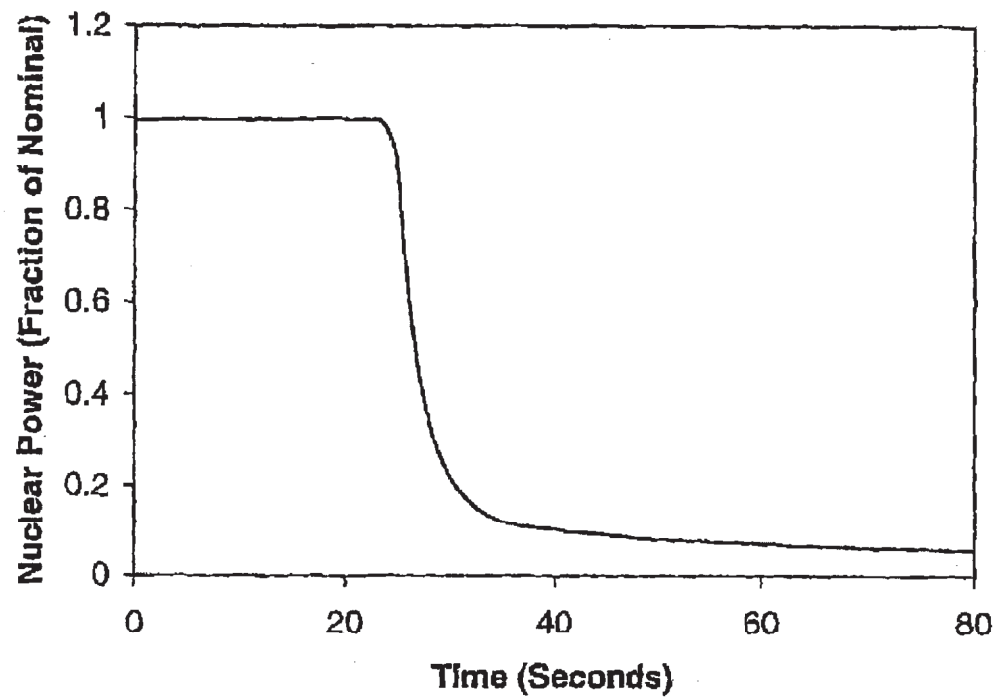


UFSAR

Section 15.6



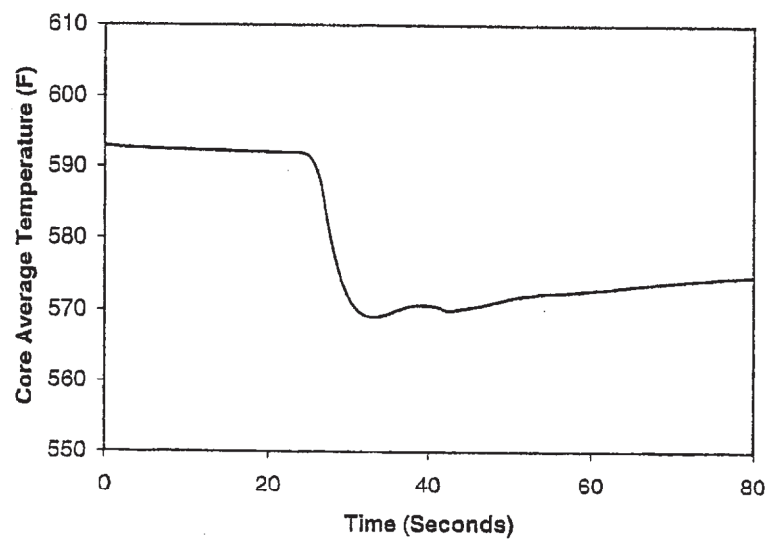
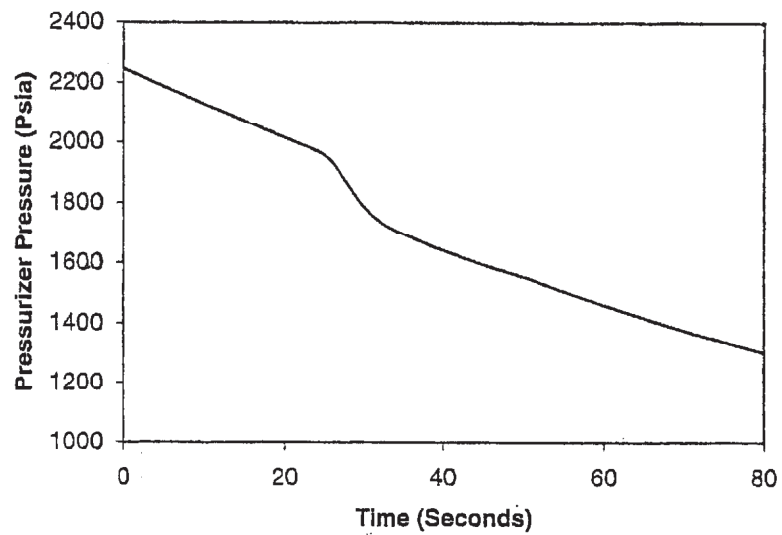
RCS Full Power $T_{avg} = 593^{\circ}F$

SOUTH TEXAS PROJECT
UNITS 1 & 2

NUCLEAR POWER TRANSIENT FOR
INADVERTENT OPENING OF A
PRESSURIZER SAFETY VALVE

FIGURE 15.6-1

REVISION 12



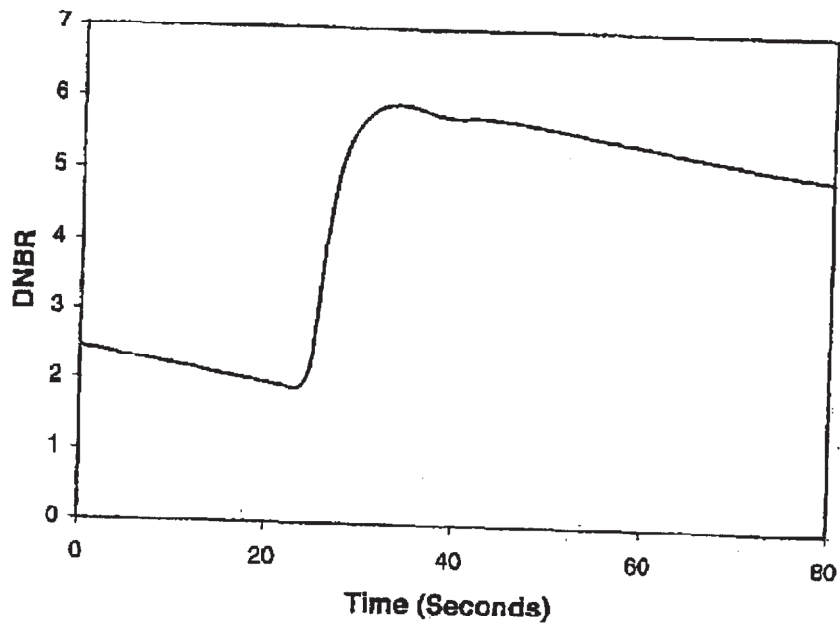
SOUTH TEXAS PROJECT UNITS 1 & 2

PRESSURIZER PRESSURE TRANSIENT AND
CORE AVERAGE TEMPERATURE
TRANSIENT FOR INADVERTENT OPENING
OF A PRESSURIZER SAFETY VALVE

FIGURE 15.6-2

REVISION 12

L0802.121
L0802.CIT



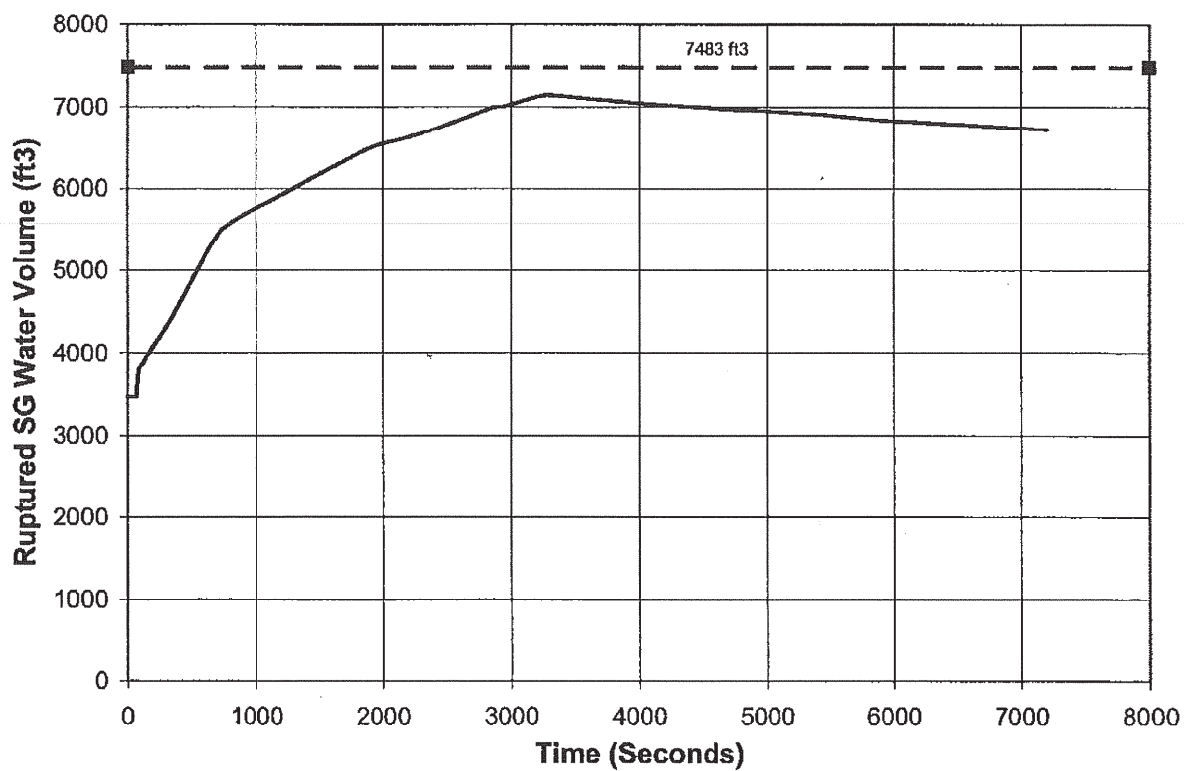
RCS Full Power $T_{avg} = 593^{\circ}\text{F}$

SOUTH TEXAS PROJECT UNITS 1 & 2

DNBR TRANSIENT FOR
INADVERTENT OPENING OF A
PRESSURIZER SAFETY VALVE

FIGURE 15.6-3

REVISION 12

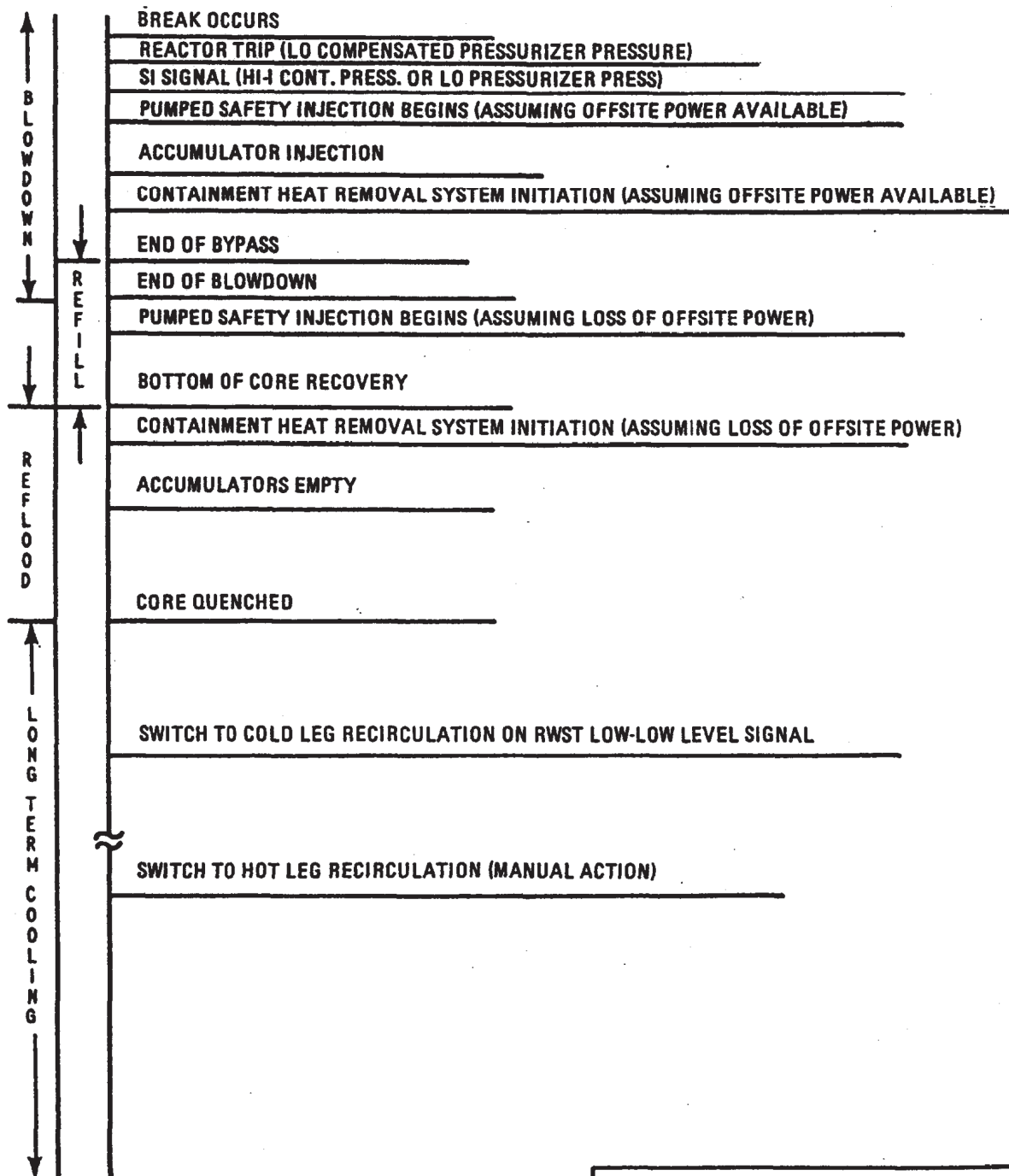


SOUTH TEXAS PROJECT
UNITS 1 & 2

STEAM GENERATOR TUBE RUPTURE
MARGIN TO OVERFILL ANALYSIS-
RUPTURED SG WATER VOLUME

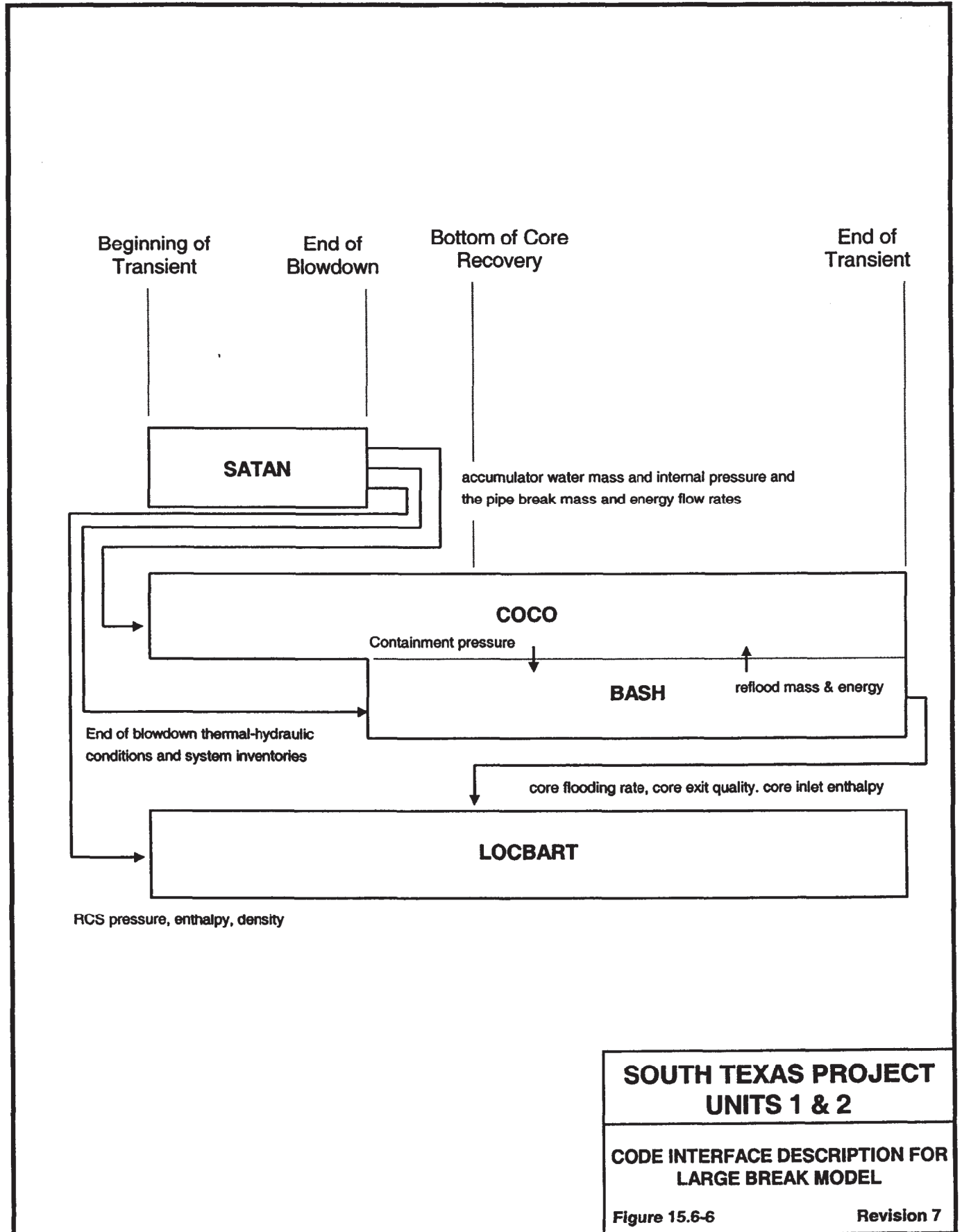
FIGURE 15.6-4

REVISION 15



SOUTH TEXAS PROJECT UNITS 1 & 2

**SEQUENCE OF EVENTS FOR
LARGE BREAK
LOSS-OF-COOLANT ANALYSIS**



NO-RECD

LOCTA

CORE PRESSURE, CORE
FLOW, MIXTURE LEVEL,
AND FUEL ROD POWER
HISTORY

Ø<TIME<CORE COVERED



SOUTH TEXAS PROJECT
UNITS 1 & 2

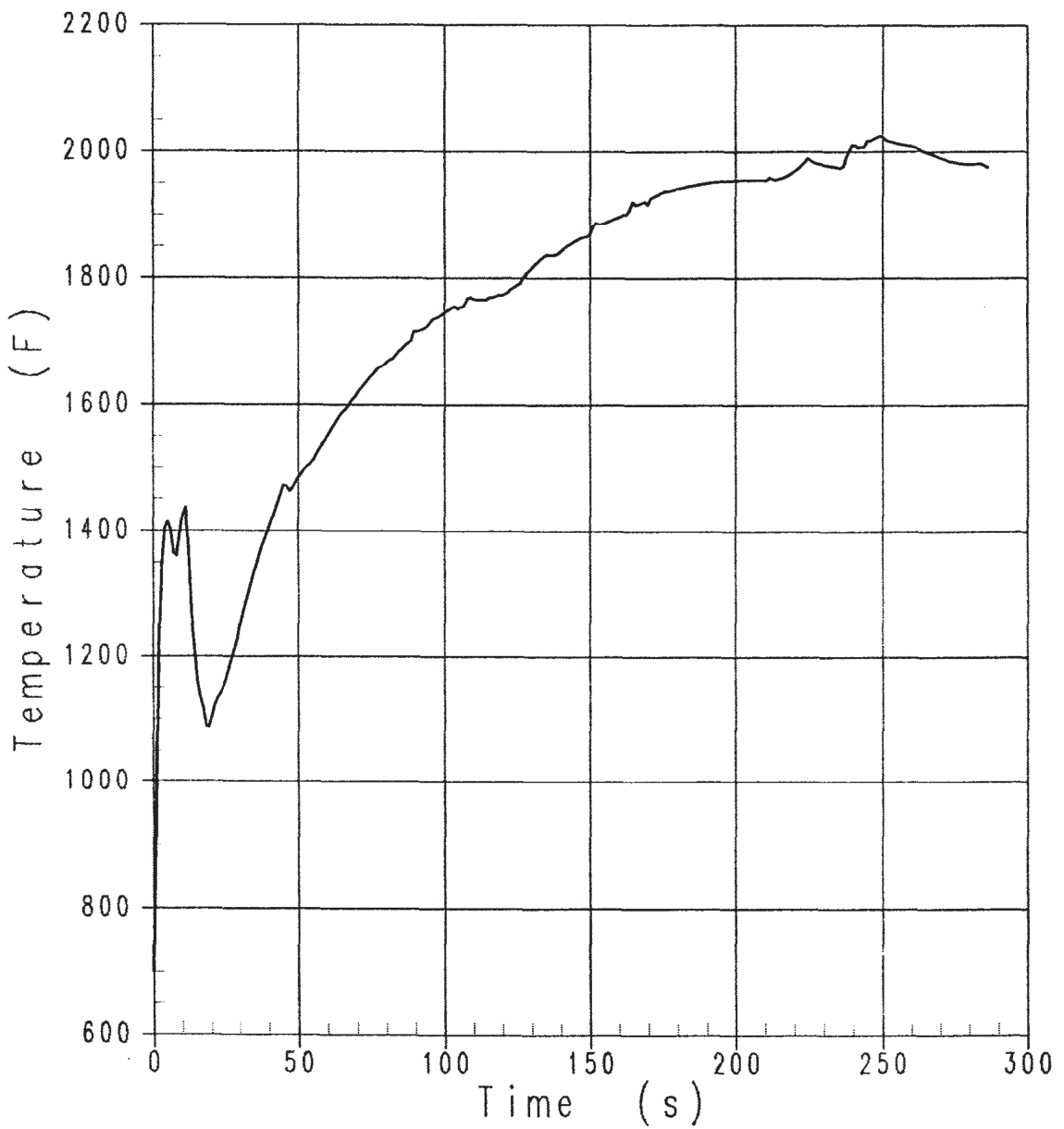
CORE INTERFACE DESCRIPTION
FOR SMALL BREAK MODEL

FIGURE 15.6-7

REVISION 5



L8804.052



**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**PEAK CLAD TEMPERATURE
DECLG, CD=0.6, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-8

Revision 7

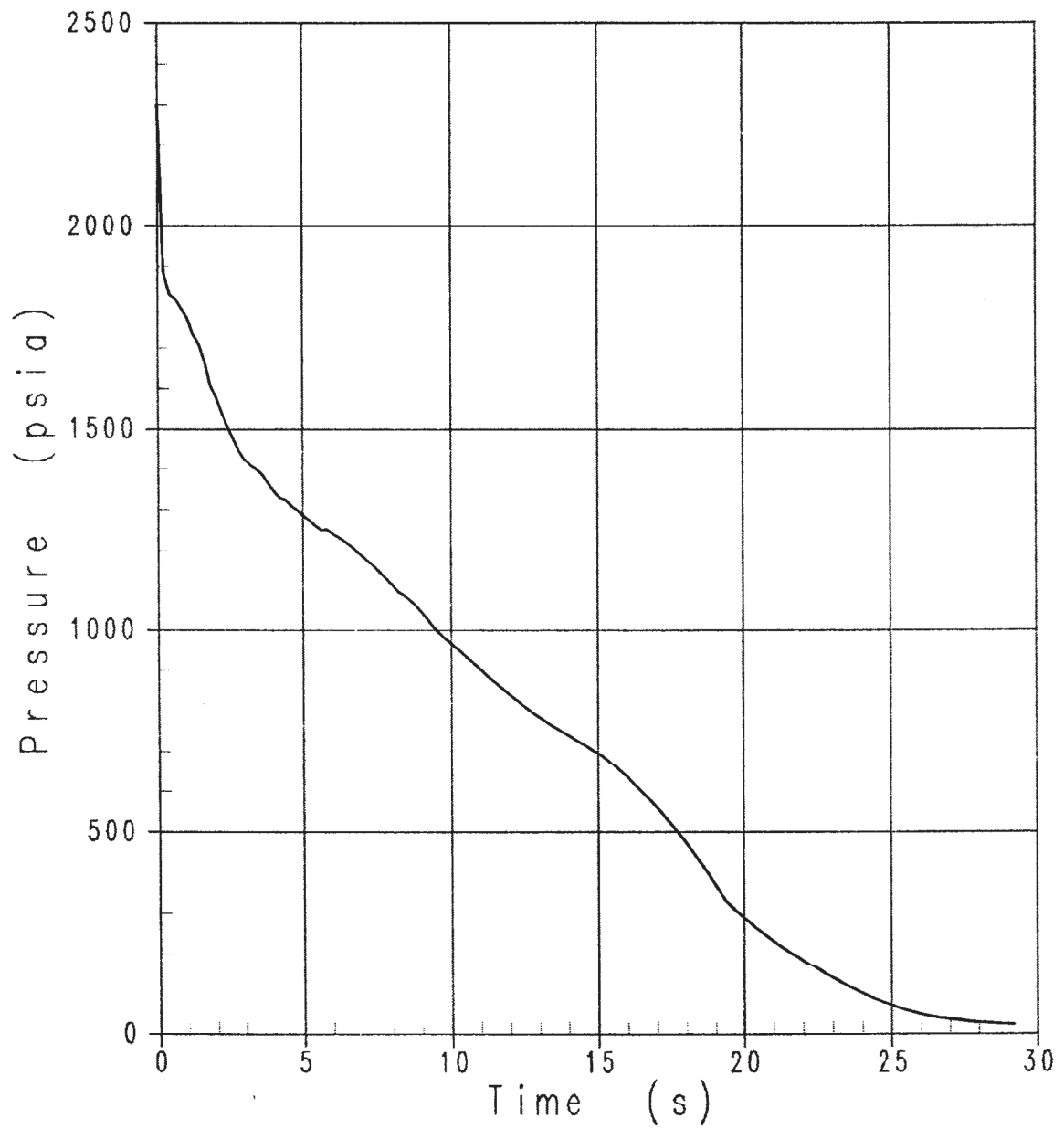
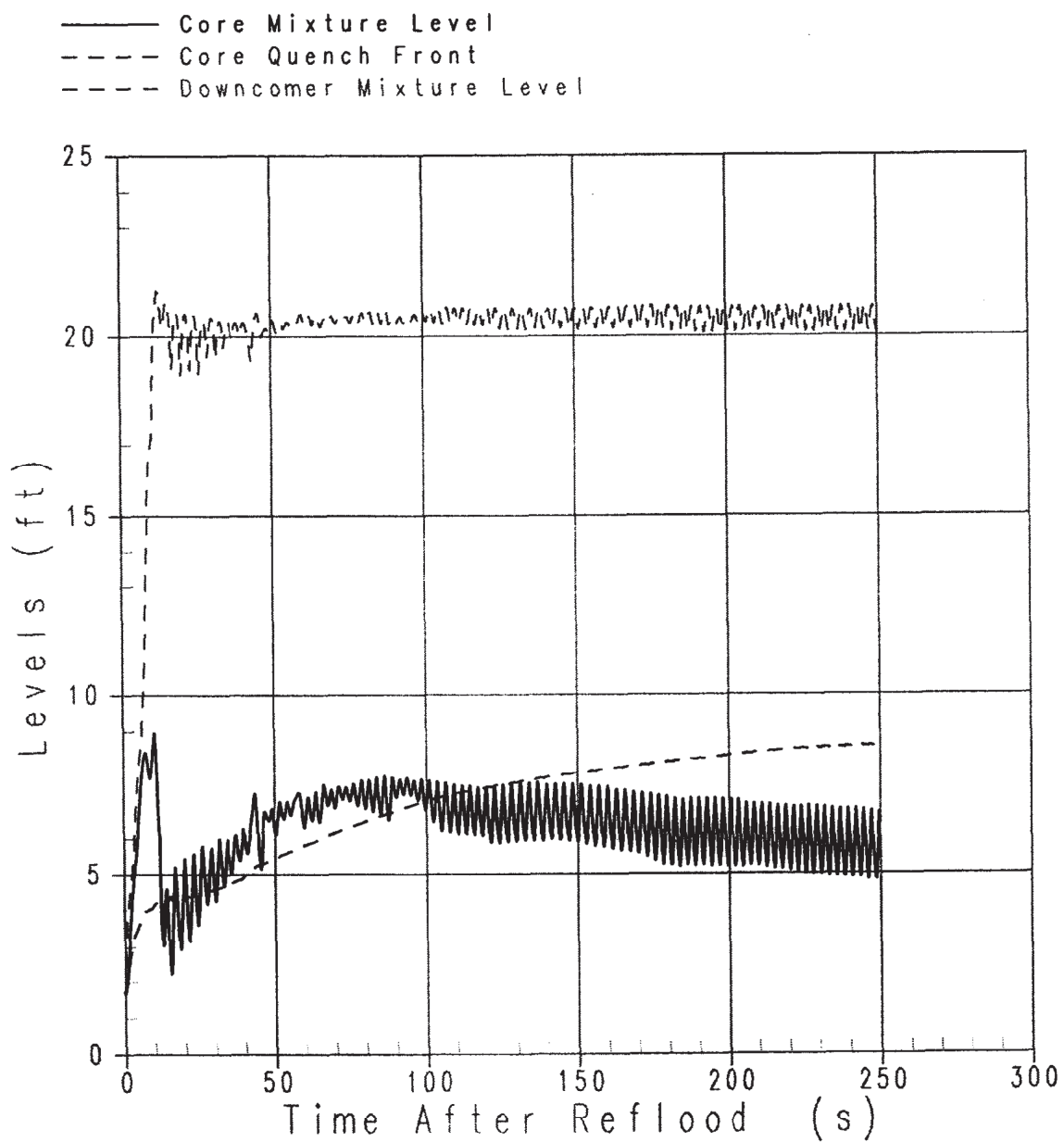
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CORE PRESSURE
DECLG, CD=0.6, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-9

