+02	0.191E+03	0
		Deg F	0.373E+03	0.104E+00	0.780E+02	0.119E+01	0.747E+02	0.375E+03	
V88FTC	0	Deg C	0.189E+03	0.349E+00	0.259E+02	0.800E+00	0.237E+02	0.189E-03	0
		Deg F	0.372E+03	0.629E+00	0.786E+02	0.144E+01	0.747E+02	0.373E-03	
V88MTC	0	Deg C	0.188E+03	0.633E-01	0.327E+02	0.361E+00	0.321E+02	0.188E-03	0
		Deg F	0.370E+03	0.114E+00	0.908E+02	0.650E+00	0.897E+02	0.371E+03	
V89CTC	0	Deg C	0.189E+03	0.567E-01	0.258E+02	0.624E+00	0.242E+02	0.190E+03	0
		Deg F	0.373E+03	0.102E+00	0.784E+02	0.112E+01	0.756E+02	0.375E+03	
V89FTC	0	Deg C	0.189E+03	0.313E+00	0.261E+02	0.687E+00	0.242E+02	0.190E+03	0
		Deg F	0.372E-03	0.564E+00	0.789E+02	0.124E+01	0.756E+02	0.374E+03	
V89MTC	0	Deg C	0.189E+03	0.177E+00	0.330E+02	0.383E+00	0.324E+02	0.189E+03	0
		Deg F	0.372E+03	0.319E+00	0.915E+02	0.690E+00	0.904E+02	0.373E+03	
V92CTC	0	Deg C	0.190E+03	0.249E+00	0.265E+02	0.643E+00	0.245E+02	0.191E+03	0
		Deg F	0.374E+03	0.449E+00	0.796E+02	0.116E+01	0.761E+02	0.376E+03	
V92FTC	0	Deg C	0.189E+03	0.179E+00	0.265E+02	0.601E+00	0.247E+02	0.190E+03	0
		Deg F	0.373E+03	0.323E+00	0.798E+02	0.108E+01	0.765E+02	0.375E-03	
V92MTC	0	Deg C	0.189E+03	0.140E+00	0.342E+02	0.402E+00	0.335E+02	0.189E+03	0
		Deg F	0.371E+03	0.252E+00	0.935E+02	0.724E+00	0.923E+02	0.372E+03	
V93CTC	0	Deg C	0.189E+03	0.362E+00	0.264E+02	0.719E+00	0.242E+02	0.190E+03	0
		Deg F	0.371E+03	0.651E+00	0.794E+02	0.129E+01	0.756E+02	0.374E+03	
V95CTC	0	Deg C	0.189E+03	0.363E+00	0.258E+02	0.894E+00	0.241E+02	0.189E+03	0
		Deg F	0.372E+03	0.653E+00	0.785E+02	0.161E+01	0.754E+02	0.372E+03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
V97CTC	0	Deg C	0.190E+03	0.868E-01	0.258E+02	0.884E+00	0.241E+02	0.190E+03	0
		Deg F	0.373E+03	0.156E+00	0.784E+02	0.159E+01	0.753E+02	0.374E+03	
V97FTC	0	Deg C	0.189E+03	0.175E+00	0.263E+02	0.944E+00	0.245E+02	0.189E+03	0
		Deg F	0.371E+03	0.316E+00	0.793E+02	0.170E+01	0.762E+02	0.373E+03	
V97MTC	0	Deg C	0.188E+03	0.104E+00	0.332E+02	0.629E+00	0.319E+02	0.190E+03	0
		Deg F	0.371E+03	0.186E+00	0.918E+02	0.113E+01	0.894E+02	0.373E+03	
V99CTC	0	Deg C	0.189E+03	0.256E+00	0.258E+02	0.777E+00	0.241E+02	0.190E-03	0
		Deg F	0.373E+03	0.461E+00	0.784E+02	0.140E+01	0.754E+02	0.374E+03	
V99FTC	0	Deg C	0.189E+03	0.172E+00	0.259E+02	0.725E+00	0.243E+02	0.190E+03	0
		Deg F	0.372E+03	0.310E+00	0.787E+02	0.131E+01	0.758E+02	0.374E+03	
V99MTC	0	Deg C	0.188E+03	0.133E+00	0.339E+02	0.555E+00	0.327E+02	0.189E+03	0
		Deg F	0.371E+03	0.240E+00	0.930E+02	0.998E+00	0.909E+02	0.372E+03	
V101CTC	0	Deg C	0.189E+03	0.161E+00	0.261E+02	0.850E+00	0.246E+02	0.189E+03	0
		Deg F	0.372E+03	0.289E+00	0.790E+02	0.153E+01	0.763E+02	0.373E+03	
V105CTC	0	Deg C	0.188E+03	0.212E+00	0.240E+02	0.469E-00	0.221E+02	0.189E+03	0
		Deg F	0.371E+03	0.382E+00	0.752E+02	0.844E+00	0.718E+02	0.373E+03	
V107CTC	0	Deg C	0.188E+03	0.205E+00	0.238E+02	0.299E+00	0.229E+02	0.189E+03	0
		Deg F	0.371E+03	0.369E+00	0.749E+02	0.539E+00	0.732E+02	0.372E+03	
V1010CTC	0	Deg C	0.189E+03	0.721E-01	0.242E+02	0.223E+00	0.237E+02	0.190E+03	0
		Deg F	0.372E+03	0.130E+00	0.755E+02	0.401E+00	0.746E+02	0.374E+03	
C52CTC	0	Deg C	0.189E+03	0.271E+00	0.273E+02	0.664E+00	0.256E+02	0.190E+03	0
		Deg F	0.372E+03	0.488E+00	0.812E+02	0.119E+01	0.781E+02	0.374E+03	
C54CTC	0	Deg C	0.190E+03	0.209E+00	0.230E+02	0.159E+01	0.193E+02	0.192E+03	0
		Deg F	0.374E+03	0.375E+00	0.734E+02	0.286E+01	0.668E+02	0.377E+03	
C54FTC	0	Deg C	0.189E+03	0.207E+00	0.228E+02	0.160E+01	0.191E+02	0.190E+03	0
		Deg F	0.372E+03	0.373E+00	0.731E+02	0.288E+01	0.663E+02	0.374E+03	
C54MTC	0	Deg C	0.190E+03	0.165E+00	0.243E+02	0.560E+00	0.230E+02	0.190E+03	0
		Deg F	0.374E+03	0.297E+00	0.757E+02	0.101E+01	0.734E+02	0.375E+03	
C56CTC	0	Deg C	0.190E+03	0.256E+00	0.187E+02	0.108E+01	0.171E+02	0.191E+03	0
		Deg F	0.374E+03	0.460E+00	0.656E+02	0.194E+01	0.627E+02	0.375E+03	
C56FTC	0	Deg C	0.189E+03	0.241E+00	0.184E+02	0.771E+00	0.173E+02	0.190E+03	0
		Deg F	0.372E+03	0.434E+00	0.651E+02	0.139E+01	0.631E+02	0.374E+03	
C56MTC	0	Deg C	0.190E+03	0.267E+00	0.205E+02	0.330E+00	0.199E+02	0.191E+03	0
		Deg F	0.373E+03	0.481E+00	0.689E+02	0.595E+00	0.677E+02	0.375E+03	
C57CTC	0	Deg C	0.190E+03	0.280E+00	0.189E+02	0.982E+00	0.175E+02	0.191E+03	0
		Deg F	0.374E+03	0.505E+00	0.661E+02	0.177E+01	0.634E+02	0.375E+03	
C57FTC	0	Deg C	0.189E+03	0.258E+00	0.187E+02	0.809E+00	0.176E+02	0.190E+03	0
		Deg F	0.372E+03	0.465E+00	0.656E+02	0.146E+01	0.637E+02	0.373E+03	
C57MTC	0	Deg C	0.189E+03	0.203E+00	0.212E+02	0.206E+00	0.205E+02	0.190E-03	0
		Deg F	0.373E+03	0.365E-00	0.701E+02	0.371E+00	0.690E+02	0.374E-03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
C58CTC	0	Deg C	0.189E+03	0.247E+00	0.196E+02	0.149E+01	0.174E+02	0.189E+03	0
		Deg F	0.372E+03	0.445E+00	0.673E+02	0.268E+01	0.634E+02	0.372E+03	
C59CTC	0	Deg C	0.190E+03	0.476E-01	0.224E+02	0.186E+01	0.181E+02	0.190E+03	0
		Deg F	0.373E+03	0.856E-01	0.723E+02	0.335E+01	0.645E+02	0.374E+03	
C59FTC	0	Deg C	0.189E+03	0.129E+00	0.214E+02	0.201E+01	0.175E+02	0.190E+03	0
		Deg F	0.371E+03	0.233E+00	0.706E+02	0.361E+01	0.634E+02	0.373E+03	
C59MTC	0	Deg C	0.190E+03	0.172E+00	0.231E+02	0.343E+00	0.223E+02	0.190E+03	0
		Deg F	0.373E+03	0.309E+00	0.737E+02	0.618E+00	0.721E+02	0.374E+03	
C62CTC	0	Deg C	0.190E+03	0.141E+00	0.275E+02	0.802E+00	0.256E+02	0.191E+03	0
		Deg F	0.374E+03	0.253E+00	0.814E+02	0.144E+01	0.780E+02	0.376E+03	
C62FTC	0	Deg C	0.189E+03	0.233E+00	0.264E+02	0.821E+00	0.260E+02	0.190E+03	0
		Deg F	0.372E+03	0.420E+00	0.831E+02	0.148E+01	0.787E+02	0.374E+03	
C62MTC	B ~~0~~	Deg C	0.682E+02	0.208E+00	0.207E+02	0.202E+00	0.203E+02	0.687E+02	0
		Deg F	0.155E+03	0.374E+00	0.692E+02	0.363E+00	0.685E+02	0.156E+03	
C64CTC	0	Deg C	0.190E+03	0.244E+00	0.216E+02	0.143E+01	0.189E+02	0.191E+03	0
		Deg F	0.374E+03	0.439E+00	0.709E+02	0.257E+01	0.660E+02	0.375E+03	
C64FTC	0	Deg C	0.189E+03	0.228E+00	0.216E+02	0.156E+01	0.190E+02	0.190E+03	0
		Deg F	0.372E+03	0.410E+00	0.709E+02	0.281E+01	0.663E+02	0.374E+03	
C64MTC	0	Deg C	0.190E+03	0.174E+00	0.239E+02	0.278E+00	0.232E+02	0.191E+03	0
		Deg F	0.374E+03	0.313E+00	0.750E+02	0.501E+00	0.738E+02	0.376E+03	
C67CTC	0	Deg C	0.190E+03	0.229E+00	0.198E+02	0.864E+00	0.183E+02	0.191E+03	0
		Deg F	0.374E+03	0.412E+00	0.676E+02	0.155E+01	0.650E+02	0.375E+03	
C67FTC	0	Deg C	0.189E+03	0.295E+00	0.197E+02	0.919E+00	0.182E+02	0.190E+03	0
		Deg F	0.372E+03	0.531E+00	0.674E+02	0.165E+01	0.648E+02	0.374E+03	
C67MTC	0	Deg C	0.190E+03	0.117E+00	0.213E+02	0.237E+00	0.209E+02	0.191E+03	0
		Deg F	0.374E+03	0.211E+00	0.704E+02	0.426E+00	0.696E+02	0.376E+03	
C69CTC	0	Deg C	0.190E+03	0.271E+00	0.230E+02	0.201E+01	0.190E+02	0.191E+03	0
		Deg F	0.374E+03	0.488E+00	0.734E+02	0.363E+01	0.661E+02	0.376E+03	
C69FTC	0	Deg C	0.189E+03	0.213E+00	0.229E+02	0.220E+01	0.181E+02	0.190E+03	0
		Deg F	0.372E+03	0.384E+00	0.732E+02	0.397E+01	0.646E+02	0.374E+03	
C69MTC	0	Deg C	0.190E+03	0.155E+00	0.247E+02	0.453E+00	0.236E+02	0.190E+03	0
		Deg F	0.374E+03	0.279E+00	0.764E+02	0.815E+00	0.744E-02	0.375E+03	
C72CTC	0	Deg C	0.190E+03	0.891E-01	0.269E+02	0.762E+00	0.245E+02	0.190E+03	0
		Deg F	0.373E+03	0.160E+00	0.805E+02	0.137E+01	0.761E+02	0.374E+03	
C72FTC	0	Deg C	0.189E+03	0.152E+00	0.271E+02	0.759E+00	0.251E+02	0.190E+03	0
		Deg F	0.372E+03	0.274E+00	0.808E+02	0.137E+01	0.772E+02	0.373E+03	
C72MTC	0	Deg C	0.190E+03	0.435E-01	0.326E+02	0.373E+00	0.319E+02	0.190E+03	0
		Deg F	0.373E+03	0.783E-01	0.907E+02	0.671E+00	0.893E+02	0.374E+03	
C74CTC	0	Deg C	0.190E+03	0.153E+00	0.213E+02	0.161E+01	0.193E+02	0.191E+03	0
		Deg F	0.373E+03	0.275E+00	0.703E+02	0.290E+01	0.667E+02	0.376E+03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
C74FTC	0	Deg C	0.189E+03	0.131E+00	0.216E+02	0.181E+01	0.190E+02	0.191E+03	0
		Deg F	0.372E+03	0.236E+00	0.709E+02	0.326E+01	0.663E+02	0.375E+03	
C74MTC	0	Deg C	0.190E+03	0.998E-01	0.255E+02	0.349E+00	0.248E+02	0.190E+03	0
		Deg F	0.373E+03	0.180E+00	0.779E+02	0.628E+00	0.767E+02	0.374E+03	
C77CTC	0	Deg C	0.190E+03	0.109E+00	0.210E+02	0.175E+01	0.184E+02	0.191E+03	0
		Deg F	0.373E+03	0.195E+00	0.698E+02	0.316E+01	0.650E+02	0.376E+03	
C77FTC	0	Deg C	0.189E+03	0.157E+00	0.208E+02	0.159E+01	0.185E+02	0.189E+03	0
		Deg F	0.372E+03	0.283E+00	0.695E+02	0.286E+01	0.653E+02	0.373E+03	
C77MTC	0	Deg C	0.190E+03	0.787E-01	0.238E+02	0.332E+00	0.232E+02	0.191E+03	0
		Deg F	0.373E+03	0.142E+00	0.749E+02	0.597E+00	0.738E+02	0.377E+03	
C79CTC	0	Deg C	0.190E+03	0.848E-01	0.256E+02	0.159E+01	0.209E+02	0.190E+03	0
		Deg F	0.373E+03	0.153E+00	0.781E+02	0.286E+01	0.696E+02	0.374E+03	
C79FTC	0	Deg C	0.189E+03	0.454E-02	0.256E+02	0.163E+01	0.210E+02	0.190E+03	0
		Deg F	0.372E+03	0.816E-02	0.782E+02	0.293E+01	0.698E+02	0.374E+03	
C79MTC	0	Deg C	0.189E+03	0.570E-01	0.292E+02	0.443E+00	0.282E+02	0.191E+03	0
		Deg F	0.373E+03	0.103E+00	0.846E+02	0.798E+00	0.828E+02	0.375E+03	
C82CTC	0	Deg C	0.189E+03	0.123E+00	0.262E+02	0.716E+00	0.237E+02	0.190E+03	0
		Deg F	0.372E+03	0.221E+00	0.791E+02	0.129E+01	0.746E+02	0.374E+03	
C84CTC	0	Deg C	0.189E+03	0.179E+00	0.214E+02	0.183E+01	0.194E+02	0.190E+03	0
		Deg F	0.372E+03	0.322E+00	0.705E+02	0.329E+01	0.669E+02	0.373E+03	
C87CTC	0	Deg C	0.189E+03	0.116E+00	0.228E+02	0.209E+01	0.192E+02	0.189E+03	0
		Deg F	0.372E+03	0.209E+00	0.730E+02	0.376E+01	0.666E+02	0.373E+03	
C89CTC	0	Deg C	0.189E+03	0.458E-01	0.253E+02	0.876E+00	0.226E+02	0.190E+03	0
		Deg F	0.372E+03	0.825E-01	0.776E+02	0.158E+01	0.727E+02	0.373E+03	
C92CTC	0	Deg C	0.189E+03	0.242E+00	0.243E+02	0.182E+01	0.203E+02	0.190E+03	0
		Deg F	0.372E+03	0.435E+00	0.757E+02	0.328E+01	0.685E+02	0.373E+03	
C94CTC	0	Deg C	0.190E+03	0.237E+00	0.211E+02	0.148E+01	0.192E+02	0.190E+03	0
		Deg F	0.373E+03	0.426E+00	0.700E+02	0.266E+01	0.666E+02	0.374E+03	
C97CTC	0	Deg C	0.189E+03	0.205E+00	0.239E+02	0.124E+01	0.206E+02	0.189E+03	0
		Deg F	0.372E+03	0.369E+00	0.750E+02	0.223E+01	0.691E+02	0.373E+03	
C99CTC	0	Deg C	0.189E+03	0.134E+00	0.248E+02	0.663E+00	0.227E+02	0.190E+03	0
		Deg F	0.372E+03	0.240E+00	0.766E+02	0.119E+01	0.728E+02	0.374E+03	
C102CTC	0	Deg C	0.188E+03	0.224E+00	0.227E+02	0.191E+01	0.198E+02	0.189E+03	0
		Deg F	0.371E+03	0.404E+00	0.728E+02	0.344E+01	0.677E+02	0.372E+03	
C104CTC	0	Deg C	0.188E+03	0.145E+00	0.217E+02	0.168E+01	0.196E+02	0.190E+03	0
		Deg F	0.371E+03	0.261E+00	0.710E+02	0.302E+01	0.673E+02	0.374E+03	
C106CTC	0	Deg C	0.188E+03	0.994E-01	0.230E+02	0.132E+01	0.196E+02	0.189E+03	0
		Deg F	0.371E+03	0.179E+00	0.734E+02	0.238E+01	0.672E+02	0.372E+03	
C108CTC	0	Deg C	0.189E+03	0.219E+00	0.243E+02	0.244E+00	0.234E+02	0.190E+03	0
		Deg F	0.372E+03	0.395E+00	0.757E+02	0.440E+00	0.742E+02	0.375E+03	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
V57VWTC	0	Deg C Deg F	0.187E+03 0.368E+03	0.196E+00 0.353E+00	0.319E+02 0.894E+02	0.301E+00 0.541E+00	0.313E+02 0.884E+02	0.188E+03 0.370E+03	0
V72VWTC	N								
V97VWTC	0	Deg C Deg F	0.187E+03 0.368E+03	0.905E-01 0.163E+00	0.378E+02 0.100E+03	0.357E+00 0.643E+00	0.370E+02 0.986E+02	0.188E+03 0.371E+03	0
C57VWTC	0	Deg C Deg F	0.186E+03 0.367E+03	0.105E+00 0.188E+00	0.253E+02 0.776E+02	0.211E+00 0.379E+00	0.249E+02 0.768E+02	0.188E+03 0.370E+03	0
C72VWTC	0	Deg C Deg F	0.187E+03 0.369E+03	0.408E+00 0.735E+00	0.347E+02 0.945E+02	0.276E+00 0.496E+00	0.342E+02 0.935E+02	0.188E+03 0.371E+03	0
C97VWTC	0	Deg C Deg F	0.187E+03 0.369E+03	0.300E+00 0.539E+00	0.314E+02 0.886E+02	0.260E+00 0.467E+00	0.309E+02 0.876E+02	0.188E+03 0.371E+03	0
V57PWTC	0	Deg C Deg F	0.188E+03 0.370E+03	0.118E+00 0.213E+00	0.299E+02 0.859E+02	0.317E+00 0.570E+00	0.293E+02 0.847E+02	0.190E+03 0.373E+03	0
V62PWTC	B ~~0~~	Deg C Deg F	0.141E+03 0.286E+03	0.170E+00 0.305E+00	0.291E+02 0.844E+02	0.294E+00 0.529E+00	0.284E+02 0.832E+02	0.142E+03 0.288E+03	0
V64PWTC	0	Deg C Deg F	0.189E+03 0.373E+03	0.109E+00 0.195E+00	0.317E+02 0.890E+02	0.319E+00 0.575E+00	0.310E+02 0.878E+02	0.190E+03 0.374E+03	0
V67PWTC	0	Deg C Deg F	0.189E+03 0.373E+03	0.168E+00 0.302E+00	0.336E+02 0.924E+02	0.358E+00 0.644E+00	0.328E+02 0.910E+02	0.191E+03 0.376E+03	0
V610PWTC	0	Deg C Deg F	0.189E+03 0.373E+03	0.875E-01 0.158E+00	0.367E+02 0.981E+02	0.374E+00 0.674E+00	0.359E+02 0.966E+02	0.190E+03 0.375E+03	0
V77PWTC	0	Deg C Deg F	0.188E+03 0.370E+03	0.316E+00 0.569E+00	0.358E+02 0.964E+02	0.377E+00 0.678E+00	0.349E+02 0.949E+02	0.188E+03 0.371E+03	0
V86PWTC	3 ~~0~~	Deg C Deg F	0.170E+03 0.339E+03	0.338E+00 0.608E+00	0.361E+02 0.970E+02	0.336E+00 0.605E+00	0.353E+02 0.955E+02	0.174E+03 0.345E+03	0
V97PWTC	0	Deg C Deg F	0.187E+03 0.369E+03	0.245E+00 0.442E+00	0.374E+02 0.994E+02	0.364E+00 0.655E+00	0.367E+02 0.981E+02	0.188E+03 0.371E+03	0
LP1	0	Deg C Deg F	0.190E+03 0.373E+03	0.139E+00 0.251E+00	0.240E+02 0.752E+02	0.271E+00 0.488E+00	0.232E+02 0.737E+02	0.190E+03 0.375E+03	0
LP2	0	Deg C Deg F	0.188E+03 0.371E+03	0.204E+00 0.367E+00	0.236E+02 0.745E+02	0.258E+00 0.464E+00	0.229E+02 0.732E+02	0.190E+03 0.373E+03	0
LP3	0	Deg C Deg F	0.188E+03 0.371E+03	0.212E+00 0.382E+00	0.237E+02 0.746E+02	0.195E+00 0.350E+00	0.231E+02 0.735E+02	0.189E+03 0.372E+03	0
LP4	0	Deg C Deg F	0.189E+03 0.372E+03	0.172E+00 0.309E+00	0.238E+02 0.749E+02	0.453E+00 0.815E+00	0.223E+02 0.722E+02	0.190E+03 0.374E+03	0
LP5	0	Deg C Deg F	0.189E+03 0.373E+03	0.124E+00 0.223E+00	0.238E+02 0.749E+02	0.482E+00 0.868E+00	0.225E+02 0.726E+02	0.190E+03 0.374E+03	0
SPWT	0	Deg C Deg F	0.189E+03 0.371E+03	0.277E+00 0.498E+00	0.252E+02 0.774E+02	0.290E+00 0.523E+00	0.247E+02 0.764E+02	0.190E+03 0.375E+03	0

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
SPWTC2	0	Deg C	0.189E+03	0.157E+00	0.252E+02	0.265E+00	0.246E+02	0.191E+03	0
		Deg F	0.373E+03	0.282E+00	0.773E+02	0.476E+00	0.762E+02	0.375E+03	
SPWTC3	0	Deg C	0.188E+03	0.157E+00	0.263E+02	0.277E+00	0.258E+02	0.188E+03	0
		Deg F	0.370E+03	0.283E+00	0.793E+02	0.498E+00	0.784E+02	0.371E+03	
VLC21	0	m/sec	-.338E-01	0.768E-01	0.106E+00	0.266E-01	-.136E+00	0.517E+00	0
		ft/sec	-.111E+00	0.252E+00	0.348E+00	0.871E-01	-.447E+00	0.170E+01	
VLC23	0	m/sec	-.722E-01	0.341E-01	0.956E-02	0.397E-01	-.182E+00	0.296E+00	0
		ft/sec	-.237E+00	0.112E+00	0.314E-01	0.130E+00	-.598E+00	0.977E+00	
VLC25	0	m/sec	-.675E-01	0.283E-01	0.463E-01	0.294E-01	-.137E+00	0.196E+00	0
		ft/sec	-.221E+00	0.928E-01	0.152E+00	0.963E-01	-.450E+00	0.643E+00	
VLC27	0	m/sec	0.148E-01	0.518E-01	-.663E-01	0.227E-01	-.191E+00	0.218E+00	0
		ft/sec	0.486E-01	0.170E+00	-.218E+00	0.746E-01	-.627E+00	0.714E+00	
VLC29	0	m/sec	-.839E-02	0.670E-01	-.275E-01	0.610E-01	-.172E+00	0.184E+00	0
		ft/sec	-.275E-01	0.220E+00	-.903E-01	0.200E+00	-.564E+00	0.605E+00	
V67V	0	m/sec	-.649E-01	0.261E-01	-.103E+00	0.158E-01	-.350E+00	0.622E+00	0
		ft/sec	-.213E+00	0.856E-01	-.337E+00	0.518E-01	-.115E+01	0.204E+01	
V92V	0	m/sec	0.272E-01	0.409E-01	-.568E-01	0.216E-01	-.417E+00	0.634E+00	0
		ft/sec	0.894E-01	0.134E+00	-.186E+00	0.709E-01	-.137E+01	0.208E+01	
V97V	0	m/sec	0.219E-01	0.406E-01	0.549E-01	0.290E-01	-.471E+00	0.631E+00	0
		ft/sec	0.719E-01	0.133E+00	0.180E+00	0.953E-01	-.155E+01	0.207E+01	
C67V	0	m/sec	0.142E+00	0.867E-02	0.198E+00	0.944E-02	0.302E-01	0.751E+00	0
		ft/sec	0.466E+00	0.284E-01	0.649E+00	0.310E-01	0.990E-01	0.246E+01	
V53HF	0	W/m2	-.189E+04	0.547E+03	0.808E+04	0.137E+04	-.500E+04	0.697E+05	0
		B/hr-ft2	-.601E+03	0.173E+03	0.256E+04	0.436E+03	-.159E+04	0.221E+05	
V54HF	0	W/m2	-.276E+04	0.314E+03	0.457E+04	0.134E+04	-.420E+04	0.652E+05	0
		B/hr-ft2	-.874E+03	0.995E+02	0.145E+04	0.424E+03	-.133E+04	0.207E+05	
V55HF	0	W/m2	-.325E+04	0.354E+03	0.631E+04	0.229E+04	-.866E+04	0.130E+06	0
		B/hr-ft2	-.103E+04	0.112E+03	0.200E+04	0.726E+03	-.275E+04	0.411E+05	
V56HF	0	W/m2	-.158E+04	0.262E+03	0.506E+04	0.120E+04	-.881E+04	0.124E+06	0
		B/hr-ft2	-.500E+03	0.831E+02	0.161E+04	0.380E+03	-.279E+04	0.393E+05	
V57HF	0	W/m2	-.121E+04	0.172E+03	0.311E+04	0.993E+03	-.172E+04	0.811E+05	0
		B/hr-ft2	-.384E+03	0.546E+02	0.987E+03	0.315E+03	-.546E+03	0.257E+05	
V58HF	0	W/m2	-.186E+04	0.238E+03	0.511E+04	0.182E+04	-.253E+04	0.109E+06	0
		B/hr-ft2	-.590E+03	0.754E+02	0.162E+04	0.577E+03	-.803E+03	0.345E+05	
V59HF	0	W/m2	-.203E+04	0.259E+03	0.643E+04	0.204E+04	-.341E+04	0.869E+05	0
		B/hr-ft2	-.644E+03	0.822E+02	0.204E+04	0.647E+03	-.108E+04	0.276E+05	
V62HF	0	W/m2	-.505E+03	0.161E+03	0.429E+04	0.132E+04	-.193E+04	0.686E+05	0
		B/hr-ft2	-.160E+03	0.510E+02	0.136E+04	0.418E+03	-.611E+03	0.217E+05	
V64HF	0	W/m2	-.118E+03	0.247E+03	0.620E+04	0.975E+03	-.749E+03	0.744E+05	0
		B/hr-ft2	-.373E+02	0.783E+02	0.196E+04	0.309E+03	-.237E+03	0.236E+05	