Revision 7

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

REFLOOD TRANSIENT DOWNCOMER
AND CORE WATER LEVELS
DECLG, CD=0.6, MIN SI, HIGH TAVG,
NON-IFBA

Figure 15.6-10

Revision 7

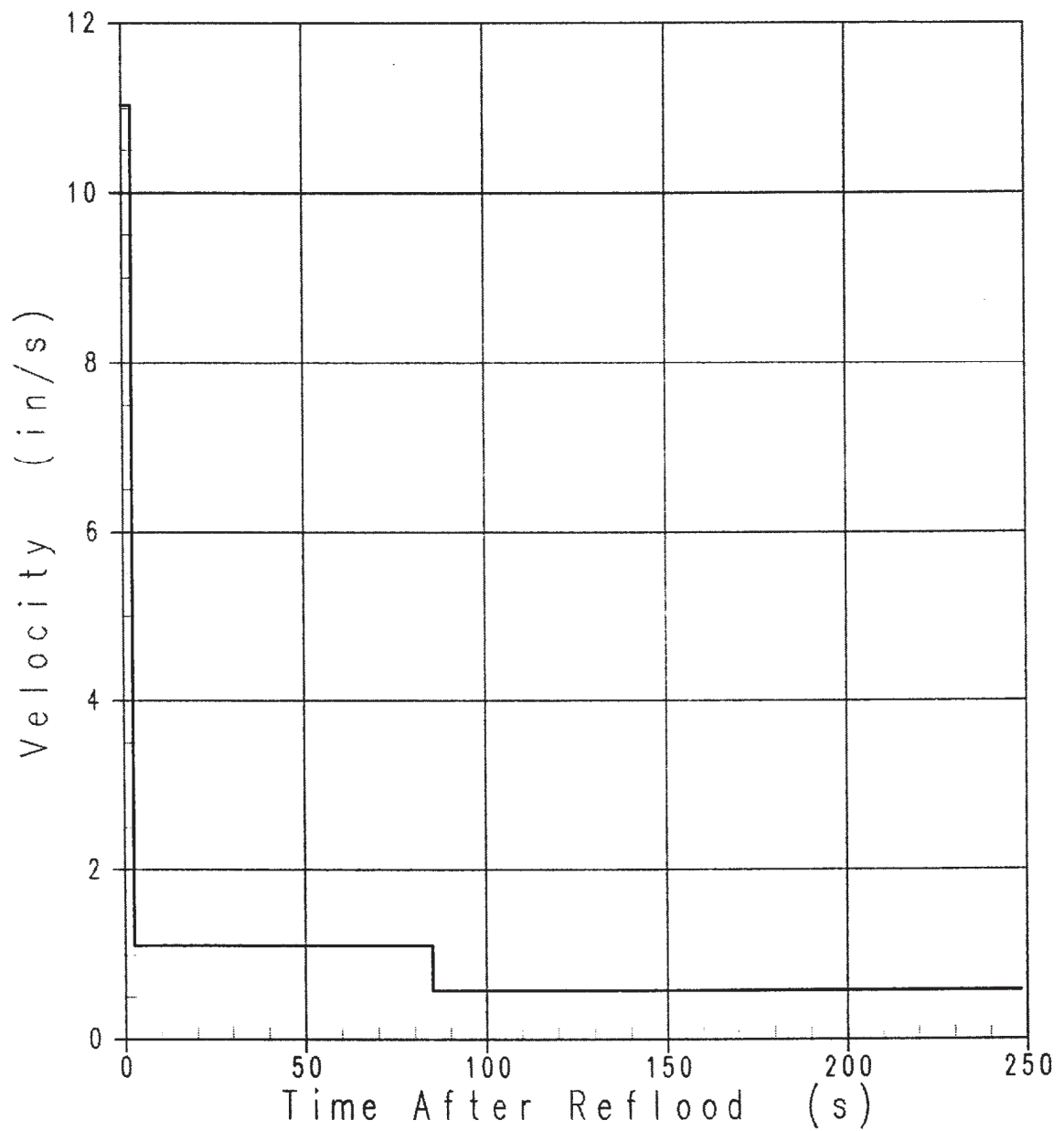
**SOUTH TEXAS PROJECT
UNITS 1 & 2****REFLOOD TRANSIENT CORE INLET
FLUID VELOCITY
DECLG, CD=0.6, MIN SI, HIGH TAVG,
NON-IFBA**

Figure 15.6-11

Revision 7

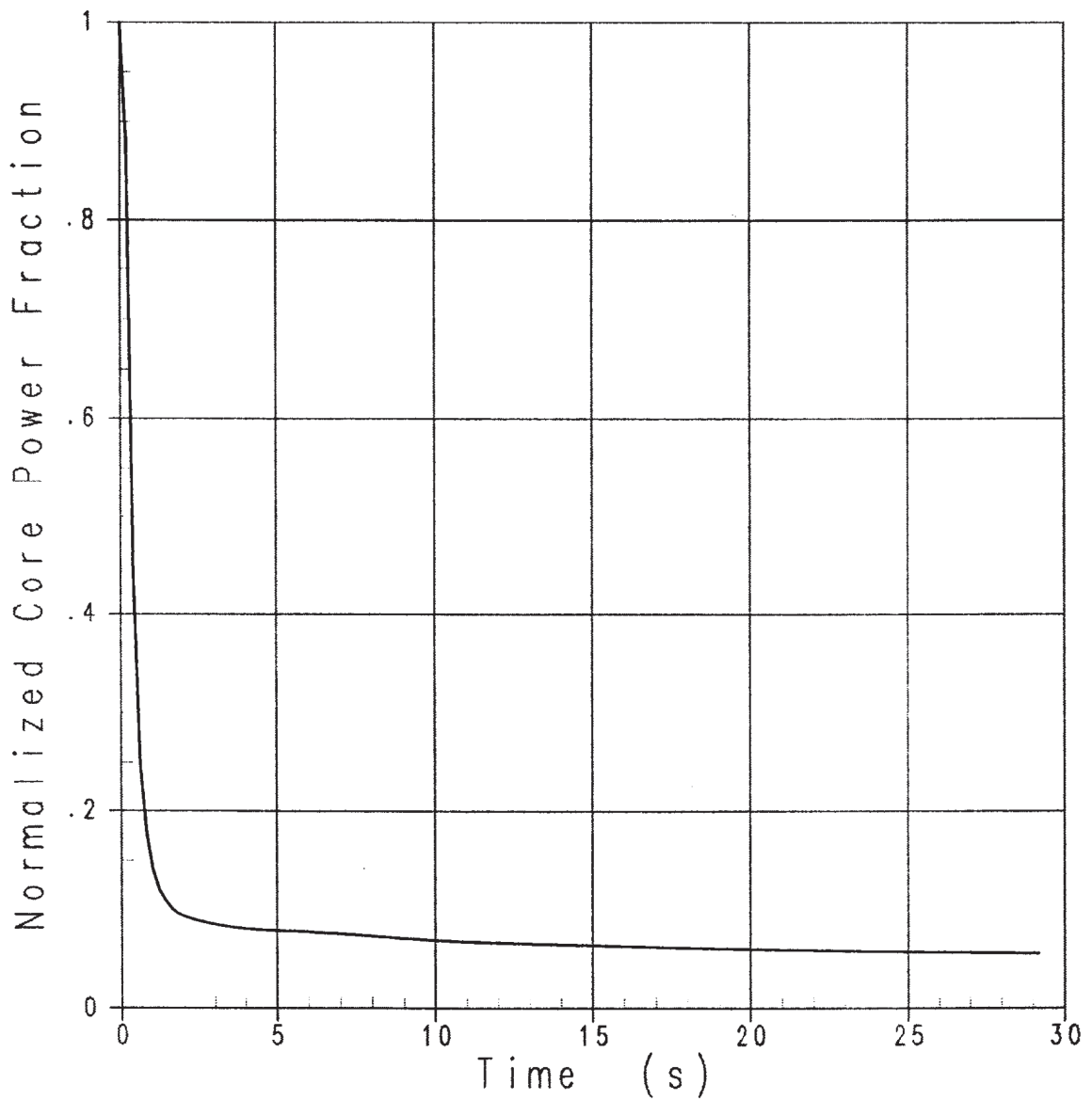
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CORE POWER TRANSIENT
DECLG, CD=0.6, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-12

Revision 7

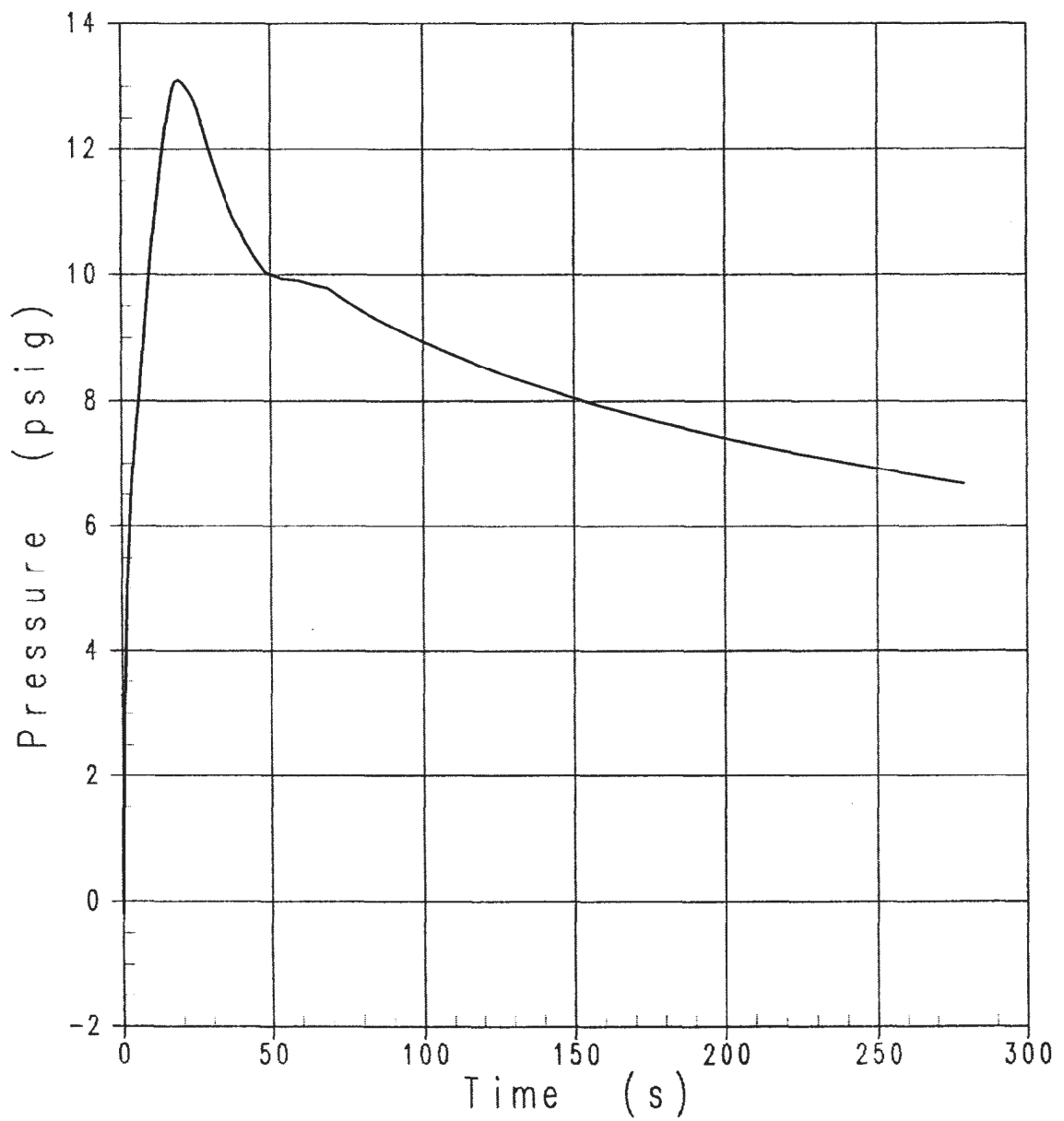
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CONTAINMENT PRESSURE
DECLG, CD=0.6, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-13

Revision 7

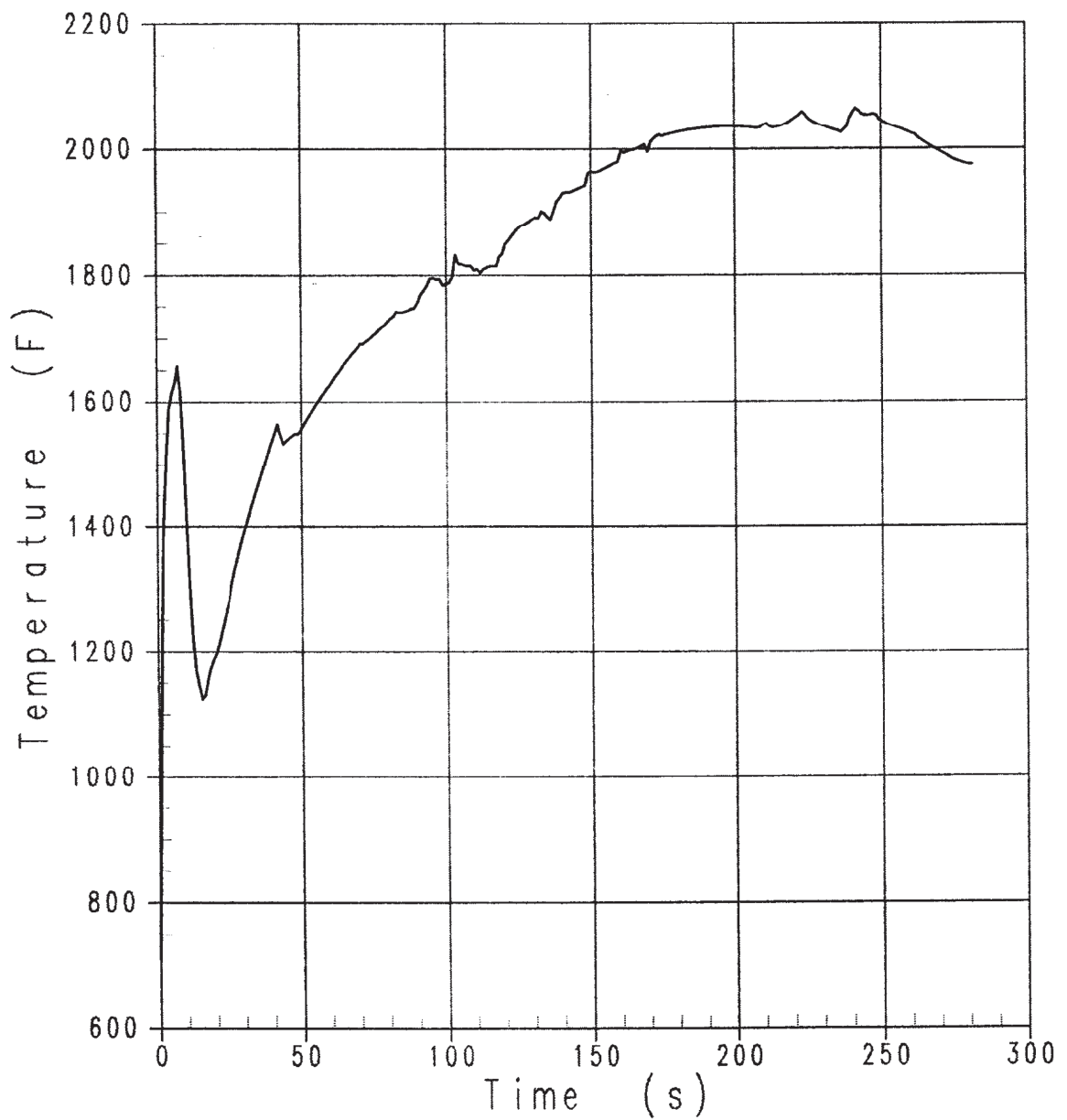
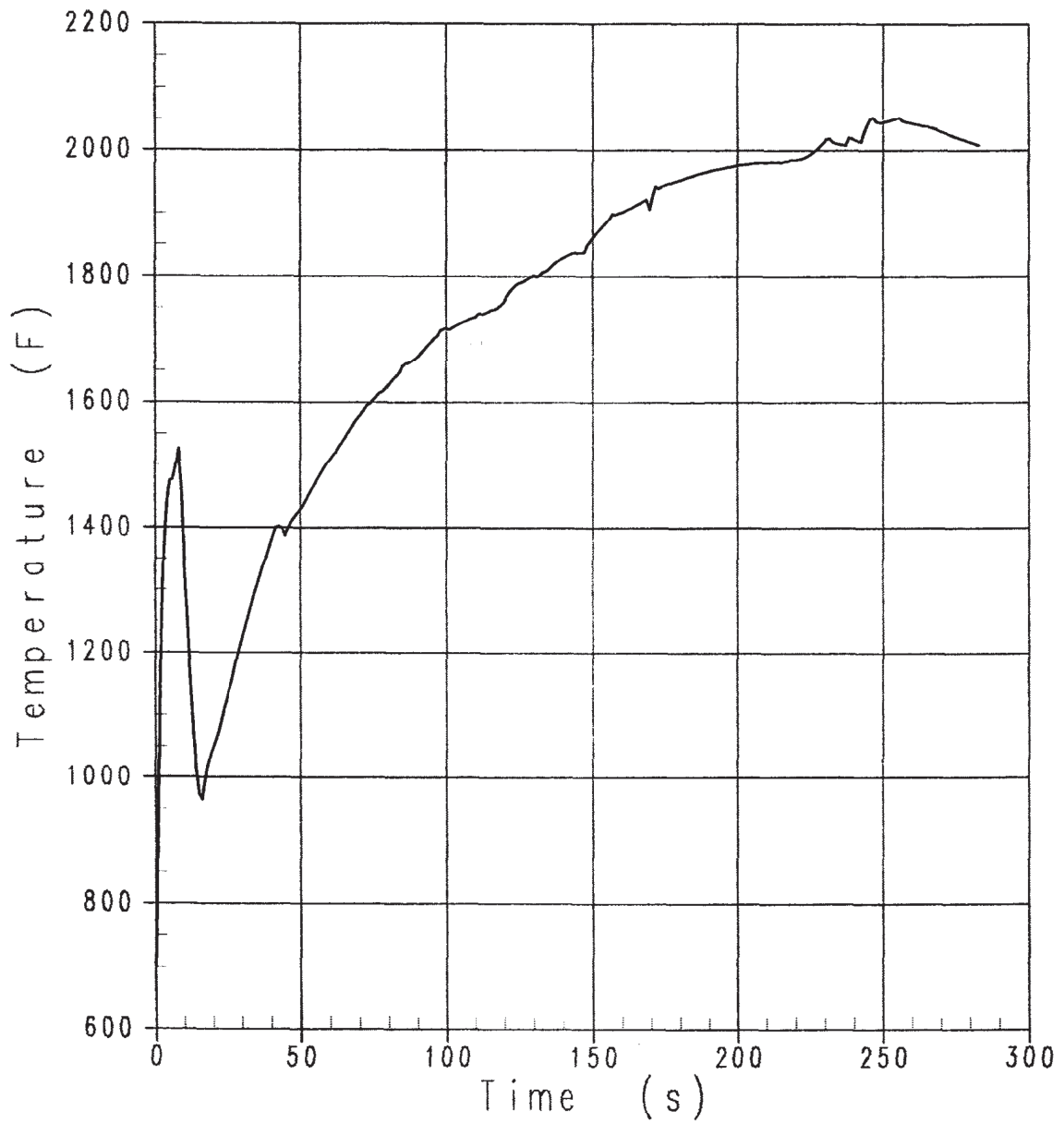
**SOUTH TEXAS PROJECT
UNITS 1 & 2****PEAK CLAD TEMPERATURE
DECLG, CD=0.8, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-14

Revision 7

STPEGS UFSAR



**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**PEAK CLAD TEMPERATURE
DECLG, CD=0.8, MIN SI,
LOW TAVG, NON-IFBA**

Figure 15.6-14a

Revision 7

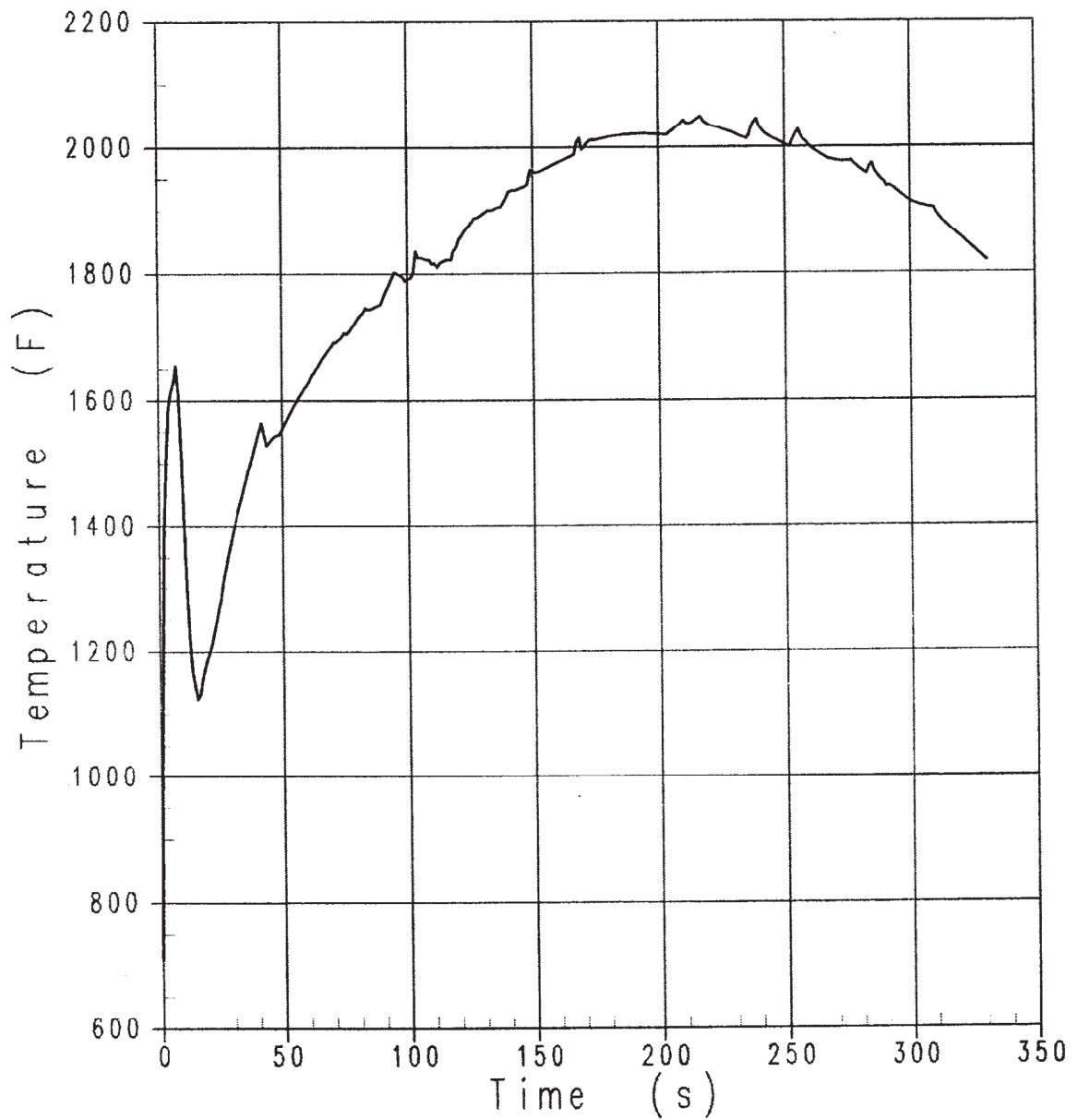
**SOUTH TEXAS PROJECT
UNITS 1 & 2****PEAK CLAD TEMPERATURE
DECLG, CD=0.8, MAX SI,
HIGH TAVG, IFBA**

Figure 15.6-14b

Revision 7

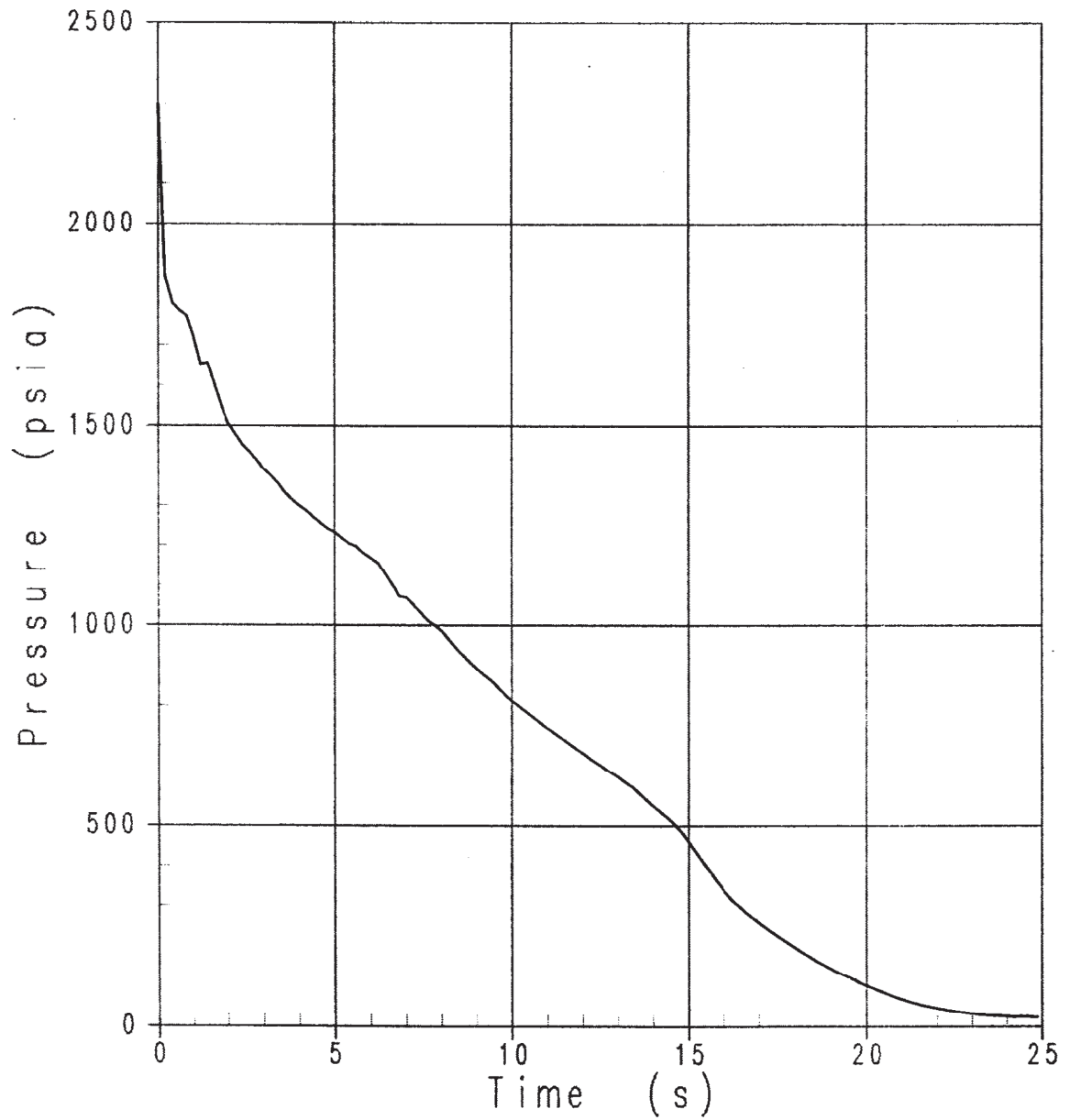
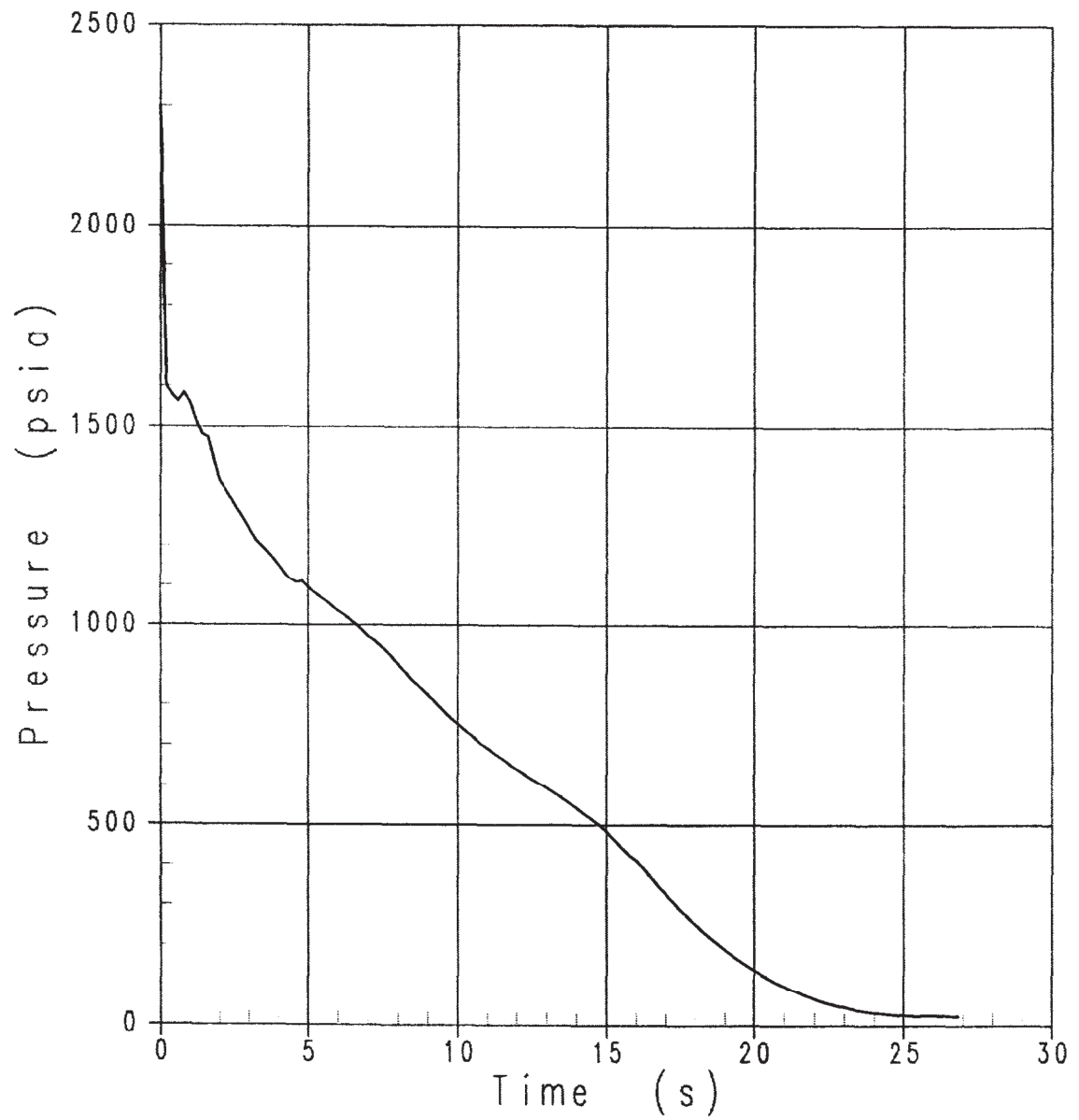
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CORE PRESSURE
DECLG, CD=0.8, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-15

Revision 7



**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**CORE PRESSURE
DECLG, CD=0.8, MIN SI,
LOW TAVG, NON-IFBA**

Figure 15.6-15a

Revision 7

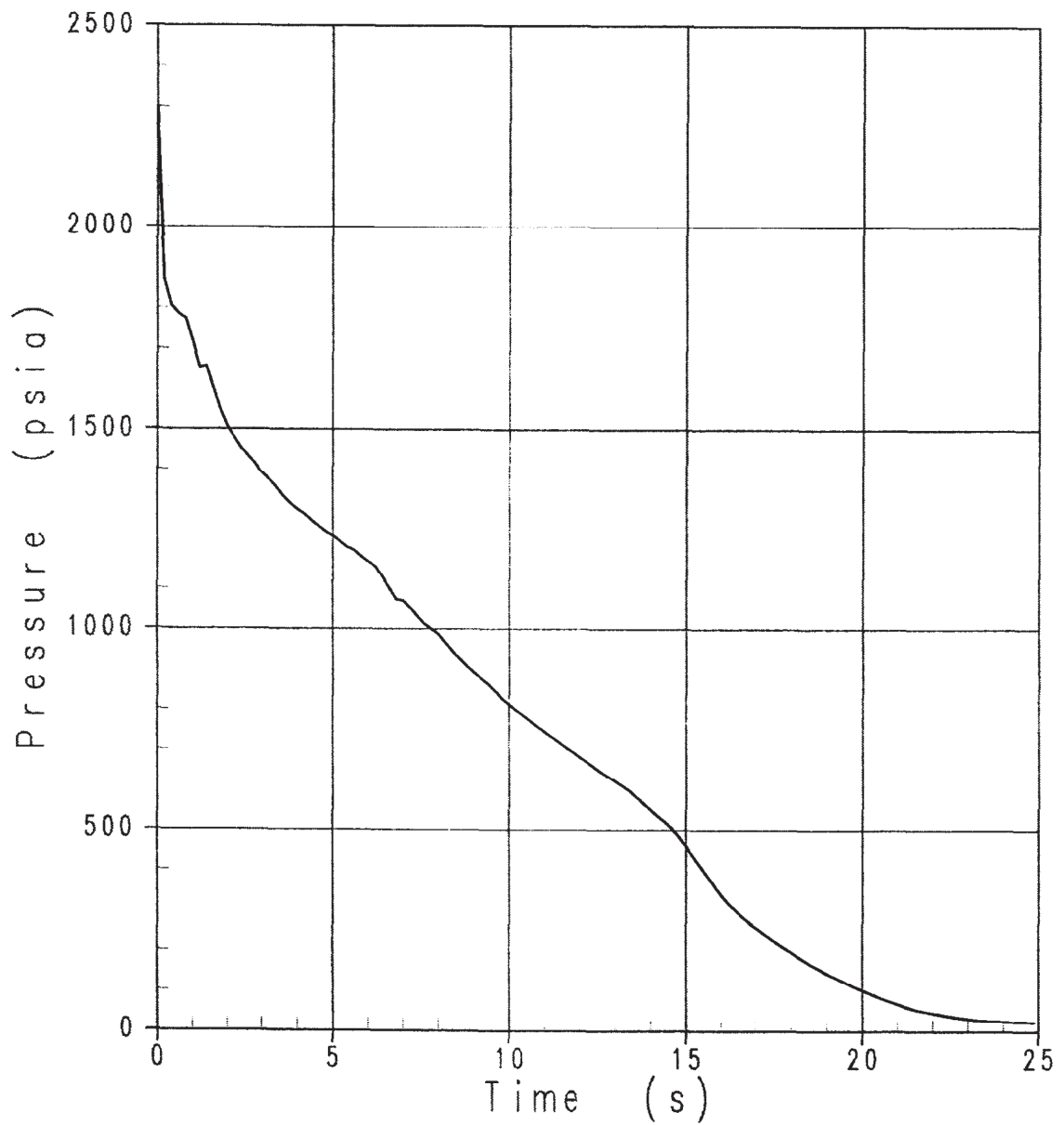
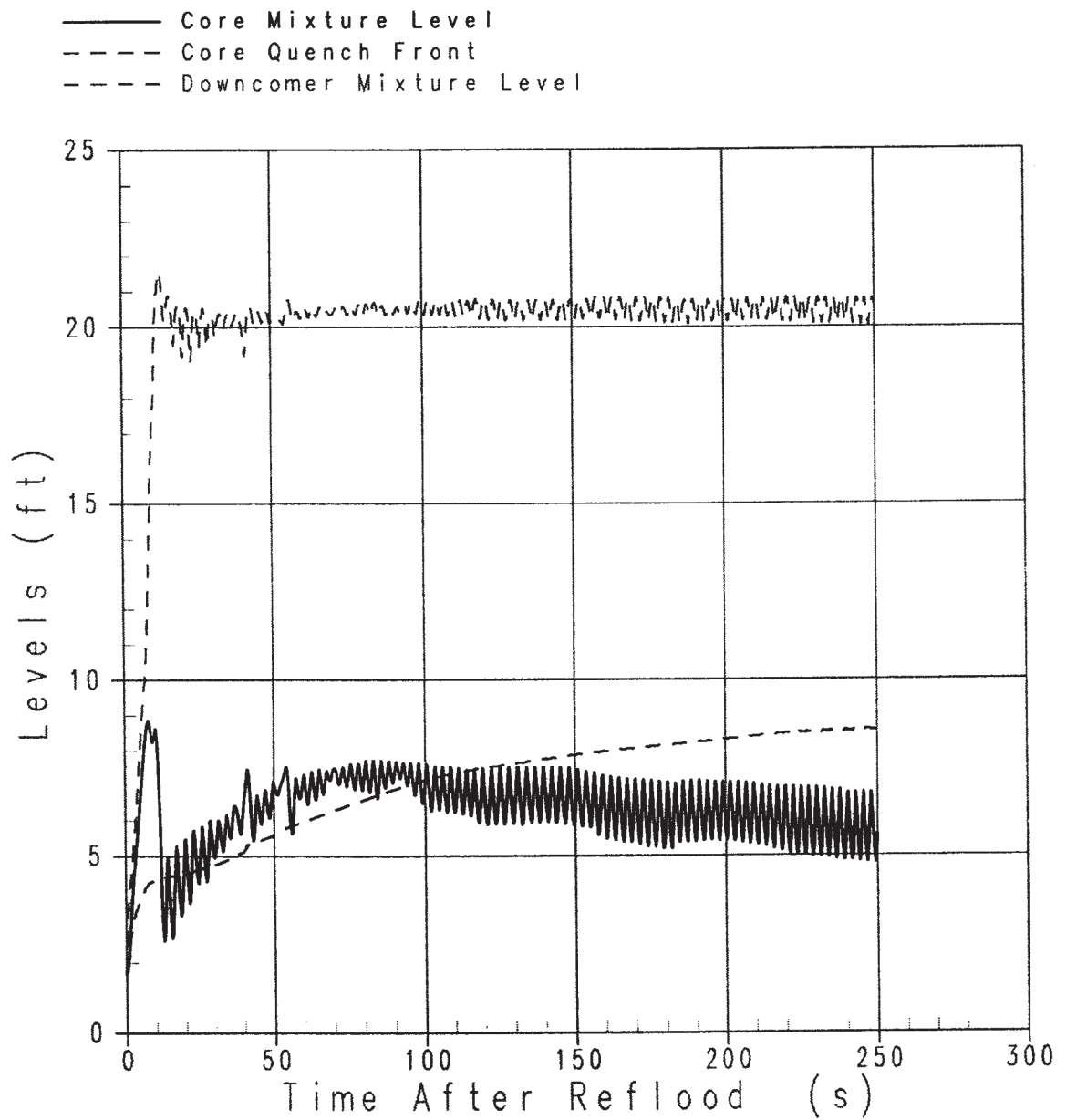
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CORE PRESSURE
DECLG, CD=0.8, MAX SI,
HIGH TAVG, IFBA**

Figure 15.6-15b

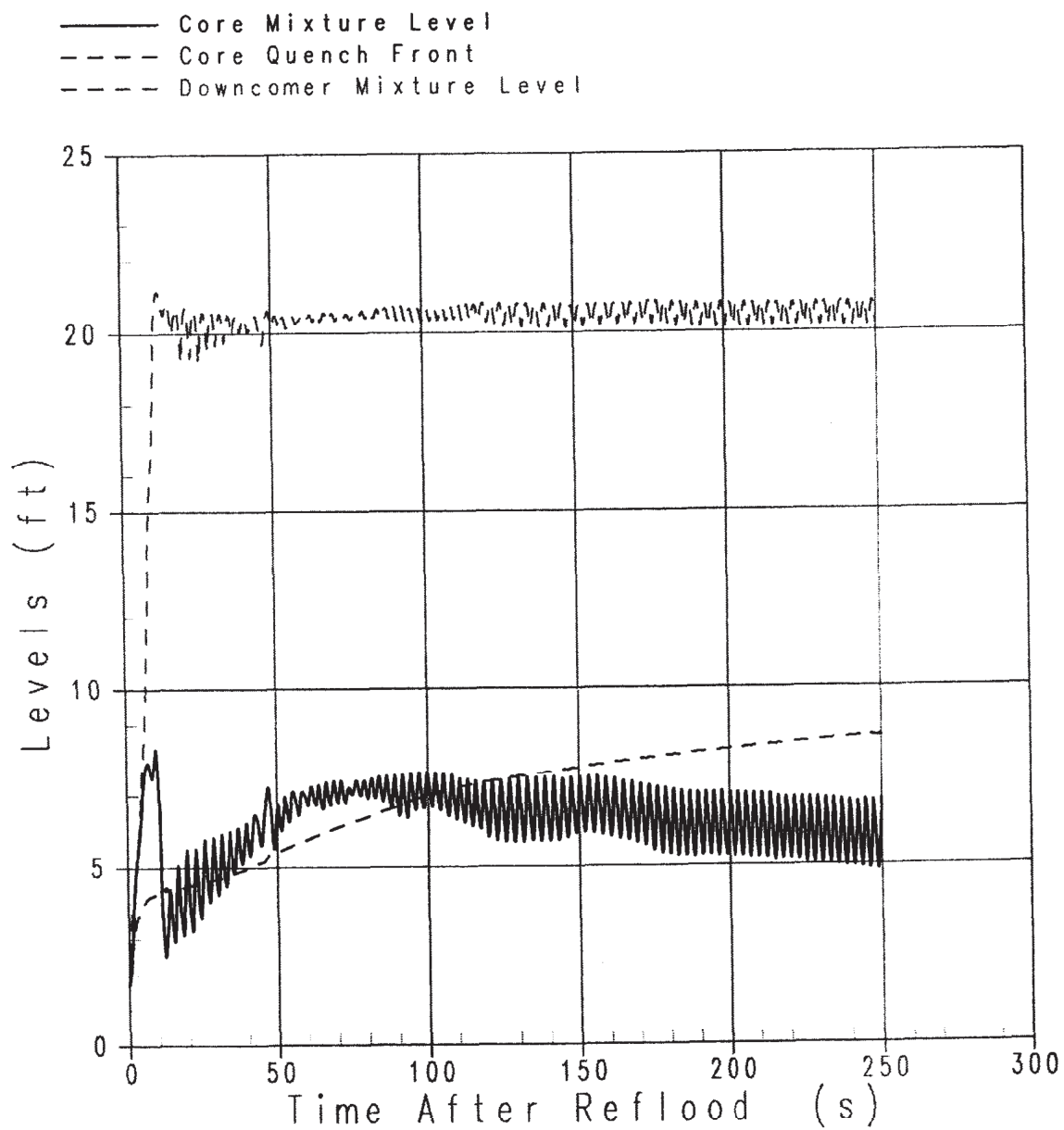
Revision 7

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

REFLOOD TRANSIENT DOWNCOMER
AND CORE WATER LEVELS
DECLG, CD=0.8, MIN SI, HIGH TAVG,
NON-IFBA

Figure 15.6-16

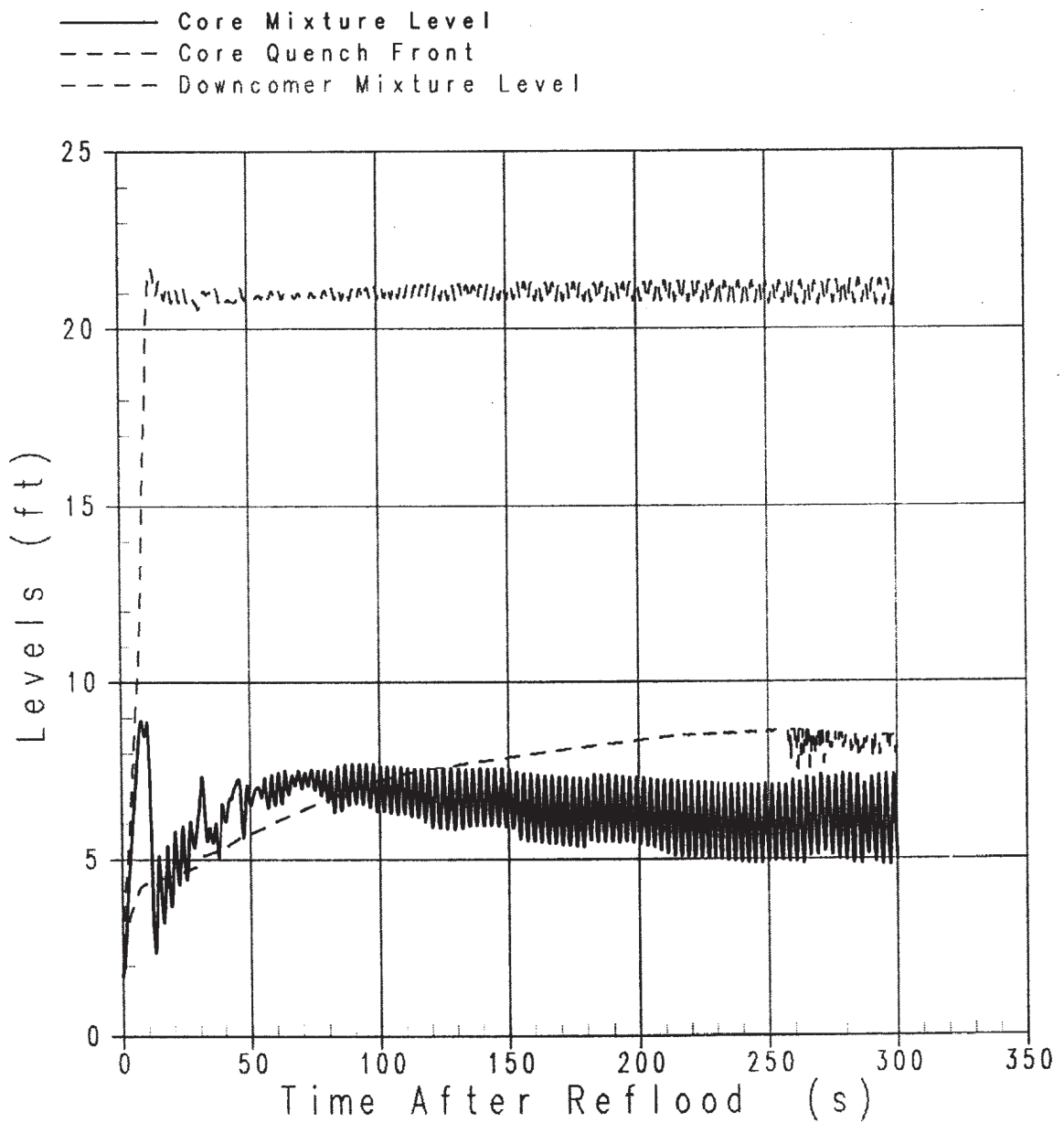
Revision 7

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

REFLOOD TRANSIENT DOWNCOMER
AND CORE WATER LEVELS
DECLG, CD=0.8, MIN SI, LOW TAVG,
NON-IFBA

Figure 15.6-16a

Revision 7

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

REFLOOD TRANSIENT DOWNCOMER
AND CORE WATER LEVELS
DECLG, CD=0.8, MAX SI, HIGH TAVG,
IFBA

Figure 15.6-16b

Revision 7

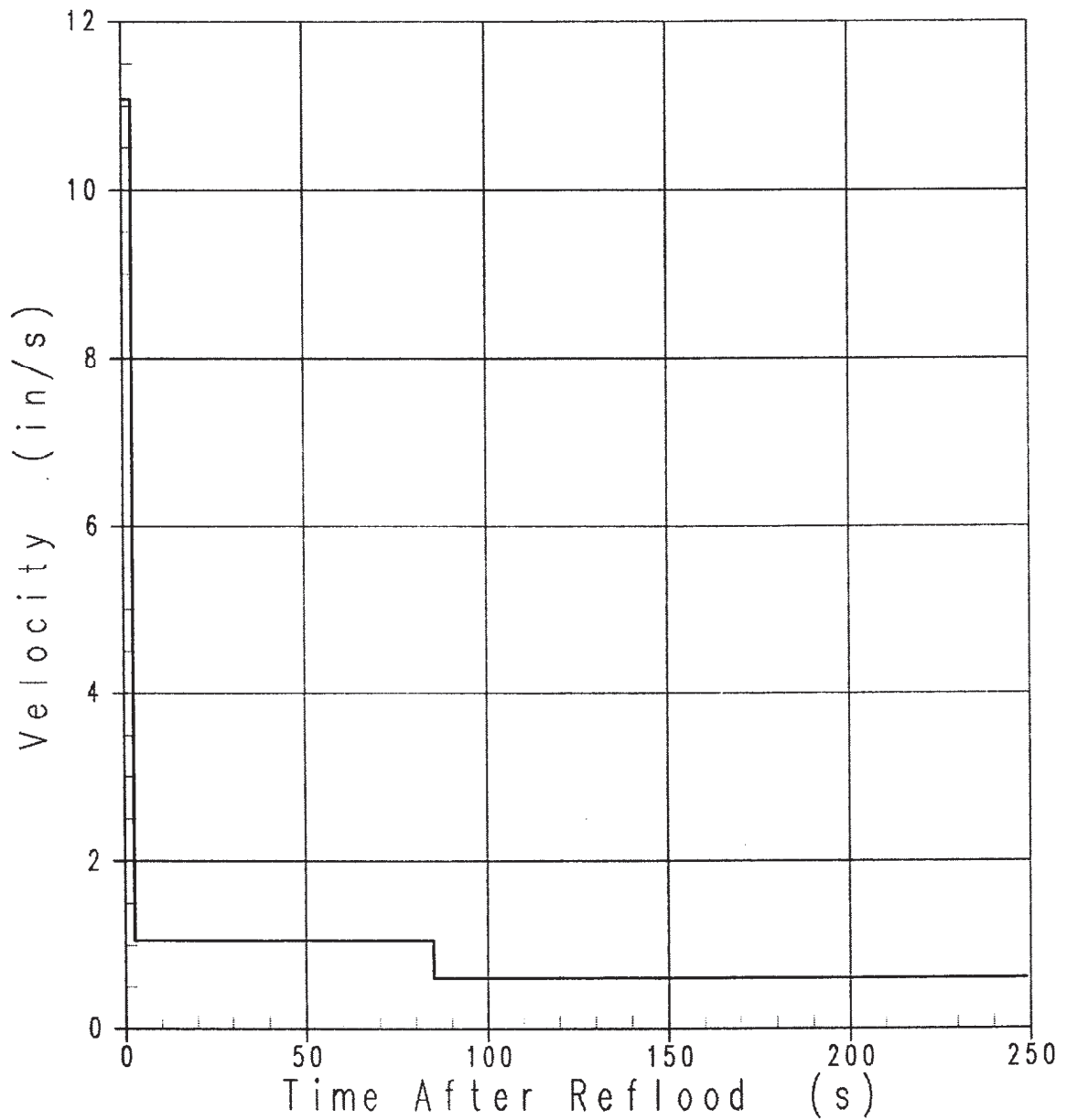
**SOUTH TEXAS PROJECT
UNITS 1 & 2****REFLOOD TRANSIENT CORE INLET
FLUID VELOCITY
DECLG, CD=0.8, MIN SI, HIGH TAVG,
NON-IFBA**