TABLE 5 - TEST MAY106

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
V66HF	0	W/m2	-.158E+03	0.126E+03	0.430E+04	0.939E+03	-.175E+05	0.110E+06	0
		B/hr-ft2	-.500E+02	0.400E+02	0.136E+04	0.298E+03	-.554E+04	0.350E+05	
V67HF	0	W/m2	-.588E+03	0.133E+03	0.374E+04	0.923E+03	-.963E+03	0.771E+05	0
		B/hr-ft2	-.186E+03	0.423E+02	0.119E+04	0.293E+03	-.305E+03	0.245E+05	
V68HF	0	W/m2	-.101E+04	0.249E+03	0.411E+04	0.126E+04	-.446E+04	0.106E+06	0
		B/hr-ft2	-.319E+03	0.789E+02	0.130E+04	0.398E+03	-.141E+04	0.335E+05	
V69HF	0	W/m2	-.361E+03	0.311E+03	0.521E+04	0.126E+04	-.372E+04	0.112E+06	0
		B/hr-ft2	-.115E+03	0.985E+02	0.165E+04	0.400E+03	-.118E+04	0.355E+05	
V72HF	0	W/m2	0.840E+04	0.383E+03	0.000E+00	0.000E+00	-.953E+05	0.132E+05	0
		B/hr-ft2	0.266E+04	0.122E+03	0.000E+00	0.000E+00	-.302E+05	0.418E+04	
V74HF	0	W/m2	-.165E+04	0.280E+03	0.381E+04	0.118E+04	-.297E+04	0.923E+05	0
		B/hr-ft2	-.523E+03	0.888E+02	0.121E+04	0.373E+03	-.943E+03	0.293E+05	
V76HF	0	W/m2	-.724E+03	0.227E+03	0.484E+04	0.123E+04	-.143E+04	0.979E+05	0
		B/hr-ft2	-.229E+03	0.721E+02	0.154E+04	0.390E+03	-.453E+03	0.310E+05	
V77HF	0	W/m2	-.182E+03	0.208E+03	0.520E+04	0.145E+04	-.128E+04	0.706E+05	0
		B/hr-ft2	-.578E+02	0.660E+02	0.165E+04	0.460E+03	-.405E+03	0.224E+05	
V78HF	0	W/m2	-.789E+03	0.195E+03	0.378E+04	0.115E+04	-.138E+04	0.867E+05	0
		B/hr-ft2	-.250E+03	0.619E[illegible]	0.120E+04	0.366E+03	-.437E+03	0.275E+05	
V79HF	0	W/m2	-.971E+03	0.168E+03	0.328[illegible]+04	0.770E+03	-.325E+04	0.875E+05	0
		B/hr-ft2	-.308E+03	0.533E+02	0.104[illegible]+04	0.244E+03	-.103E+04	0.277E+05	
V82HF	0	W/m2	-.162E+04	0.320E+03	0.664E+04	0.270E+04	-.266E+04	0.893E+05	0
		B/hr-ft2	-.513E+03	0.101E+03	0.210E+04	0.856E+03	-.844E+03	0.283E+05	
V84HF	0	W/m2	-.334E+04	0.315E+03	0.594E+04	0.188E+04	-.459E+04	0.924E+05	0
		B/hr-ft2	-.106E+04	0.998E+02	0.188E+04	0.596E+03	-.146E+04	0.293E+05	
V86HF	N								
V87HF	0	W/m2	-.536E+04	0.490E+03	0.497E+04	0.128E+04	-.717E+04	0.778E+05	0
		B/hr-ft2	-.170E+04	0.155E+03	0.157E+04	0.405E+03	-.227E+04	0.247E+05	
V88HF	0	W/m2	-.294E+04	0.226E+03	0.432E+04	0.122E+04	-.359E+04	0.849E+05	0
		B/hr-ft2	-.933E+03	0.718E+02	0.137E+04	0.387E+03	-.114E+04	0.269E+05	
V89HF	0	W/m2	-.259E+04	0.312E+03	0.917E+04	0.232E+04	-.624E+04	0.128E+06	0
		B/hr-ft2	-.821E+03	0.990E+02	0.291E+04	0.734E+03	-.198E+04	0.405E+05	
V92HF	0	W/m2	0.225E+06	0.170E+03	0.264E+06	0.119E+03	0.168E+06	0.264E+06	0
		B/hr-ft2	0.713E+05	0.539E+02	0.838E+05	0.376E+02	0.531E+05	838E+05	
V97HF	0	W/m2	-.297E+03	0.264E+03	0.716E+04	0.183E+04	-.142E+04	0.721E+05	0
		B/hr-ft2	-.940E+02	0.838E+02	0.227E+04	0.579E+03	-.450E+03	0.229E+05	
V99HF	0	W/m2	-.150E+04	0.402E+03	0.413E+04	0.127E+04	-.414E+04	0.611E+05	0
		B/hr-ft2	-.477E+03	0.128E+03	0.131E+04	0.402E+03	-.131E+04	0.194E+05	
C54HF	0	W/m2	-.165E+04	0.221E+03	0.186E+04	0.123E+04	-.300E+04	0.741E+05	0
		B/hr-ft2	-.523E+03	0.700E+02	0.588E+03	0.390E+03	-.950E+03	0.235E+05	

TABLE 5 - TEST MAY1Ø6

INITIAL AND FINAL VALUES

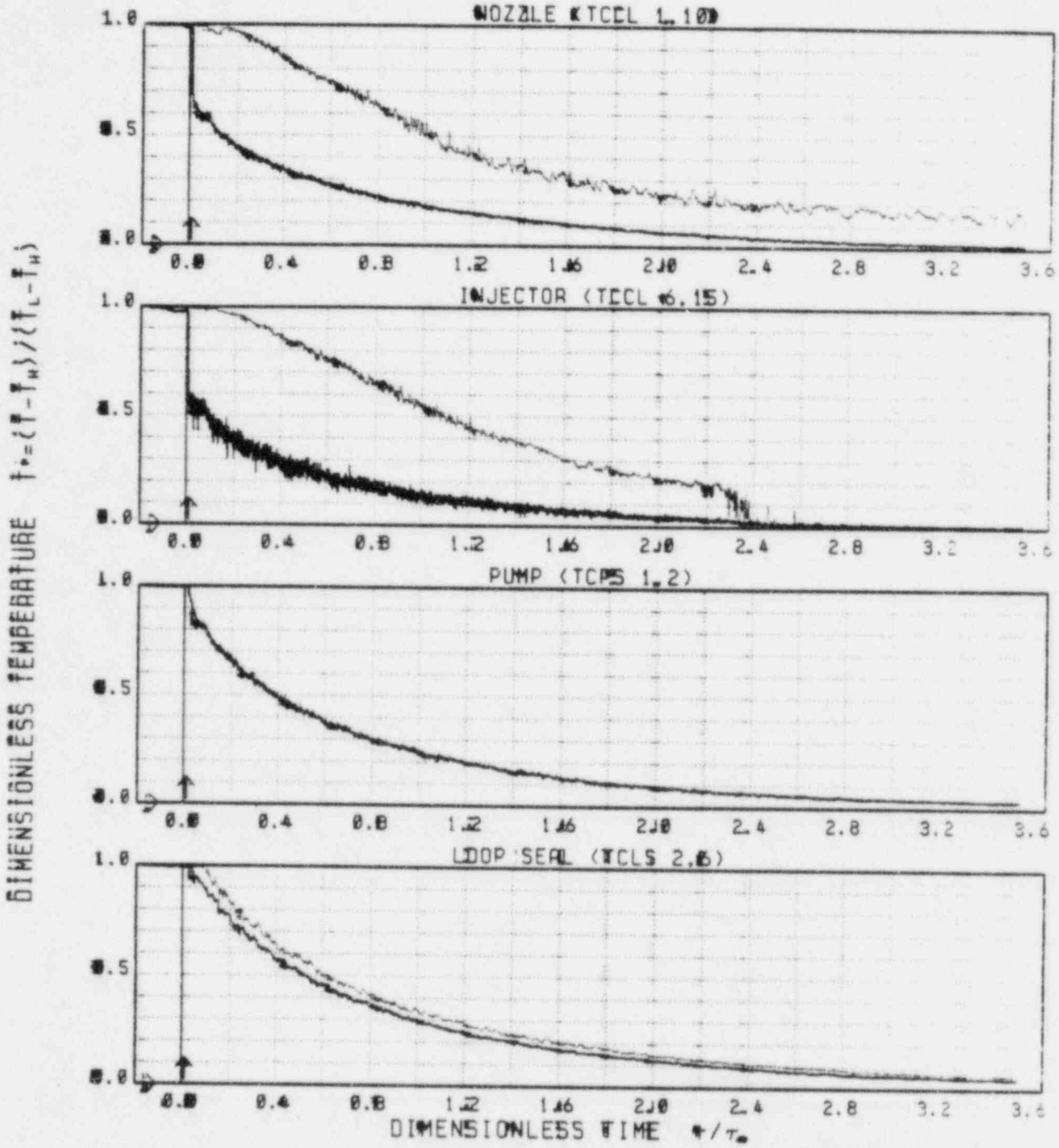
INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2] MEAN	INITIAL VALUE[2] ST DEV	FINAL VALUE[3] MEAN	FINAL VALUE[3] ST DEV	MIN	MAX	SAT[4]
C56HF	O	W/m2 B/hr-ft2	-.972E+Ø3 -.3Ø8E+Ø3	Ø.182E+Ø3 Ø.577E+Ø2	Ø.164E+Ø4 Ø.521E+Ø3	Ø.324E+Ø3 Ø.1Ø3E+Ø3	-.138E+Ø5 -.438E+Ø4	Ø.1Ø4E+Ø6 Ø.331E+Ø5	Ø
C57HF	O	W/m2 B/hr-ft2	-.864E+Ø3 -.274E+Ø3	Ø.178E+Ø3 Ø.564E+Ø2	Ø.3Ø7E+Ø4 Ø.973E+Ø3	Ø.589E+Ø3 Ø.187E+Ø3	-.347E+Ø4 -.11ØE+Ø4	Ø.126E+Ø6 Ø.399E+Ø5	Ø
C59HF	O	W/m2 B/hr-ft2	-.127E+Ø4 -.4Ø3E+Ø3	Ø.177E+Ø3 Ø.561E+Ø2	Ø.244E+Ø4 Ø.773E+Ø3	Ø.127E+Ø4 Ø.4Ø2E+Ø3	-.445E+Ø4 -.141E+Ø4	Ø.117E+Ø6 Ø.37ØE+Ø5	Ø
C62HF	O	W/m2 B/hr-ft2	-.9ØØE+Ø3 -.285E+Ø3	Ø.367E+Ø3 Ø.116E+Ø3	Ø.411E+Ø4 Ø.13ØE+Ø4	Ø.981E+Ø3 Ø.311E+Ø3	-.278E+Ø4 -.881E+Ø3	Ø.1Ø1E+Ø6 Ø.321E+Ø5	Ø
C64HF	O	W/m2 B/hr-ft2	-.412E+Ø3 -.131E+Ø3	Ø.154E+Ø3 Ø.488E+Ø2	Ø.129E+Ø4 Ø.4Ø8E+Ø3	Ø.71ØE+Ø3 Ø.225E+Ø3	-.14ØE+Ø4 -.444E+Ø3	Ø.5Ø7E+Ø5 Ø.161E+Ø5	Ø
C67HF	O	W/m2 B/hr-ft2	-.429E+Ø3 -.136E+Ø3	Ø.145E+Ø3 Ø.461E+Ø2	Ø.144E+Ø4 Ø.458E+Ø3	Ø.498E+Ø3 Ø.158E+Ø3	-.253E+Ø5 -.8Ø1E+Ø4	Ø.993E-Ø5 Ø.315E+Ø5	Ø
C69HF	O	W/m2 B/hr-ft2	Ø.969E+Ø2 Ø.3Ø7E+Ø2	Ø.2Ø2E+Ø3 Ø.64ØE+Ø2	Ø.182E+Ø4 Ø.577E+Ø3	Ø.134E+Ø4 Ø.425E+Ø3	-.539E+Ø4 -.171E+Ø4	Ø.1Ø7E+Ø6 Ø.34ØE-Ø5	Ø
C72HF	O	W/m2 B/hr-ft2	-.384E+Ø3 -.122E+Ø3	Ø.532E+Ø3 Ø.169E+Ø3	Ø.486E+Ø4 Ø.154E+Ø4	Ø.915E+Ø3 Ø.29ØE+Ø3	-.252E+Ø4 -.799E+Ø3	Ø.848E+Ø5 Ø.269E-Ø5	Ø
C74HF	O	W/m2 B/hr-ft2	-.567E+Ø3 -.18ØE+Ø3	Ø.298E+Ø3 Ø.944E+Ø2	Ø.535E+Ø4 Ø.17ØE+Ø4	Ø.2Ø4E+Ø4 Ø.646E+Ø3	-.17ØE+Ø5 -.54ØE+Ø4	Ø.125E+Ø6 Ø.395E+Ø5	Ø
C77HF	O	W/m2 B/hr-ft2	-.526E+Ø3 -.167E+Ø3	Ø.264E+Ø3 Ø.838E+Ø2	Ø.237E+Ø4 Ø.752E+Ø3	Ø.925E+Ø3 Ø.293E+Ø3	-.928E+Ø4 -.294E+Ø4	Ø.121E+Ø6 Ø.383E+Ø5	Ø
C79HF	O	W/m2 B/hr-ft2	-.3Ø5E+Ø3 -.967E+Ø2	Ø.372E+Ø3 Ø.118E+Ø3	Ø.158E+Ø4 Ø.5ØØE+Ø3	Ø.137E+Ø4 Ø.435E+Ø3	-.418E+Ø5 -.133E+Ø5	Ø.138E+Ø6 Ø.437E+Ø5	Ø
HWTRC	N								
HWUTC	O	Deg C Deg F	Ø.19ØE+Ø3 Ø.373E+Ø3	Ø.149E+ØØ Ø.269E+ØØ	Ø.588E+Ø2 Ø.138E+Ø3	Ø.1Ø1E+Ø1 Ø.181E+Ø1	Ø.568E+Ø2 Ø.134E+Ø3	Ø.191E+Ø3 Ø.376E+Ø3	Ø
HWBTC	O	Deg C Deg F	Ø.189E+Ø3 Ø.372E+Ø3	Ø.251E+ØØ Ø.451E+ØØ	Ø.495E+Ø2 Ø.121E+Ø3	Ø.732E+ØØ Ø.132E+Ø1	Ø.478E+Ø2 Ø.118E+Ø3	Ø.19ØE+Ø3 Ø.374E+Ø3	Ø
HWLTC	O	Deg C Deg F	Ø.189E+Ø3 Ø.373E+Ø3	Ø.298E+ØØ Ø.537E+ØØ	Ø.477E+Ø2 Ø.118E+Ø3	Ø.685E+ØØ Ø.123E+Ø1	Ø.466E+Ø2 Ø.116E+Ø3	Ø.19ØE+Ø3 Ø.374E+Ø3	Ø
HWETC	O	Deg C Deg F	Ø.188E+Ø3 Ø.371E+Ø3	Ø.279E+ØØ Ø.5Ø3E+ØØ	Ø.463E+Ø2 Ø.115E+Ø3	Ø.521E+ØØ Ø.939E+ØØ	Ø.453E+Ø2 Ø.113E+Ø3	Ø.19ØE+Ø3 Ø.374E+Ø3	Ø
CV1TC	O	Deg C Deg F	Ø.846E+Ø2 Ø.184E+Ø3	Ø.628E+Ø2 Ø.113E+Ø3	Ø.476E+Ø2 Ø.118E+Ø3	Ø.6Ø3E+ØØ Ø.1Ø8E+Ø1	Ø.332E+Ø2 Ø.918E+Ø2	Ø.19ØE+Ø3 Ø.374E+Ø3	Ø
LOOPT	O	Deg C Deg F	Ø.19ØE+Ø3 Ø.374E+Ø3	Ø.139E+Ø1 Ø.25ØE+Ø1	Ø.185E+Ø3 Ø.364E+Ø3	Ø.242E+ØØ Ø.436E+ØØ	Ø.184E+Ø3 Ø.364E+Ø3	Ø.194E+Ø3 Ø.382E+Ø3	Ø
LOOPT2	O	Deg C Deg F	Ø.189E+Ø3 Ø.372E+Ø3	Ø.236E+ØØ Ø.426E+ØØ	Ø.184E+Ø3 Ø.363E+Ø3	Ø.211E+ØØ Ø.38ØE+ØØ	Ø.184E+Ø3 Ø.362E+Ø3	Ø.19ØE+Ø3 Ø.375E+Ø3	Ø
HPISUPT1	O	Deg C Deg F	Ø.145E+Ø2 Ø.58ØE+Ø2	Ø.175E+ØØ Ø.314E+ØØ	Ø.152E+Ø2 Ø.593E+Ø2	Ø.18ØE+ØØ Ø.323E+ØØ	Ø.118E+Ø2 Ø.532E+Ø2	Ø.182E+Ø2 Ø.648E+Ø2	Ø

TABLE 5 - TEST MAY1Ø6

INITIAL AND FINAL VALUES

INSTR. ID	STATUS[1]	UNITS	INITIAL VALUE[2]		FINAL VALUE[3]		MIN	MAX	SAT[4]
			MEAN	ST DEV	MEAN	ST DEV			
HPISUPT2	O	Deg C Deg F	Ø.145E+Ø2 Ø.582E+Ø2	Ø.183E+ØØ Ø.329E+ØØ	Ø.151E+Ø2 Ø.592E+Ø2	Ø.18ØE+ØØ Ø.323E+ØØ	Ø.124E+Ø2 Ø.543E+Ø2	Ø.168E+Ø2 Ø.622E+Ø2	Ø
VENTVALT	N								
TVP	O	MPa psia	Ø.14ØE+Ø1 Ø.2Ø3E+Ø3	Ø.686E-Ø1 Ø.994E+Ø1	Ø.146E+Ø1 Ø.211E+Ø3	Ø.277E-Ø2 Ø.4Ø1E+ØØ	Ø.126E+Ø1 Ø.182E+Ø3	Ø.148E+Ø1 Ø.215E+Ø3	4Ø
HWRDP	O	cm. H2O in. H2O	Ø.18ØE+Ø2 Ø.7Ø7E+Ø1	Ø.126E+Ø2 Ø.495E+Ø1	Ø.32ØE+Ø2 Ø.126E+Ø2	Ø.5Ø2E+ØØ Ø.198E+ØØ	-.324E-Ø1 -.127E-Ø1	Ø.94ØE-Ø2 Ø.37ØE-Ø2	Ø
HPICLDP	O	******** psi	Ø.ØØØE+ØØ Ø.166E+Ø1	Ø.ØØØE+ØØ Ø.4Ø6E+ØØ	Ø.ØØØE+ØØ Ø.172E+ØØ	Ø.ØØØE+ØØ Ø.263E-Ø1	Ø.ØØØE+ØØ -.147E+ØØ	Ø.ØØØE+ØØ Ø.3Ø9E+Ø1	Ø
LOOPFLOW	O	cm. H2O in. H2O	-.996E+ØØ -.392E+ØØ	Ø.464E+ØØ Ø.183E+ØØ	-.745E+ØØ -.293E+ØØ	Ø.3Ø6E+ØØ Ø.12ØE+ØØ	-.619E+Ø1 -.244E+Ø1	Ø.283E+Ø1 Ø.1[illegible]-Ø1	Ø
HPIFLOW	O	cm. H2O in. H2O	Ø.971E+Ø2 Ø.382E+Ø2	Ø.149E+Ø2 Ø.585E+Ø1	Ø.112E+Ø3 Ø.441E+Ø2	Ø.1Ø3E+Ø1 Ø.4Ø4E+ØØ	Ø.6Ø5E+Ø2 Ø.238E+Ø2	Ø.137E+Ø3 Ø.54ØE+Ø2	Ø
SPHWFLO	Ø	cm. H2O in. H2O	Ø.123E+Ø1 Ø.483E+ØØ	Ø.5Ø1E+Ø1 Ø.197E+Ø1	Ø.188E+Ø2 Ø.74ØE+Ø1	Ø.219E+ØØ Ø.863E-Ø1	-.252E+Ø1 -.991E+ØØ	Ø.274E+Ø2 Ø.1Ø8E+Ø2	Ø
VVALFLO	N								
CLDP5	Ø N								
DDP6	Ø N								

1. Status: O = Operational: N = Not in place: B = Broken
2. Over 132 second interval prior to HPI
3. Over 99 second interval at the end of test (Ø.1τ.)
4. Number of times instrument output exceded range of measurment



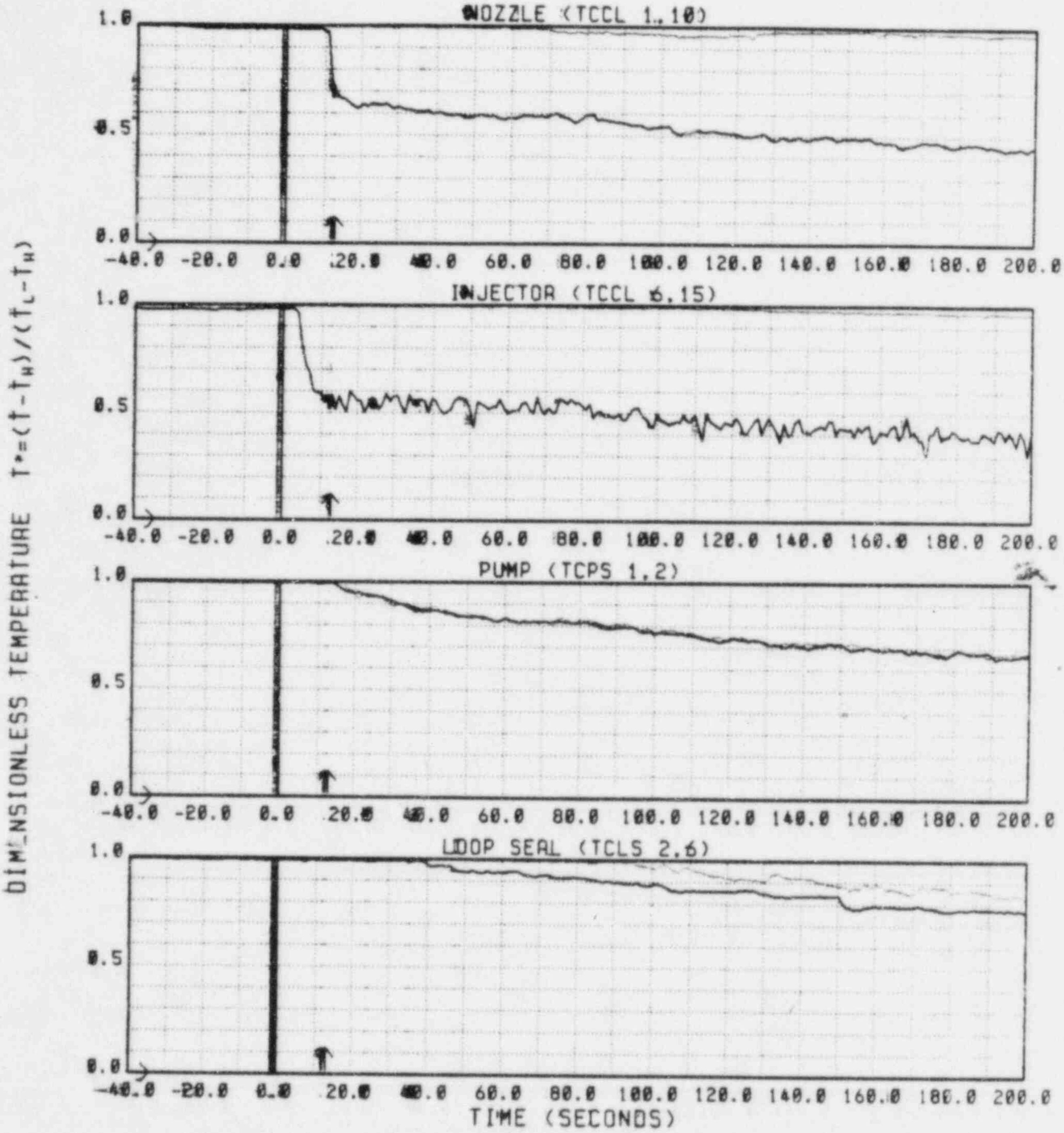
POSITION	NORMALIZING FACTORS
—— BOTTOM ------ TOP	τ_m = 987 sec T_H = 14.8 °C (58.7 °F) T_L = 190.0 °C (374.0 °F)

FIGURE 3.1.o TEST MAY106

TRANSIENT COLD LEG TEMPERATURES

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



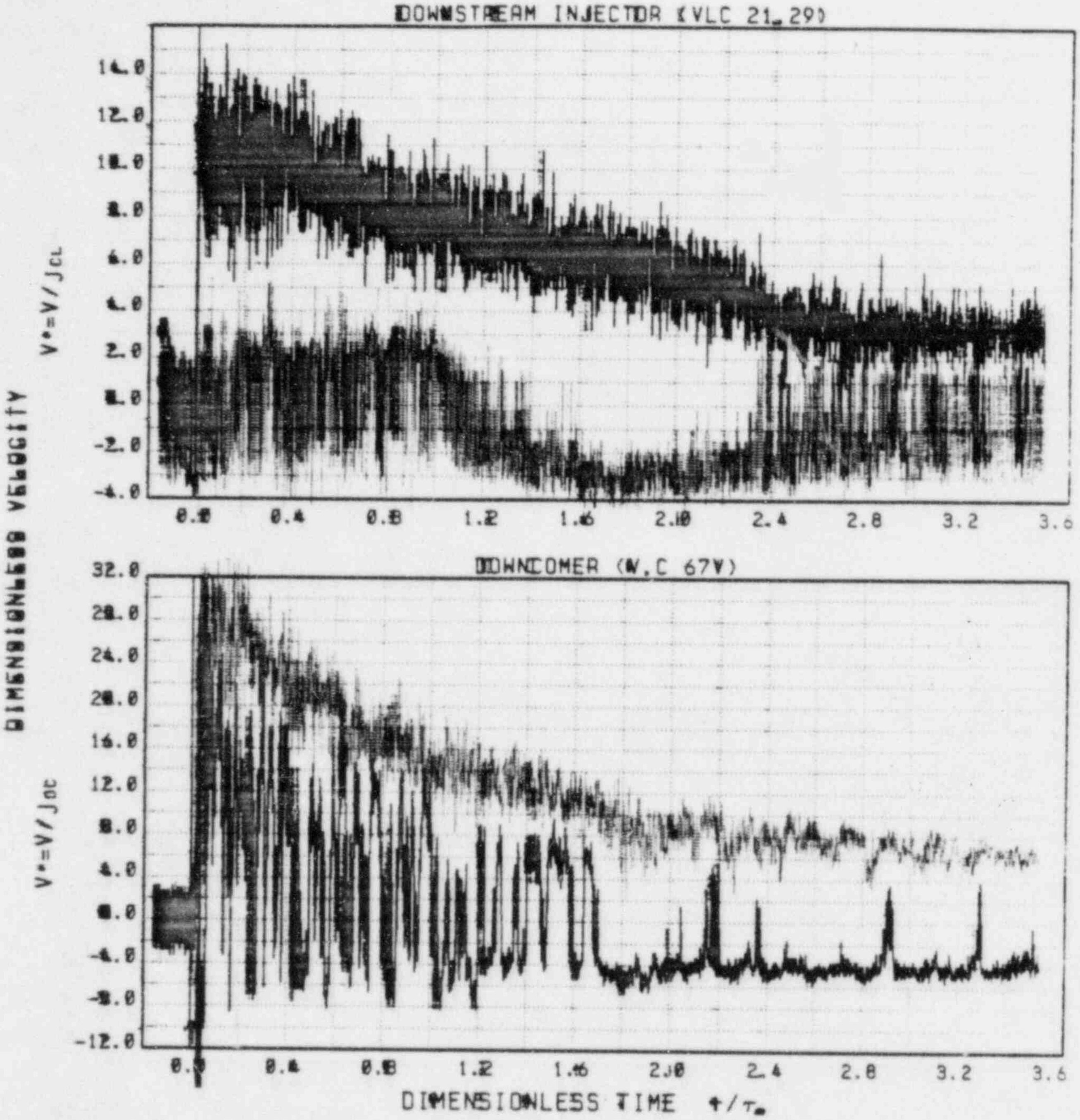
POSITION	NORMALIZING FACTORS
—— BOTTOM - - - TOP	τ_o= 987 sec T_H= 14.8 °C (58.7 °F) T_L=190.0 °C (374.0 °F)

FIGURE 3.1.6 TEST MAY106

TRANSIENT COLD LEG TEMPERATURES

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer

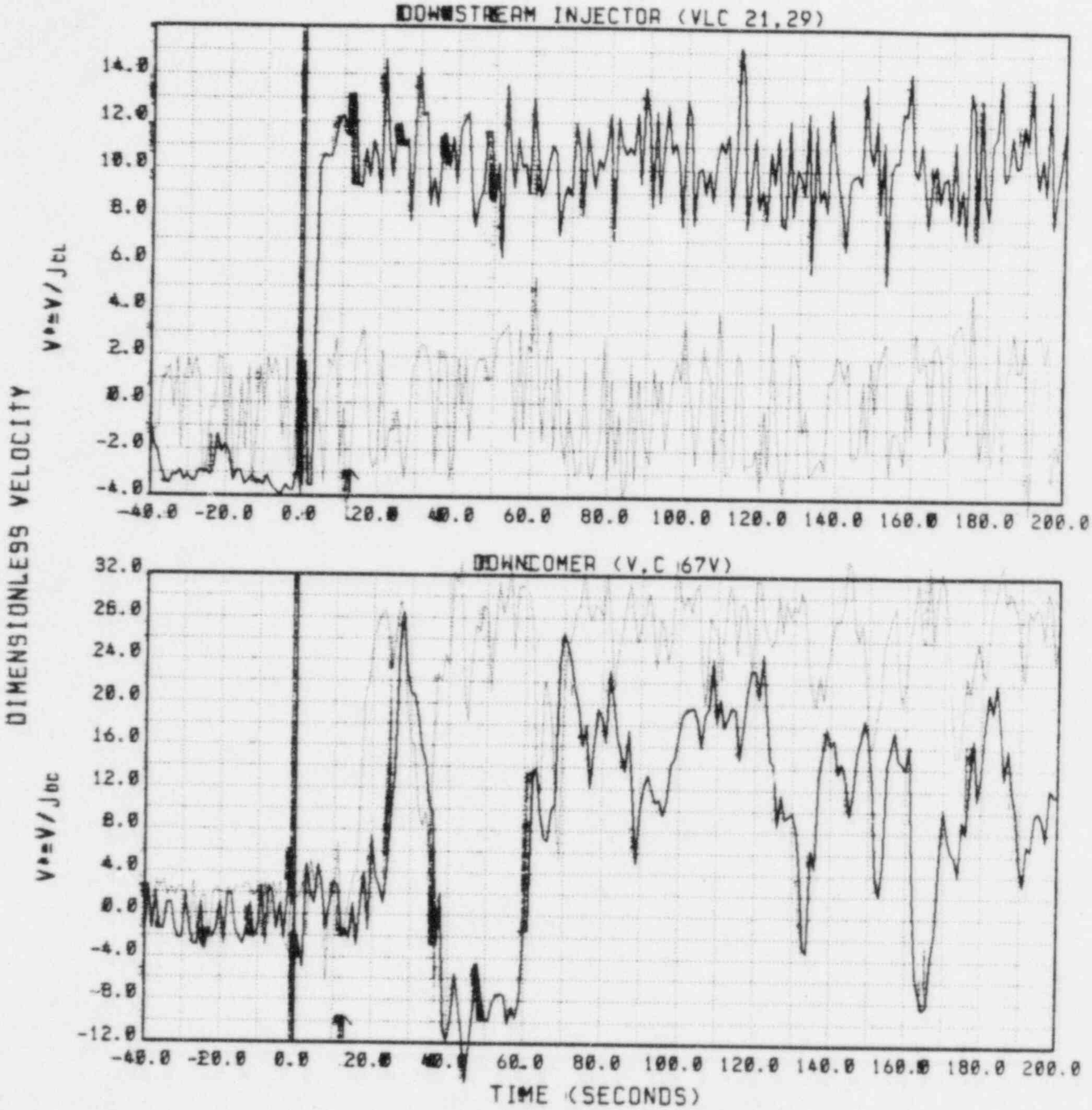


POSITION	NORMALIZING FACTORS
—— BOTTOM; VESSEL	τ_o = [illegible]87 sec J_{CL}=0.03 m/s (0.11 ft/s)
- - - TOP; CORE	J_{DC}=0.02 m/s (0.07 ft/s)

FIGURE 3.2.o TEST MAY106

TRANSIENT COLD LEG AND DOWNCOMER VELOCITIES

Time 0 indicates HPI: Arrow indicate HPI at downcomer



POSITION	NORMALIZING FACTORS
——— BOTTOM; VESSEL	τ_o= 987 sec J_{CL}=0.03 m/s (0.11 ft/s)
······ TOP; CORE	J_{DC}=0.02 m/s (0.07 ft/s)

FIGURE 3.2.6 TEST MAY106

TRANSIENT COLD LEG AND DOWNCOMER VELOCITIES

Time 0 indicates HPI: Arrow indicate HPI at downcomer

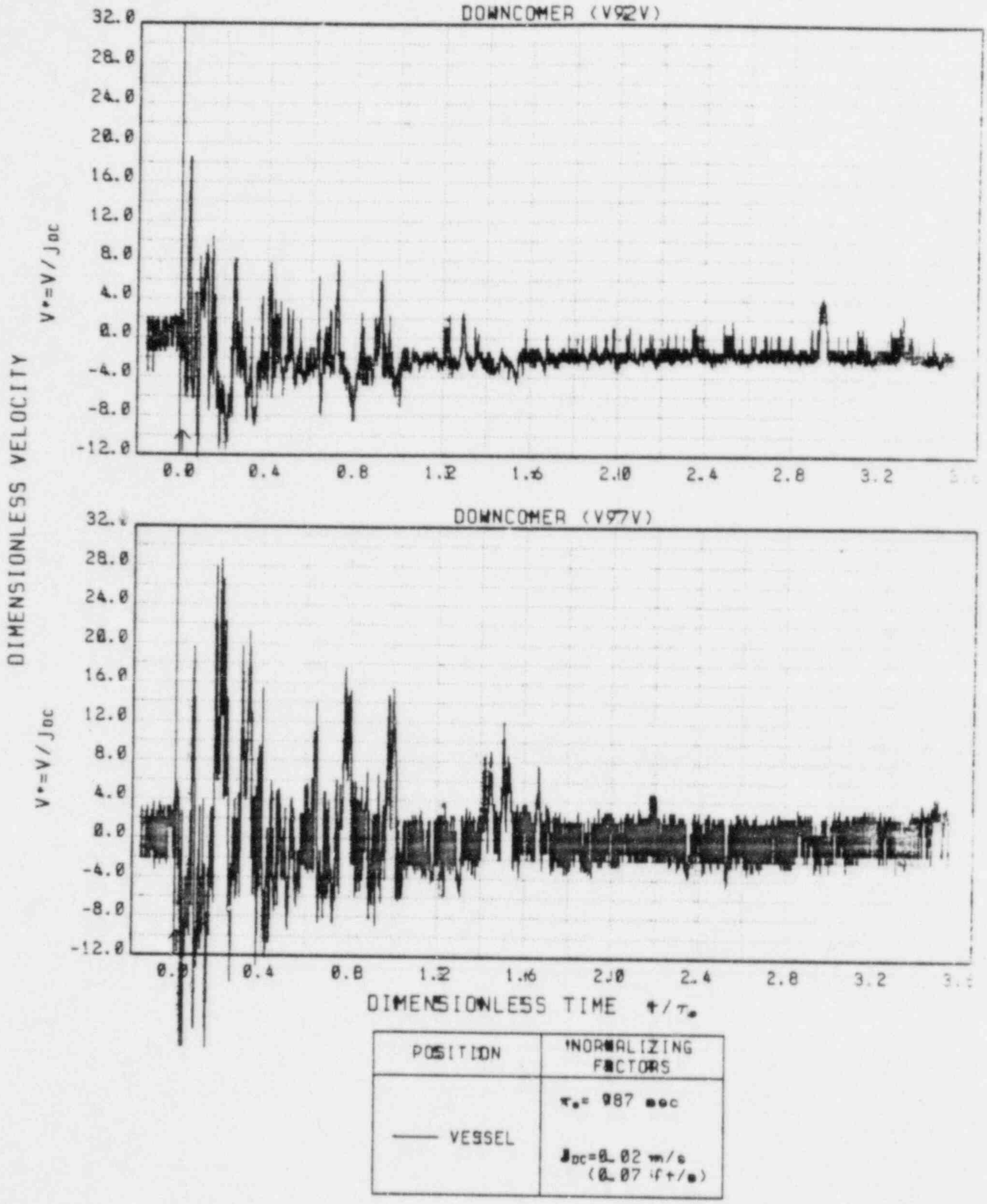
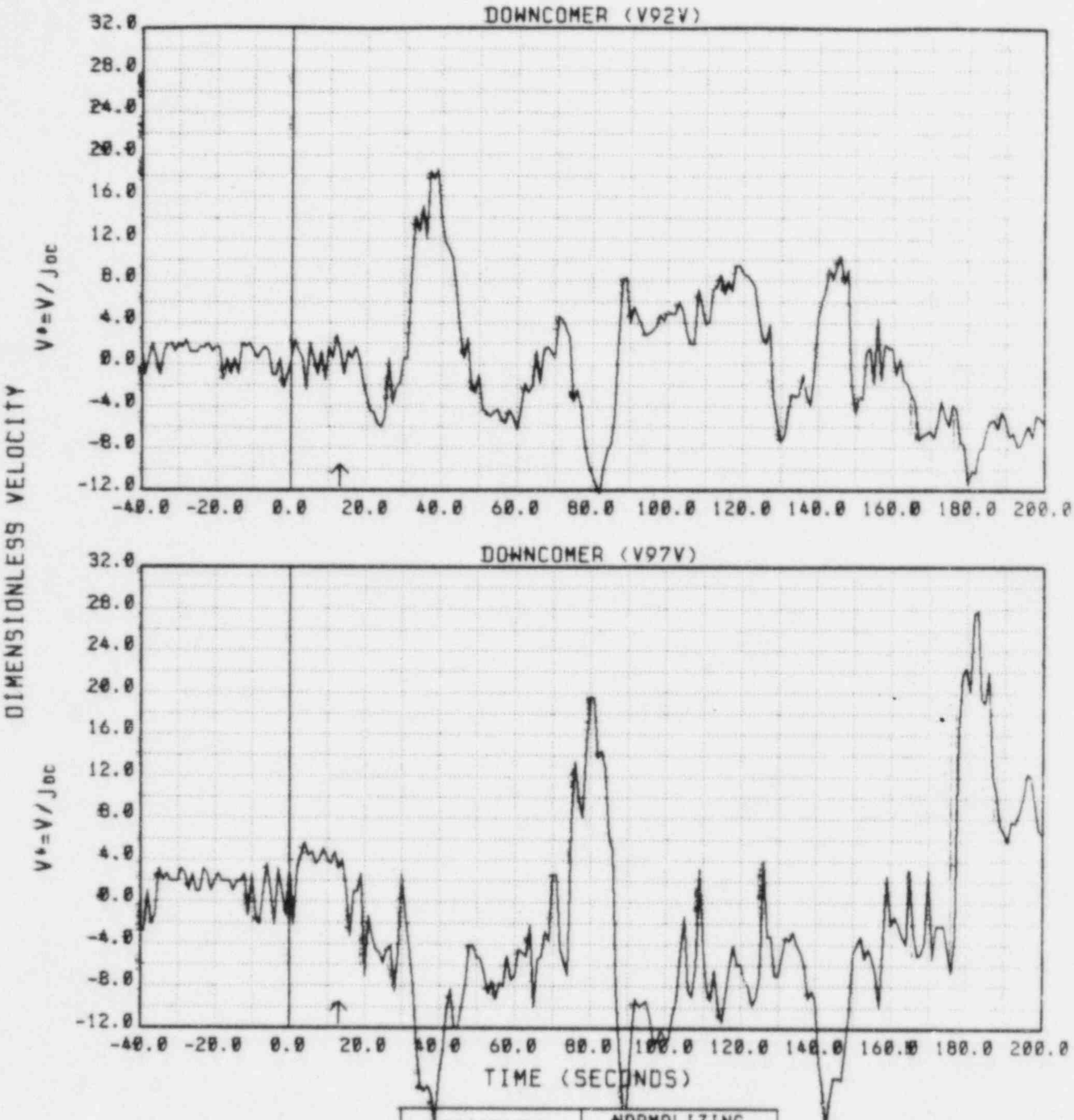


FIGURE 3.2.c TEST MAY106

TRANSIENT DOWNCOMER VELOCITIES

Time 0 indicates HPI: Arrow indicate HPI at downcomer

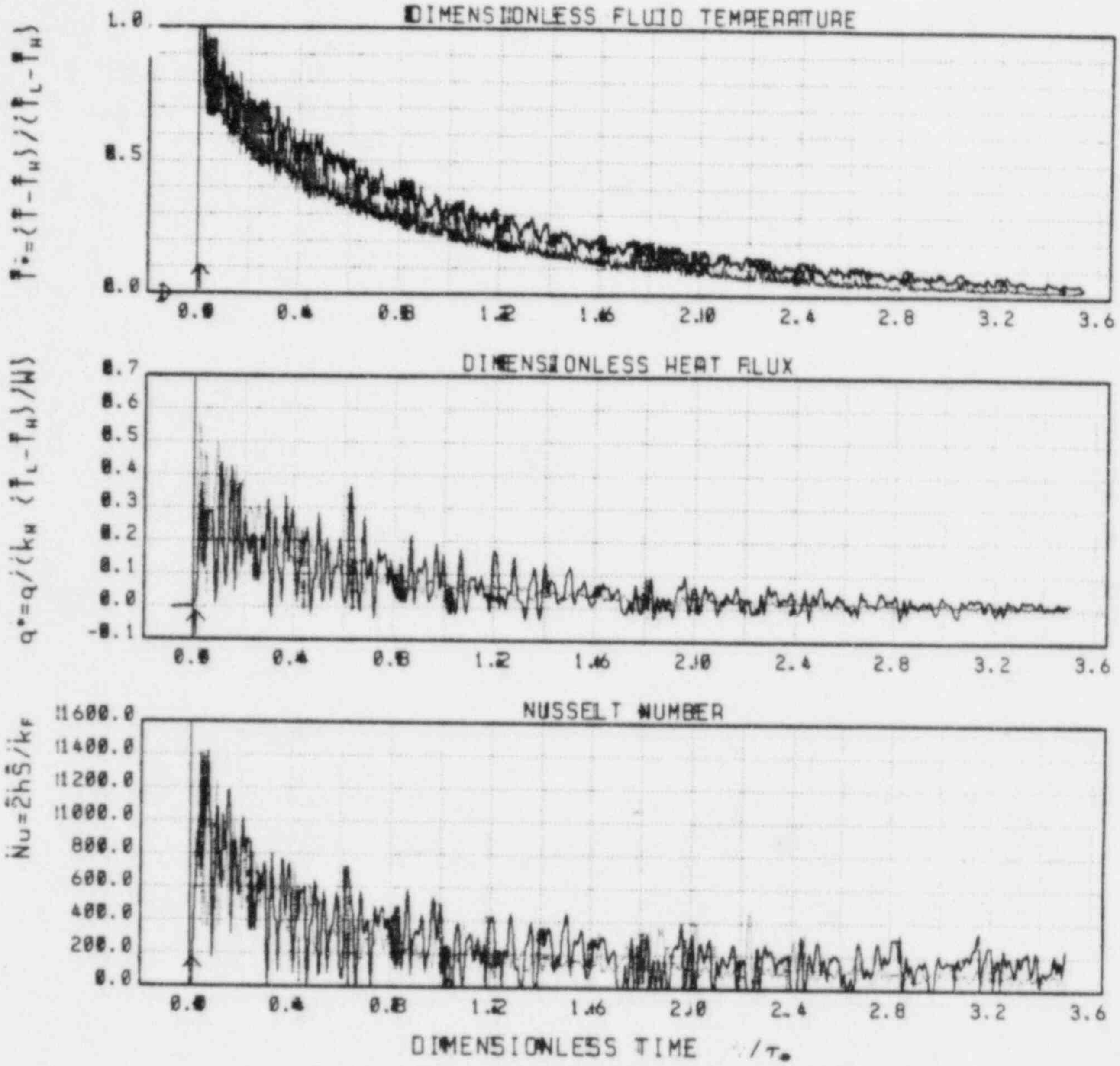


POSITION	NORMALIZING FACTORS
—— VESSEL	τ_s= 987 sec J_{DC}=0.02 m/s (0.07 ft/s)

FIGURE 3.2.d TEST MAY106

TRANSIENT DOWNCOMER VELOCITIES

Time 0 indicates HPI; Arrow indicate HPI at downcomer



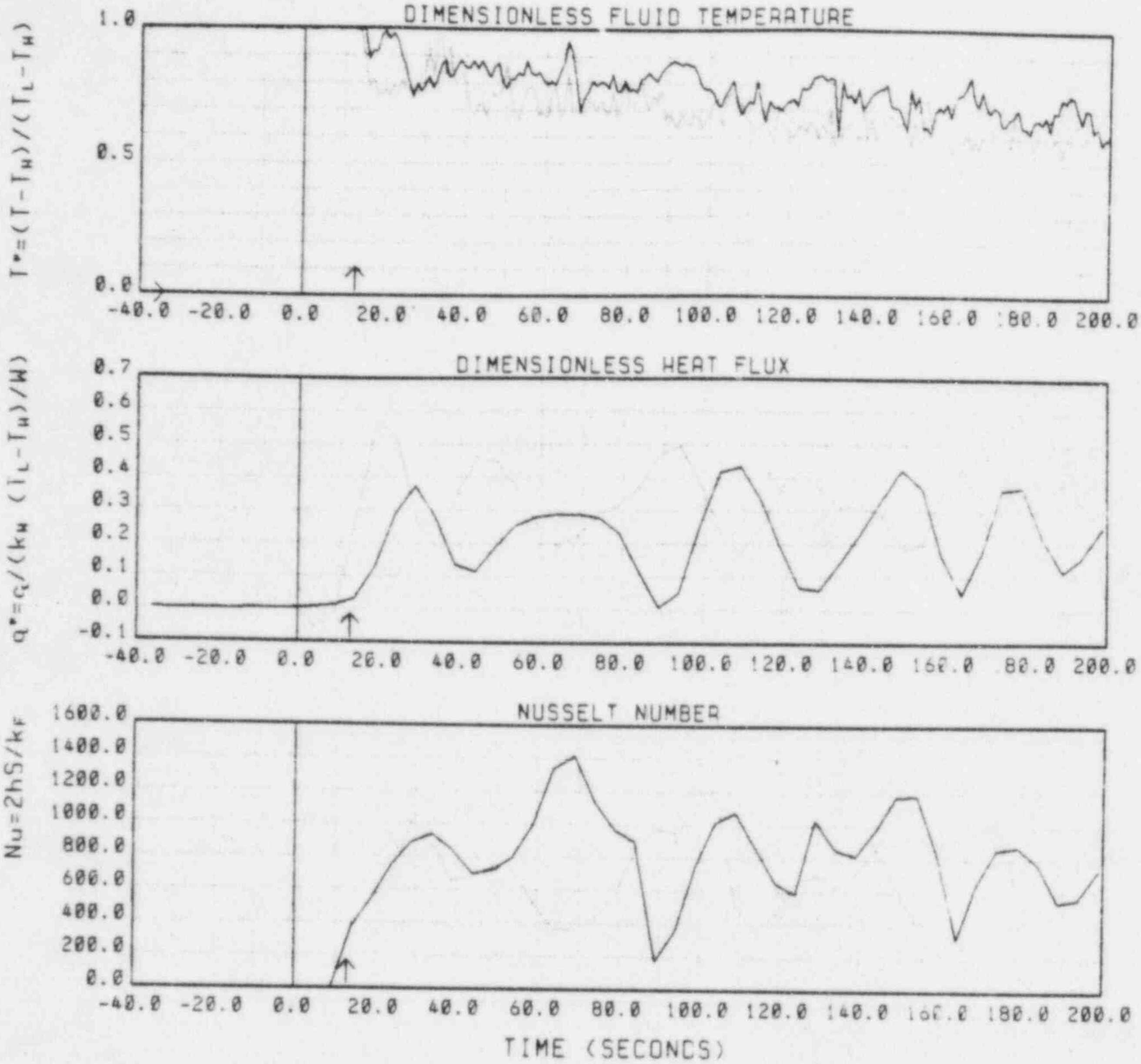
POSITION	NORMALIZING FACTORS
—— VESSEL ······ CORE	τ_0 = 987 sec T_H = 14.8 °C (58.7 °F) T_L = 190.0 °C (374.0 °F) W = 5.1 cm (2.0 in) K_W = 50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F = 0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL} = 0.059 m (0.192 ft) S_{CORE} = 0.041 m (0.133 ft)

FIGURE 3.3.o TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 57

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



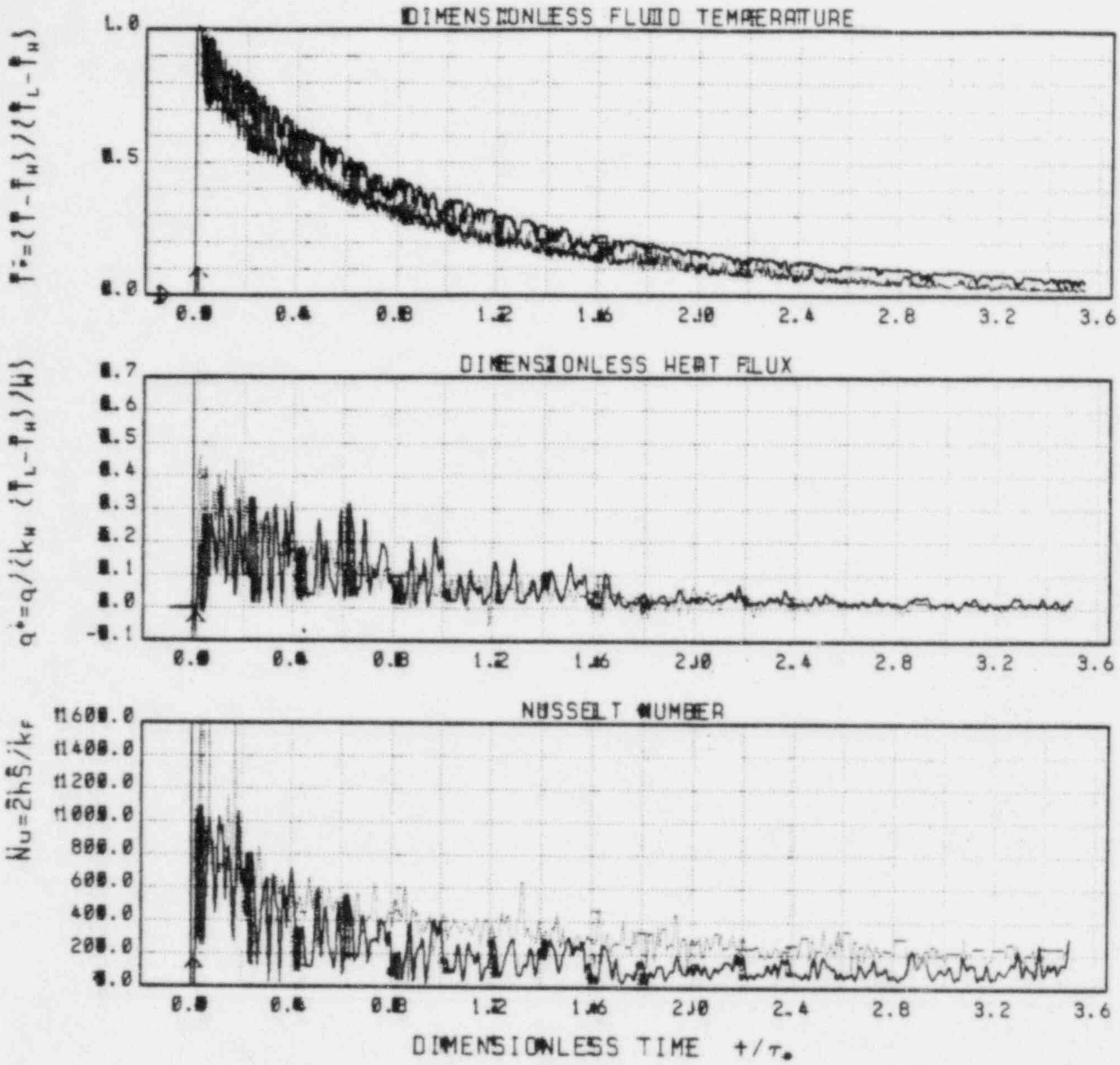
POSITION	NORMALIZING FACTORS
—— VESSEL —— CORE	τ_o= 987 sec T_W= 14.8 °C (58.7 °F) T_L=190.0 °C (374.0 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.3.6 TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 57