Figure 15.6-17

Revision 7

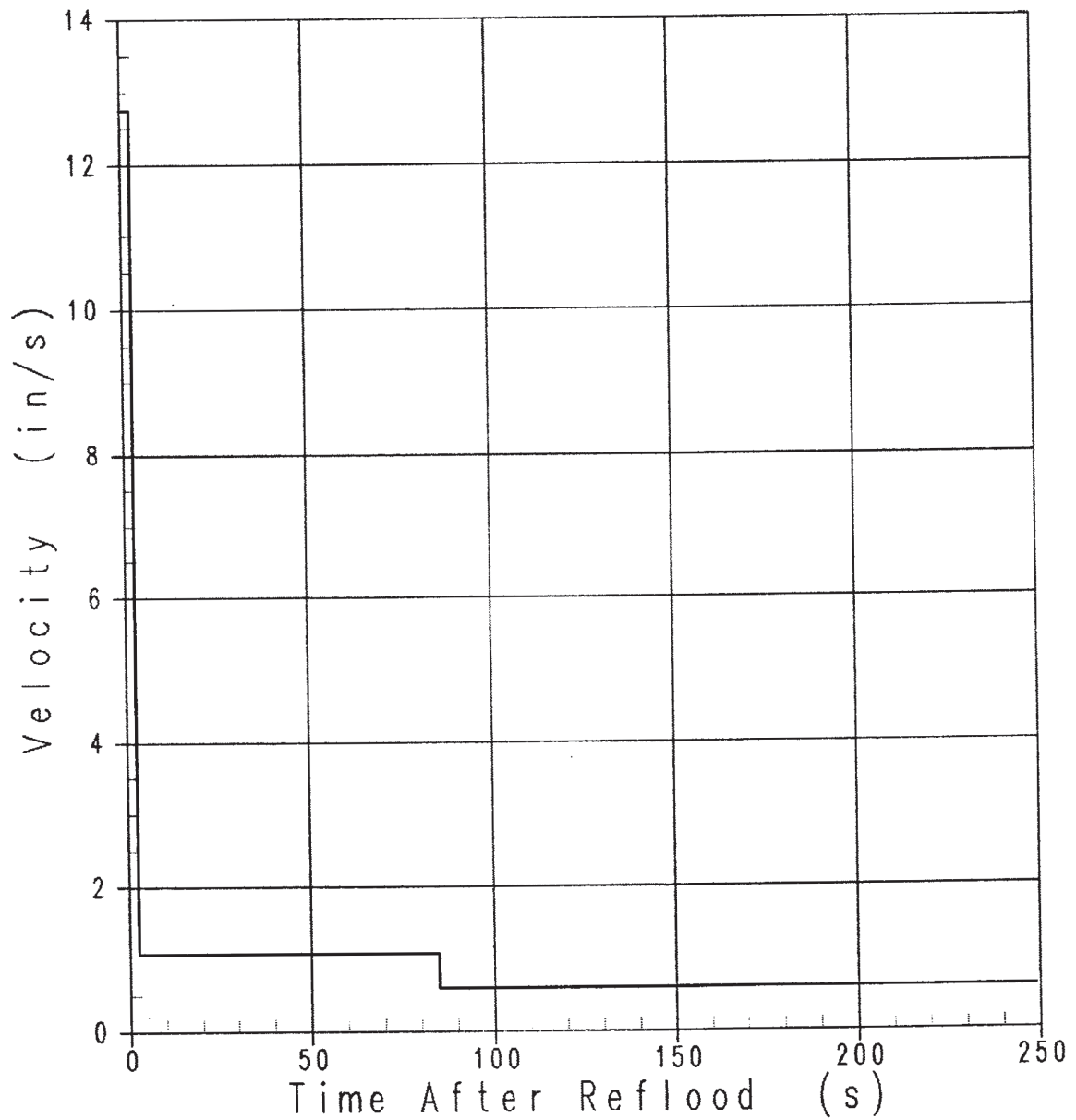
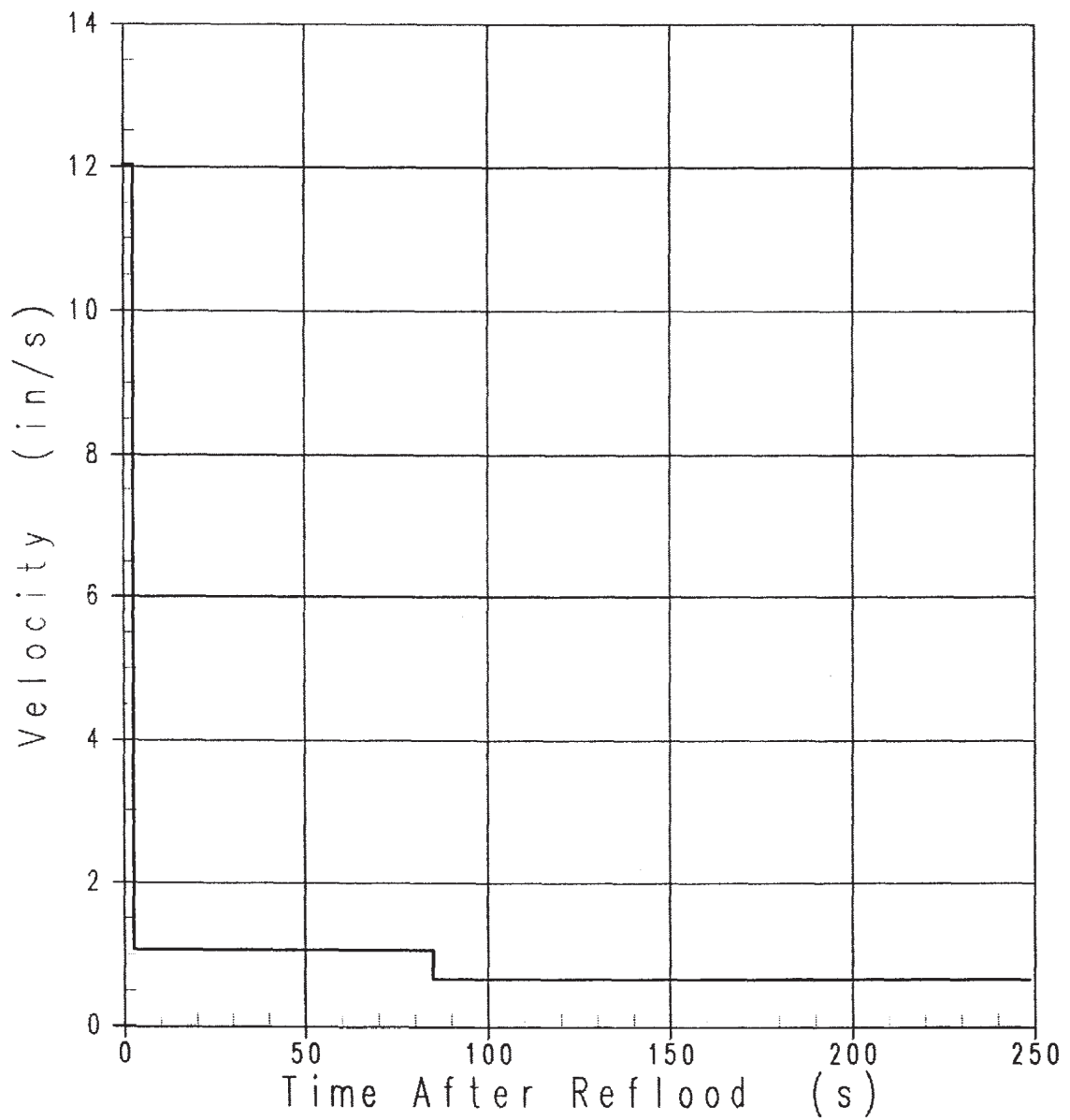
**SOUTH TEXAS PROJECT
UNITS 1 & 2****REFLOOD TRANSIENT CORE INLET
FLUID VELOCITY
DECLG, CD=0.8, MIN SI, LOW TAVG,
NON-IFBA**

Figure 15.6-17a

Revision 7

**SOUTH TEXAS PROJECT
UNITS 1 & 2****REFLOOD TRANSIENT CORE INLET
FLUID VELOCITY
DECLG, CD=0.8, MAX SI, HIGH TAVG,****Figure 15.6-17b IFBA****Revision 7**

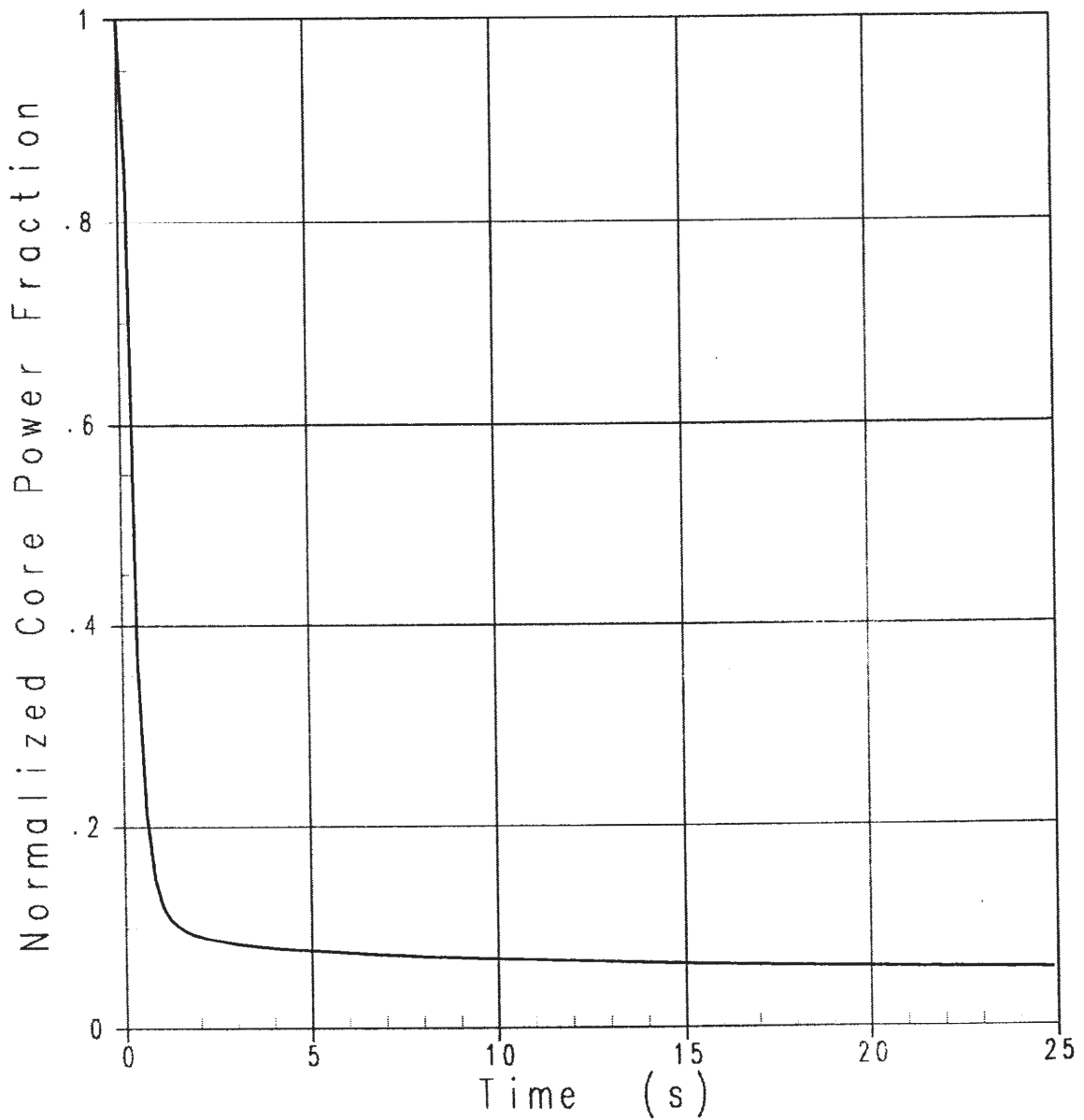
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CORE POWER TRANSIENT
DECLG, CD=0.8, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-18

Revision 7

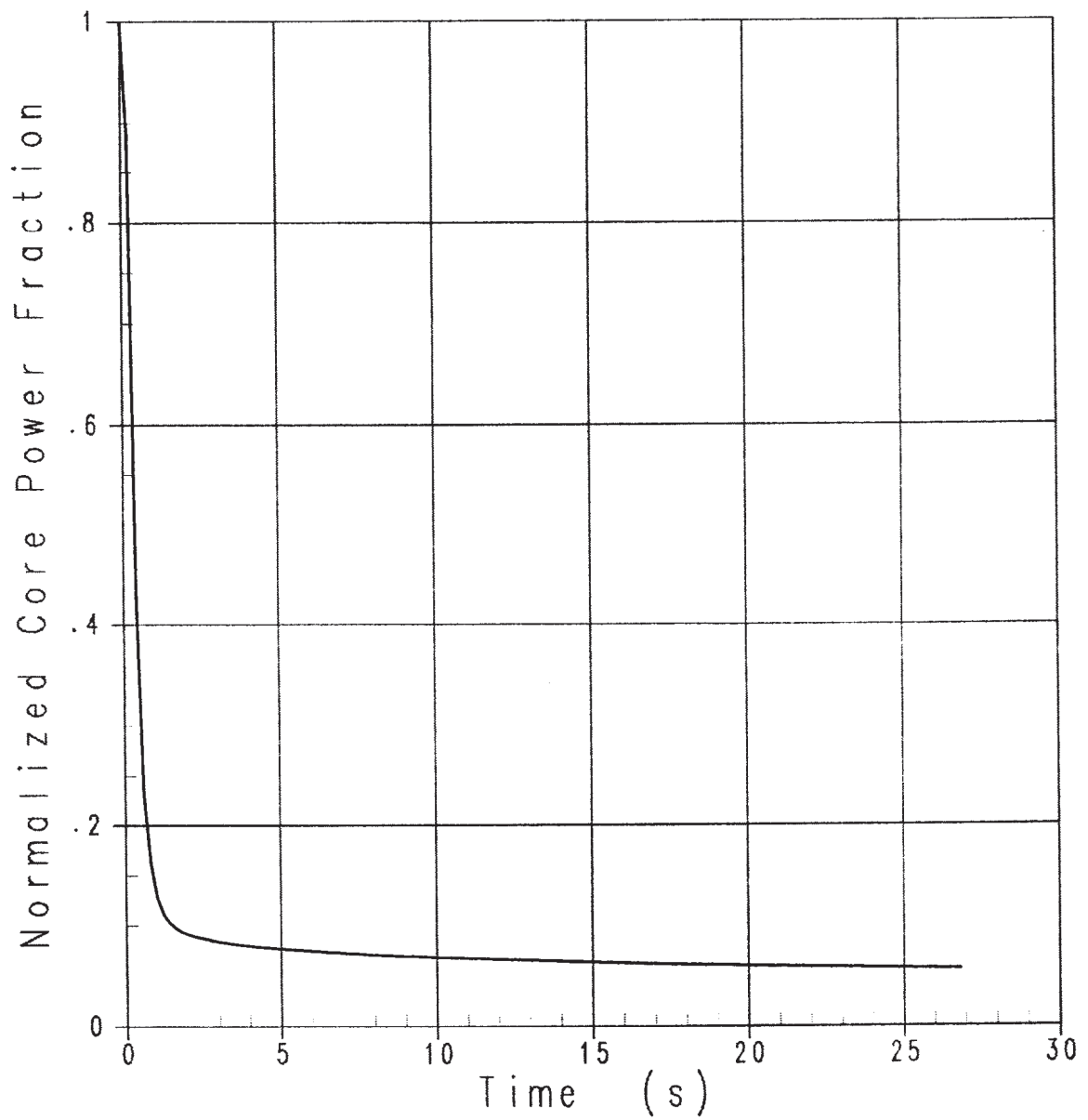
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CORE POWER TRANSIENT
DECLG, CD=0.8, MIN SI,
LOW TAVG, NON-IFBA**

Figure 15.6-18a

Revision 7

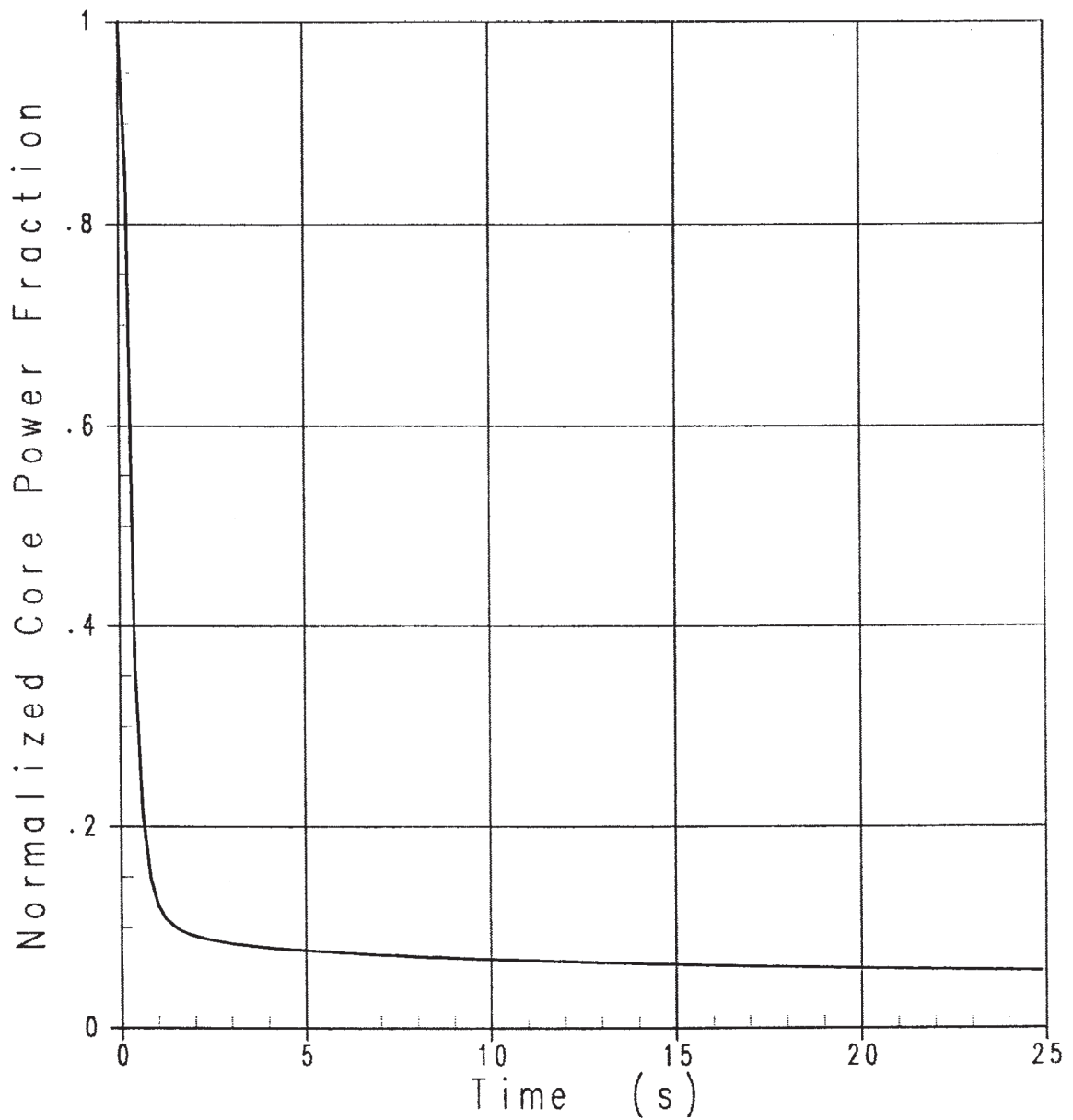
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CORE POWER TRANSIENT
DECLG, CD=0.8, MAX SI,
HIGH TAVG, IFBA**

Figure 15.6-18b

Revision 7

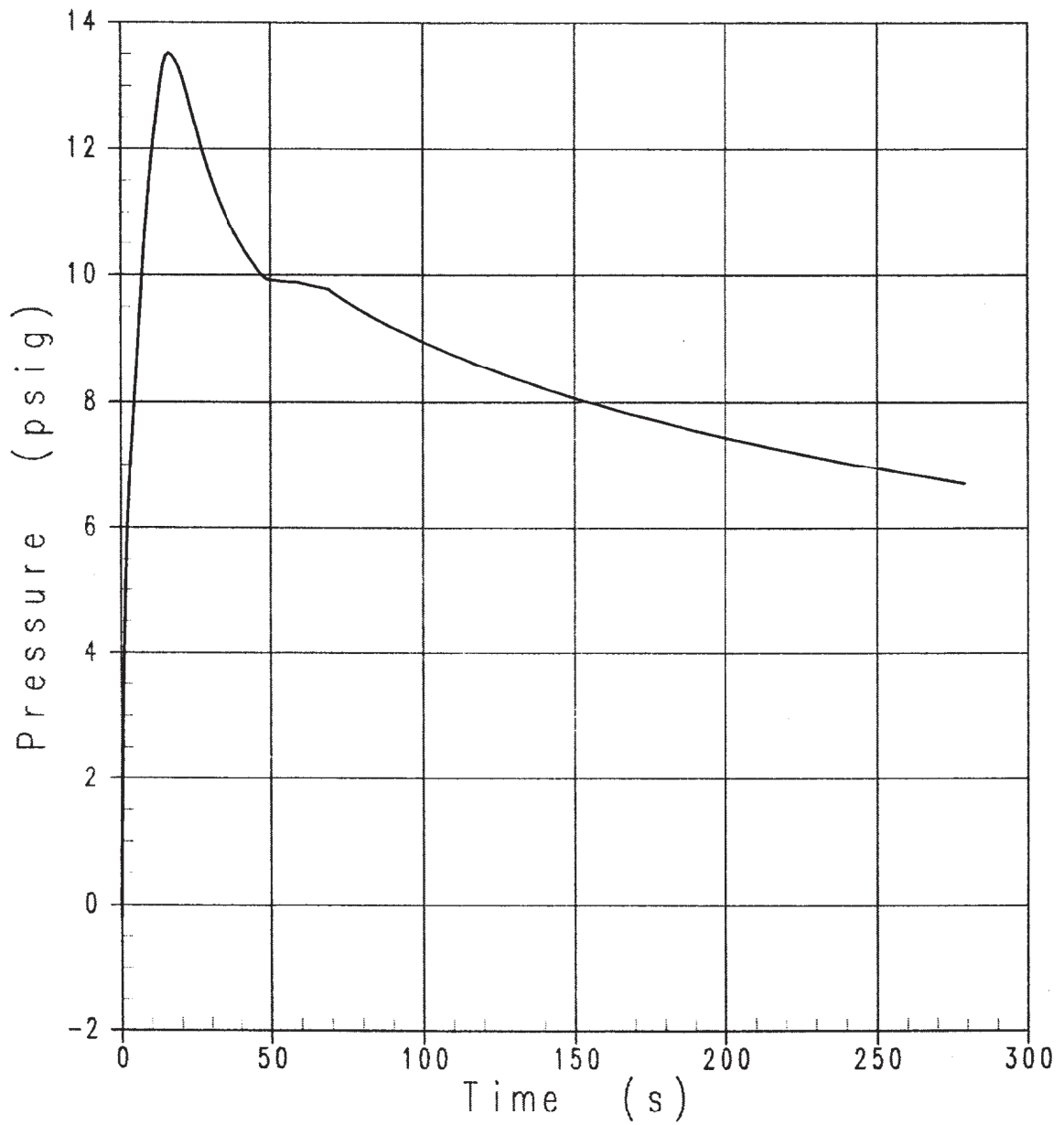
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CONTAINMENT PRESSURE
DECLG, CD=0.8, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-19

Revision 7

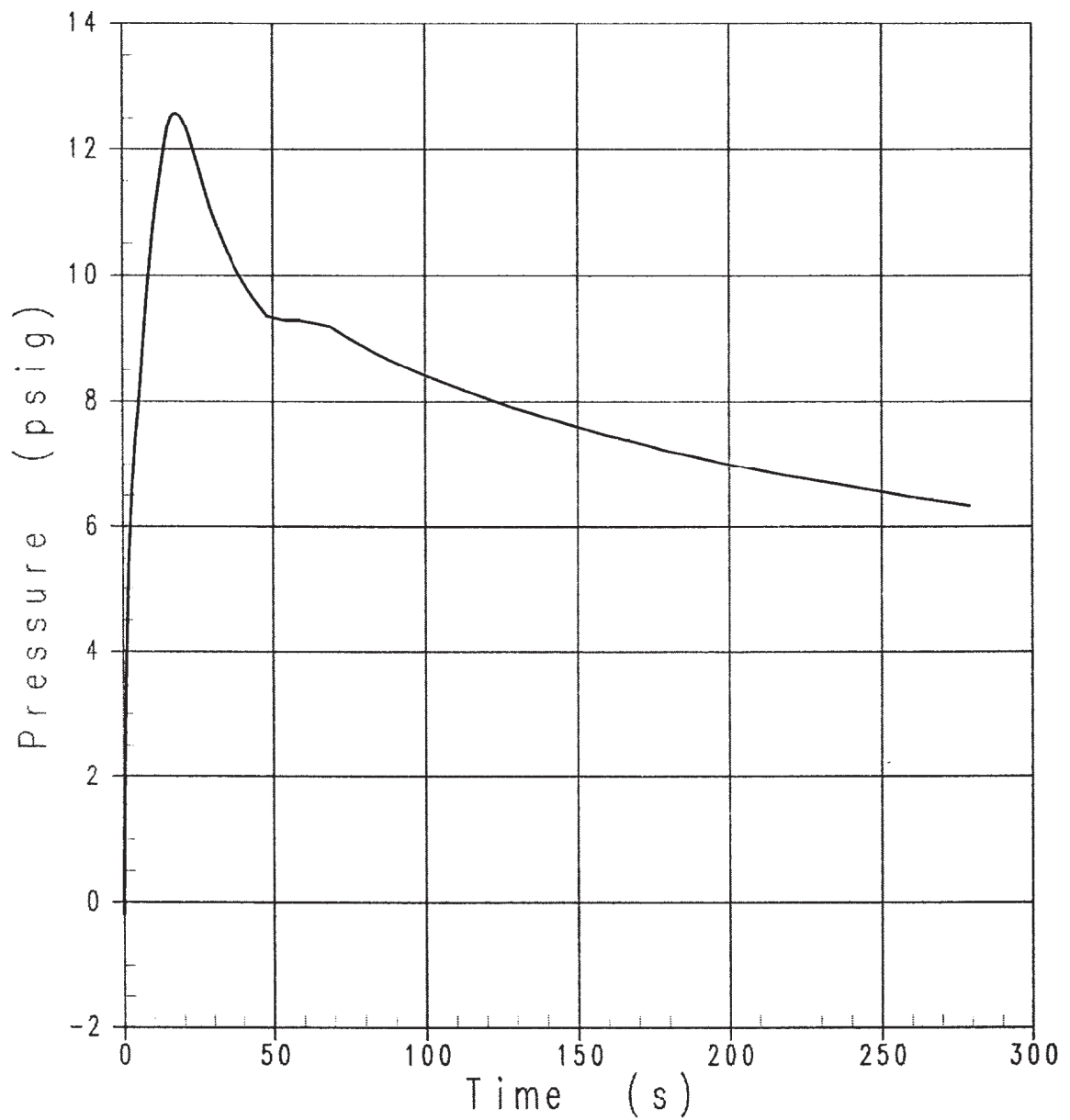
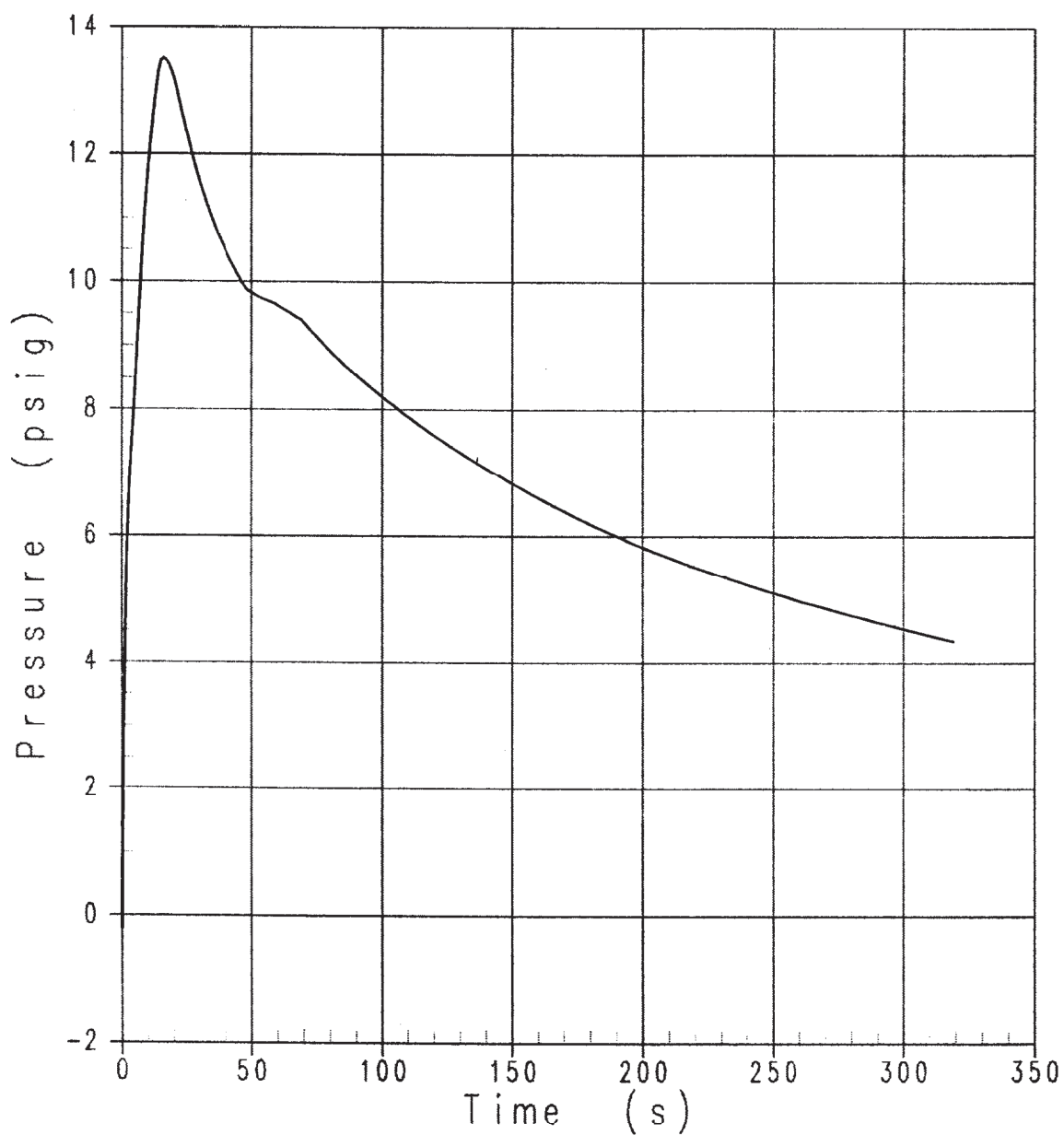
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CONTAINMENT PRESSURE
DECLG, CD=0.8, MIN SI,
LOW TAVG, NON-IFBA**