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



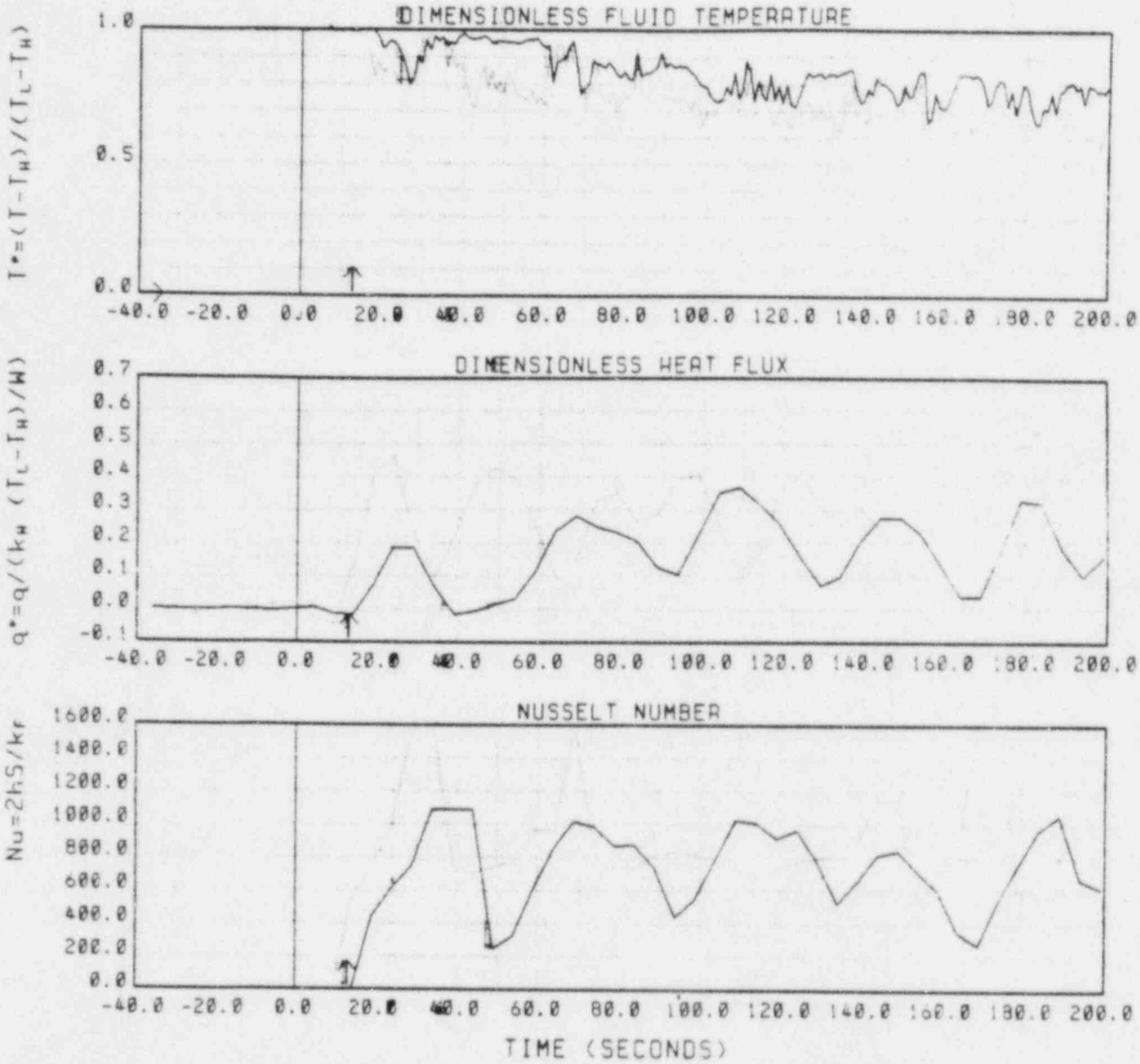
POSITION	NORMALIZING FACTORS
—— VESSEL - - - CORE	τ_o = [illegible]87 sec T_H = 14.8 °C (58.7 °F) T_L = 190.0 °C (374.0 °F) W = 5.1 cm (2.0 in) k_w = 50.1 W/m-°C (28.95 Btu/ft-hr-°F) k_f = 0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL} = 0.059 m (0.192 ft) S_{CORE} = 0.041 m (0.133 ft)

FIGURE 3.4.o TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 67

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



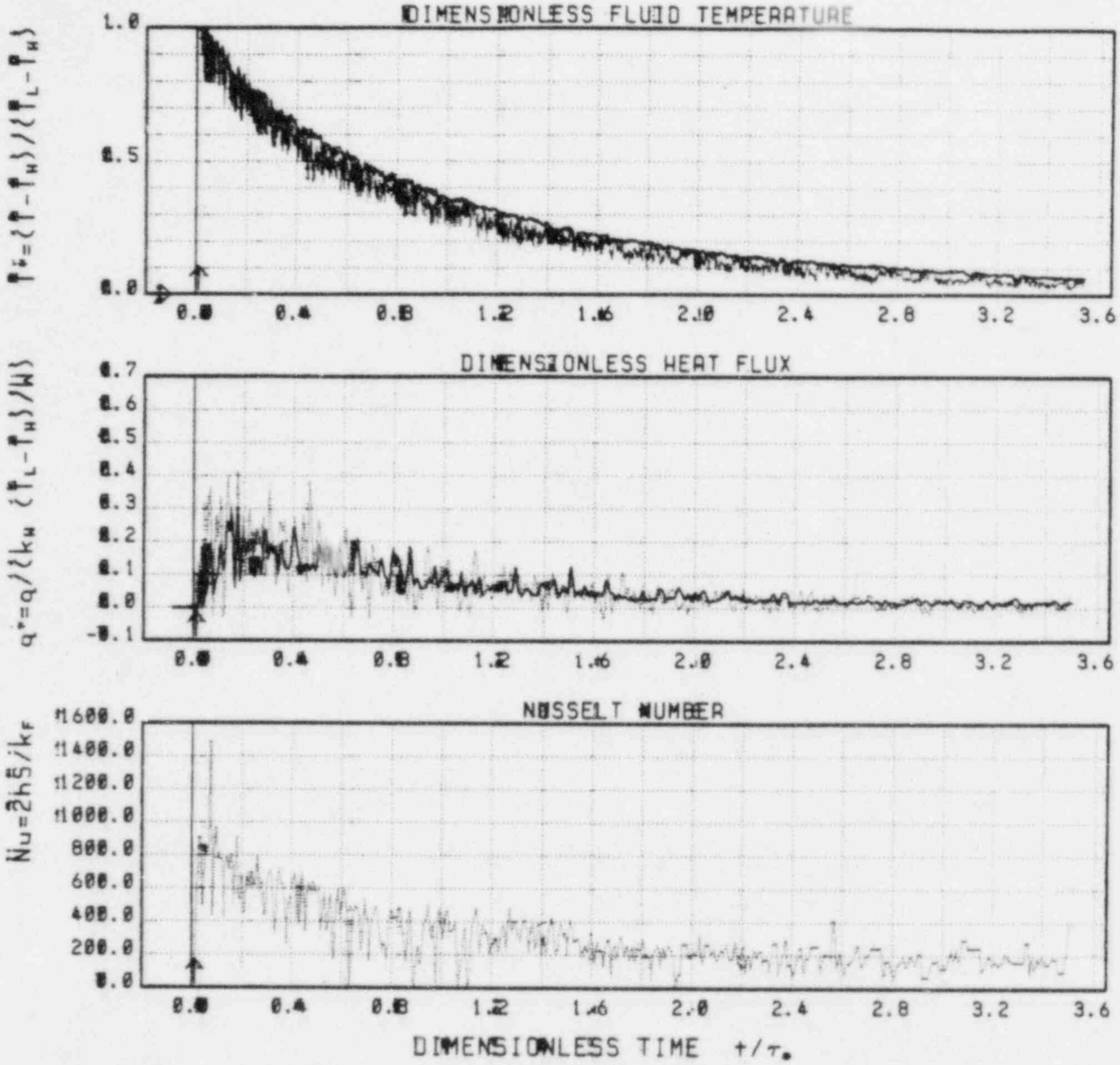
POSITION	NORMALIZING FACTORS
—— VESSEL CORE	τ_* = 987 sec T_H = 14.8 °C (58.7 °F) T_L = 190.0 °C (374.0 °F) W = 5.1 cm (2.0 in) k_W = 50.1 W/m-°C (28.95 Btu/ft-hr-°F) k_F = 0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) δ_{VESSEL} = 0.059 m (0.192ft) δ_{CORE} = 0.041 m (0.133ft)

FIGURE 3.4.6 TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 67

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



POSITION	NORMALIZING FACTORS
—— VESSEL —— CORE	τ_0= [illegible]87 sec T_H= 14.8 °C (58.7 °F) T_L=190.0 °C (374.0 °F) W=5.1 cm (2.0 in) k_w=50.1 W/m-°C (28.95 Btu/ft-hr-°F) k_f=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) δ_{VESSEL}=0.0059 m (0.0192 ft) δ_{CORE} =0.0041 m (0.0133 ft)

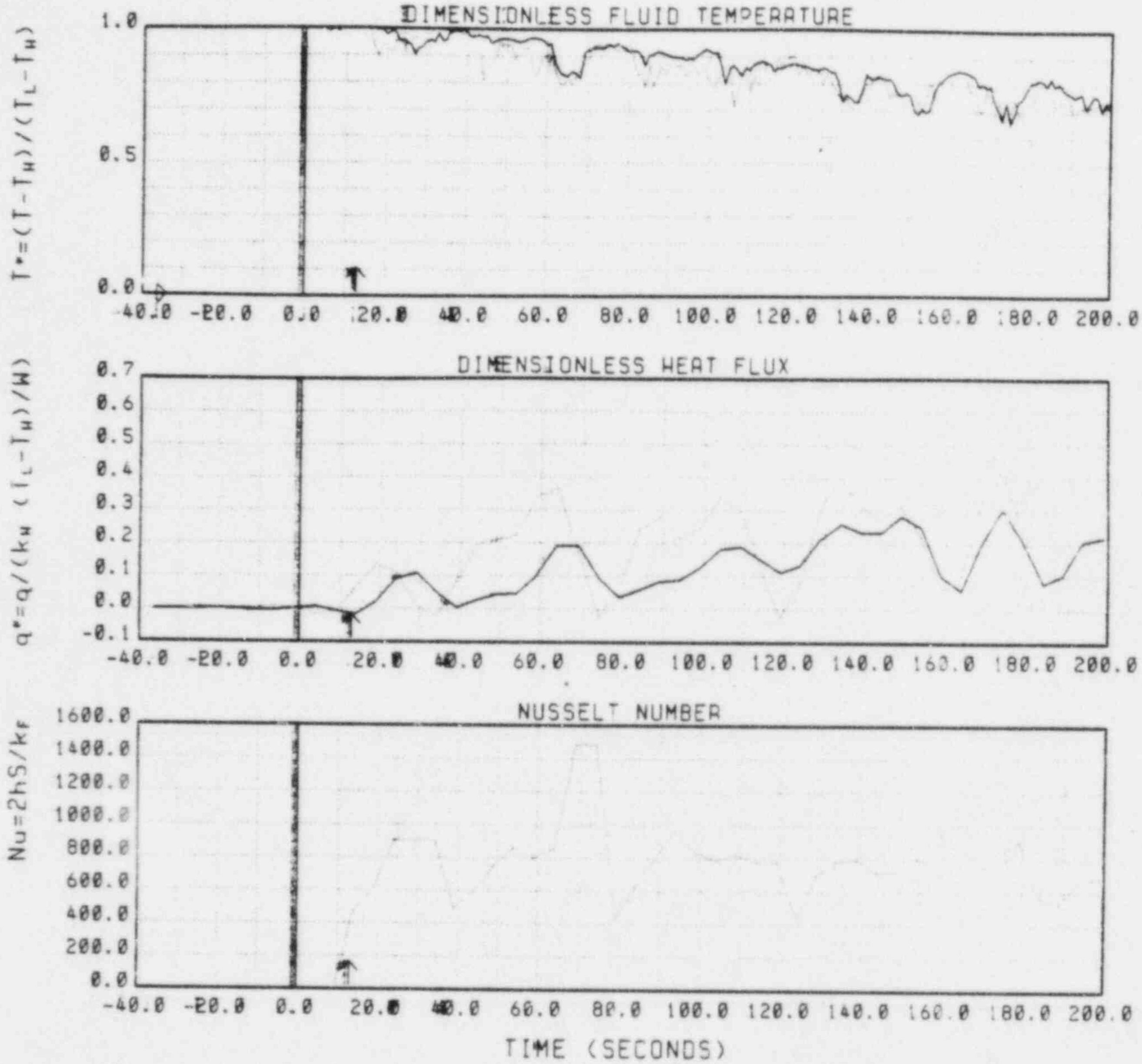
FIGURE 3.5.o TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 69

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer

842



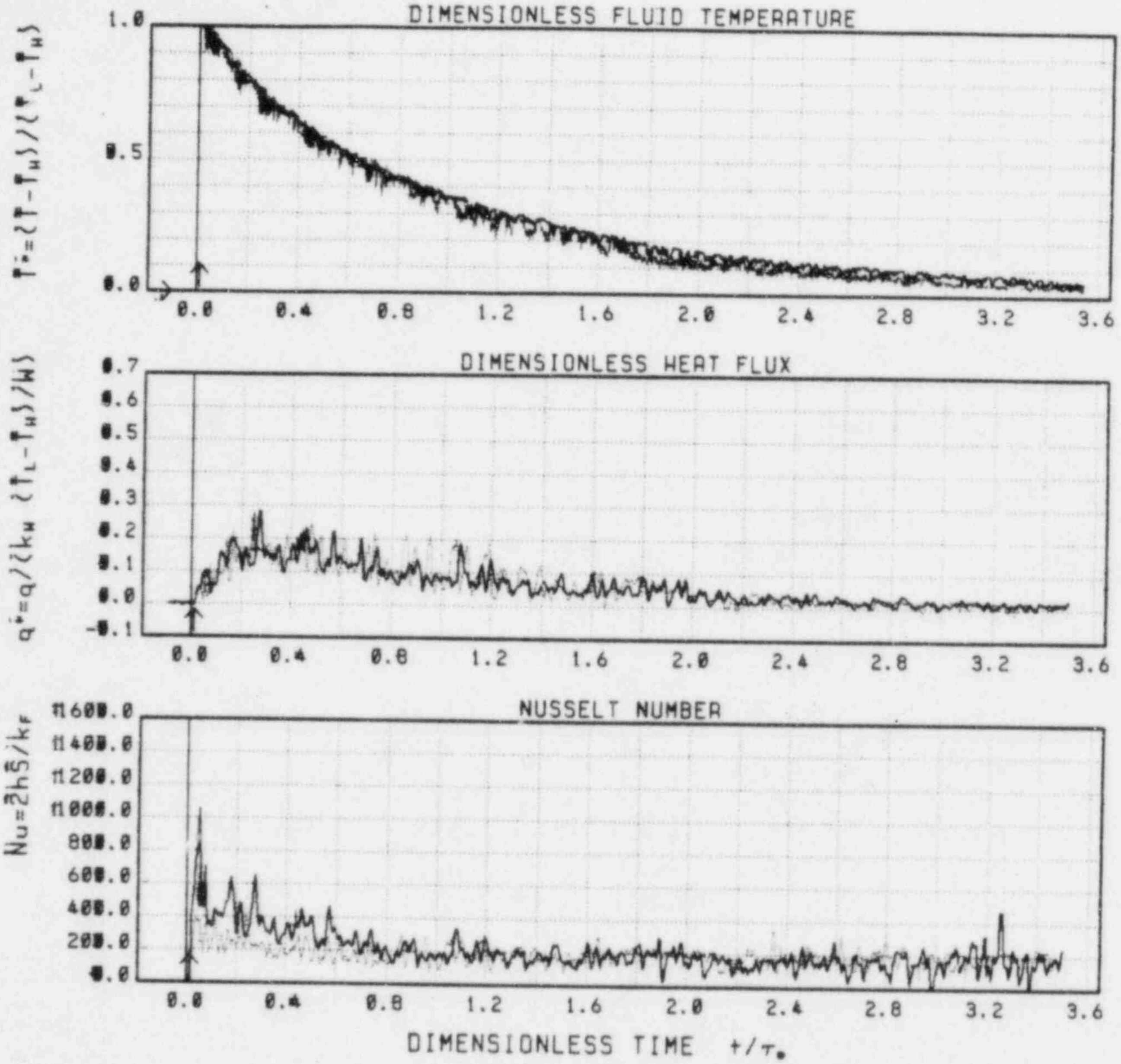
POSITION	NORMALIZING FACTORS
—— VESSEL —— CORE	τ_0= 487 sec T_H= 14.8 ·C (58.7 ·F) T_L=190.0 ·C (374.0 ·F) W=5.1 cm (2.0 in) K_H=50.1 W/m-·C (28.95 Btu/ft-hr-·F) K_F=0.61-0.69 W/m-·C (0.35-0.40 Btu/ft-hr-·F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

FIGURE 3.5.b TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 69

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer



POSITION	NORMALIZING FACTORS
—— VESSEL ····· CORE	τ_o= 987 sec T_H= 14.8 °C (58.7 °F) T_L=190.0 °C (374.0 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

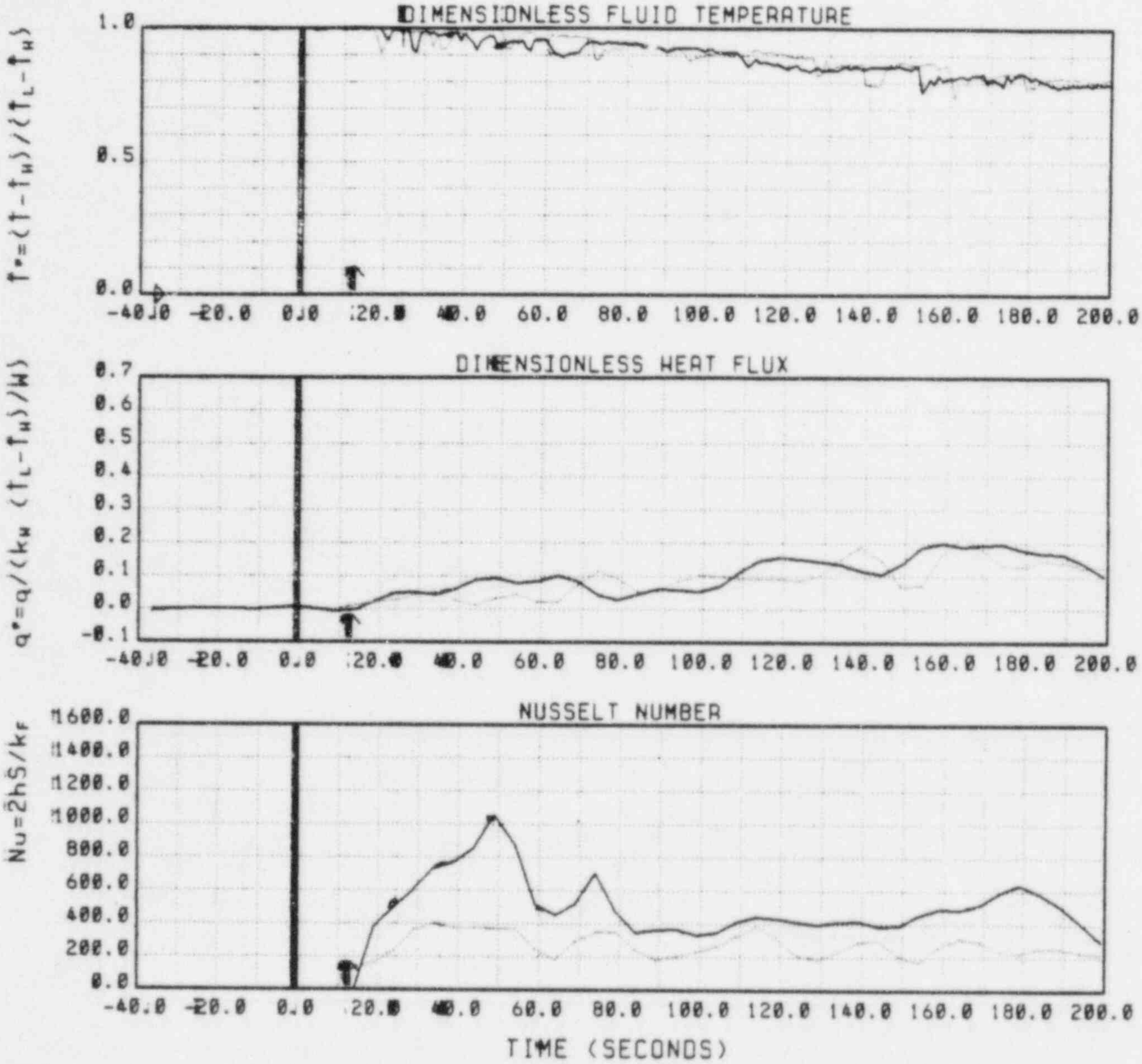
FIGURE 3.6.o TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 64

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer

341



POSITION	NORMALIZING FACTORS
—— VESSEL ······ CORE	τ_0= 987 sec T_H= 14.8 °C (58.7 °F) T_L=190.0 °C (374.0 °F) H=5.1 cm (2.0 in) K_w=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_f=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

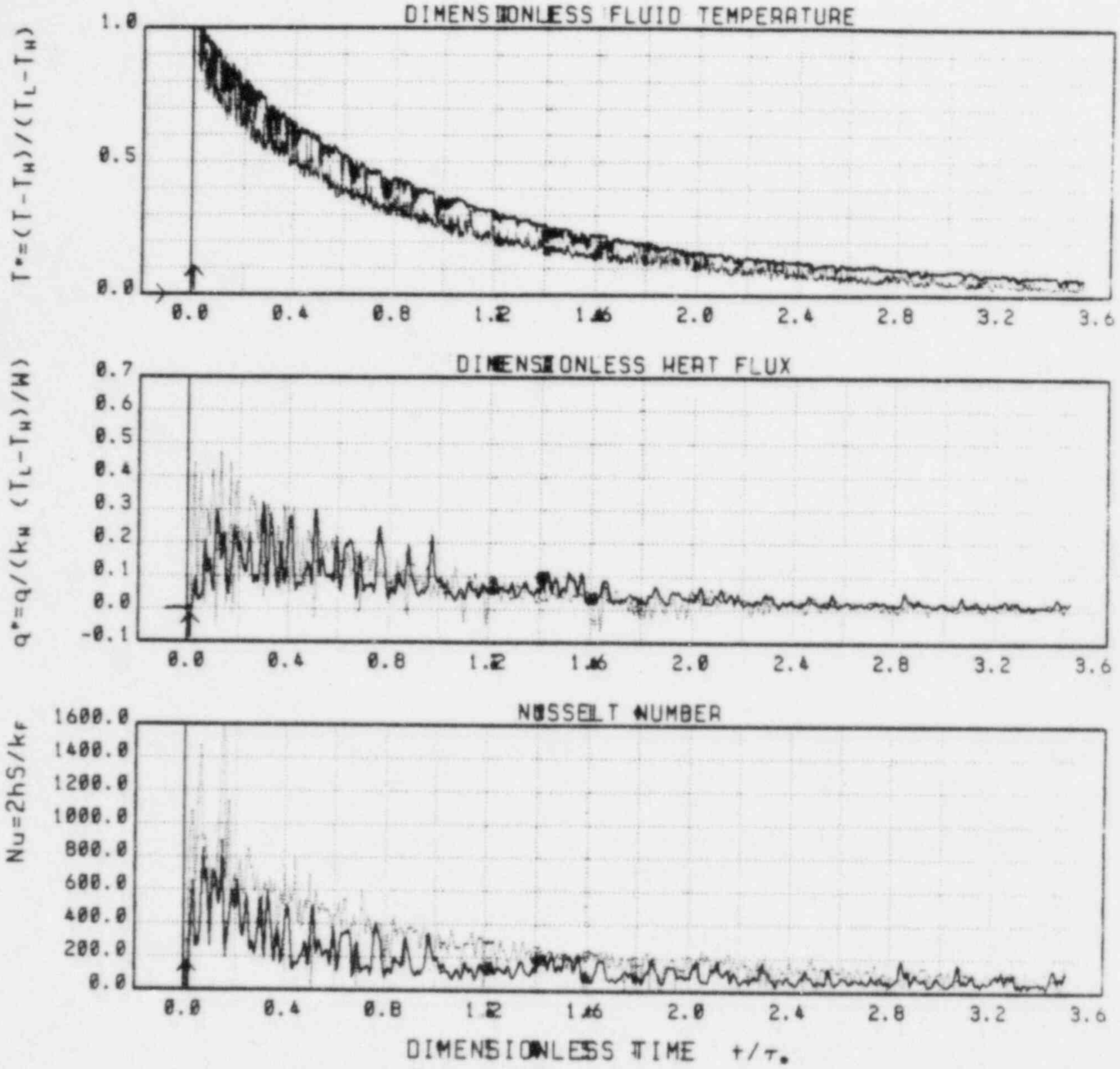
FIGURE 3.6.b TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 64

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer

034



POSITION	NORMALIZING FACTORS
—— VESSEL CORE	τ_0= 987 sec T_H= 14.8 °C (58.7 °F) T_L=190.0 °C (374.0 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.1059 m (0.192ft) S_{CORE} =0.1041 m (0.133ft)