Figure 15.6-19a

Revision 7

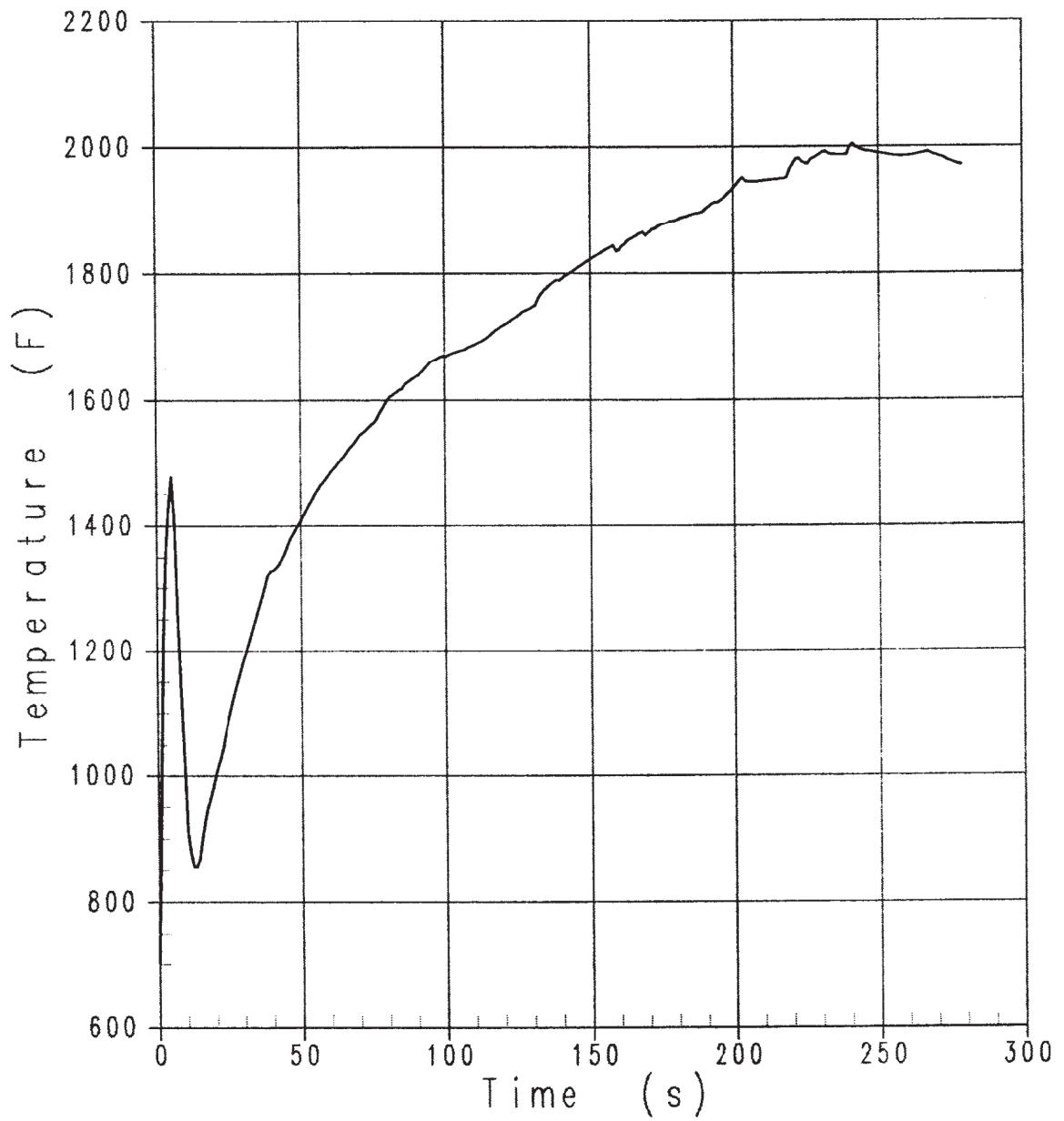


**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**CONTAINMENT PRESSURE
DECLG, CD=0.8, MAX SI,
HIGH TAVG, IFBA**

Figure 15.6-19b

Revision 7



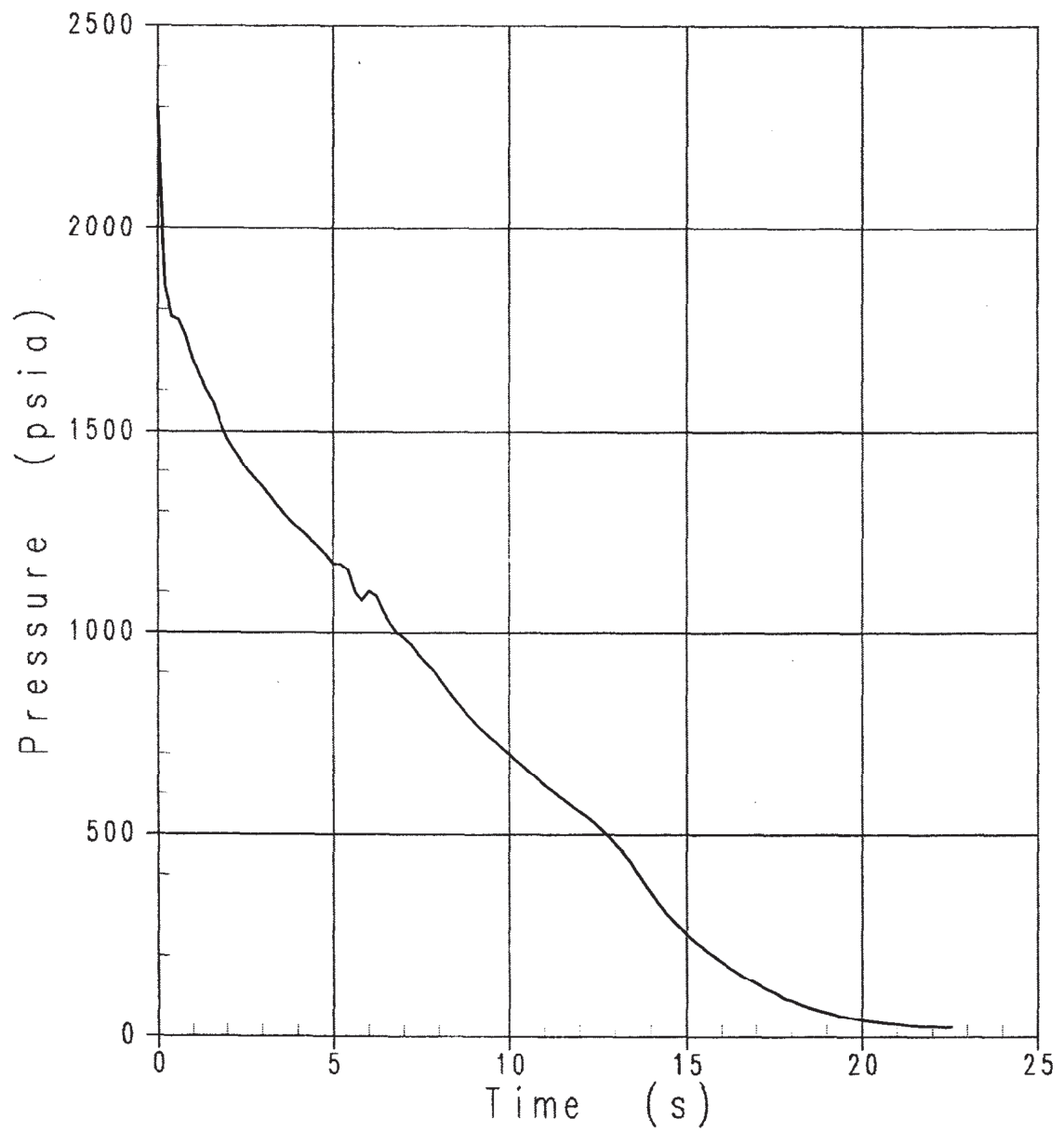
**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**PEAK CLAD TEMPERATURE
DECLG, CD=1.0, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-20

Revision 7

STPEGS UFSAR

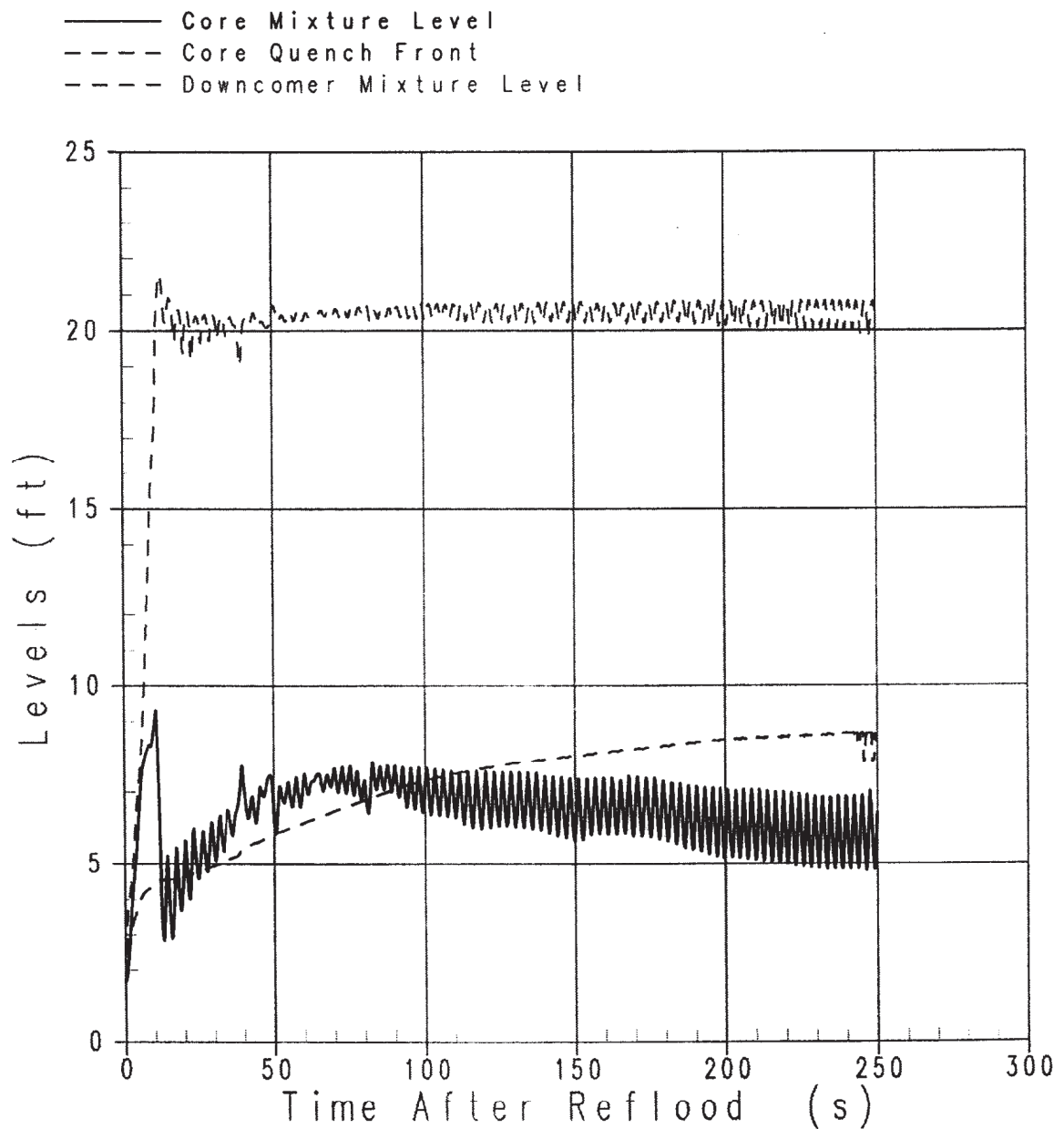


**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**CORE PRESSURE
DECLG, CD=1.0, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-21

Revision 7

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

REFLOOD TRANSIENT DOWNCOMER
AND CORE WATER LEVELS
DECLG, CD=1.0, MIN SI, HIGH TAVG,
NON-IFBA

Figure 15.6-22

Revision 7

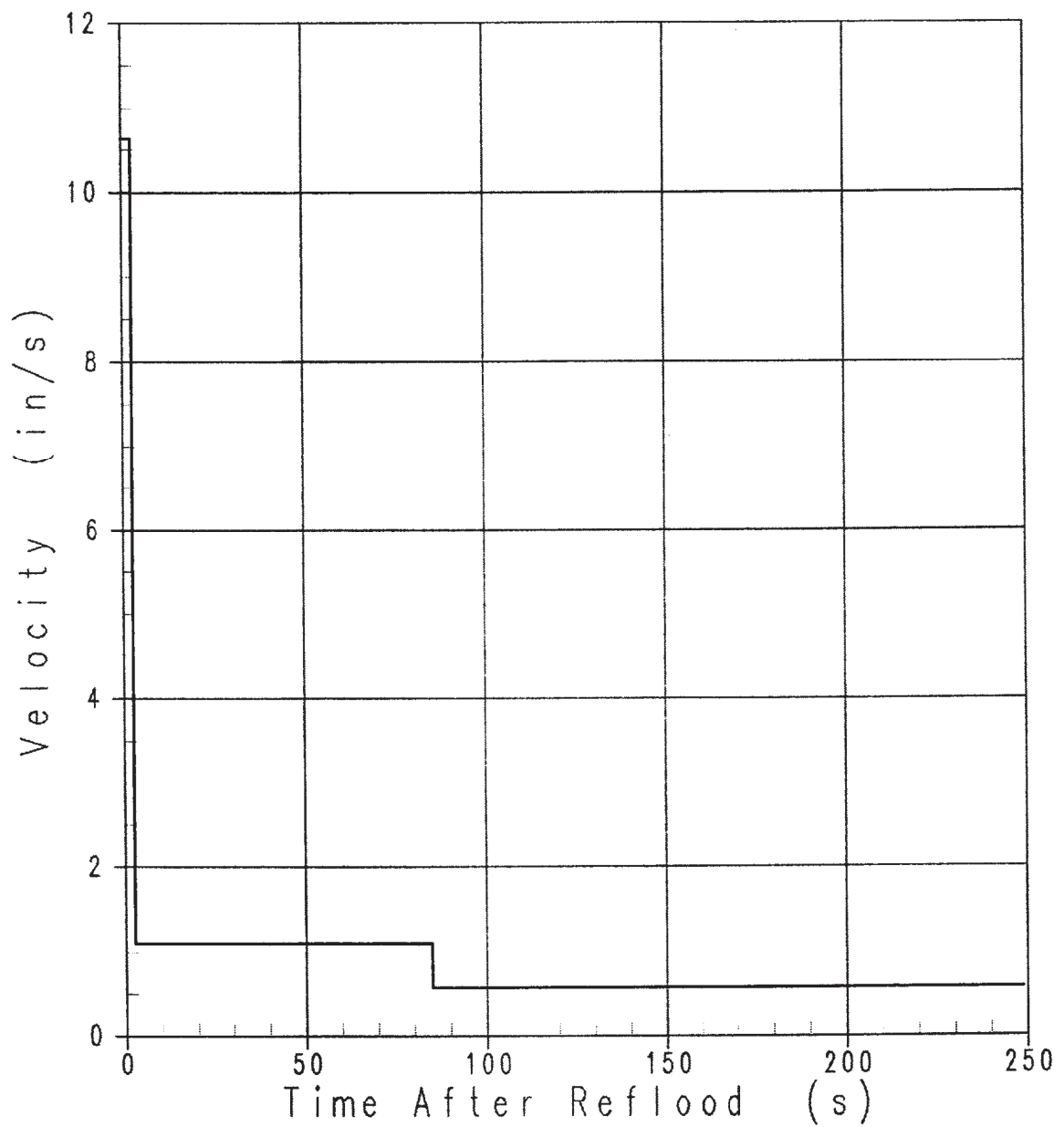
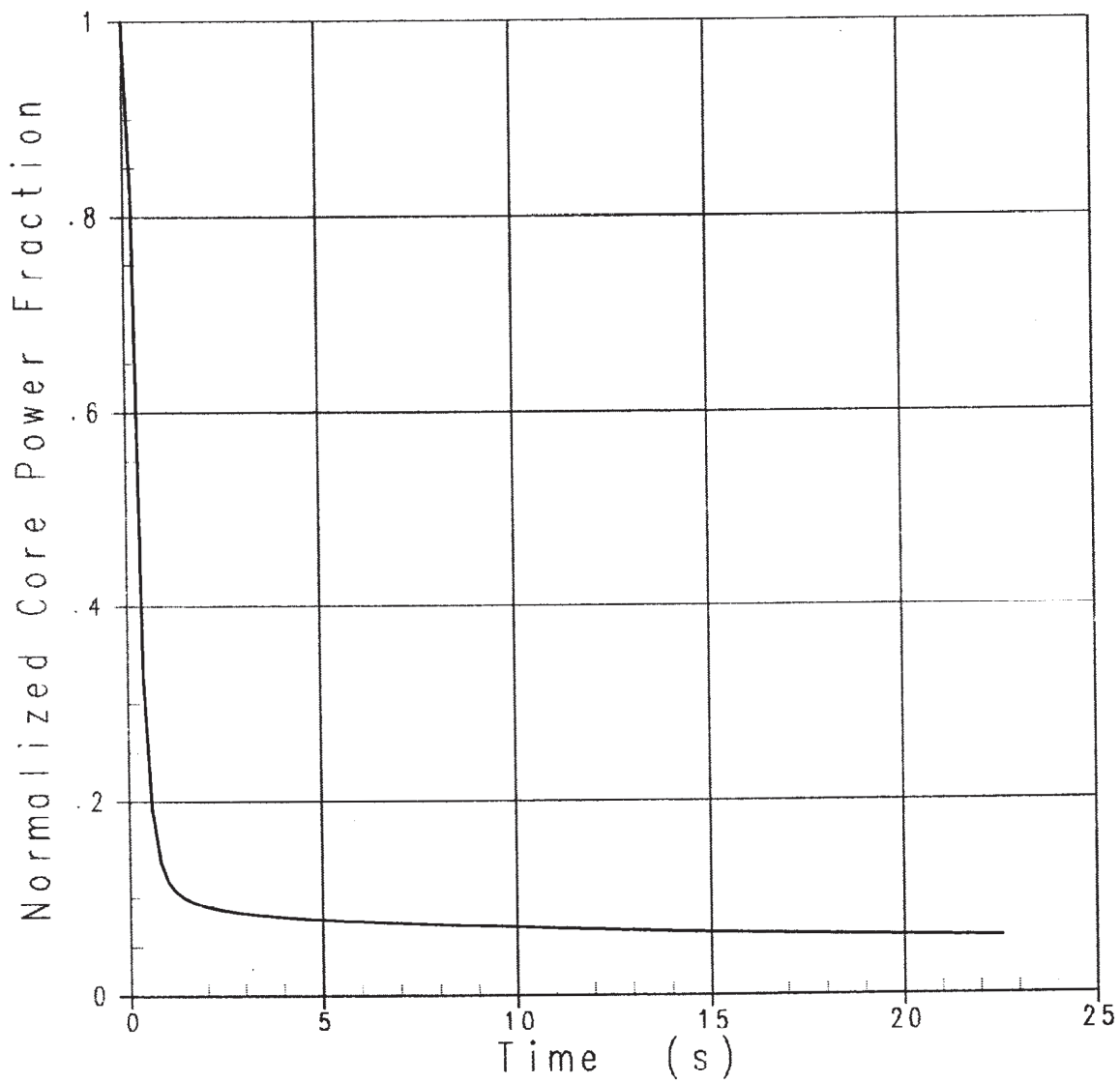
**SOUTH TEXAS PROJECT
UNITS 1 & 2****REFLOOD TRANSIENT CORE INLET
FLUID VELOCITY
DECLG, CD=1.0, MIN SI, HIGH TAVG,
NON-IFBA**

Figure 15.6-23

Revision 7



**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**CORE POWER TRANSIENT
DECLG, CD=1.0, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-24

Revision 7

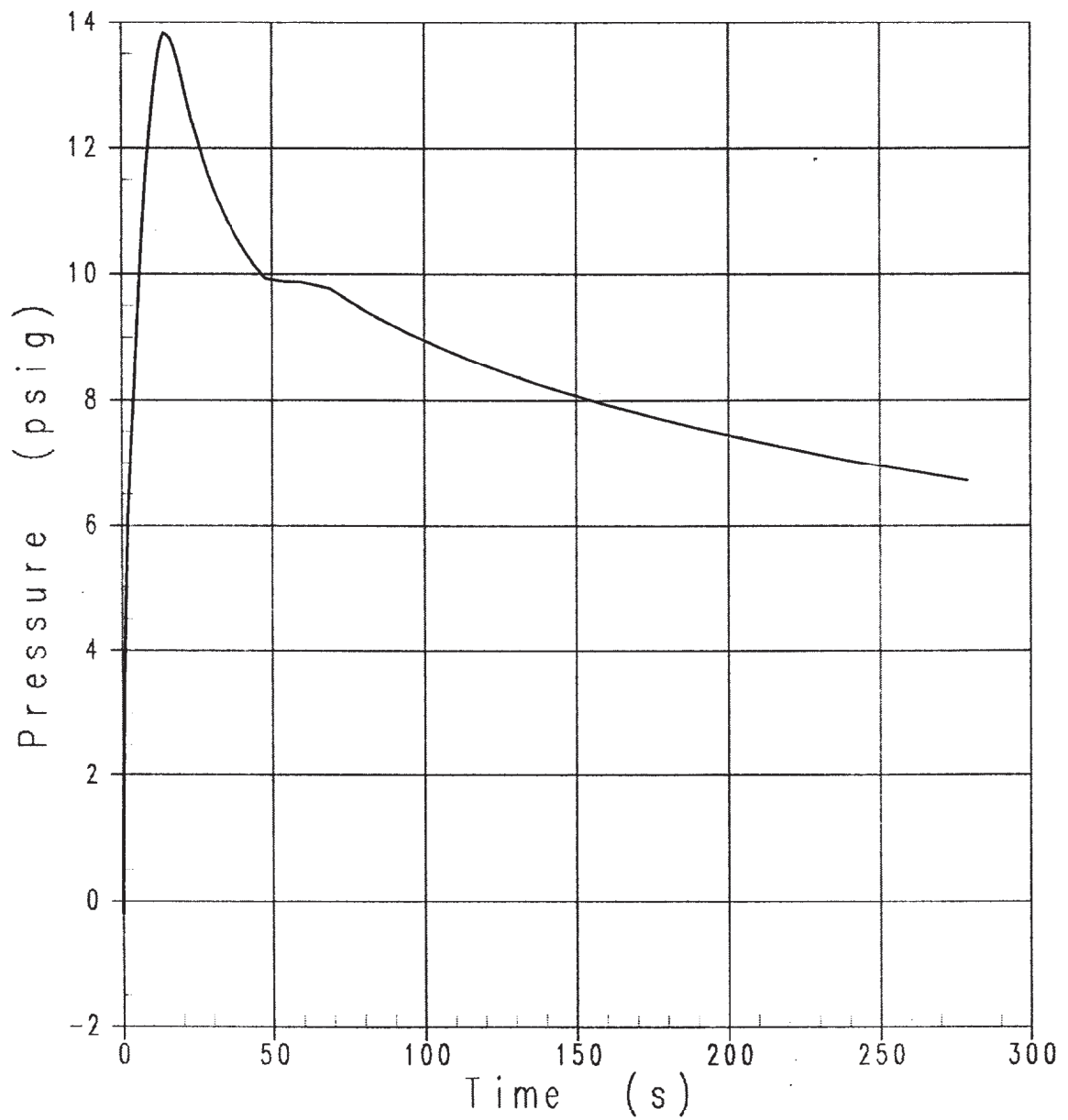
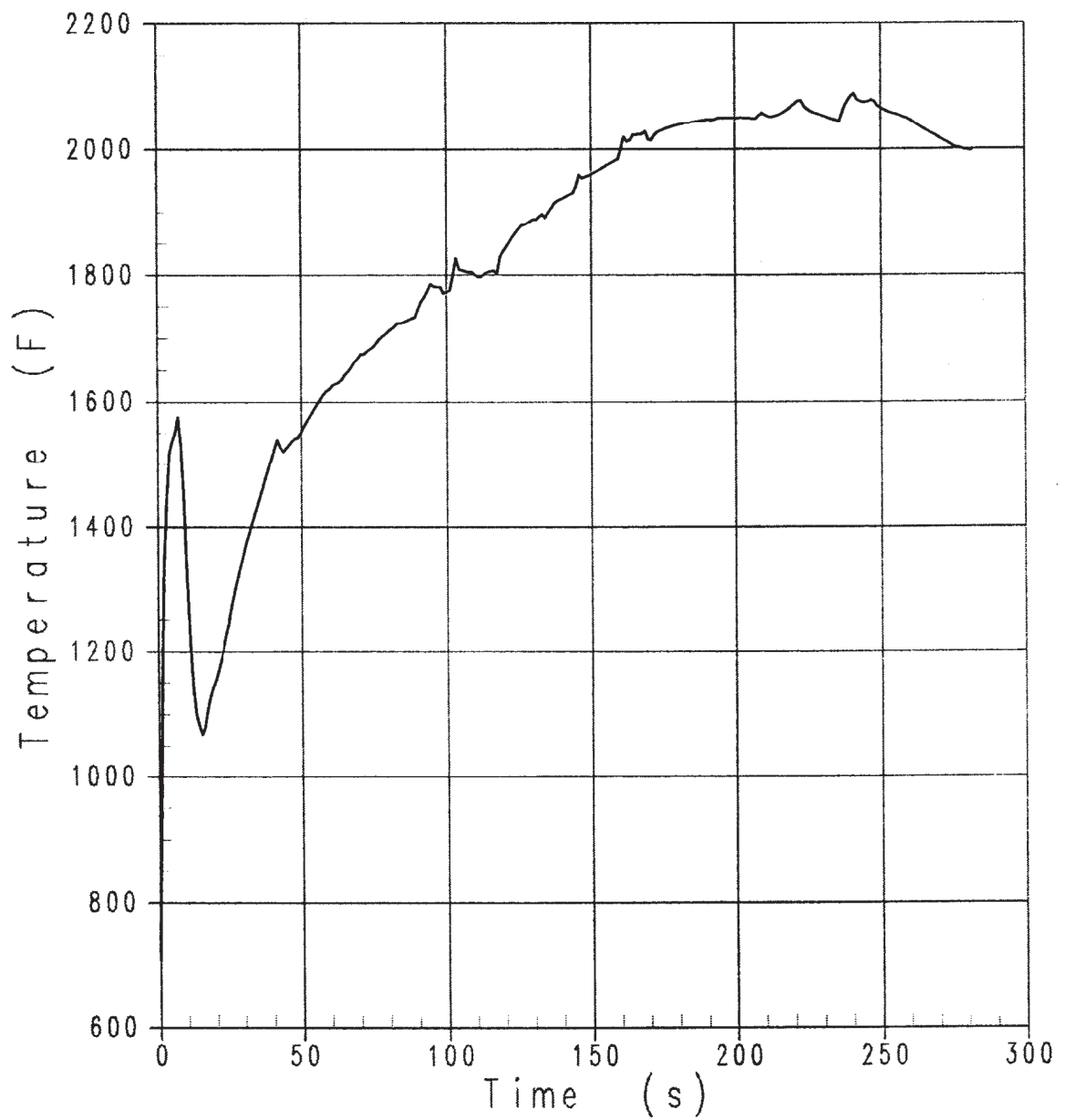
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CONTAINMENT PRESSURE
DECLG, CD=1.0, MIN SI,
HIGH TAVG, NON-IFBA**

Figure 15.6-25

Revision 7

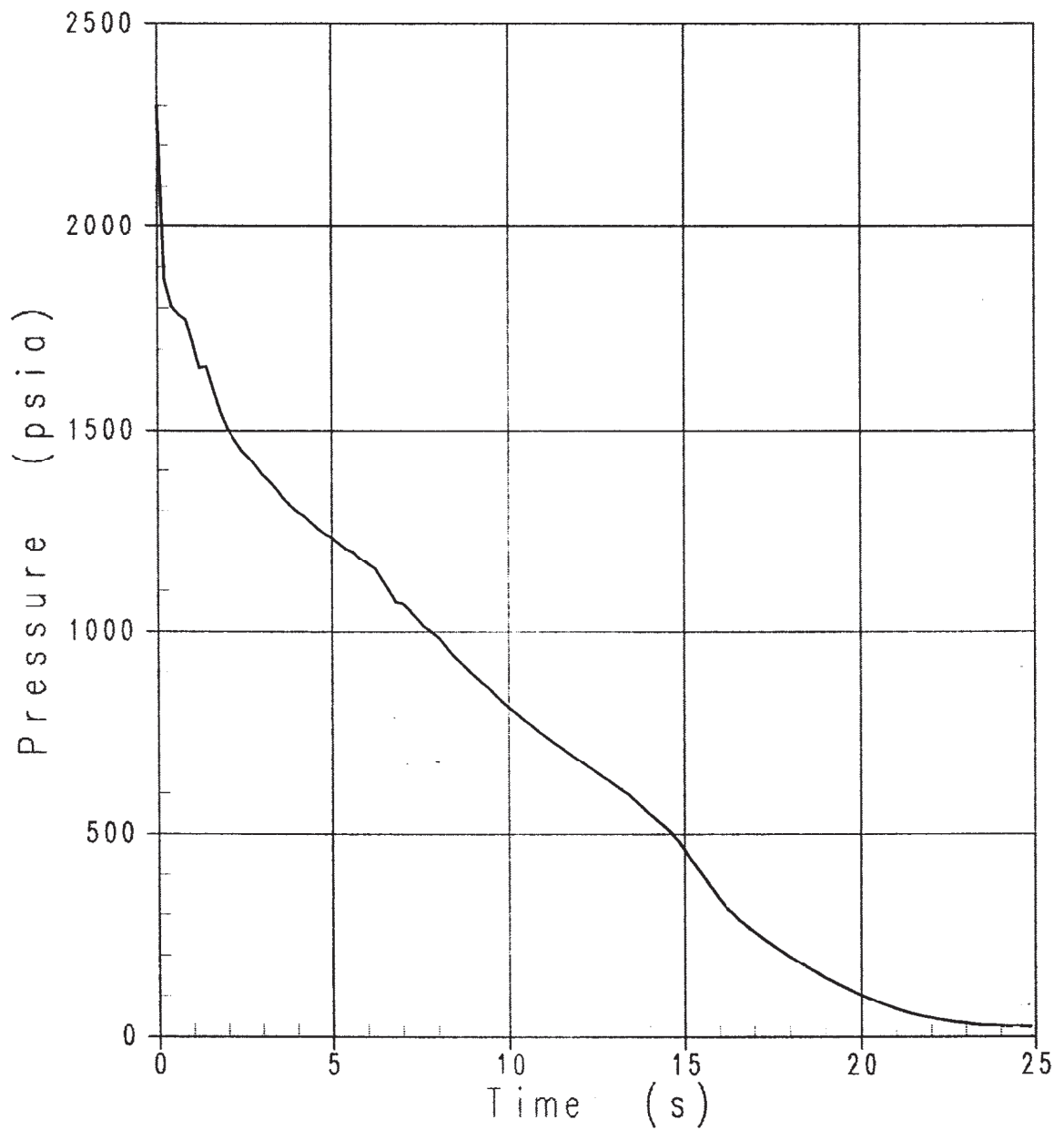


**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**PEAK CLAD TEMPERATURE
DECLG, CD=0.8, MIN SI,
HIGH TAVG, IFBA**

Figure 15.6-26

Revision 7



**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**CORE PRESSURE
DECLG, CD=0.8, MIN SI,
HIGH TAVG, IFBA**

Figure 15.6-27

Revision 7

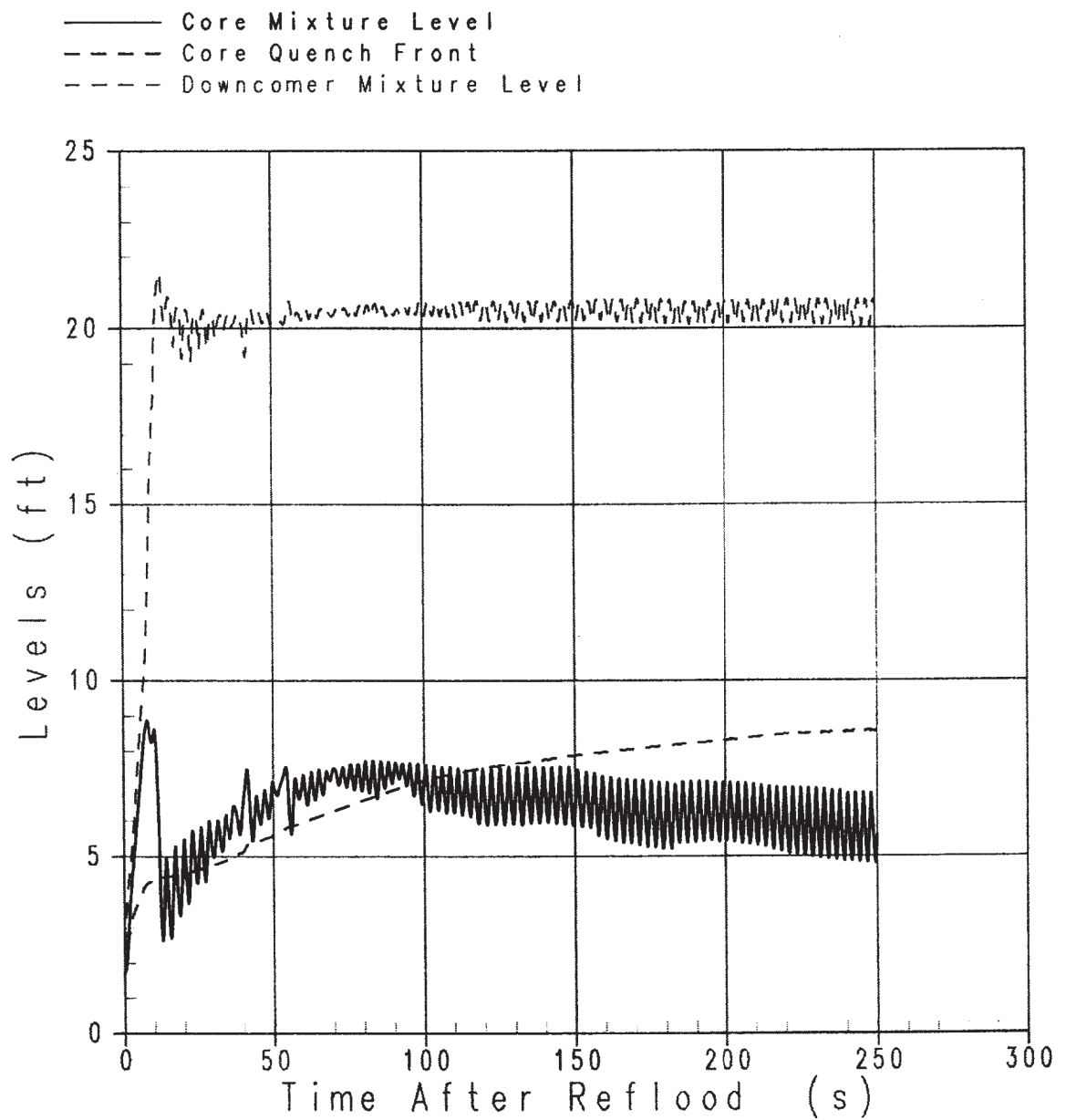
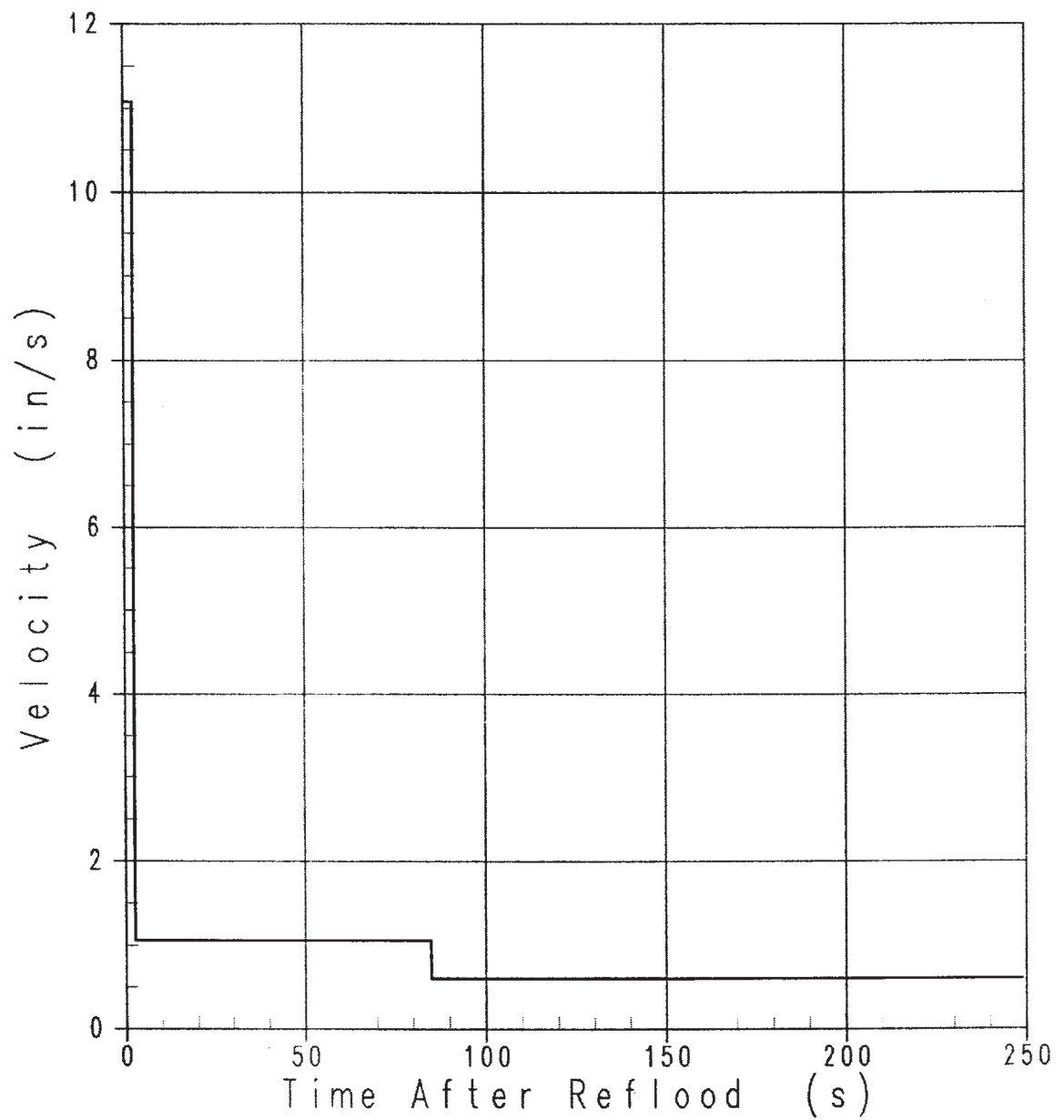
**SOUTH TEXAS PROJECT
UNITS 1 & 2****REFLOOD TRANSIENT DOWNCOMER
AND CORE WATER LEVELS**
DECLG, CD=0.8, MIN SI, HIGH TAVG,
IFBA

Figure 15.6-28

Revision 7

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

REFLOOD TRANSIENT CORE INLET
FLUID VELOCITY
DECLG, CD=0.8, MIN SI, HIGH TAVG,
IFBA

Figure 15.6-29

Revision 7

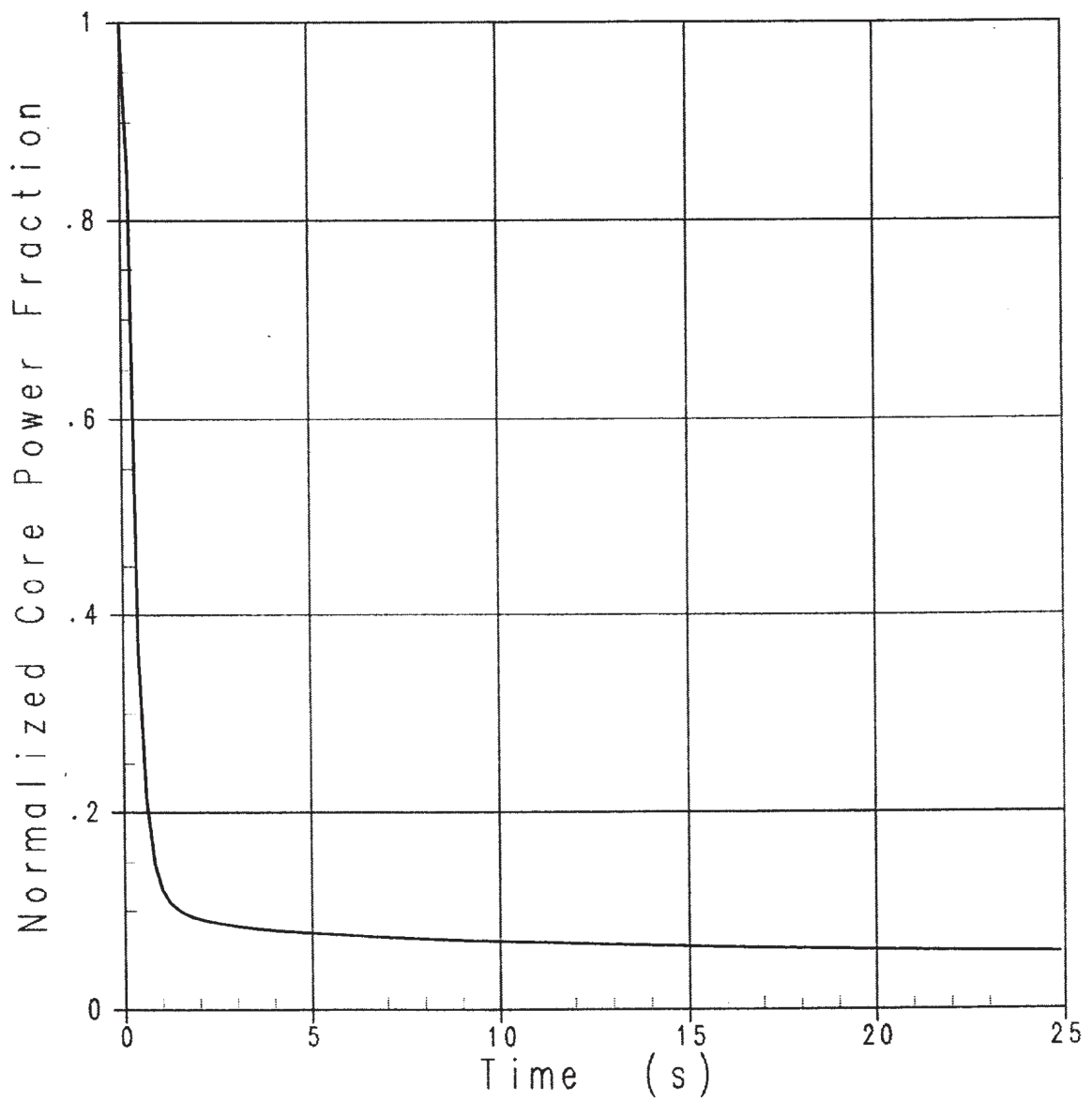
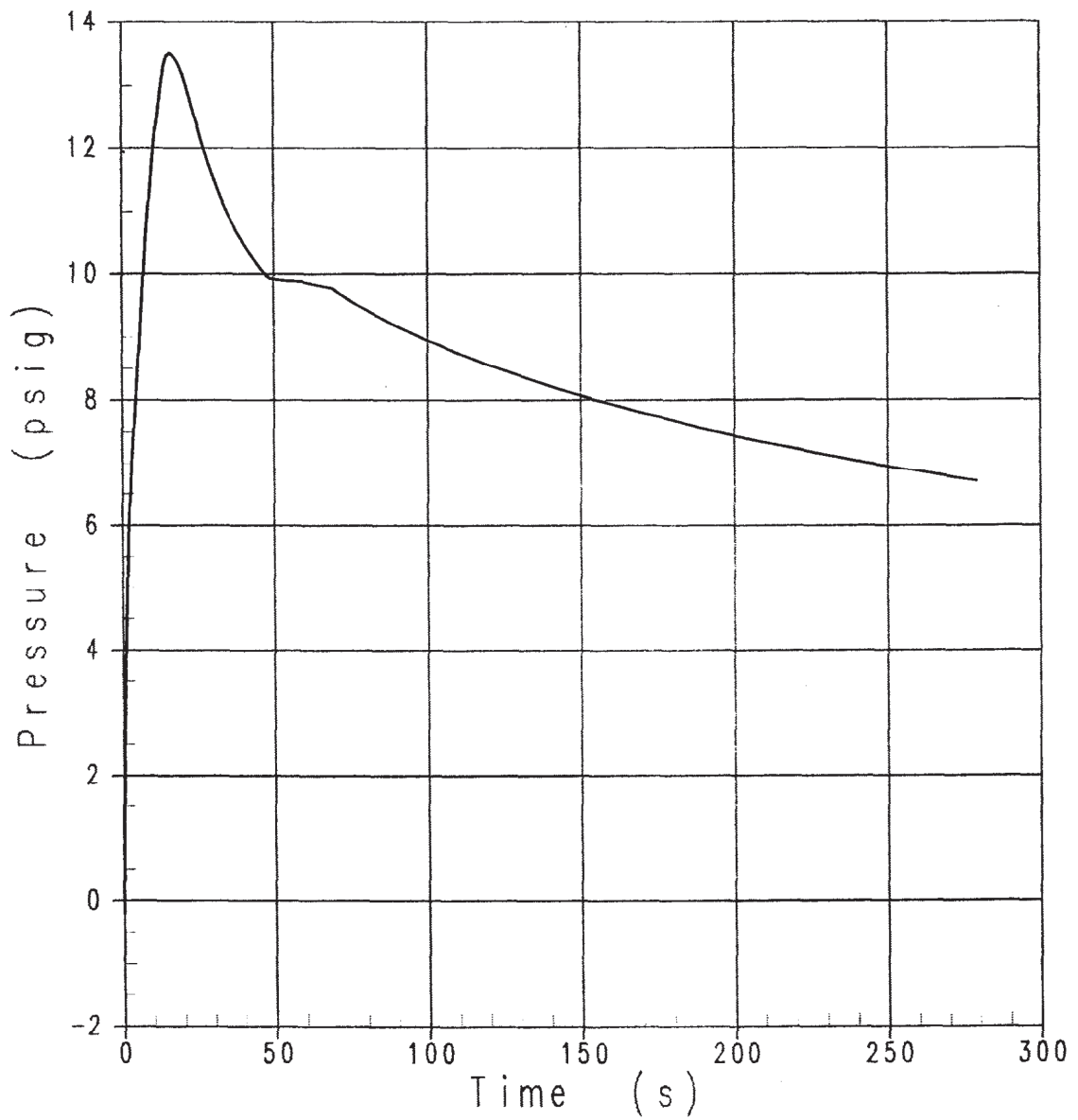
**SOUTH TEXAS PROJECT
UNITS 1 & 2****CORE POWER TRANSIENT
DECLG, CD=0.8, MIN SI,
HIGH TAVG, IFBA**

Figure 15.6-30

Revision 7



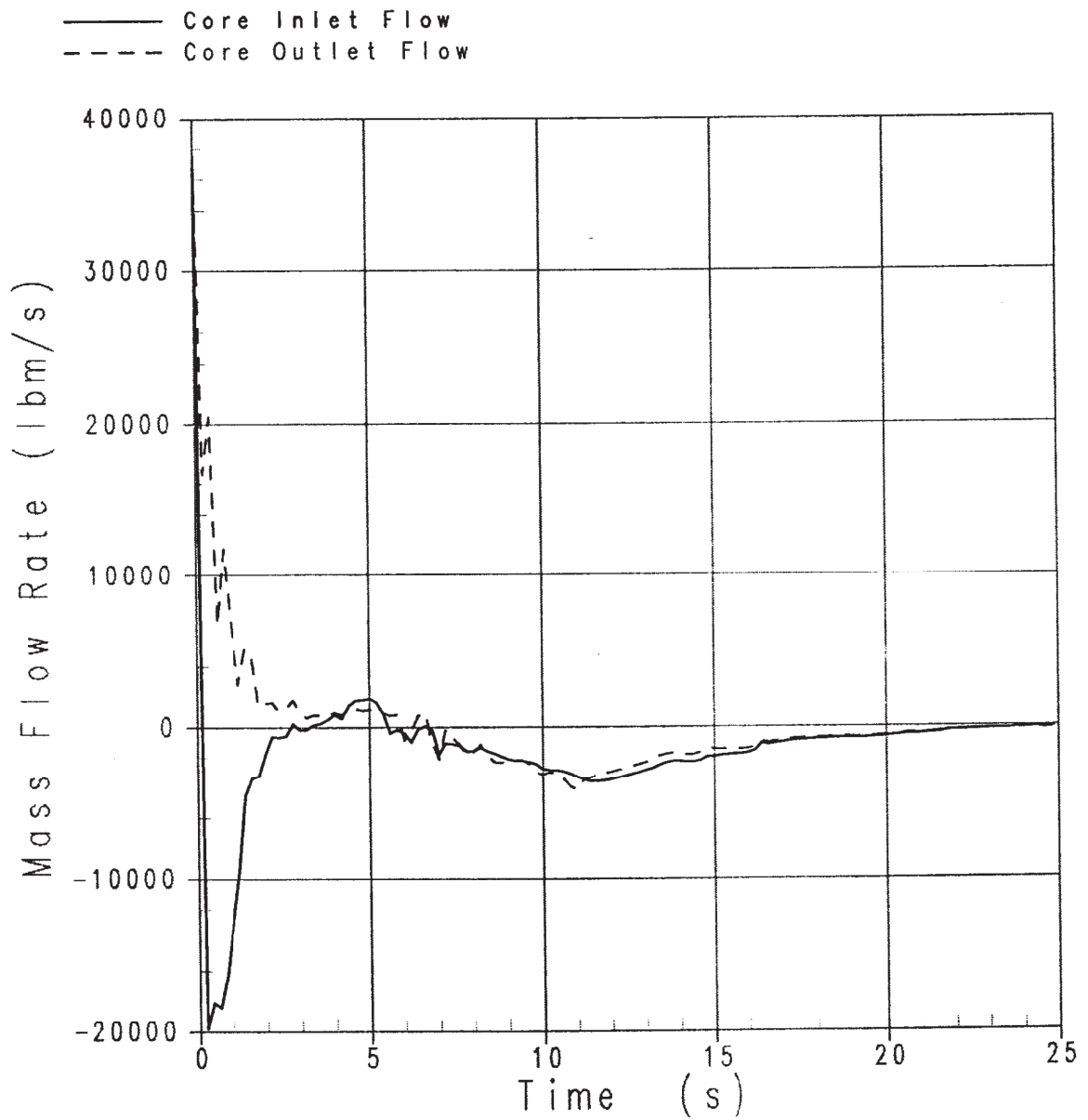
**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**CONTAINMENT PRESSURE
DECLG, CD=0.8, MIN SI,
HIGH TAVG, IFBA**

Figure 15.6-31

Revision 7

STPEGS UFSAR



**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**CORE FLOW, INLET AND OUTLET
DECLG, CD=0.8, MIN SI,
HIGH TAVG. IFBA**

Figure 15.6-32

Revision 7

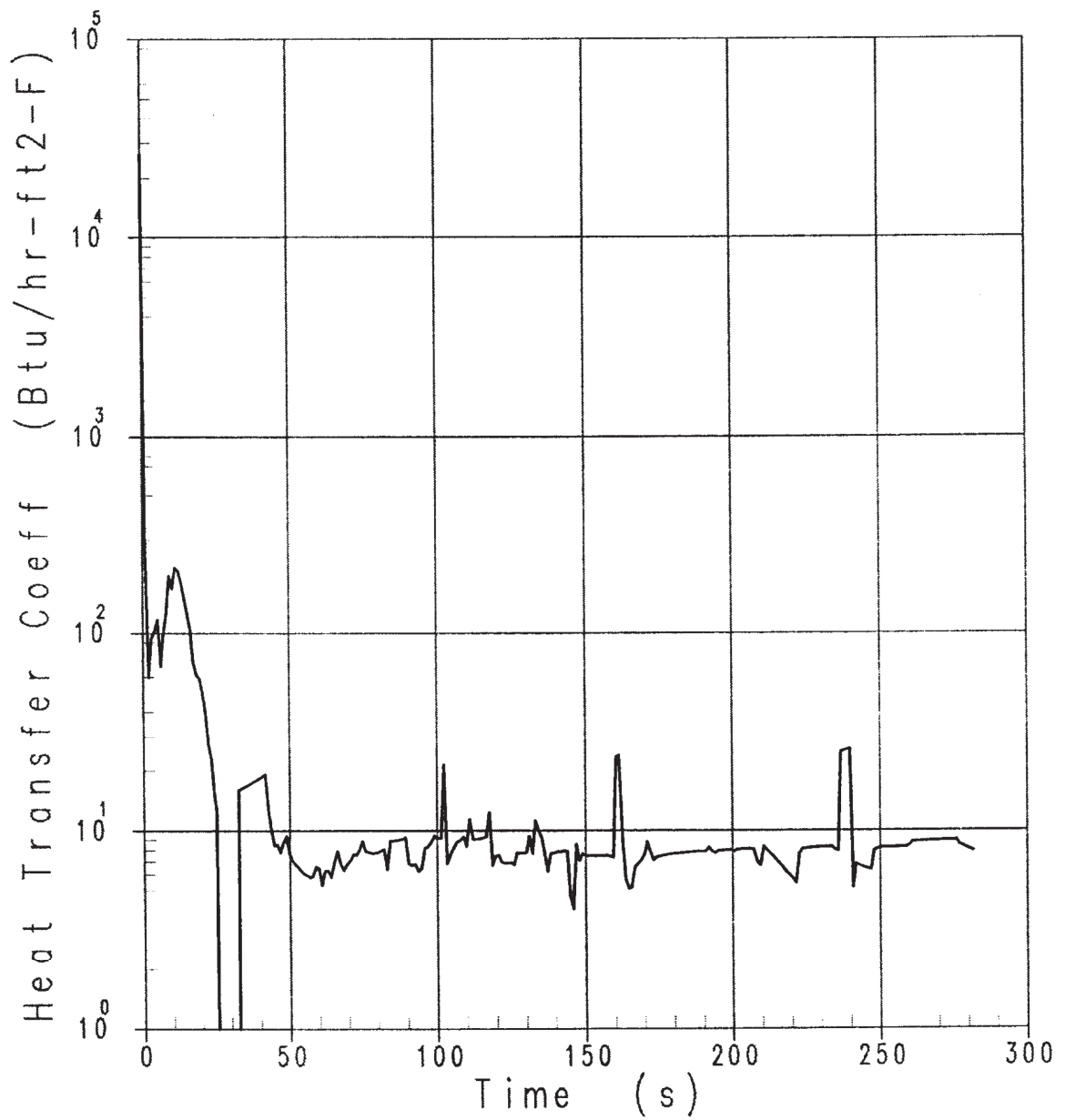
**SOUTH TEXAS PROJECT
UNITS 1 & 2****HEAT TRANSFER COEFFICIENT
DECLG, CD=0.8, MIN SI,
HIGH TAVG, IFBA**