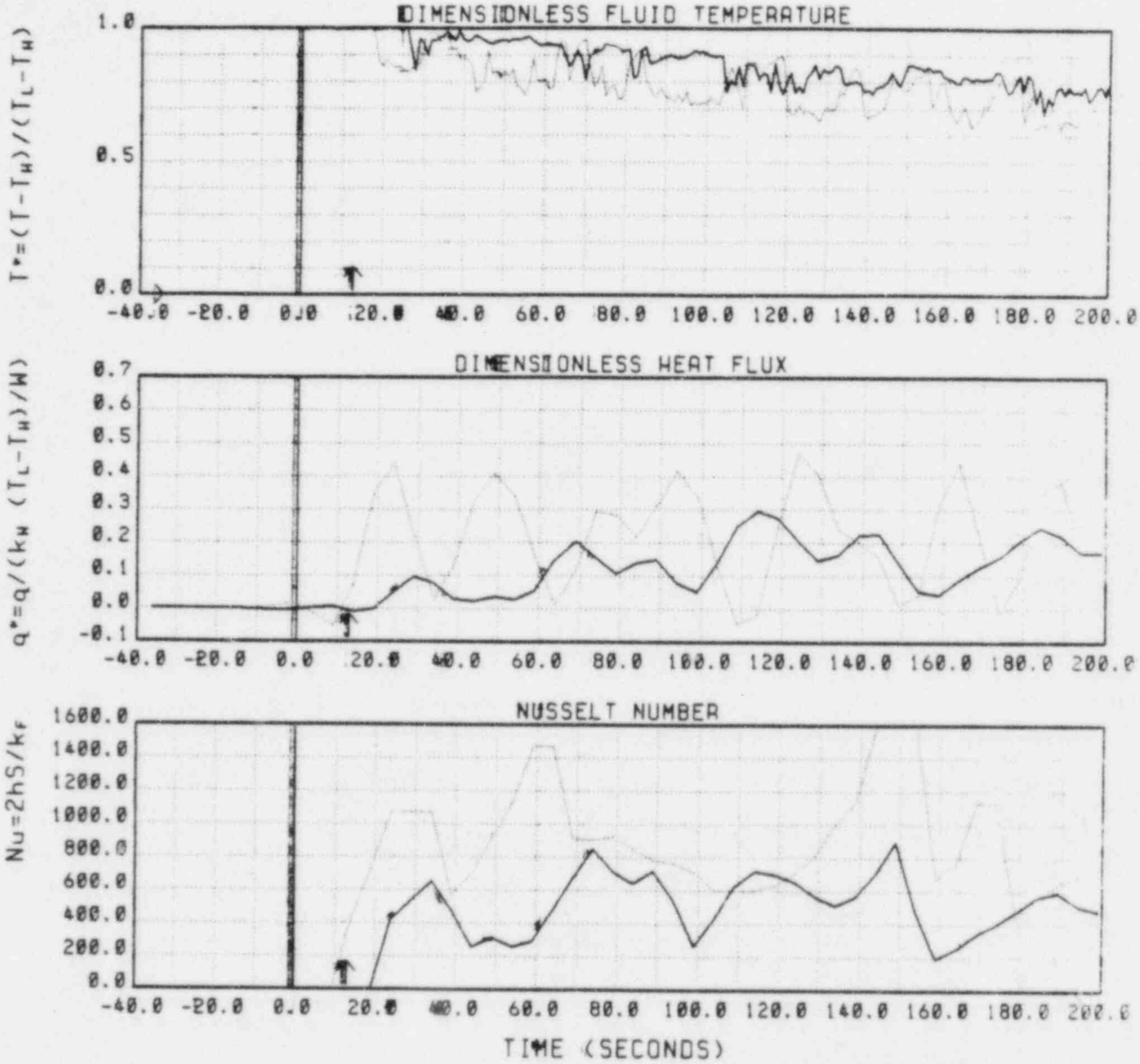
FIGURE 3.7.o TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 77

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer

840



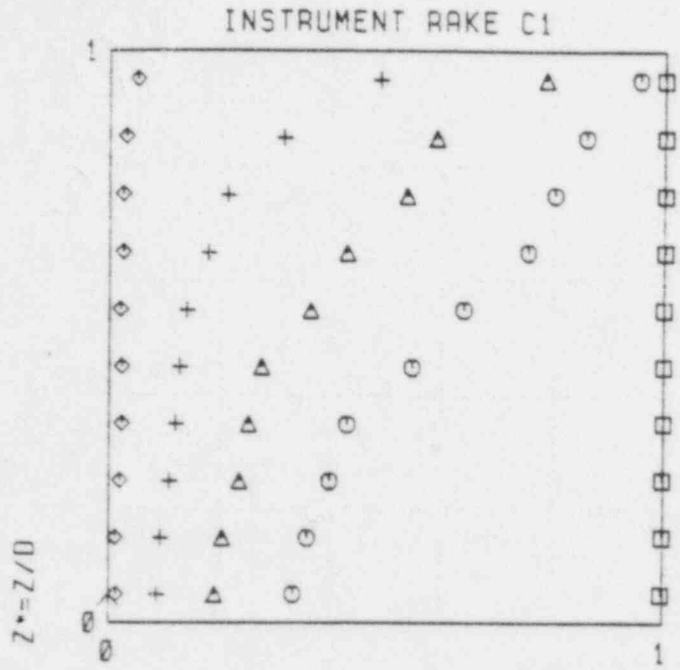
POSITION	NORMALIZING FACTORS
—— VESSEL ······ CORE	τ_0= 987 sec T_H= 14.8 °C (58.7 °F) T_L=190.0 °C (374.0 °F) W=5.1 cm (2.0 in) K_W=50.1 W/m-°C (28.95 Btu/ft-hr-°F) K_F=0.61-0.69 W/m-°C (0.35-0.40 Btu/ft-hr-°F) S_{VESSEL}=0.059 m (0.192ft) S_{CORE} =0.041 m (0.133ft)

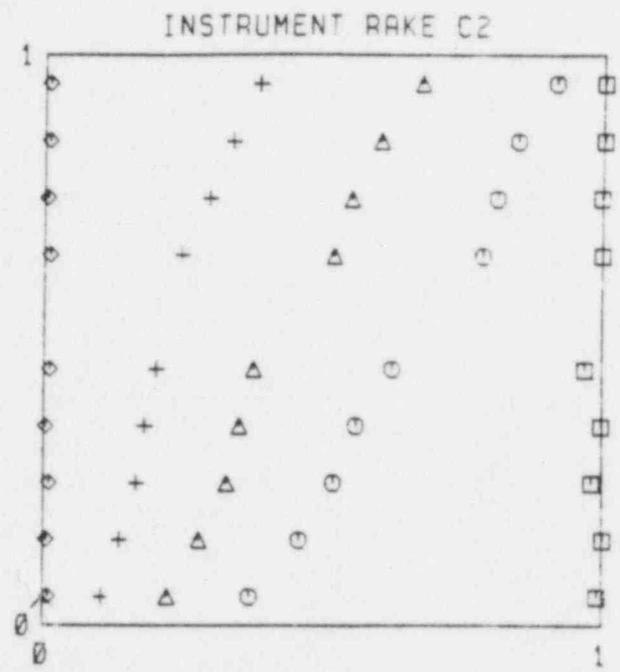
FIGURE 3.7.b TEST MAY106

TRANSIENT DOWNCOMER DATA AT LOCATION 77

Time 0 indicates HPI

Arrow : Mixed Mean Temperature : HPI at downcomer





SYMBOL	t/τ_m	t (sec)	NORMALIZING FACTORS
□	0.0	132	T_M= 14.8 °C
○	0.3	284	(58.7 °F)
△	0.7	684	T_L=190.0 °C
+	1.4	1368	(374.0 °F)
◇	3.5	3601	D= 36.3 cm.
			(14.3 in.)

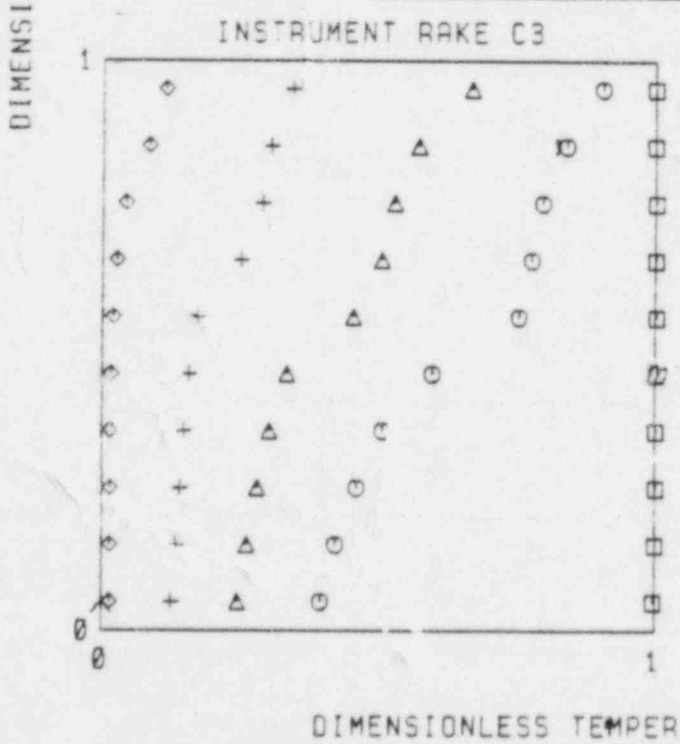
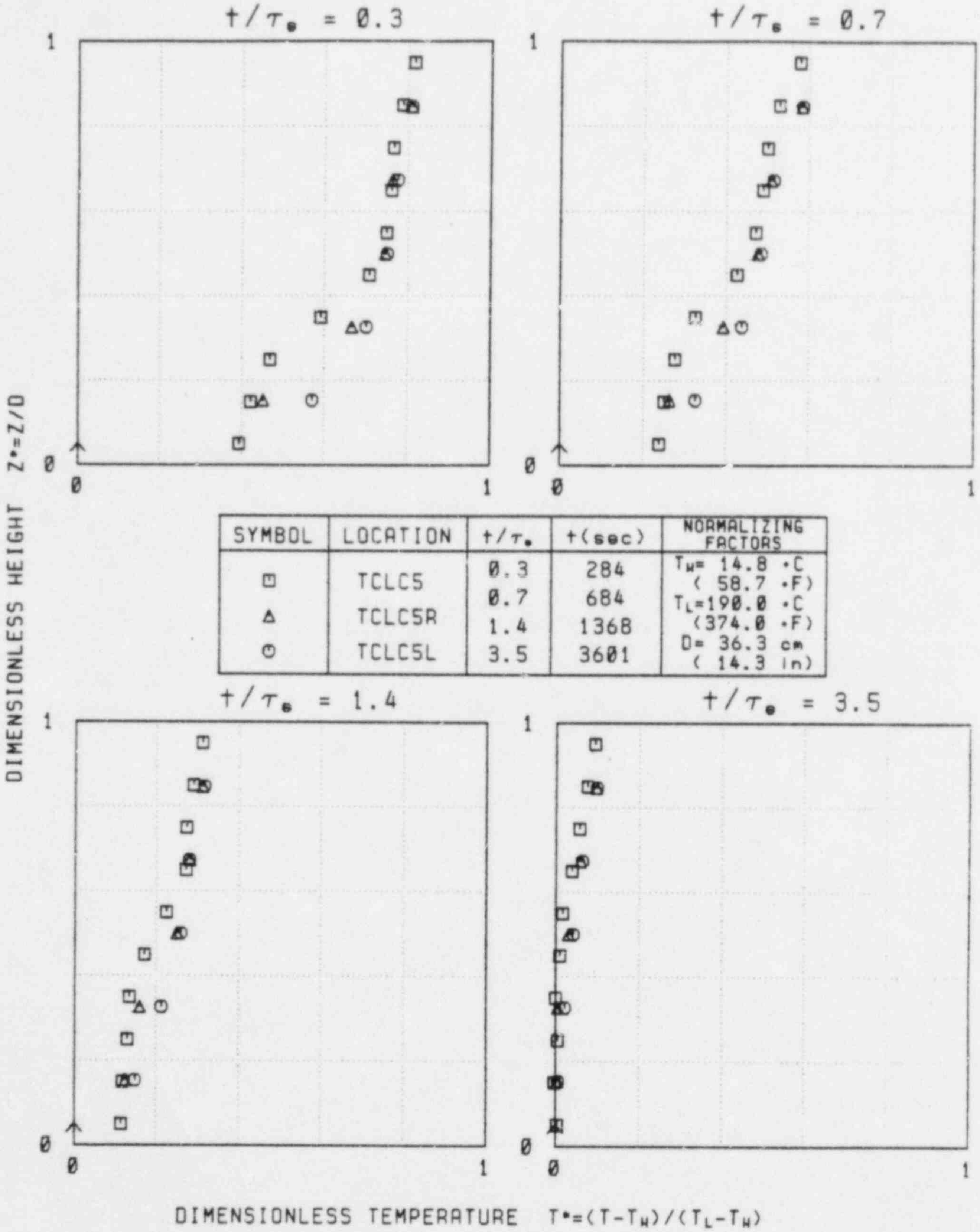


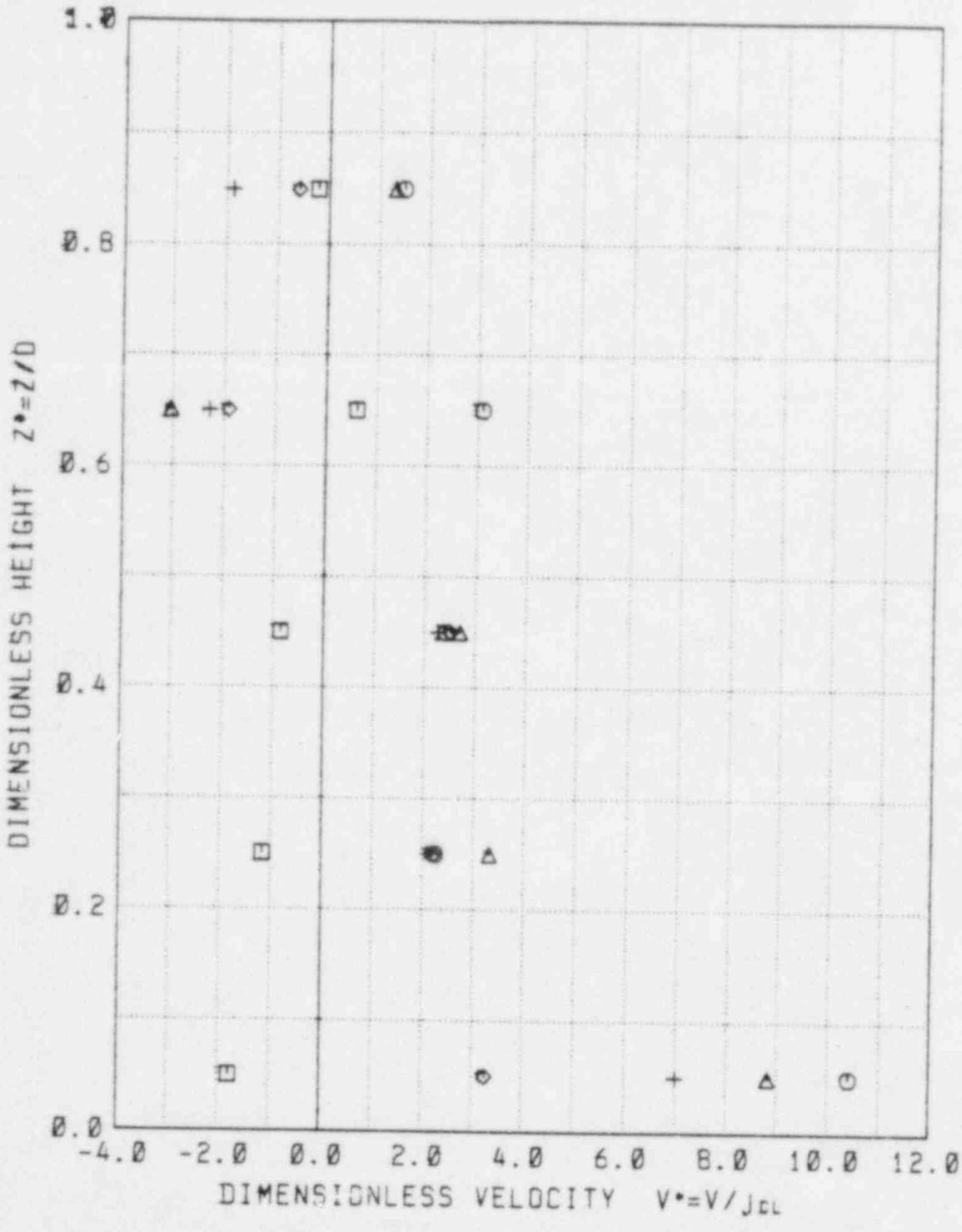
FIGURE 4.1.o TEST MAY106
COLD LEG VERTICAL TEMPERATURE PROFILES
Arrow indicates Mixed Mean Temperature



SYMBOL	LOCATION	t/τ_e	t(sec)	NORMALIZING FACTORS
□	TCLC5	0.3	284	T_H= 14.8 °C (58.7 °F)
△	TCLC5R	0.7	684	T_L=190.0 °C (374.0 °F)
○	TCLC5L	1.4	1368	D= 36.3 cm
		3.5	3601	(14.3 in)

FIGURE 4.2 TEST MAY106
NOZZLE TEMPERATURE DISTRIBUTION
Arrow indicates Mixed Mean Temperature

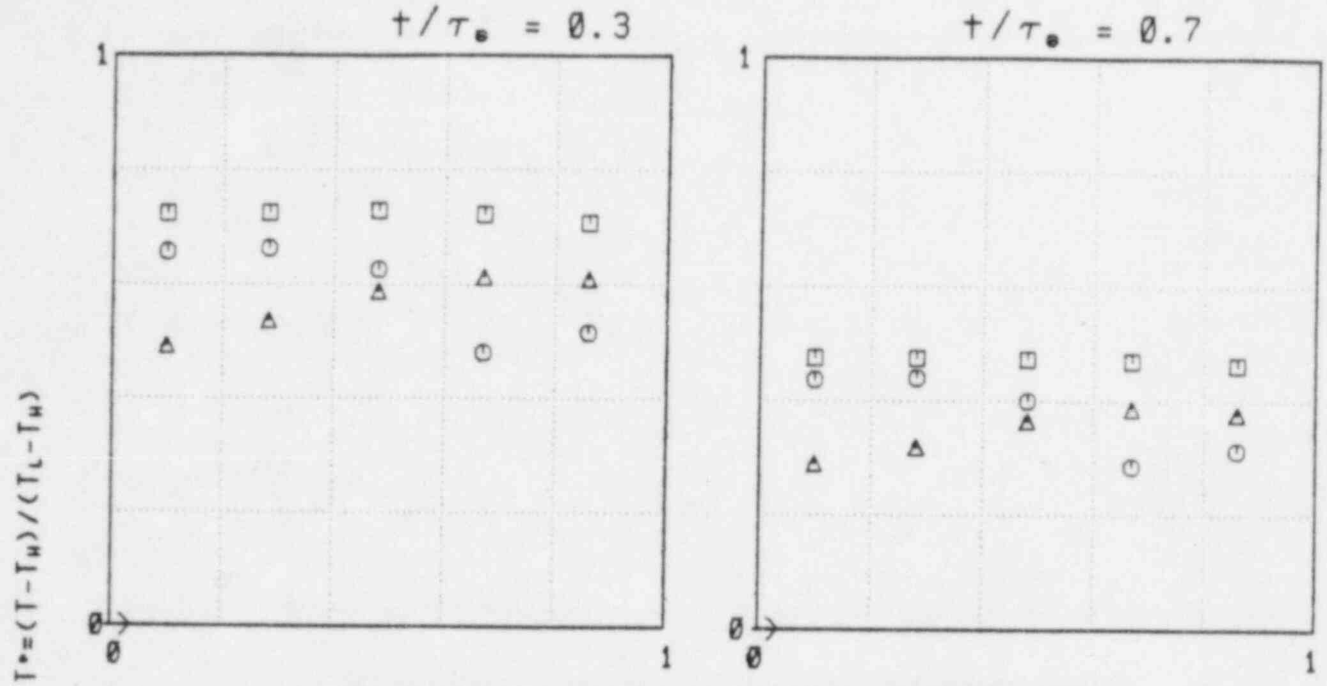
026



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	J_{CL}=0.03 m/s (0.11 ft/s)
⊙	0.3	284	
△	0.7	684	
+	1.4	1368	D= 36.3 cm. (14.3 in.)
◇	3.5	3601	

FIGURE 4.3 TEST MAY106

COLD LEG VERTICAL VELOCITY PROFILE (INST. RAKE C2)



SYMBOL	LOCATION	t/τ_e	t(sec)	NORMALIZING FACTORS
⊡	GAPJ1	0.3	284	T_W= 14.8 °C (58.7 °F)
Δ	GAPJ2	0.7	684	T_L=190.0 °C (374.0 °F)
⊙	GAPJ3	1.4	1368	S=0.138 m (0.451 ft)
		3.5	3601	

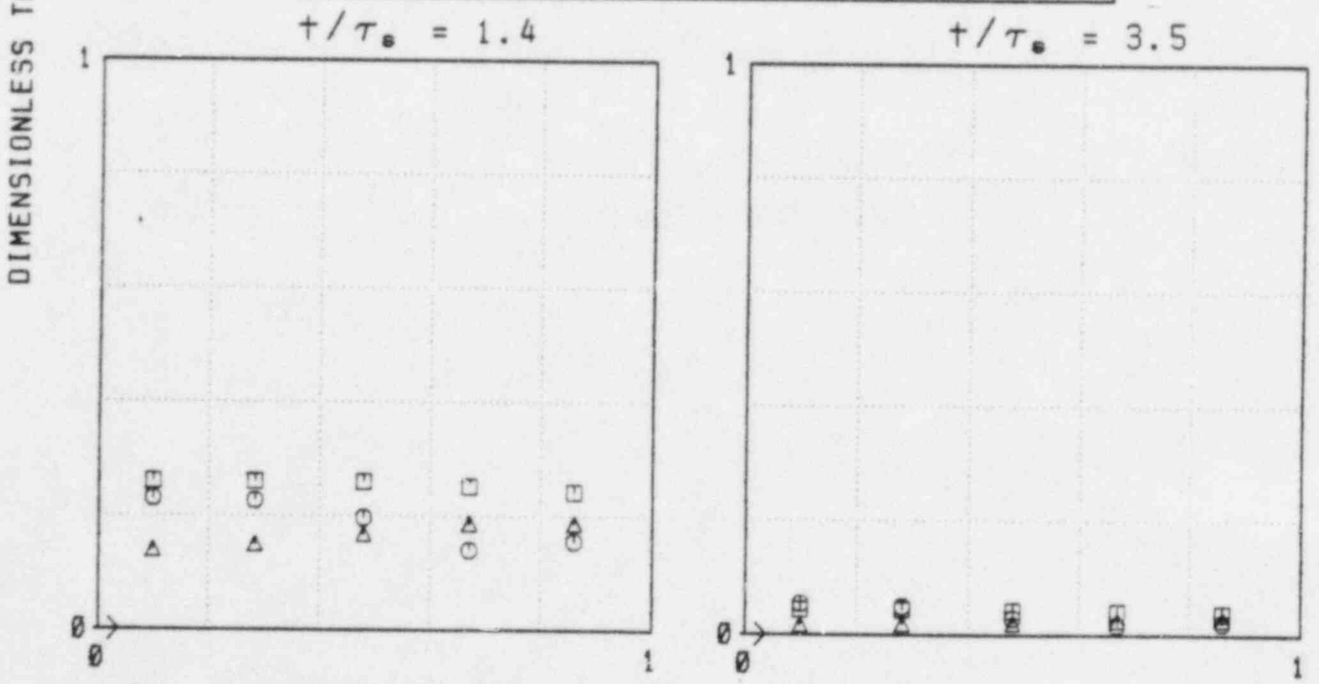
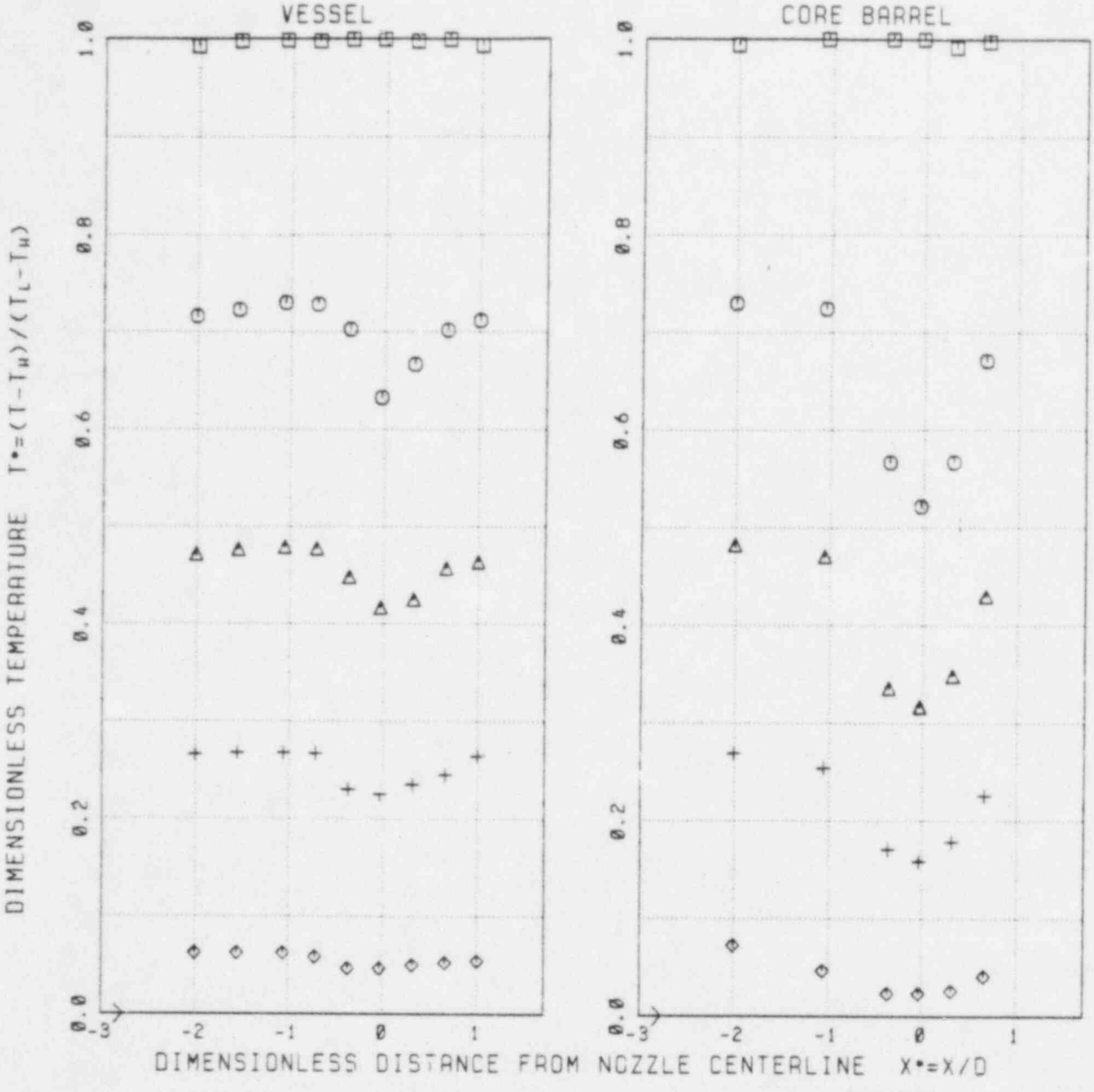


FIGURE 4.4 TEST MAY106
DOWNCOMER GAP TEMPERATURE DISTRIBUTION
Arrow indicates Mixed Mean Temperature



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_H= 14.8 °C
⊙	0.3	284	(58.7 °F)
△	0.7	684	T_L=190.0 °C
+	1.4	1368	(374.0 °F)
◇	3.5	3601	D= 36.3 cm.
			(14.3 in.)