Figure 15.6-33

Revision 7

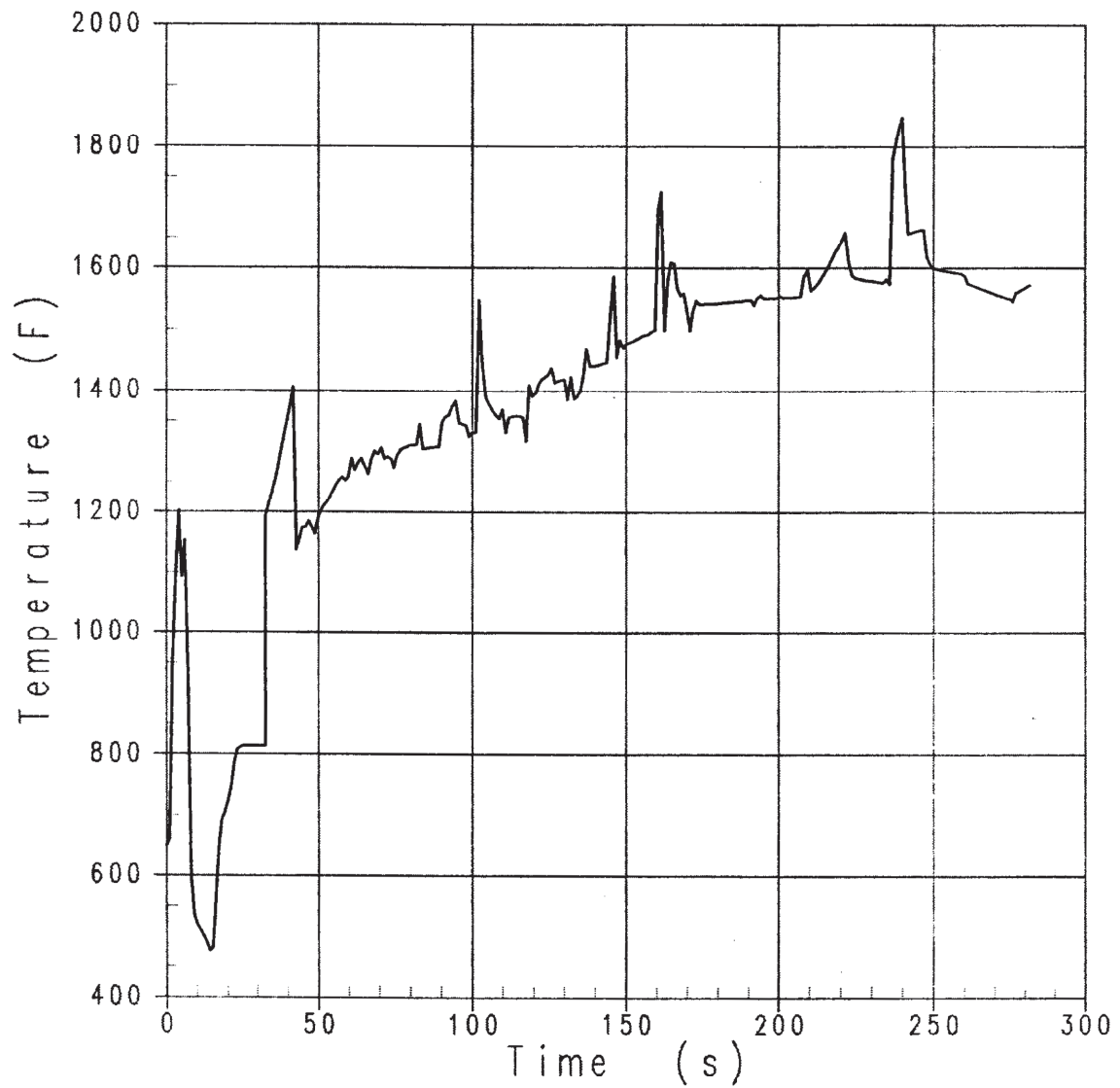
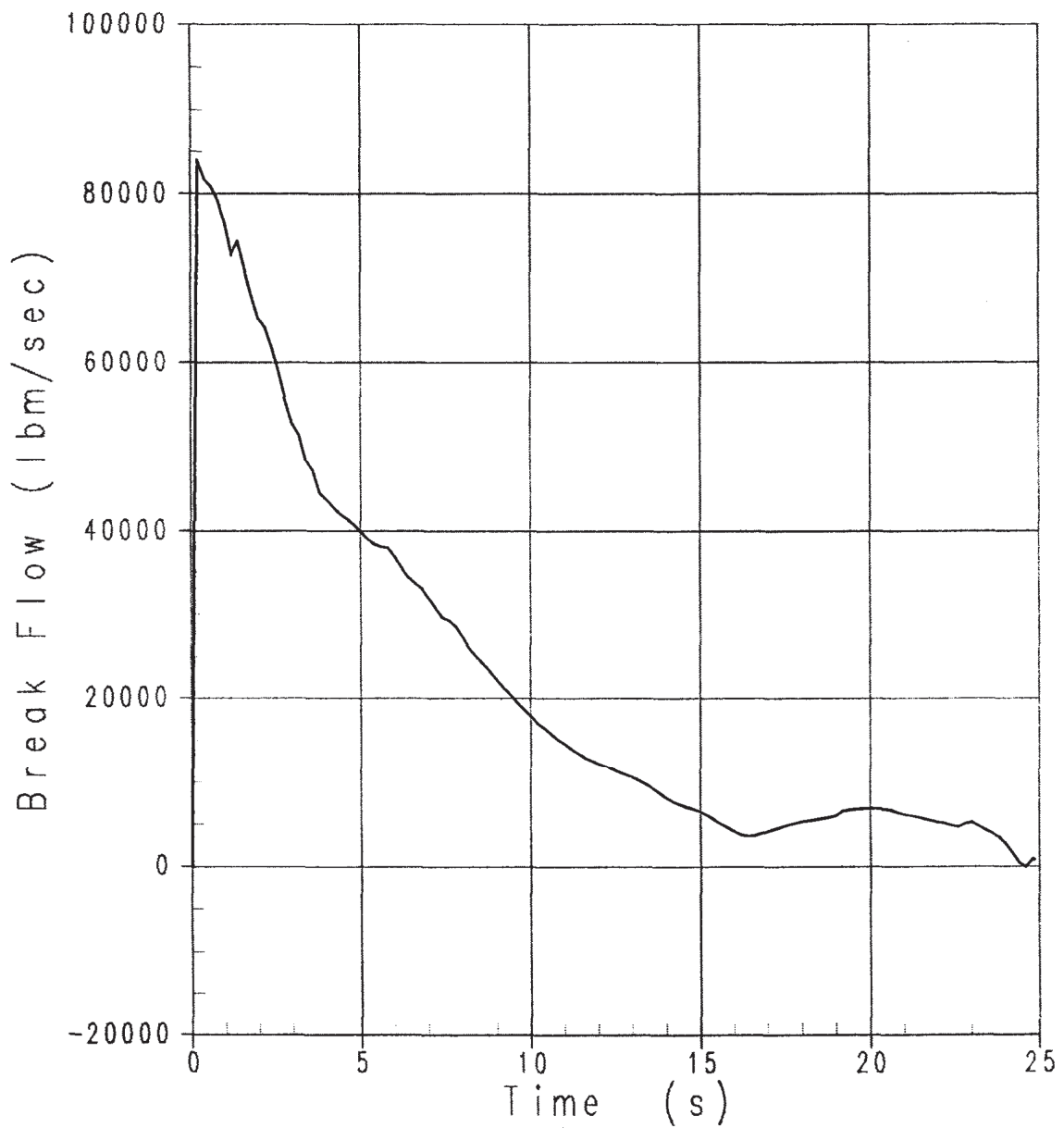
**SOUTH TEXAS PROJECT
UNITS 1 & 2****FLUID TEMPERATURE AT HOT
SPOT DECLG, CD=0.8, MIN SI,
HIGH TAVG, IFBA**

Figure 15.6-34

Revision 7

STPEGS UFSAR



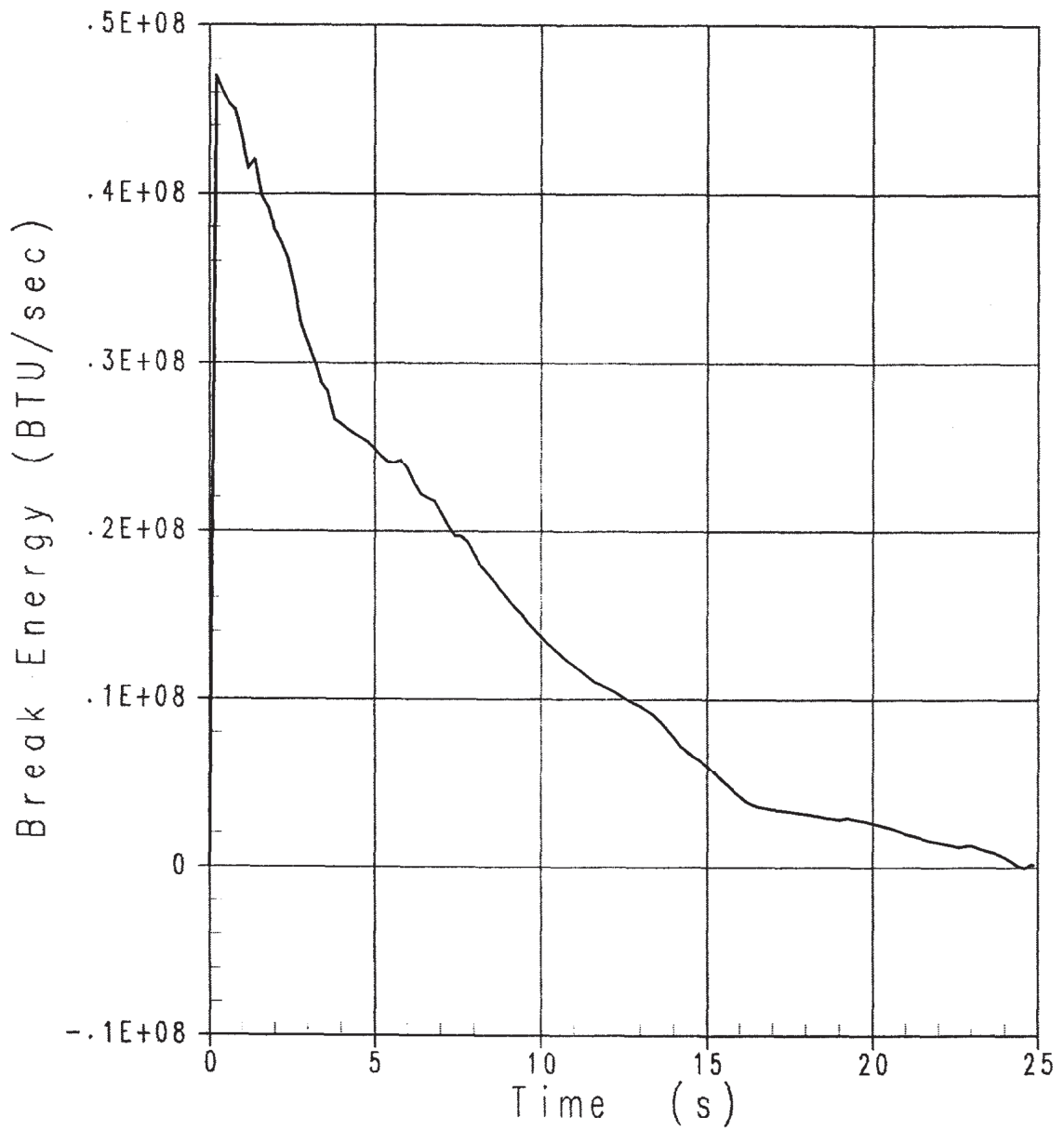
**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**BREAK MASS FLOW RATE
DECLG, CD=0.8, MIN SI,
HIGH TAVG, IFBA**

Figure 15.6-35

Revision 7

STPEGS UFSAR



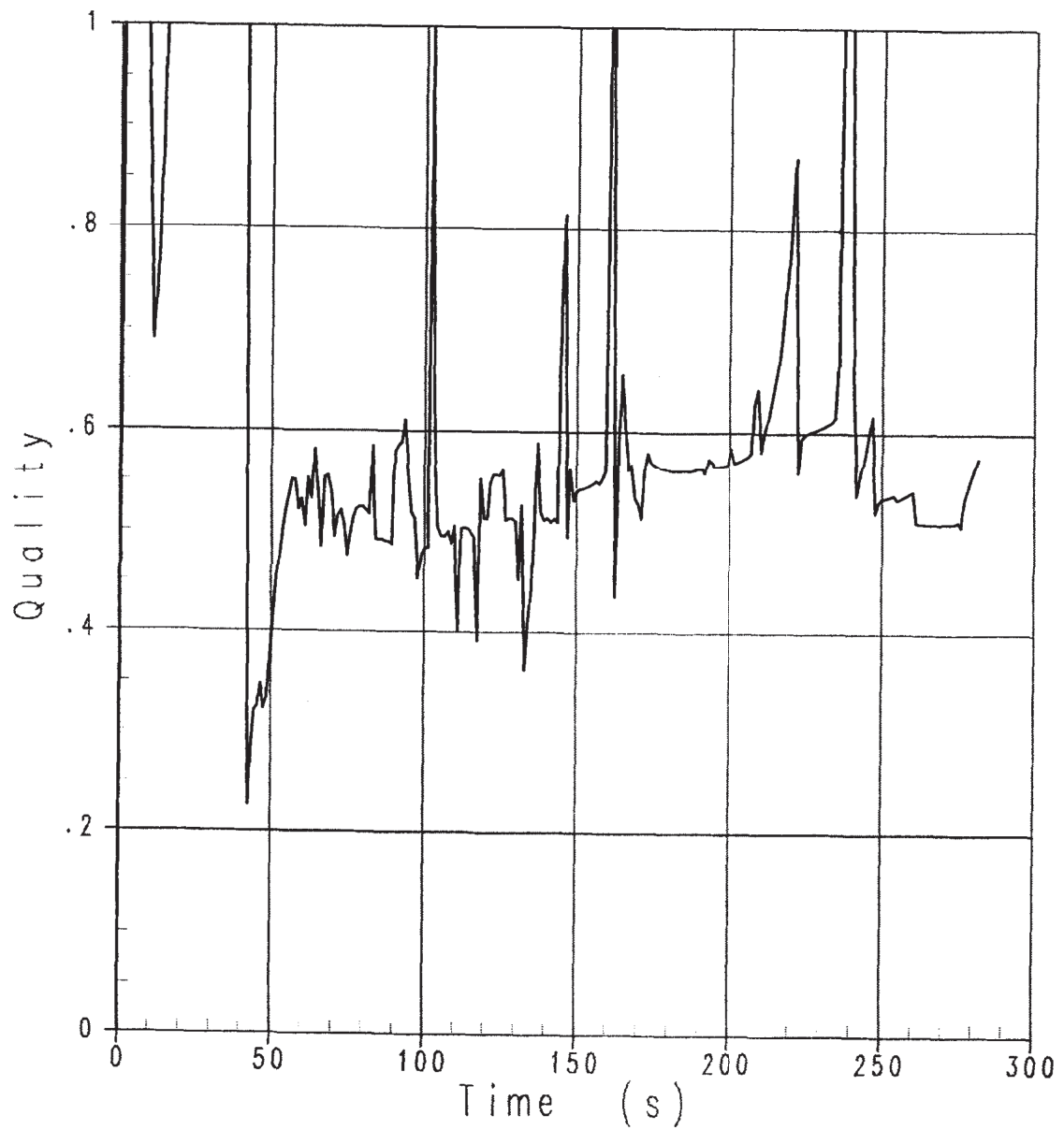
**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**BREAK ENERGY FLOWRATE TO
CONTAINMENT
DECLG, CD=0.8, MIN SI, HIGH TAVG,
IFBA**

Figure 15.6-36

Revision 7

STPEGS UFSAR

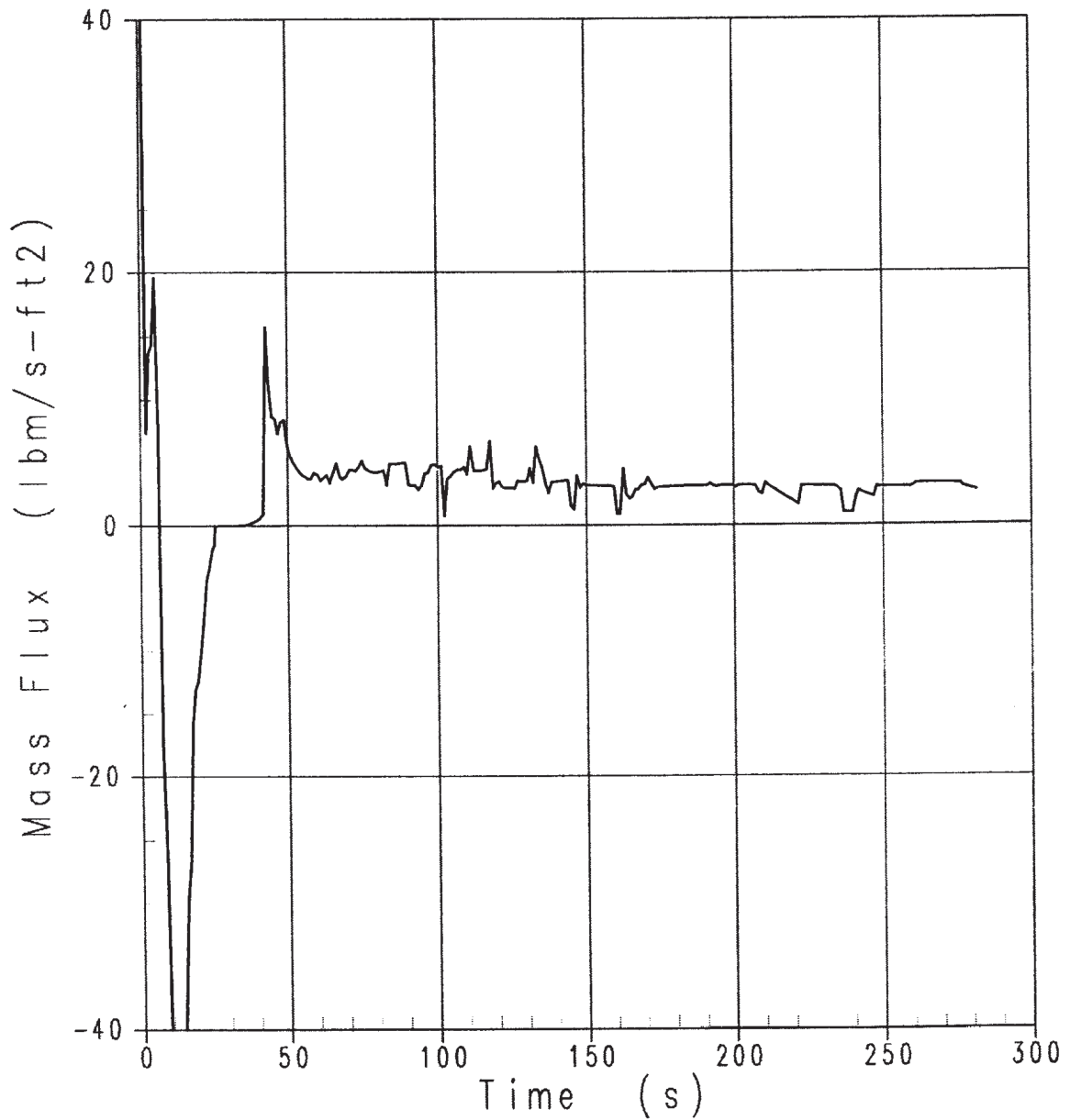


**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**FLUID QUALITY AT HOT SPOT
DECLG, CD=0.8, MIN SI,
HIGH TAVG, IFBA**

Figure 15.6-37

Revision 7

**SOUTH TEXAS PROJECT
UNITS 1 & 2****MASS FLUX AT HOT SPOT DECLG,
CD=0.8, MIN SI, HIGH TAVG, IFBA**

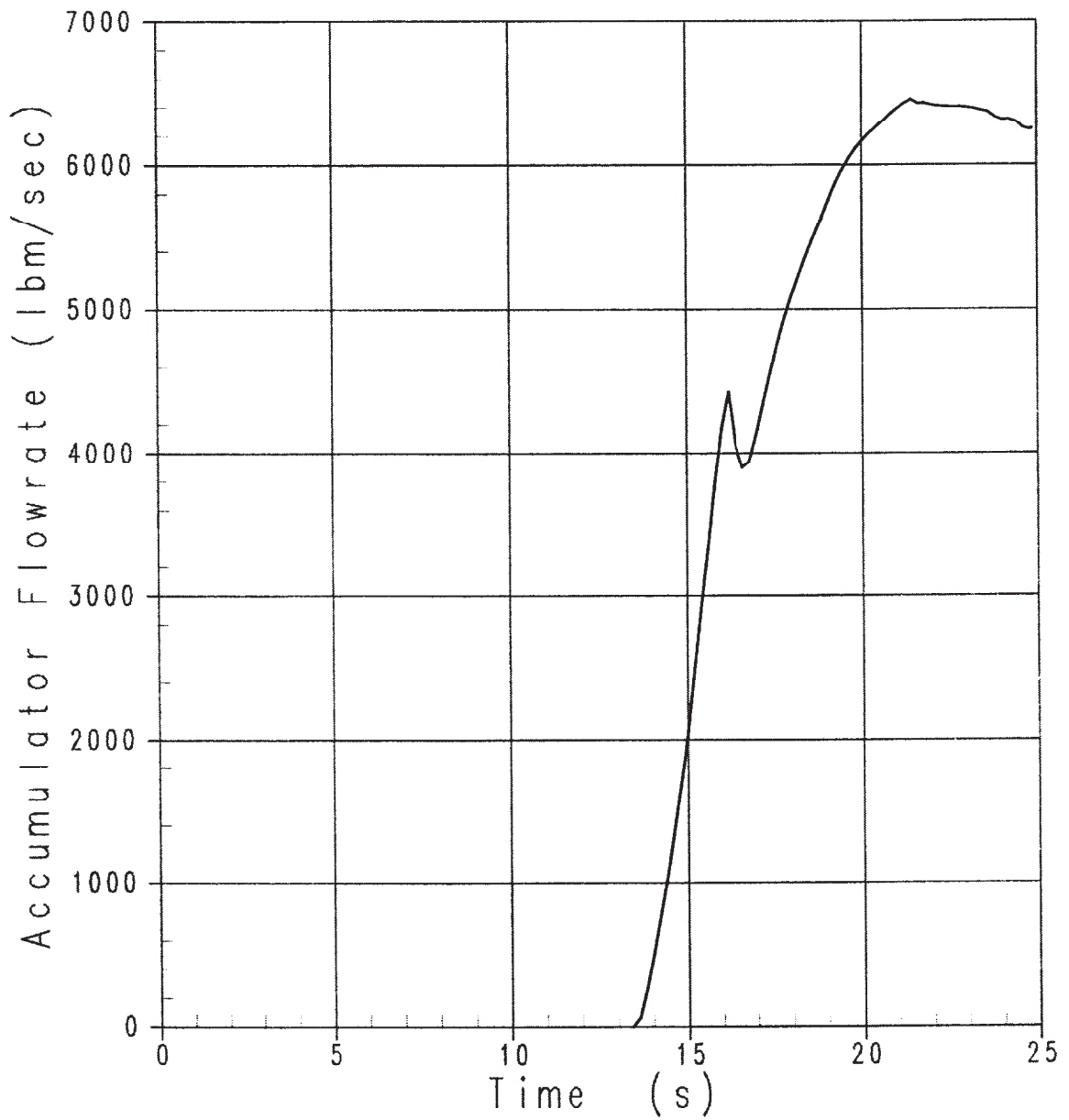
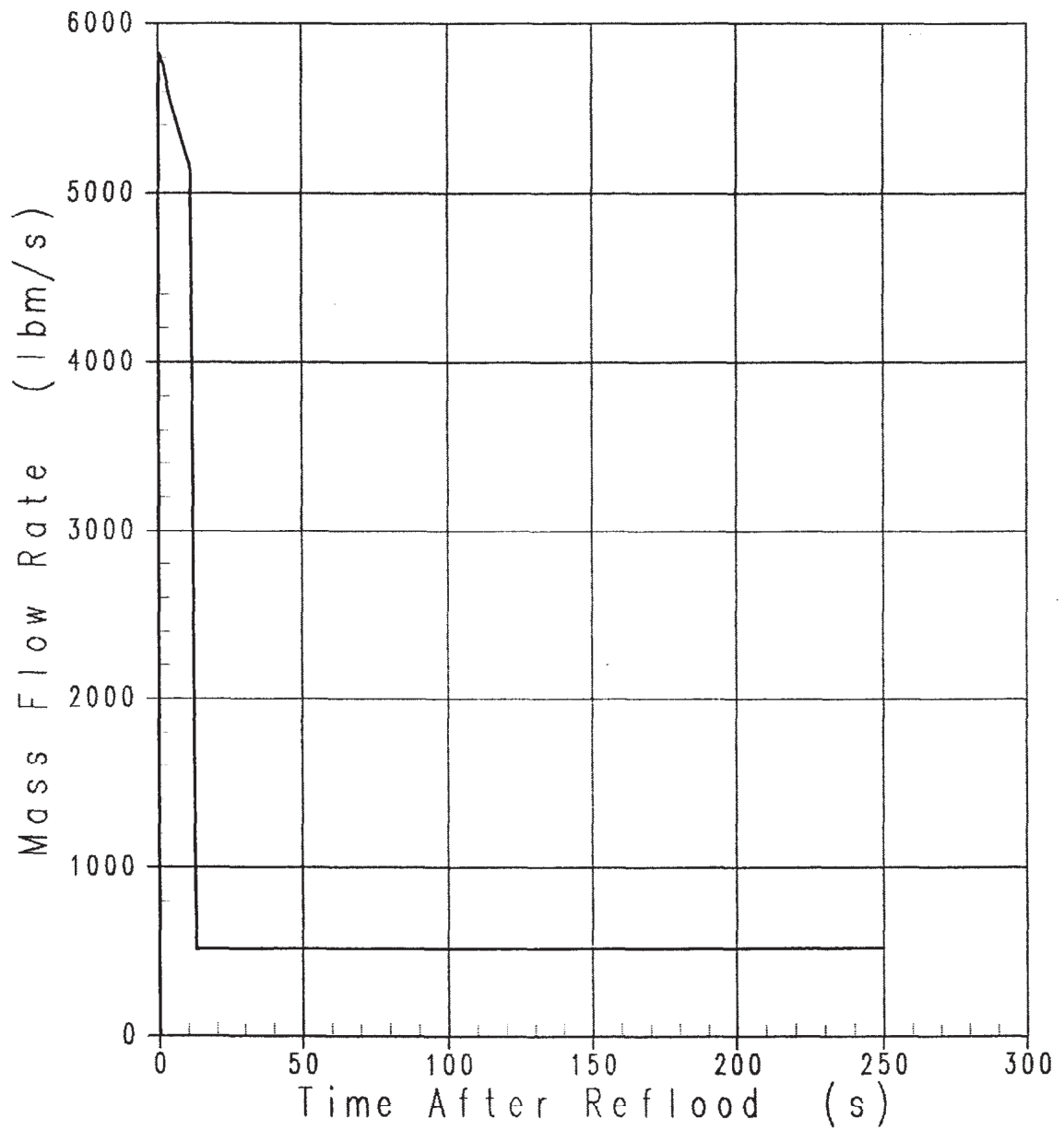
**SOUTH TEXAS PROJECT
UNITS 1 & 2****ACCUMULATOR FLOW RATE
(BLOWDOWN)
DECLG, CD=0.8, MIN SI, HIGH TAVG,
IFBA**

Figure 15.6-39

Revision 7

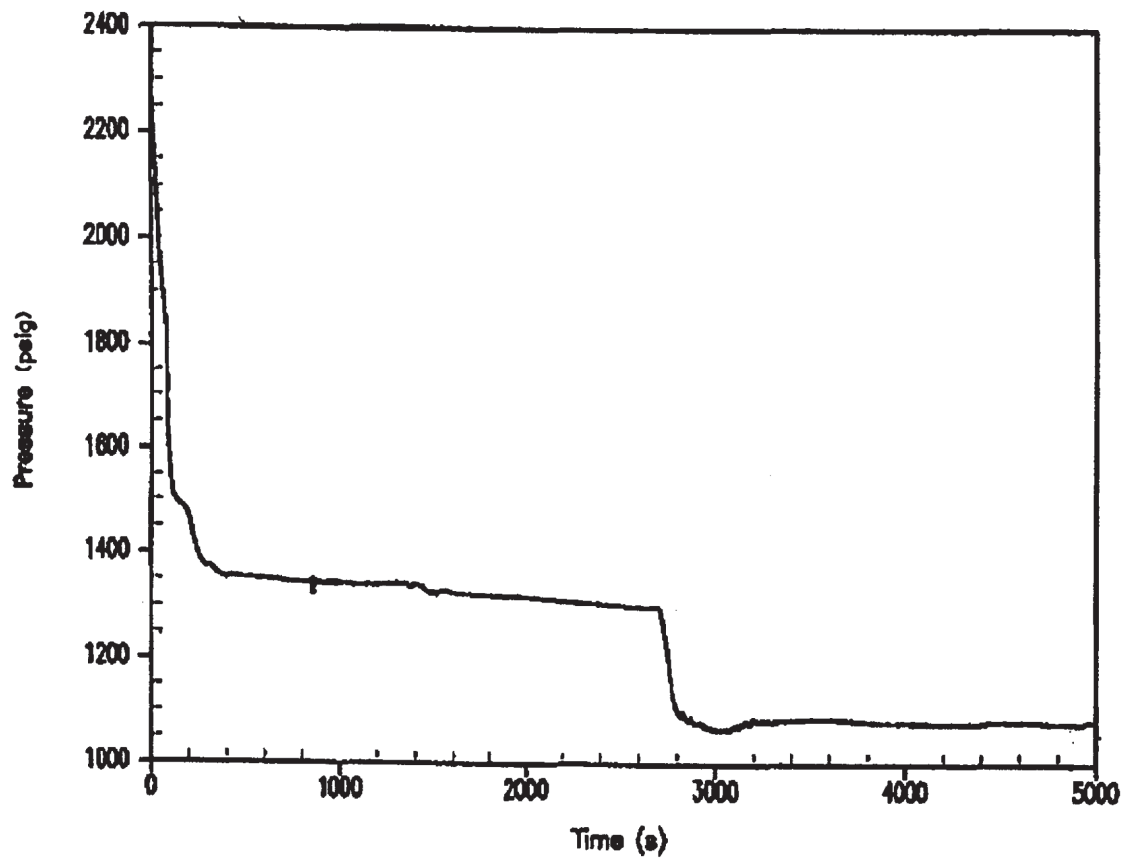


**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**ECCS INJECTION RATE DURING
REFLOOD
DECLG, CD=0.8, MIN SI, HIGH TAVG,
IFBA**