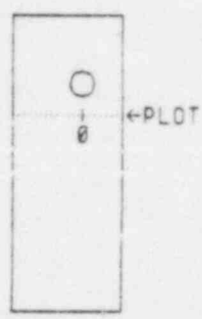


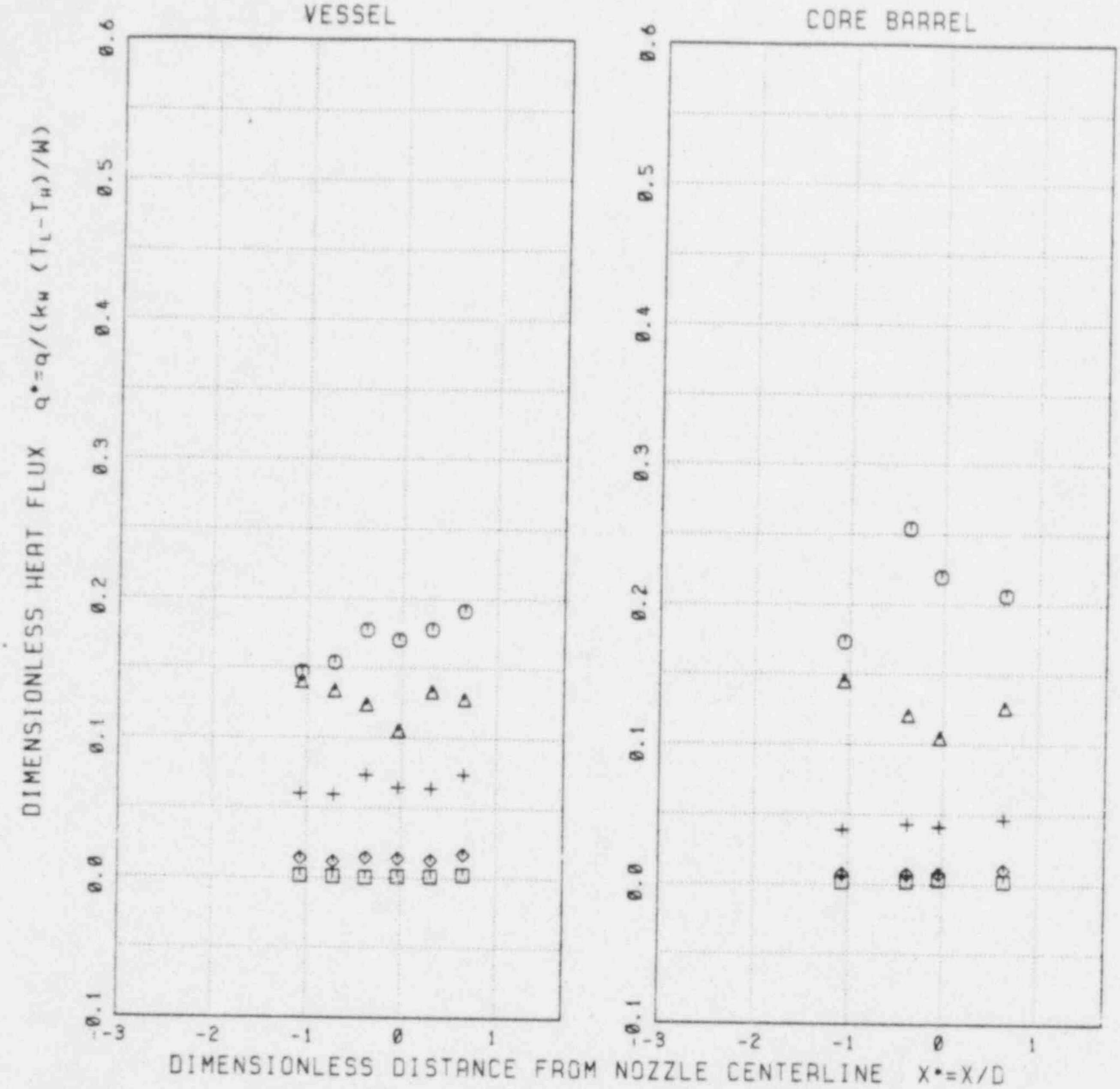
FIGURE 4.5.a TEST MAY106

DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES

(INSTRUMENT ROW 5: 0.41 m. BELOW NOZZLE CENTERLINE)

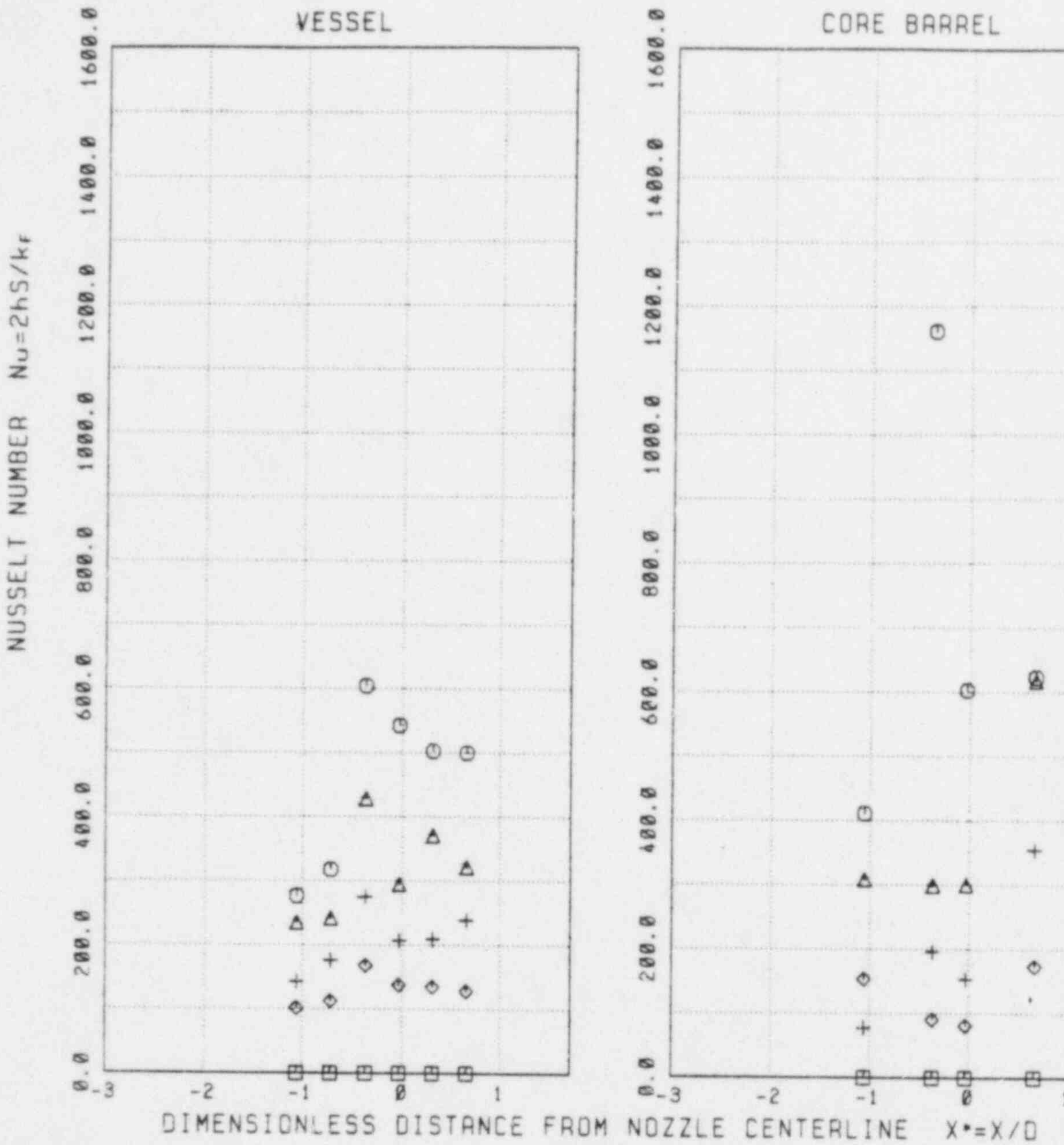
Arrow Indicates Mixed Mean Temperature

220



SYMBOL	t/τ_e	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_L=190.0 C (374.0 F)
⊖	0.3	284	T_H= 14.8 C (58.7 F)
△	0.7	684	K_W=50.10 W/m - C
+	1.4	1368	(28.95 Btu/ft-hr- F)
◇	3.5	3601	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

FIGURE 4.5.b TEST MAY106
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 5: 0.41 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊞	0.0	132	D =36.3 cm(14.3 in)
⊙	0.3	284	K_f=0.61 -0.69 W/m- C
Δ	0.7	684	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	1368	S_{vessel}=0.059 m (0.192 ft)
◇	3.5	3601	S_{core} =0.041 m (0.133 ft)

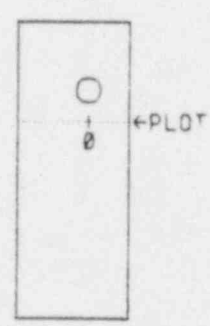
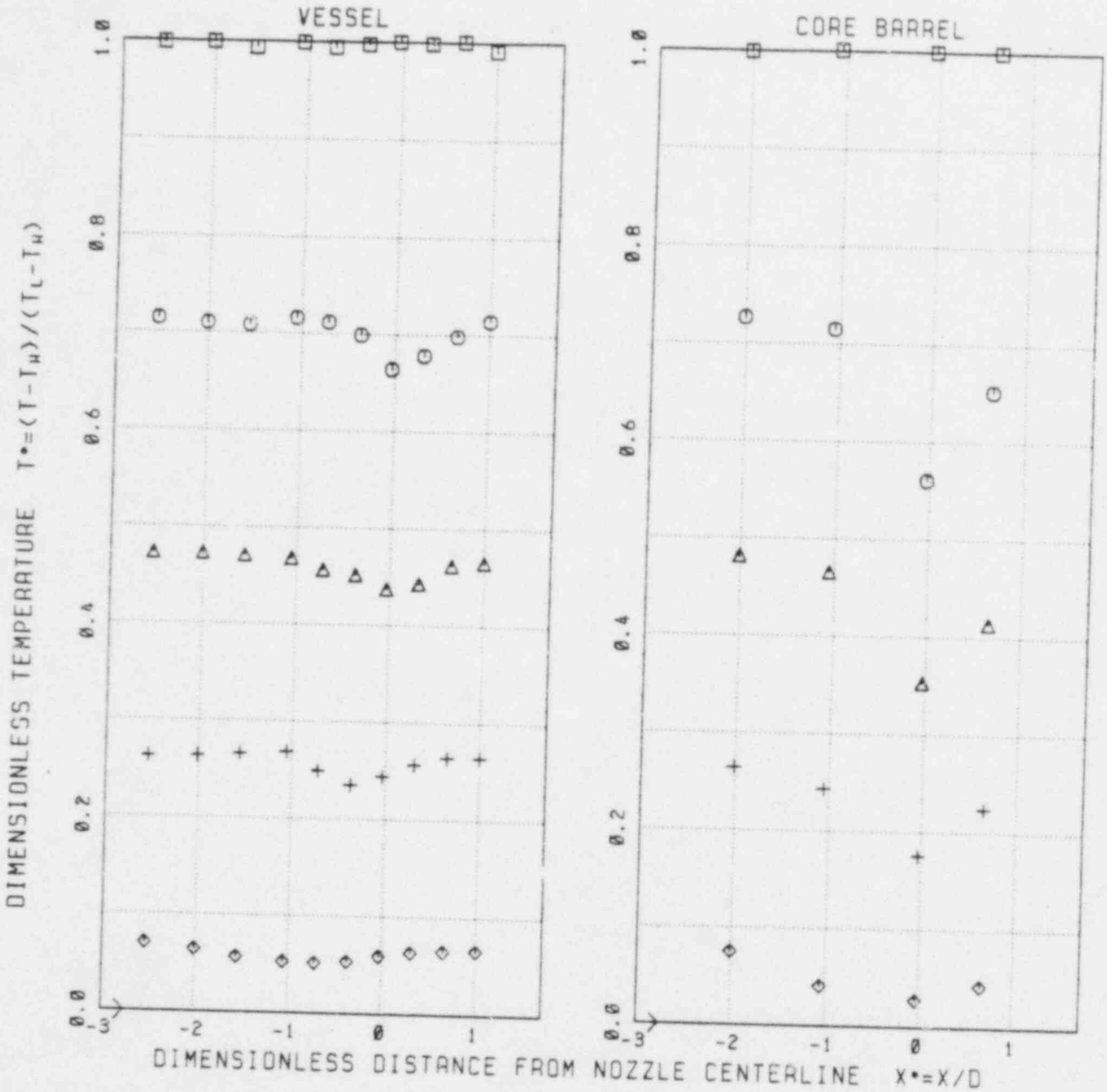


FIGURE 4.5.c TEST MAY106
DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES
(INSTRUMENT ROW 5: 0.41 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_m	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_L= 14.8 °C
⊙	0.3	284	(58.7 °F)
△	0.7	684	T_L=190.0 °C
+	1.4	1368	(374.0 °F)
◇	3.5	3601	D= 36.3 cm.
			(14.3 in.)

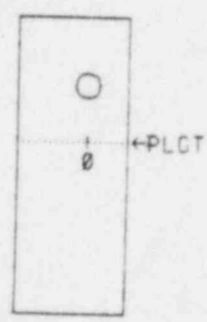
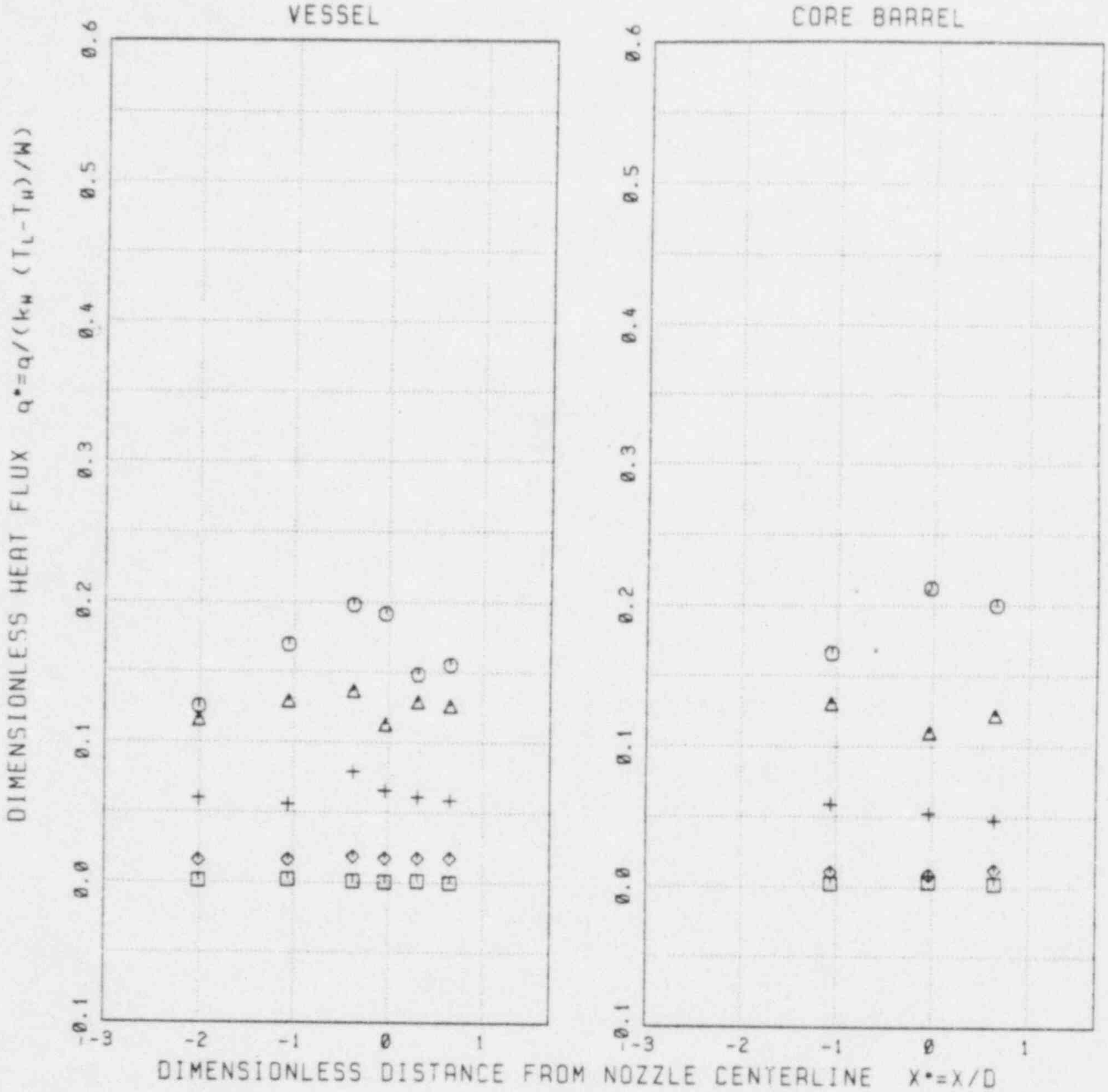


FIGURE 4.6.a TEST MAY106
DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES
(INSTRUMENT ROW 6: 0.77 m. BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_*	t (sec)	NORMALIZING FACTORS
□	0.0	132	T_L=190.0 C (374.0 F)
○	0.3	284	T_W= 14.8 C (58.7 F)
△	0.7	684	K_W=50.10 W/m - C
+	1.4	1368	(28.95 Btu/ft-hr- F)
◇	3.5	3601	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

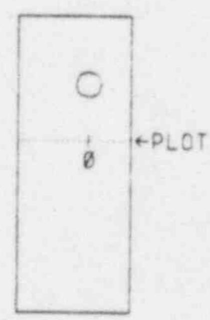
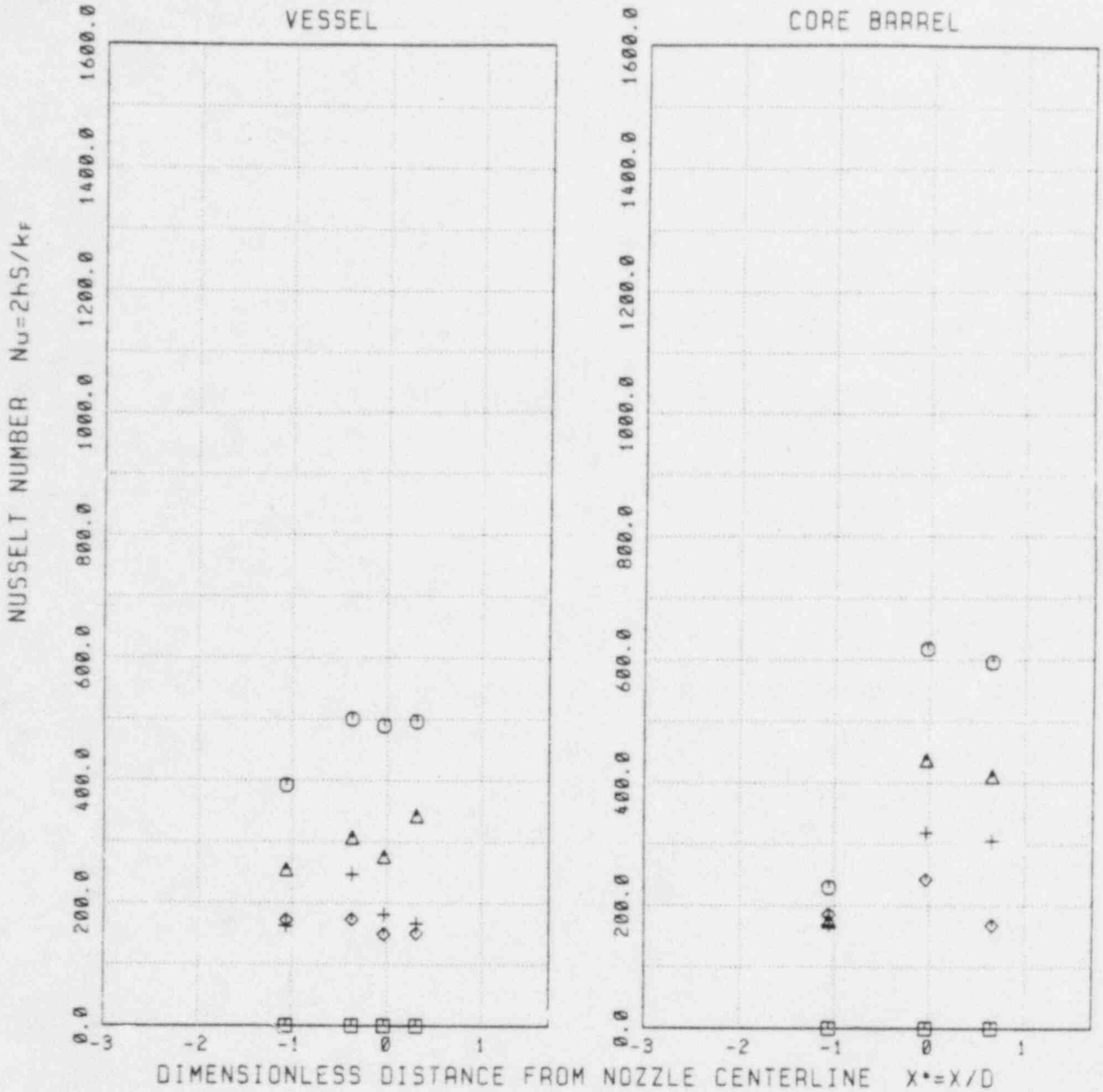


FIGURE 4.6.b TEST MAY106
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 6: 0.77 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
□	0.0	132	D = 36.3 cm (14.3 in)
○	0.3	284	K_F=0.61 -0.69 W/m- C
△	0.7	684	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	1368	S_{Vessel}=0.059 m (0.192 ft)
◇	3.5	3601	S_{Core} =0.041 m (0.133 ft)

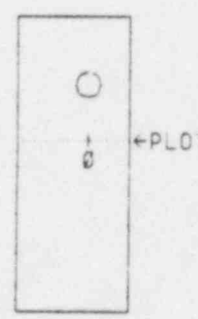
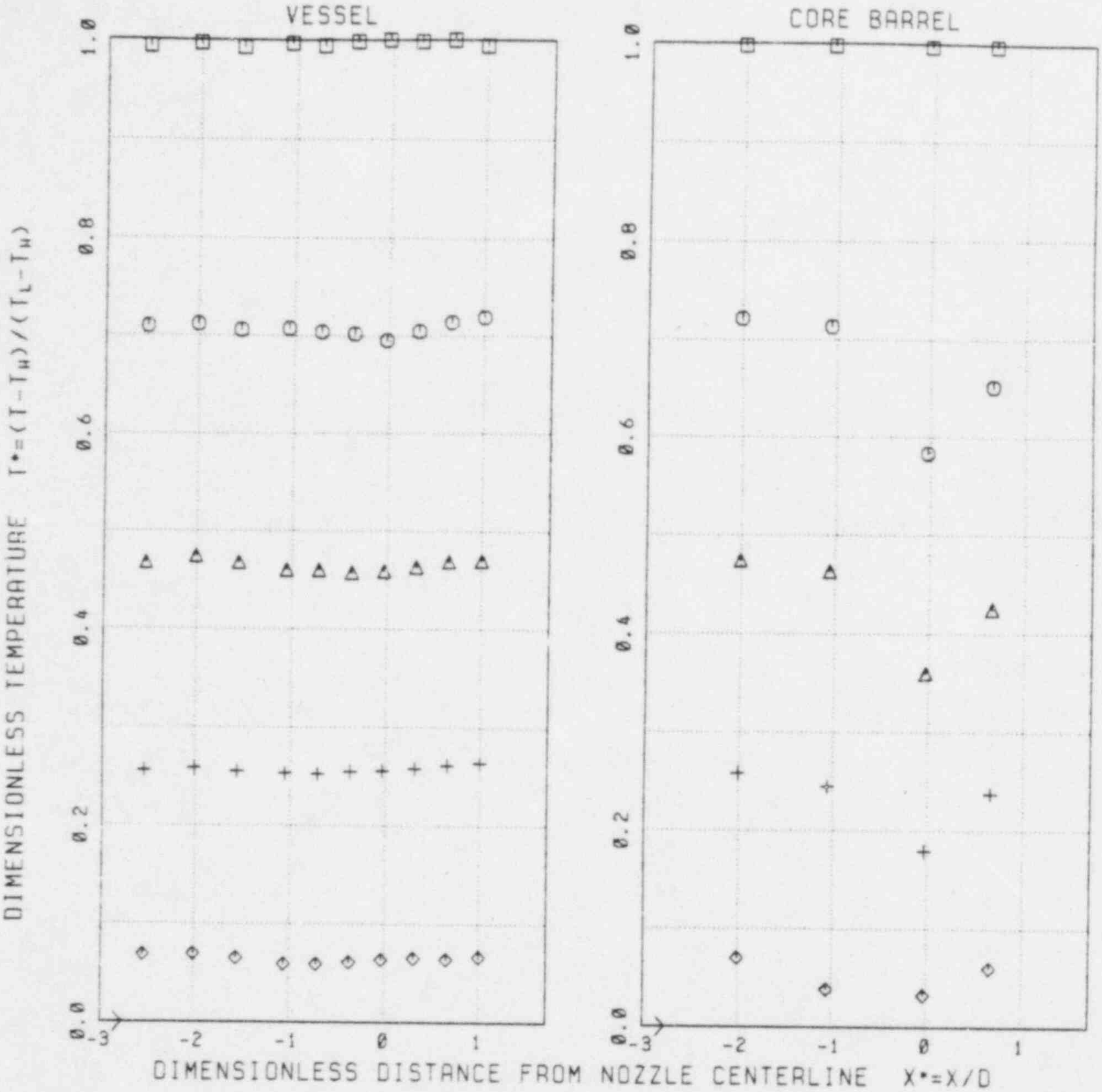


FIGURE 4.6.c TEST MAY106
DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES
(INSTRUMENT ROW 6: 0.77 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_L= 14.8 °C (58.7 °F)
⊖	0.3	284	
Δ	0.7	684	T_L=190.0 °C (374.0 °F)
+	1.4	1368	
◇	3.5	3601	D= 36.3 cm. (14.3 in.)

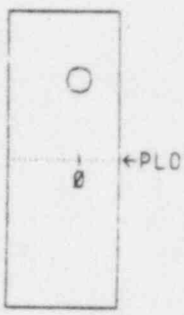
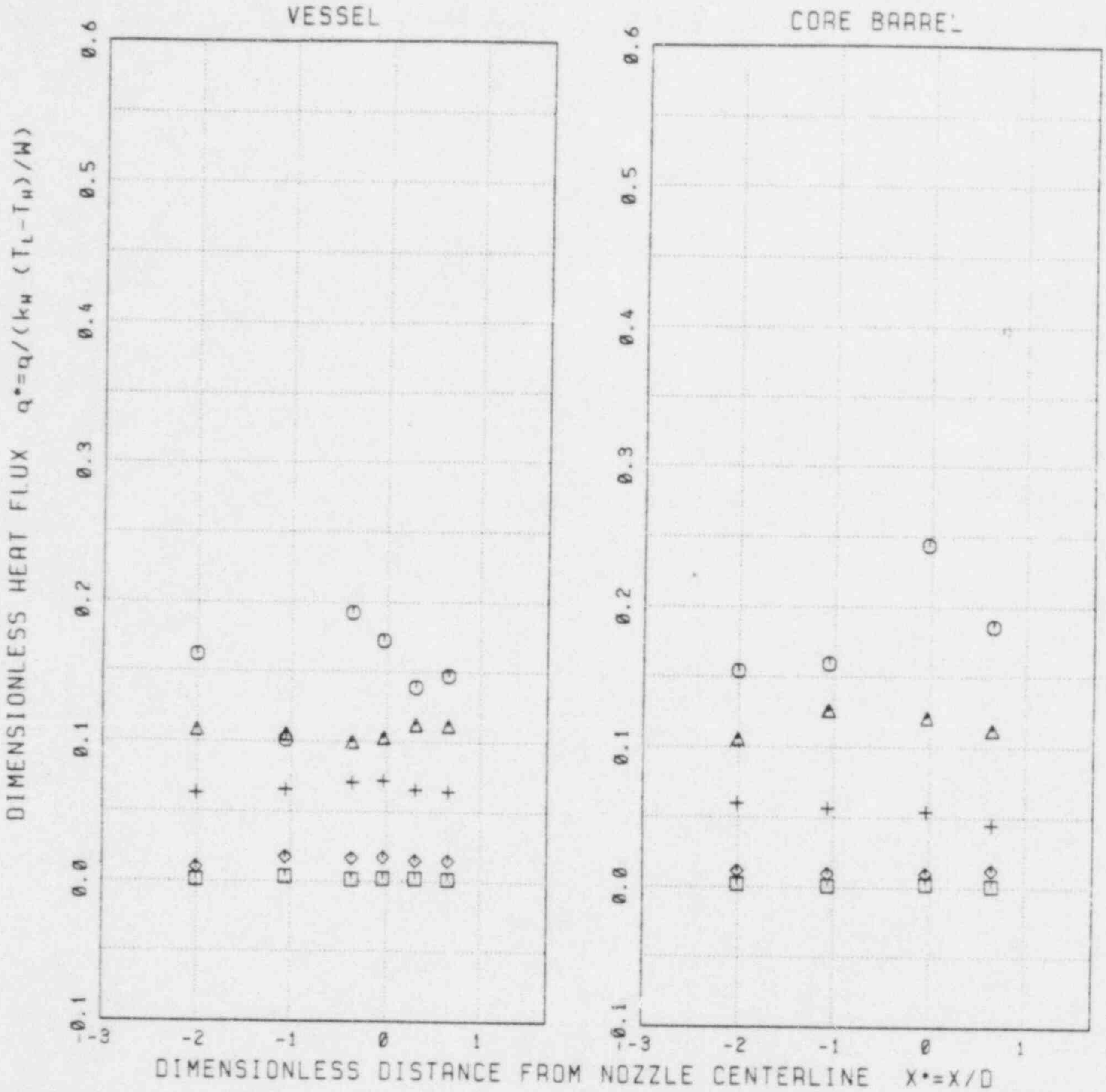


FIGURE 4.7.a TEST MAY106
DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES
(INSTRUMENT ROW 7: 1.13 m. BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature

818



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_L=190.0 C (374.0 F)
⊙	0.3	284	T_W= 14.8 C (58.7 F)
△	0.7	684	K_W=50.10 W/m - C
+	1.4	1368	(28.95 Btu/ft-hr- F)
◇	3.5	3601	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

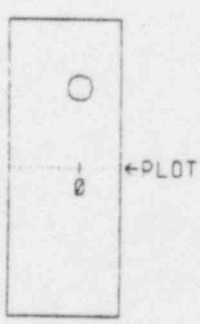
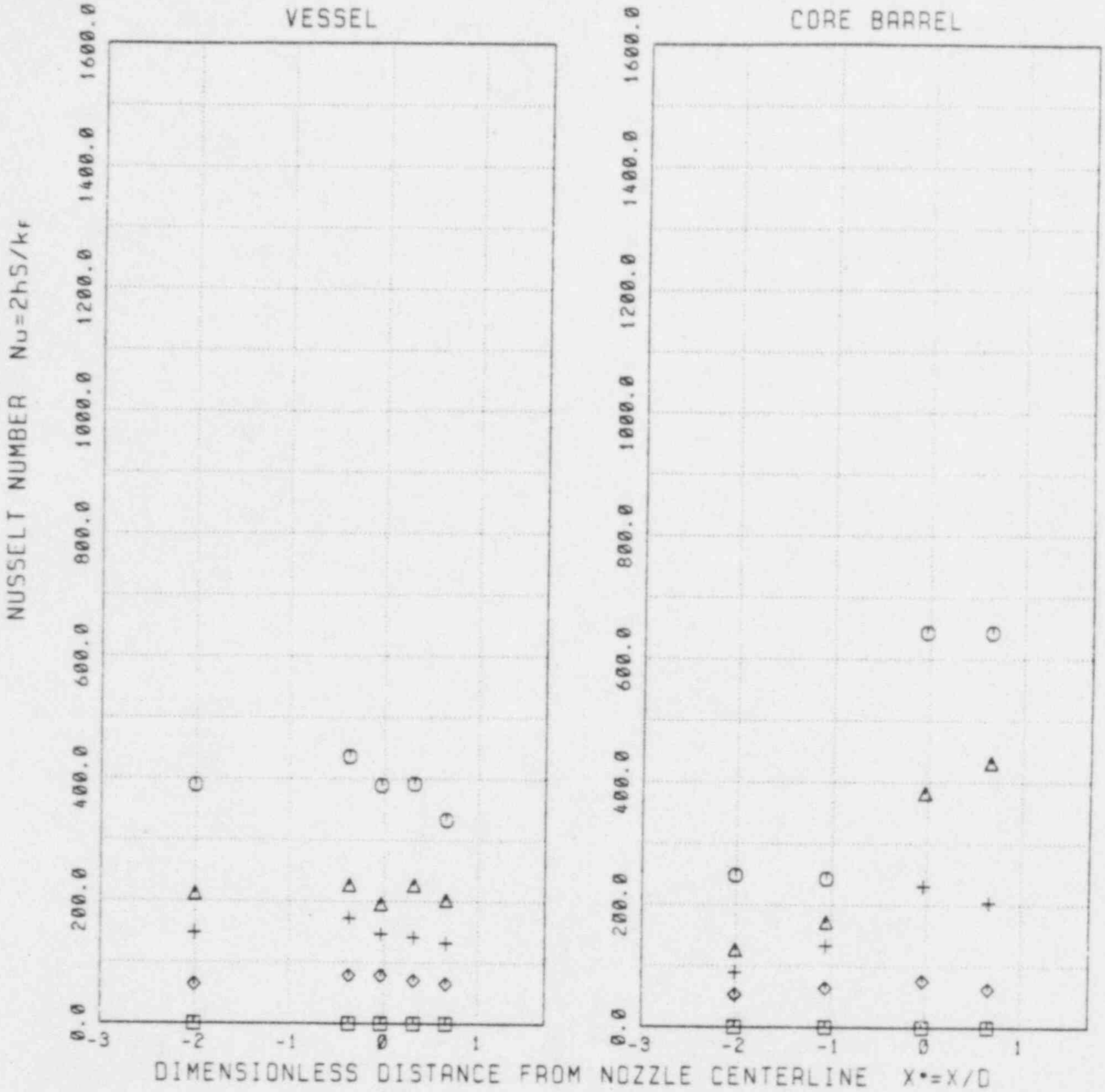


FIGURE 4.7.b TEST MAY106
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 7: 1.13 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_e	t (sec)	NORMALIZING FACTORS
⊟	0.0	132	D =36.3 cm(14.3 in)
⊖	0.3	284	K_f=0.61 -0.69 W/m- C
△	0.7	684	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	1368	S_{Vessel}=0.059 m (0.192 ft)
◇	3.5	3601	S_{Core} =0.041 m (0.133 ft)

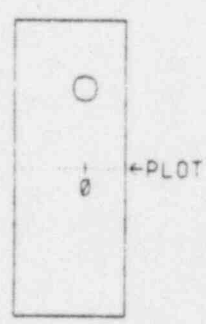
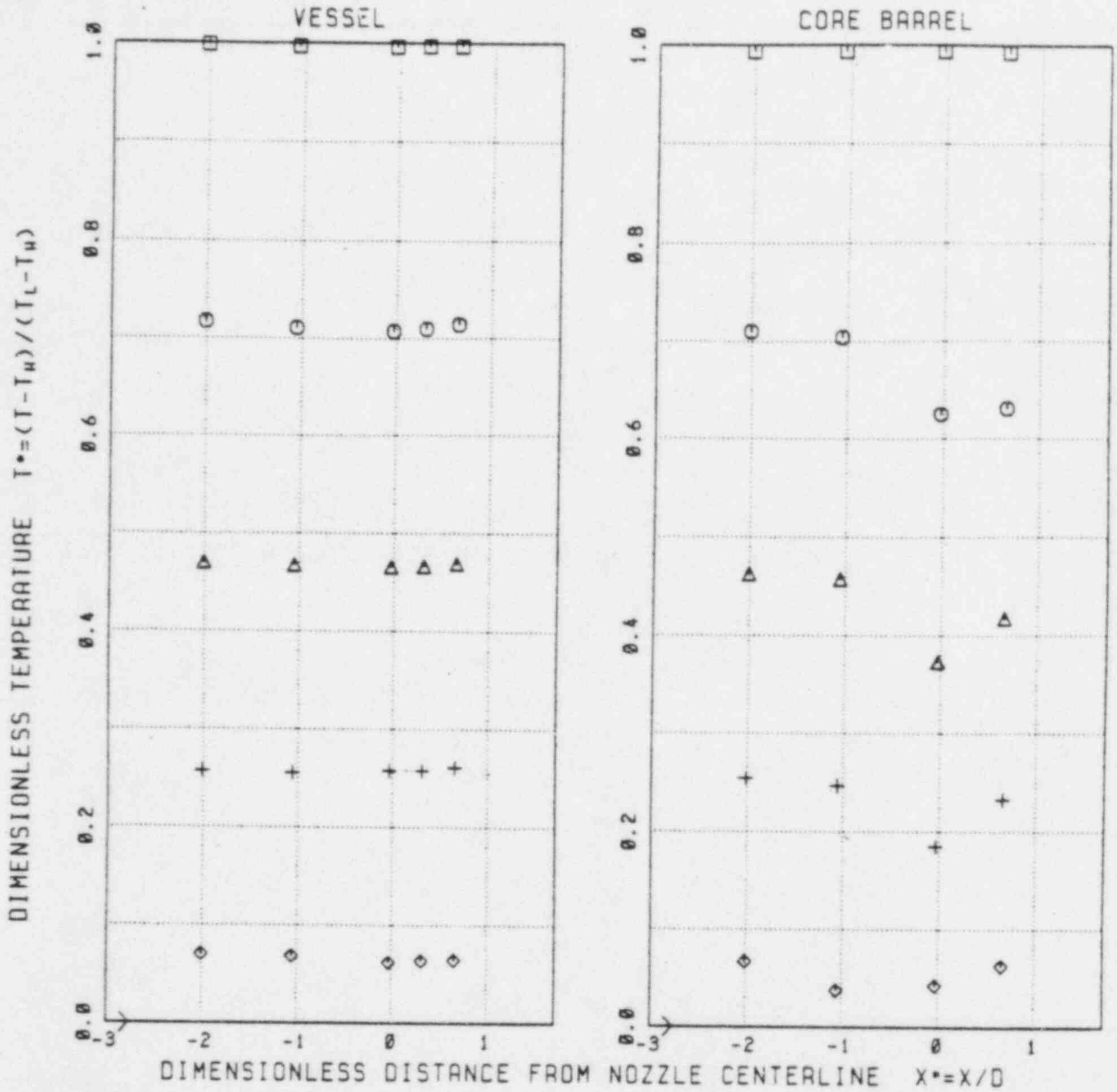


FIGURE 4.7.c TEST MAY106
DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES
(INSTRUMENT ROW 7: 1.13 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_e	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_L= 14.8 °C
⊙	0.3	284	(58.7 °F)
△	0.7	684	T_L=190.0 °C
+	1.4	1368	(374.0 °F)
◇	3.5	3601	D= 36.3 cm.
			(14.3 in.)

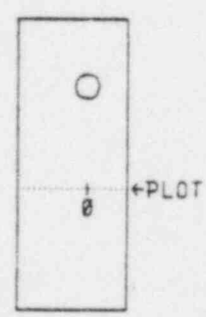
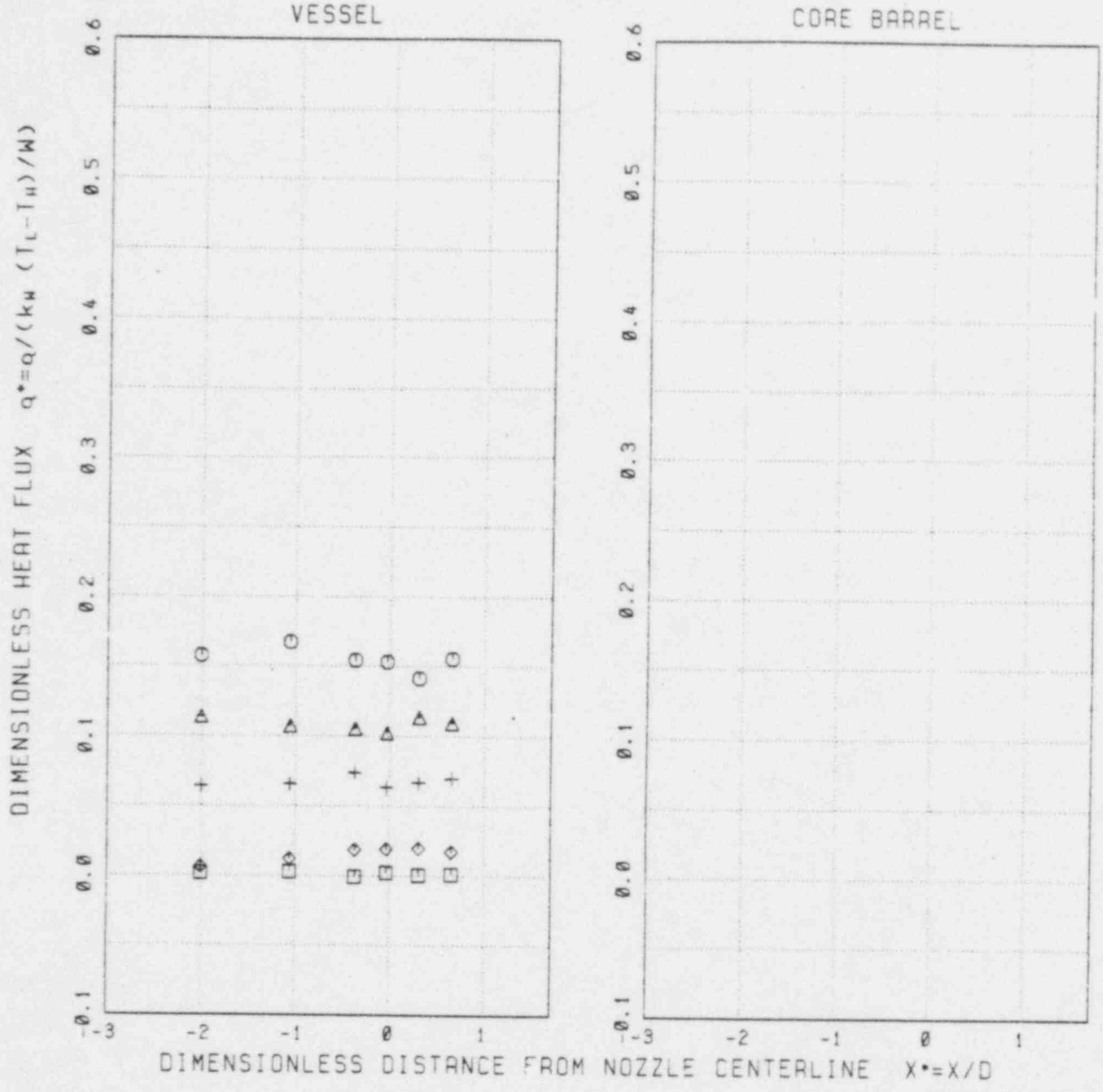


FIGURE 4.8.a. TEST MAY106
DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES
(INSTRUMENT ROW 8: 1.49 m. BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
□	0.0	132	T_L=190.0 C (374.0 F)
⊖	0.3	284	T_W= 14.8 C (58.7 F)
Δ	0.7	684	K_W=50.10 W/m - C
+	1.4	1368	(28.95 Btu/ft-hr- F)
◇	3.5	3601	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

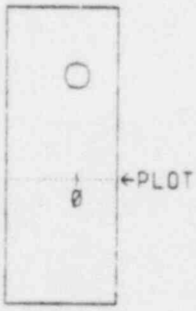
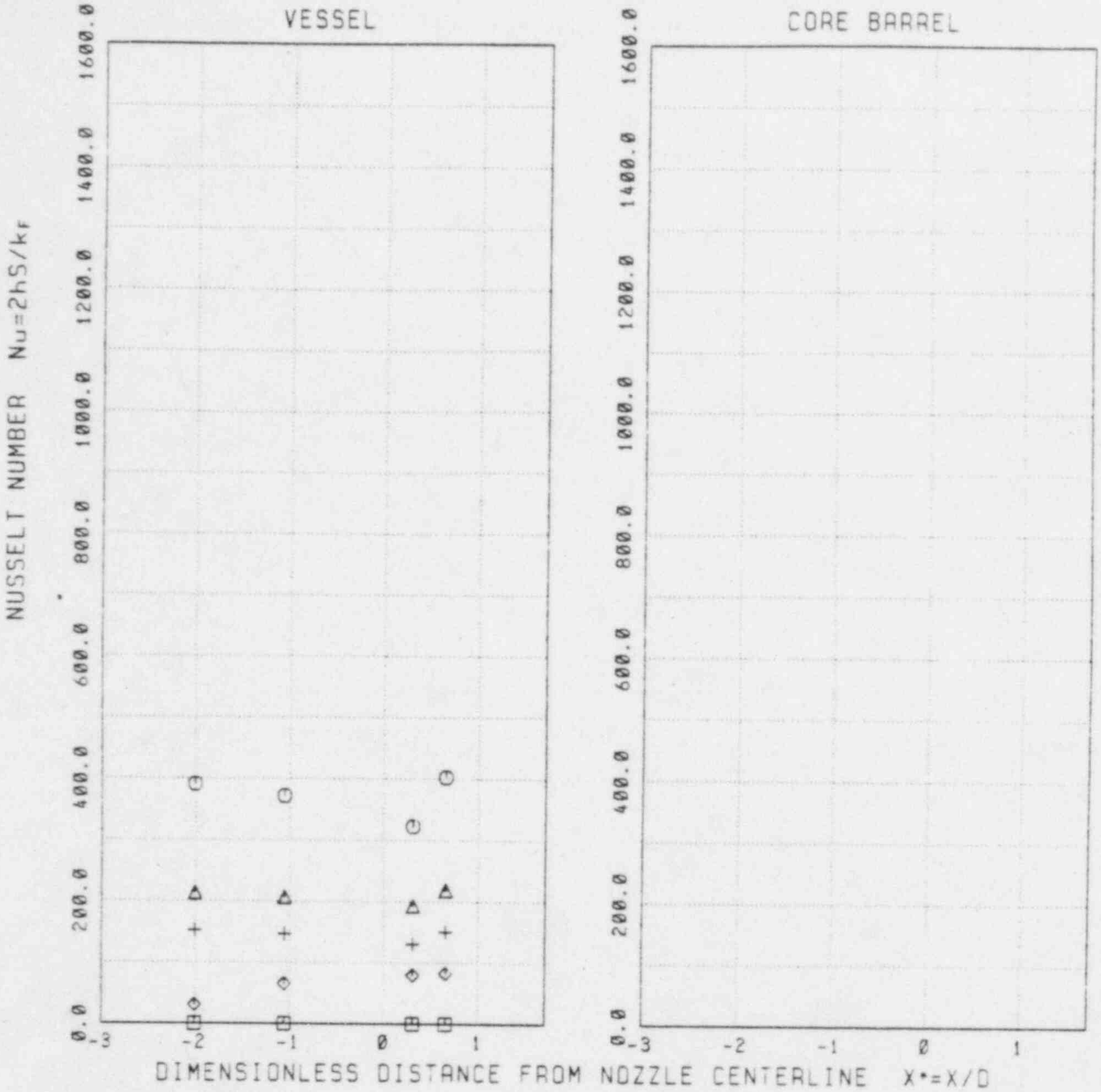


FIGURE 4.8.b TEST MAY106
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 8: 1.49 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊞	0.0	132	D =36.3 cm (14.3 in)
⊙	0.3	284	K_F=0.61 -0.69 W/m- C
Δ	0.7	684	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	1368	S_{Vessel}=0.059 m (0.192 ft)
◇	3.5	3601	S_{Core} =0.041 m (0.133 ft)

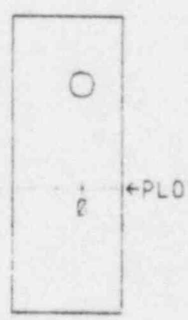
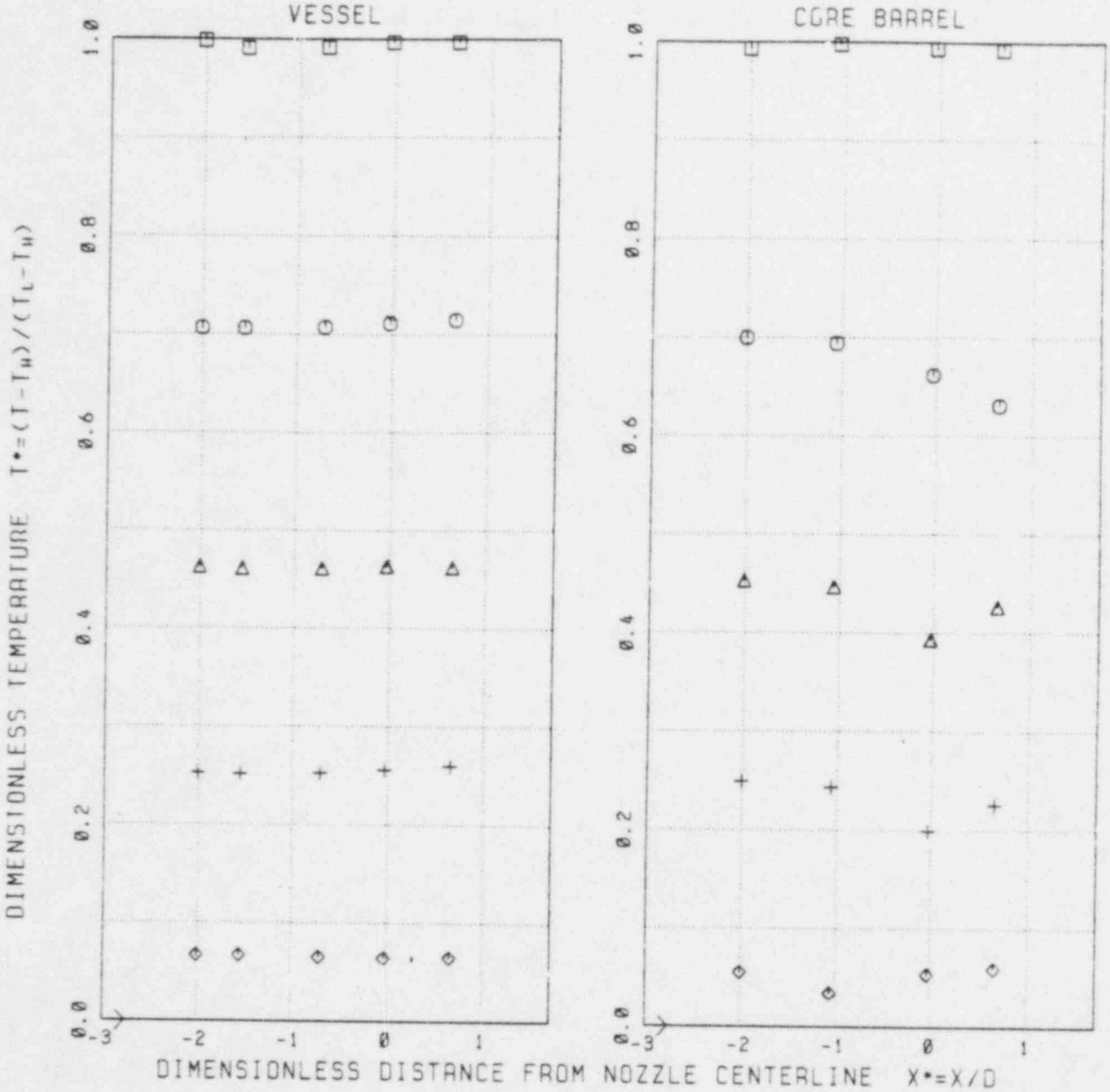


FIGURE 4.8.c TEST MAY106
DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES
(INSTRUMENT ROW 8: 1.49 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_L= 14.8 °C
⊙	0.3	284	(58.7 °F)
△	0.7	684	T_L=190.0 °C
+	1.4	1368	(374.0 °F)
◇	3.5	3601	D= 36.3 cm.
			(14.3 in.)

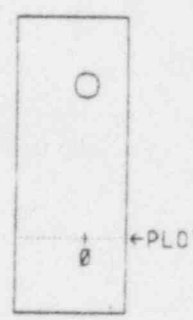
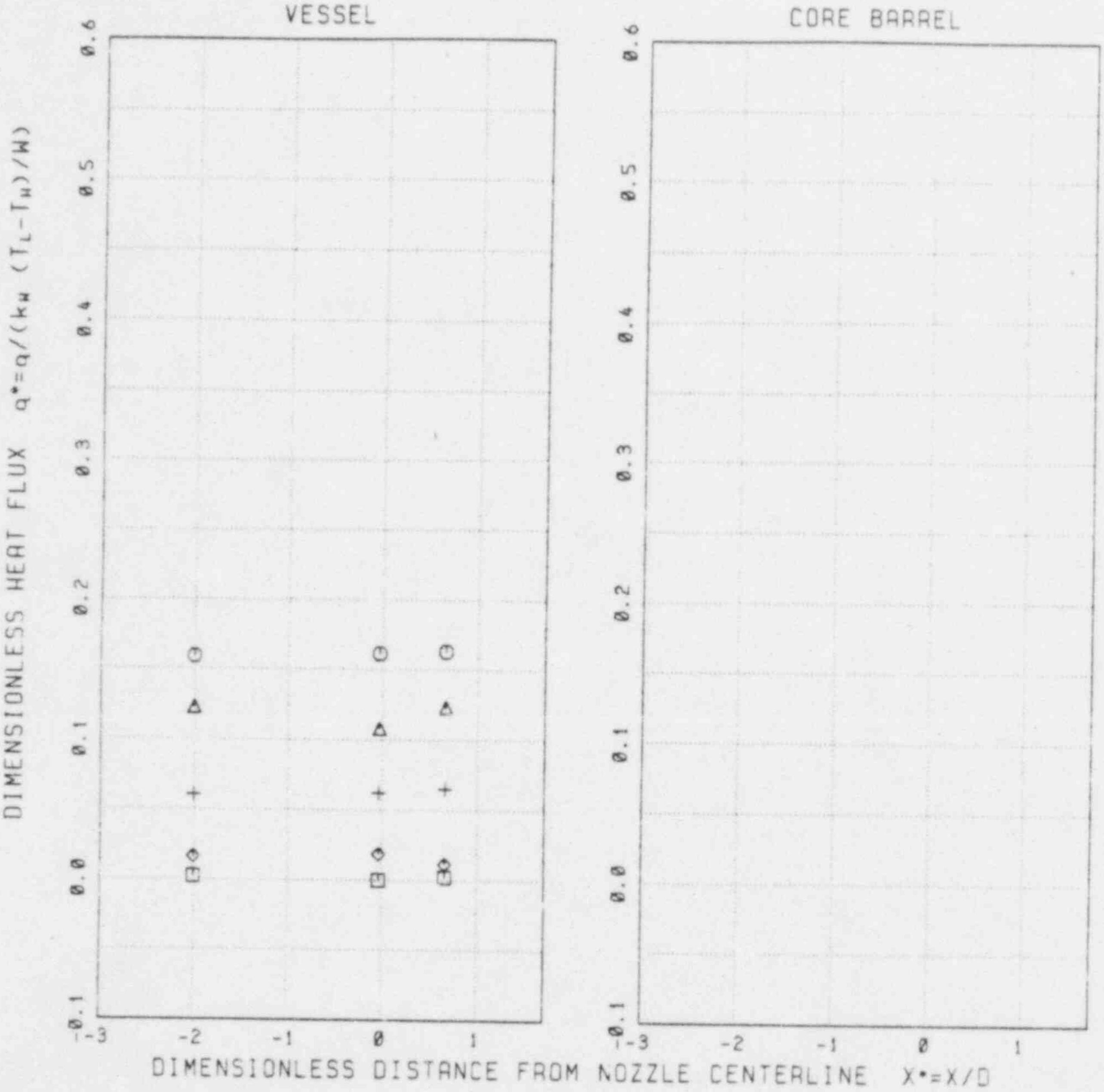


FIGURE 4.9.a TEST MAY106
DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES
(INSTRUMENT ROW 9: 2.22 m. BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_e	t (sec)	NORMALIZING FACTORS
⊞	0.0	132	T_L=190.0 C (374.0 F)
⊖	0.3	284	T_W= 14.8 C (58.7 F)
Δ	0.7	684	K_W=50.10 W/m - C
+	1.4	1368	(28.95 Btu/ft-hr- F)
◇	3.5	3601	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

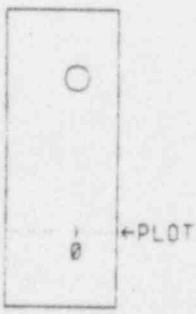
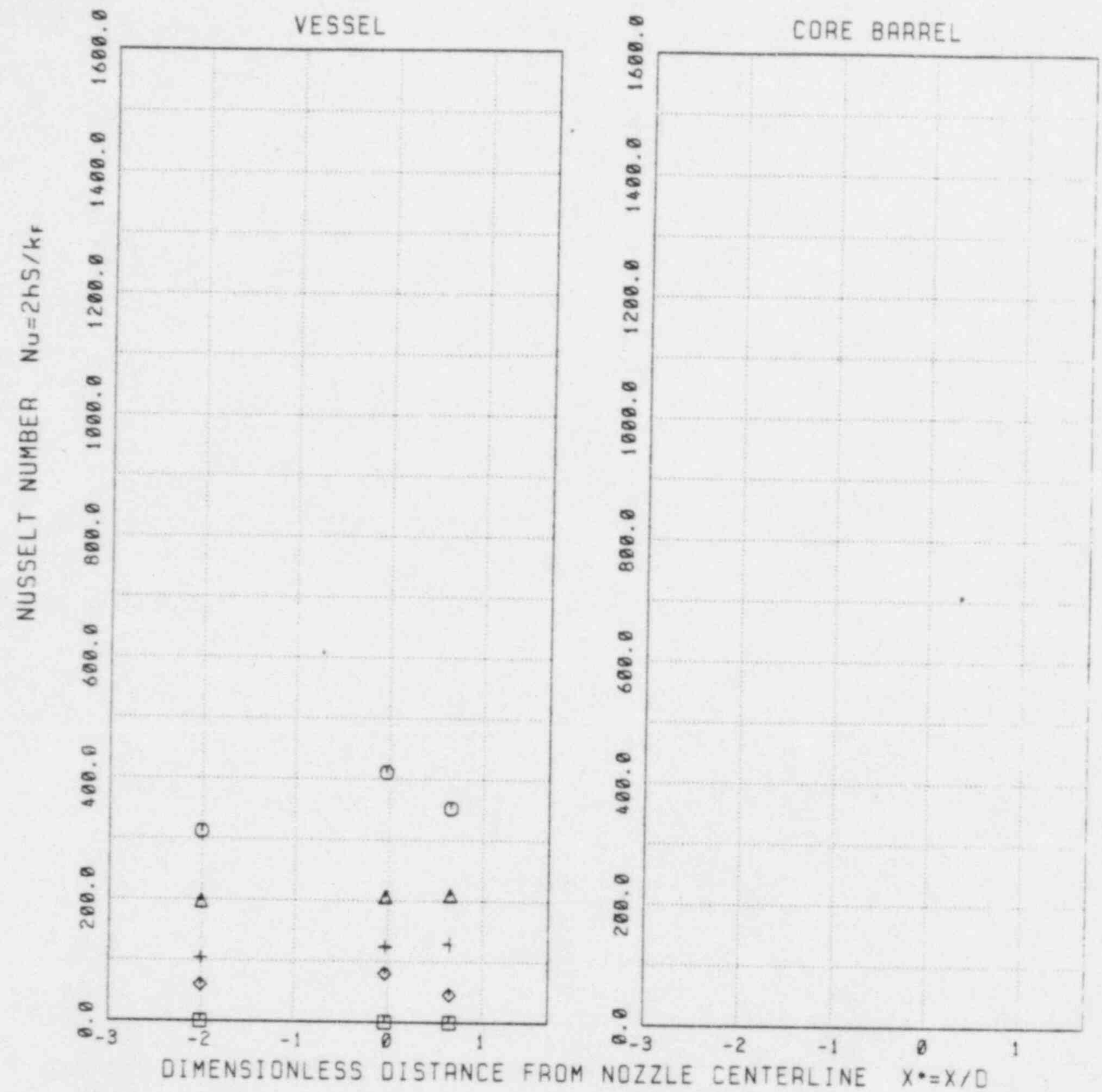


FIGURE 4.9.b TEST MAY106
DOWNCOMER HORIZONTAL HEAT FLUX PROFILES
(INSTRUMENT ROW 9: 2.22 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_e	t (sec)	NORMALIZING FACTORS
⊞	0.0	132	D =36.3 cm(14.3 in)
⊖	0.3	284	K_f=0.61 -0.69 W/m- C
Δ	0.7	684	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	1368	S_{Vessel}=0.059 m (0.192 ft)
◇	3.5	3601	S_{Core} =0.041 m (0.133 ft)

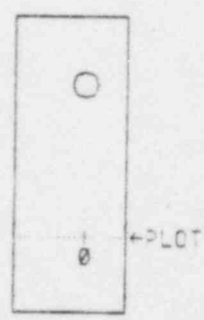
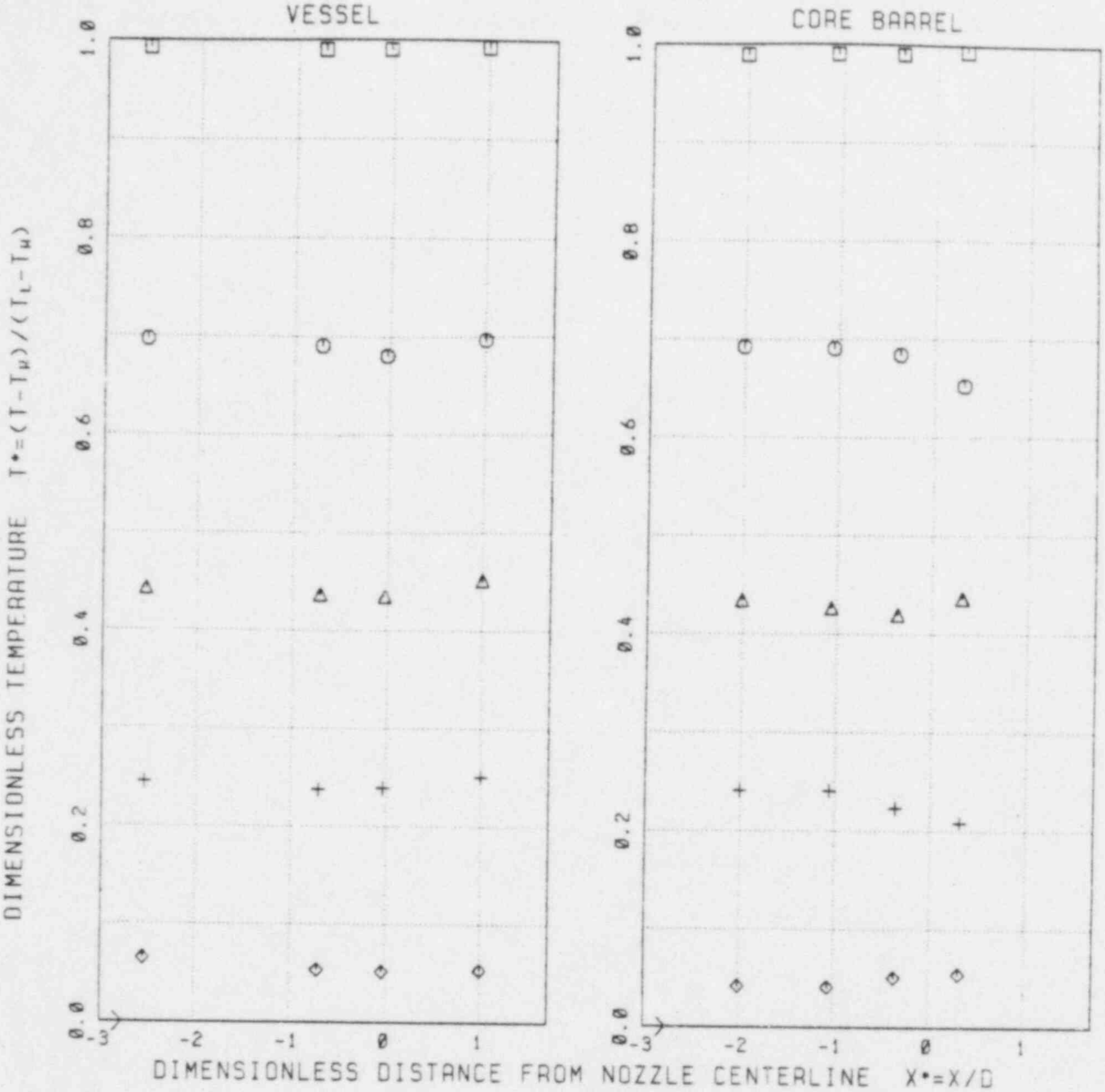


FIGURE 4.9.c TEST MAY106
DOWNCOMER HORIZONTAL NUSSELT NUMBER PROFILES
(INSTRUMENT ROW 9: 2.22 m. BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
□	0.0	132	T_L= 14.8 •C
⊙	0.3	284	(58.7 •F)
△	0.7	684	T_L=190.0 •C
+	1.4	1368	(374.0 •F)
◇	3.5	3601	D= 36.3 cm.
			(14.3 in.)

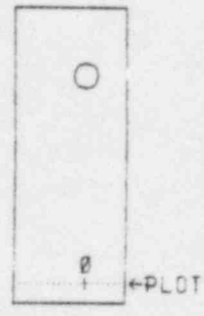
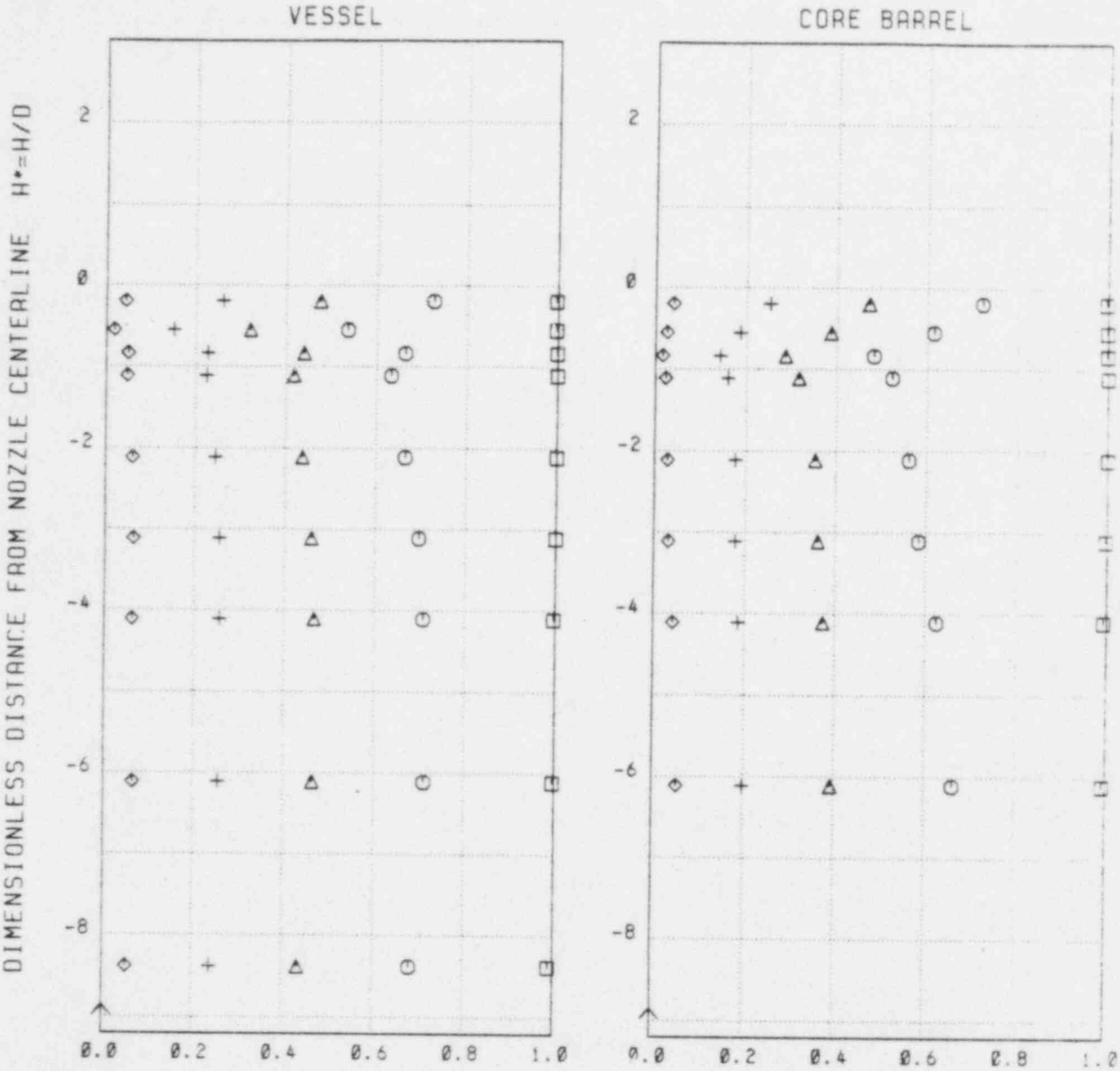


FIGURE 4.10 TEST MAY:06

DOWNCOMER HORIZONTAL FLUID TEMPERATURE PROFILES

(INSTRUMENT ROW 10 3.05 m. BELOW NOZZLE CENTERLINE)

Arrow Indicates Mixed Mean Temperature



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_H= 14.8 °C
⊙	0.3	284	(58.7 °F)
△	0.7	684	T_L=190.0 °C
+	1.4	1368	(374.0 °F)
◇	3.5	3601	D= 36.3 cm.
			(14.3 in.)

FIGURE 4.11.o TEST MAY106
DOWNCOMER VERTICAL FLUID TEMPERATURE PROFILES
(INSTRUMENT COLUMN 7 : BELOW NOZZLE CENTERLINE)
Arrow Indicates Mixed Mean Temperature

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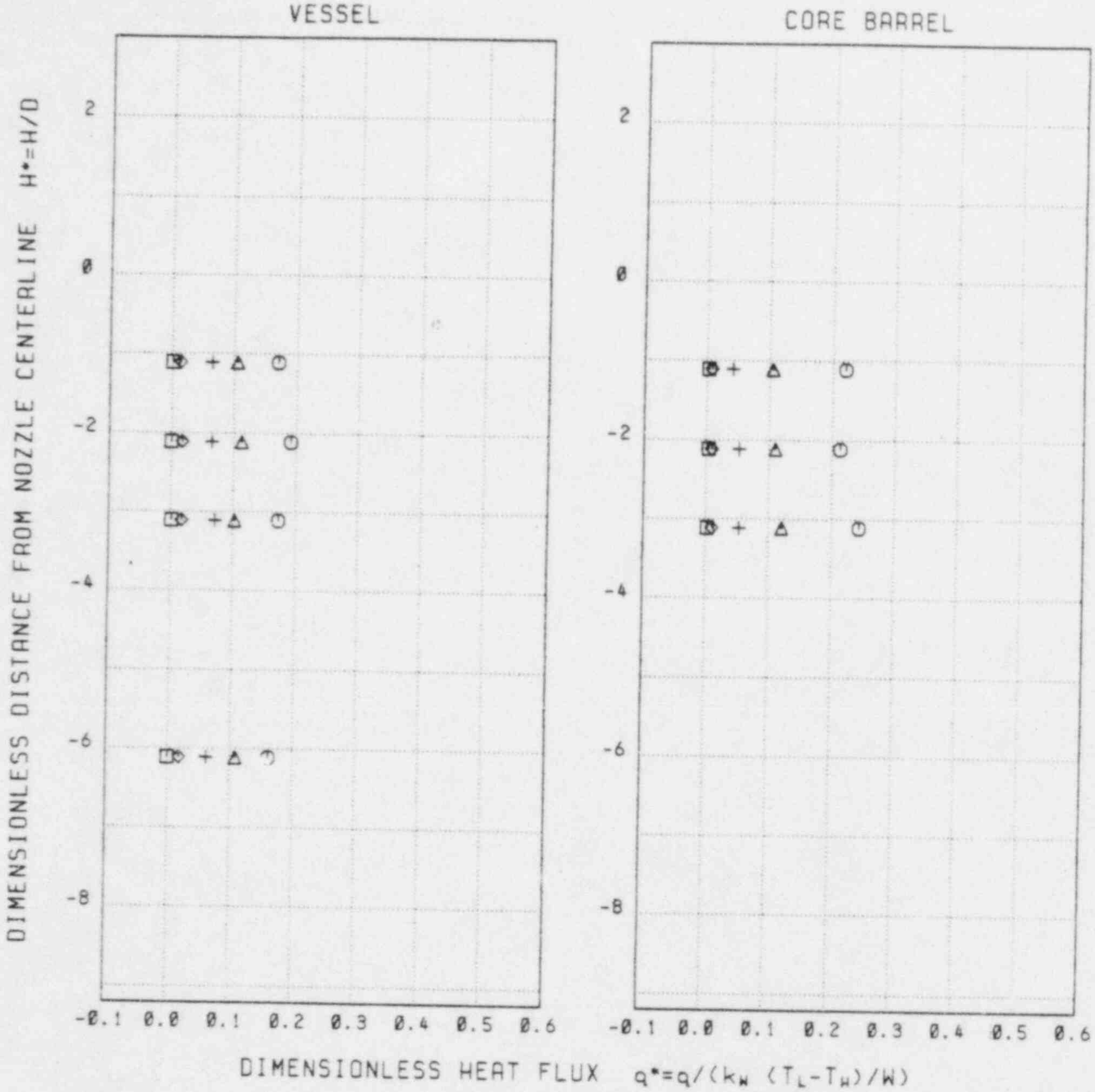
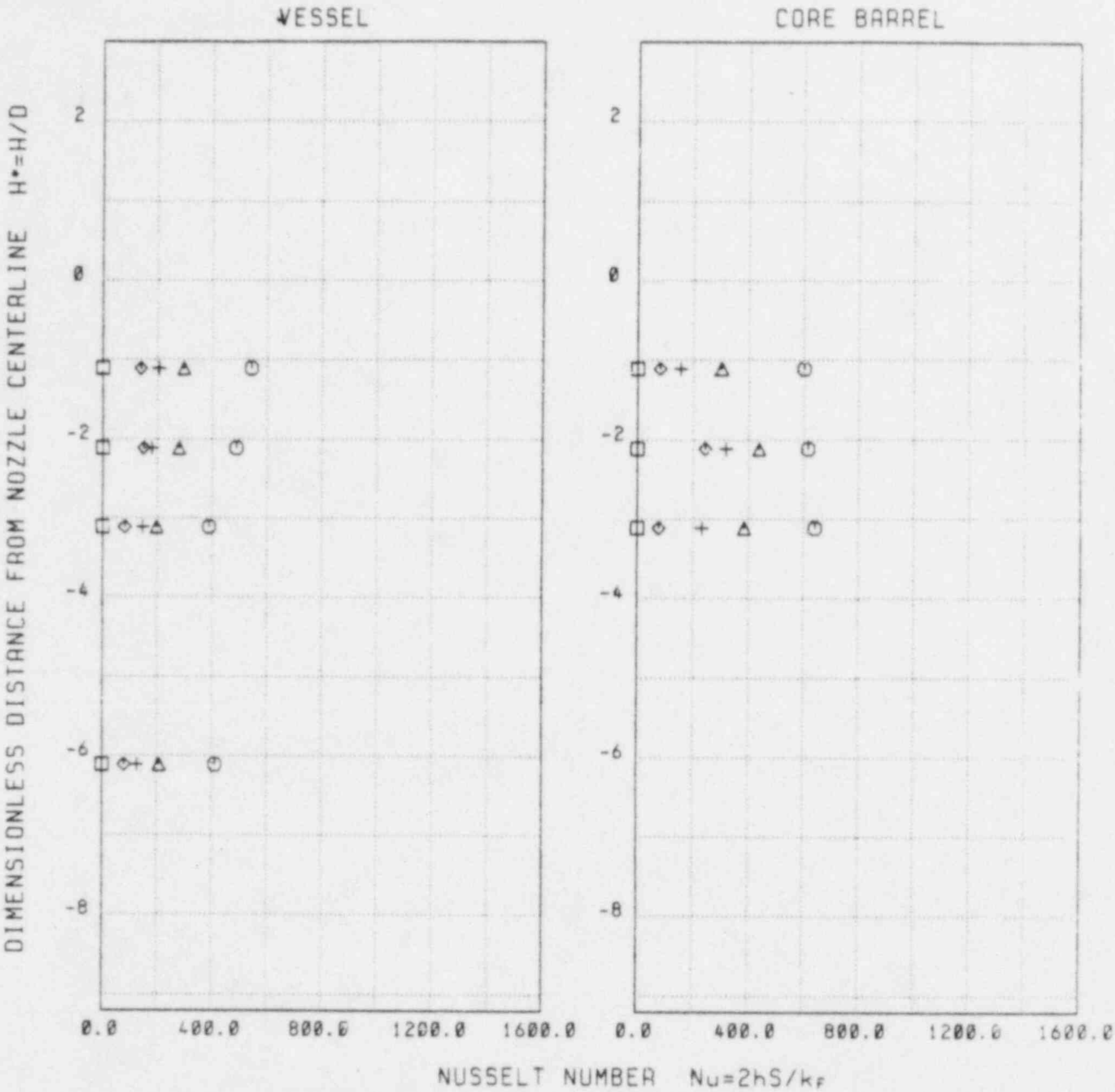


SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊡	0.0	132	T_L=190.0 C (374.0 F)
⊙	0.3	284	T_W= 14.8 C (58.7 F)
Δ	0.7	684	K_W=50.10 W/m - C
+	1.4	1368	(28.95 Btu/ft-hr- F)
⊘	3.5	3601	W = 5.08 cm(2.00in)
			D =36.35 cm(14.31in)

FIGURE 4.11.b TEST MAY106
DOWNCOMER VERTICAL HEAT FLUX PROFILES
(INSTRUMENT COLUMN 7 : BELOW NOZZLE CENTERLINE)



SYMBOL	t/τ_s	t (sec)	NORMALIZING FACTORS
⊞	0.0	132	D =36.3 cm(14.3 in)
⊙	0.3	284	K_F=0.61 -0.69 W/m- C
Δ	0.7	684	(0.35 -0.40 Btu/ft-hr-F)
+	1.4	1368	S_{Vessel} - see Table 1
◇	3.5	3601	S_{Core} - see Table 1

FIGURE 4.11.c TEST MAY106
DOWNCOMER VERTICAL NUSSELT NUMBER PROFILES
(INSTRUMENT COLUMN 7 : BELOW NOZZLE CENTERLINE)

NRC FORM 335 (7-77)

U.S. NUCLEAR REGULATORY COMMISSION

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5. DATE REPORT COMPLETED	MONTH: January; YEAR: 1985
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16. ABSTRACT *(200 words or less)*

This report presents data from an experimental study of fluid mixing in a 1/2-scale model of the cold-leg, downcomer, lower plenum, pump simulator, and loop seal typical of a Westinghouse Pressurized Water Reactor. The tests were transient cooldown tests in that they simulated an extreme condition of Small-Break Loss-of-Coolant Accident (SBLOCA) during which cold High Pressure Injection (HPI) fluid is injected into stagnant, hot primary fluid with complete loss of natural circulation in the loop.

Extensive temperature, velocity, and heat transfer coefficient data are presented at two cold-leg Froude numbers: 0:052 and 0.076. The 1/2-scale data are compared with earlier data from a 1/5-scale, geometrically similar facility to assess scaling principles.

17. KEY WORDS AND DOCUMENT ANALYSIS

17a. DESCRIPTORS

Froude Number
Thermal Fluid Mixing
HPI Jet
Buoyant Plumes

17b. IDENTIFIERS/OPEN-ENDED TERMS

18. AVAILABILITY STATEMENT	Unlimited
19. SECURITY CLASS *(This report)*	Unclassified
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21. NO. OF PAGES	
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