Figure 15.6-40

Revision 7



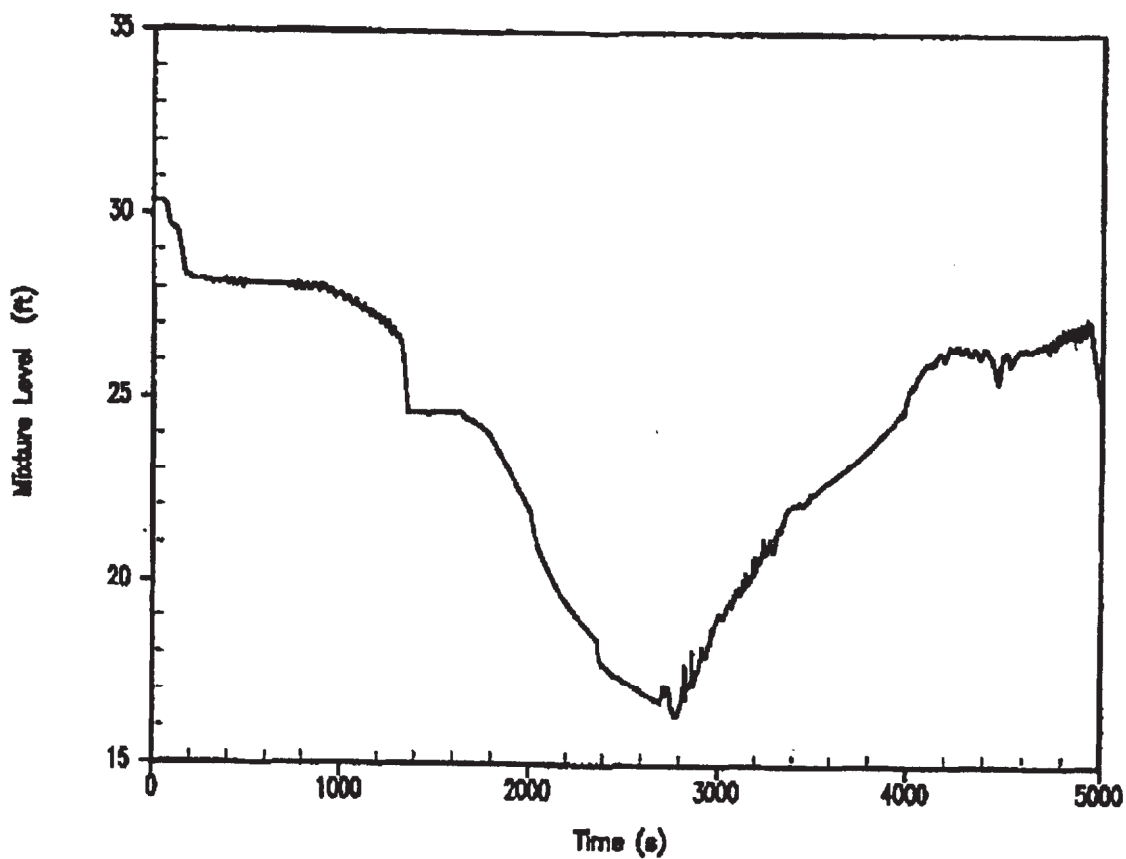
SOUTH TEXAS PROJECT
UNITS 1 & 2

RCS DEPRESSURIZATION TRANSIENT
2-INCH BREAK HIGH LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-41

REVISION 11

L1130.111
L1130.CIT



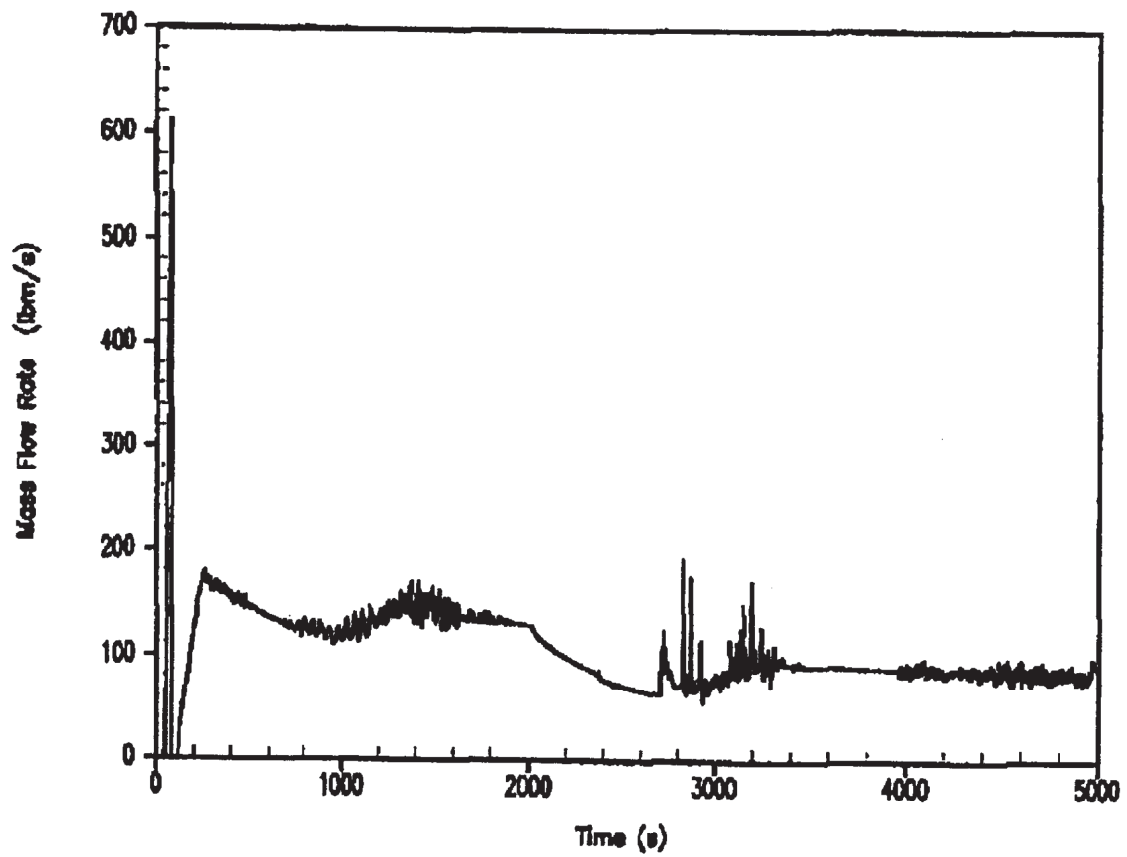
SOUTH TEXAS PROJECT
UNITS 1 & 2

CORE MIXTURE HEIGHT
2-INCH BREAK HIGH LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-42

REVISION 11

L1131.111
L1131.CIT



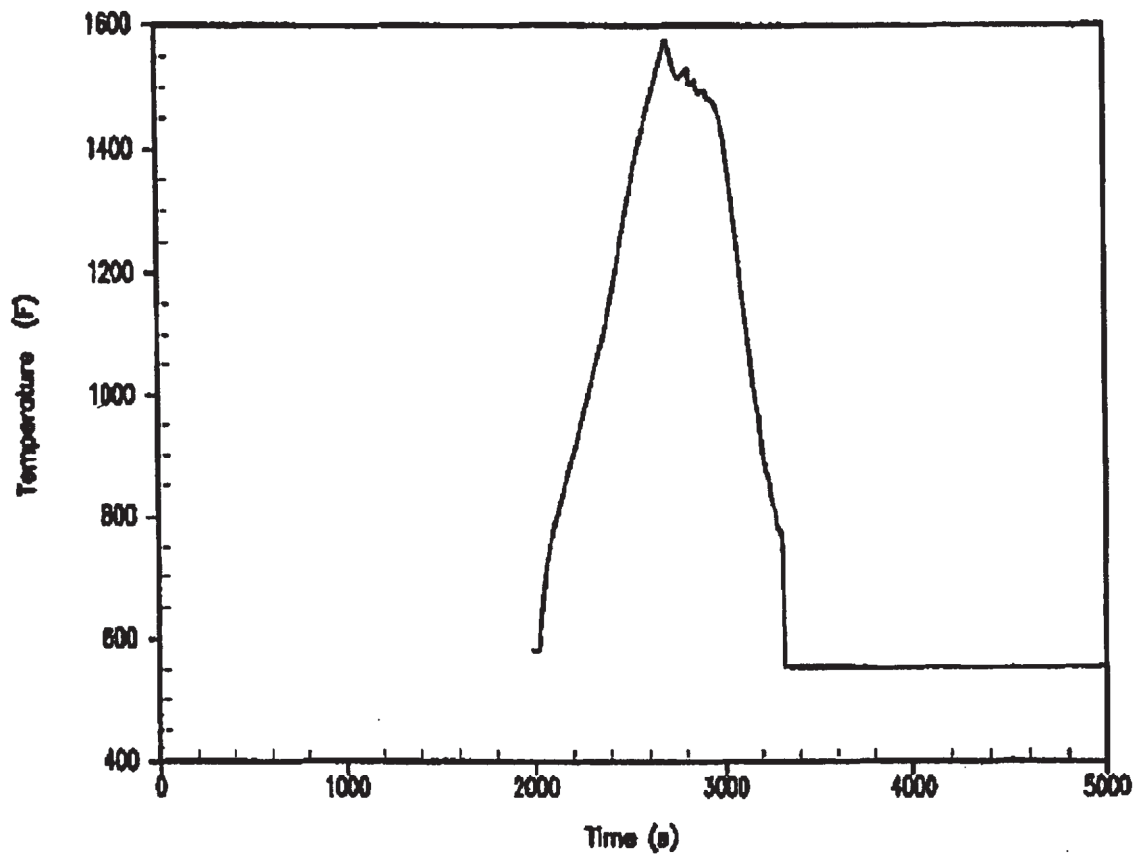
SOUTH TEXAS PROJECT
UNITS 1 & 2

CORE STEAM FLOW
2-INCH BREAK HIGH LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-43

REVISION 11

L1132.111
L1132.CIT



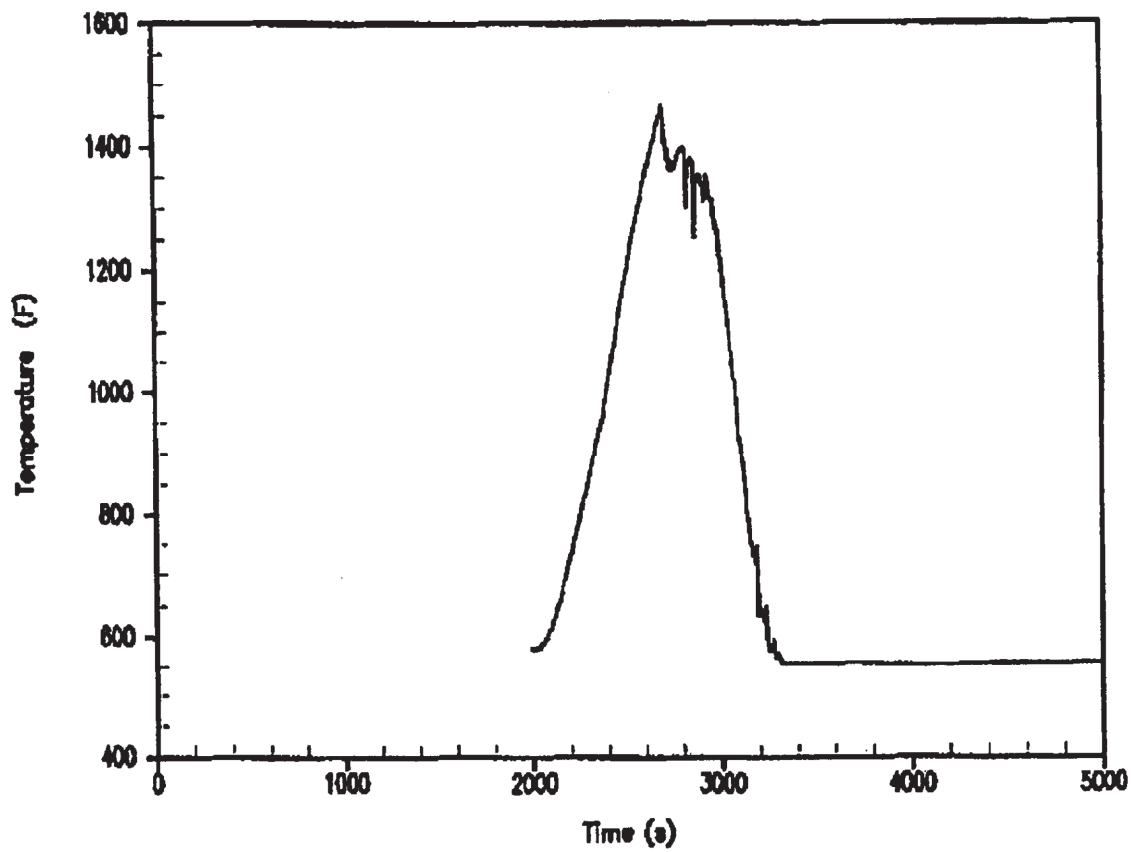
SOUTH TEXAS PROJECT
UNITS 1 & 2

CLAD TEMPERATURE TRANSIENT
2-INCH BREAK HIGH LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-44

REVISION 11

L1133.111
L1133.CIT



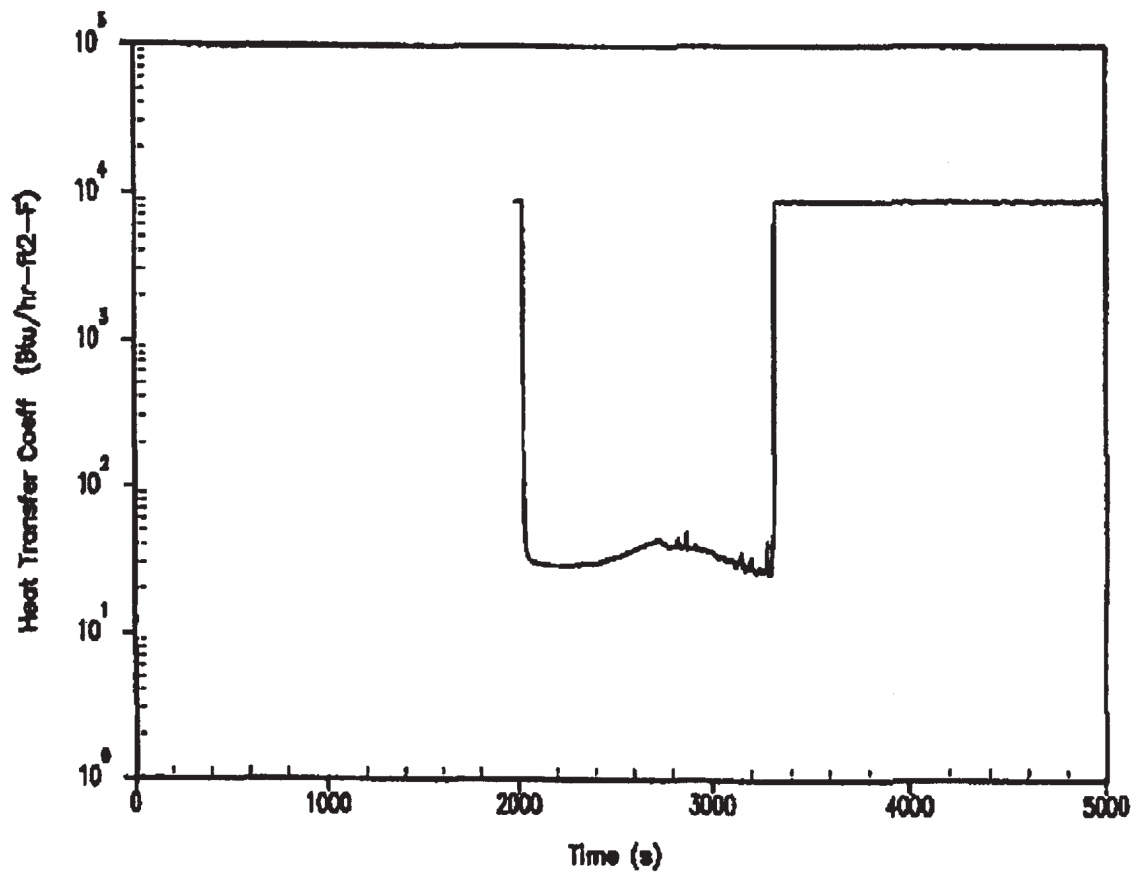
SOUTH TEXAS PROJECT
UNITS 1 & 2

HOT SPOT FLUID TEMPERATURE
2-INCH BREAK HIGH LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-45

REVISION 11

L1134.111
L1134.CIT



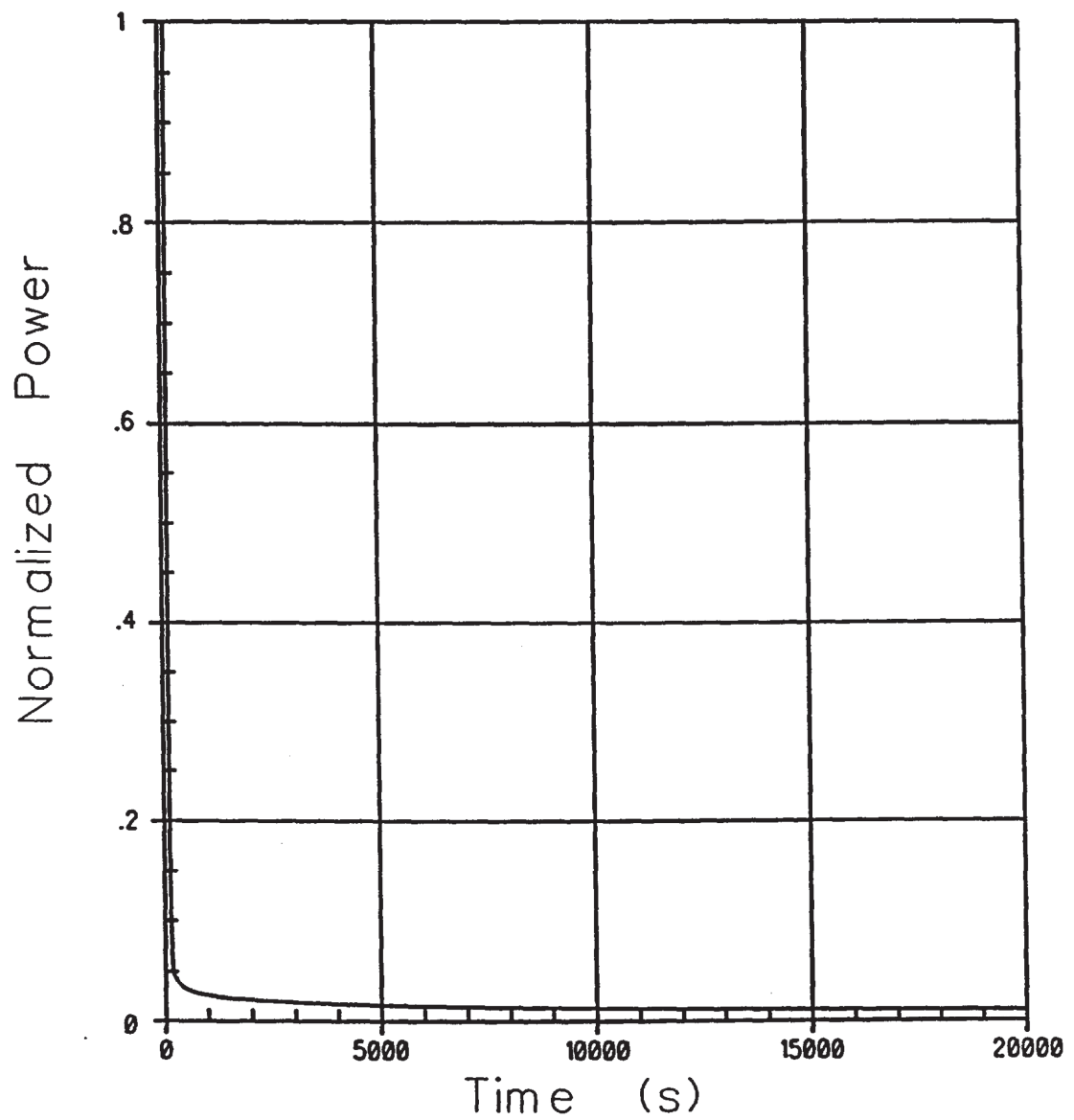
SOUTH TEXAS PROJECT
UNITS 1 & 2

ROD FILM HEAT TRANSFER COEFFICIENT
2-INCH BREAK HIGH LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-46

REVISION 11

L1135.111
L1135.CIT



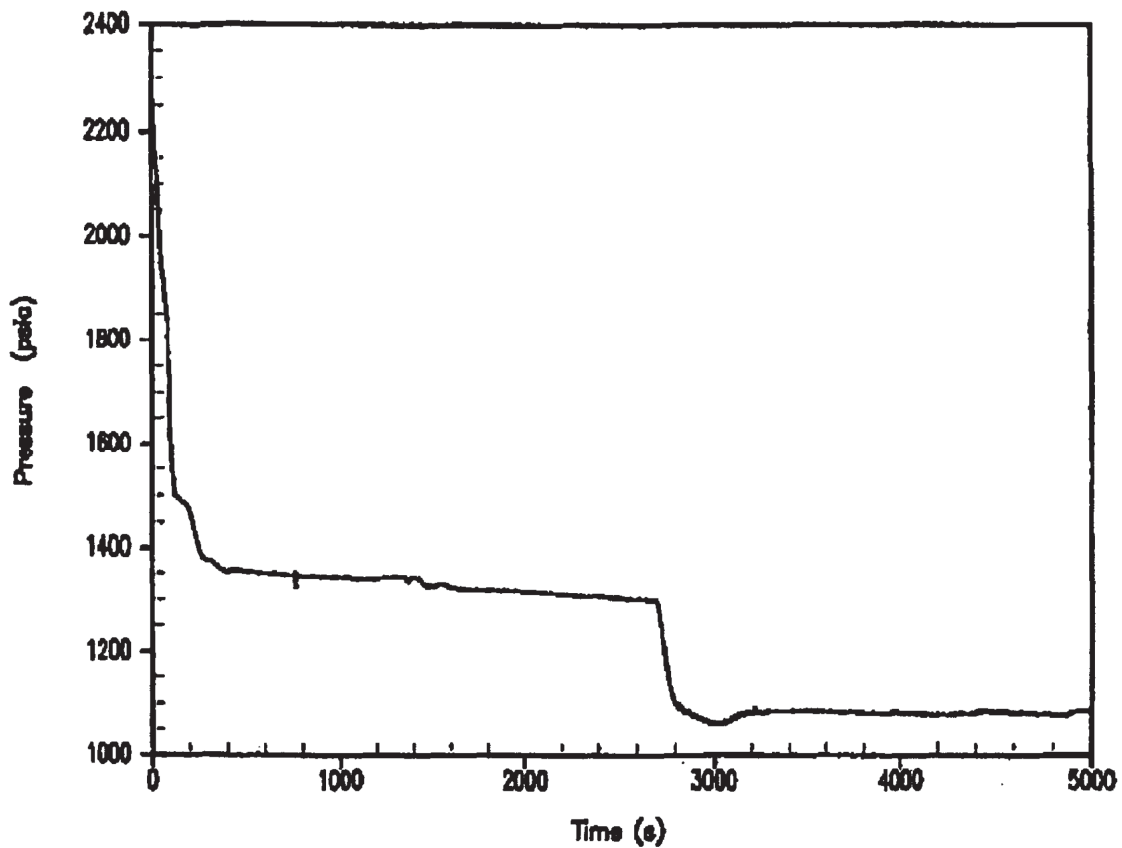
SOUTH TEXAS PROJECT
UNITS 1 & 2

CORE POWER AFTER REACTOR TRIP

Common to all cases

FIGURE 15.6-47

REVISION 6



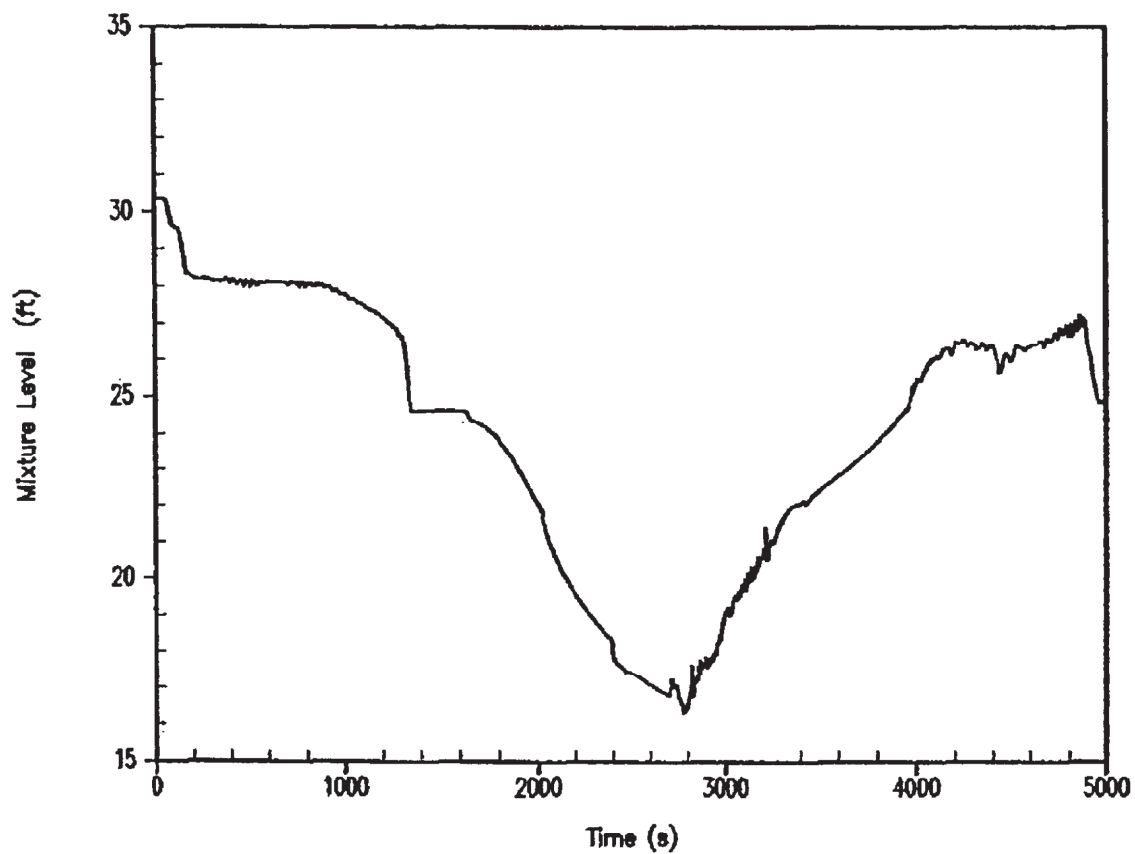
SOUTH TEXAS PROJECT
UNITS 1 & 2

RCS DEPRESSURIZATION TRANSIENT
2-INCH BREAK HIGH LOOP TEMPERATURE
LOW MFW TEMPERATURE

FIGURE 15.6-48

REVISION 11

L1136.111
L1136.CIT



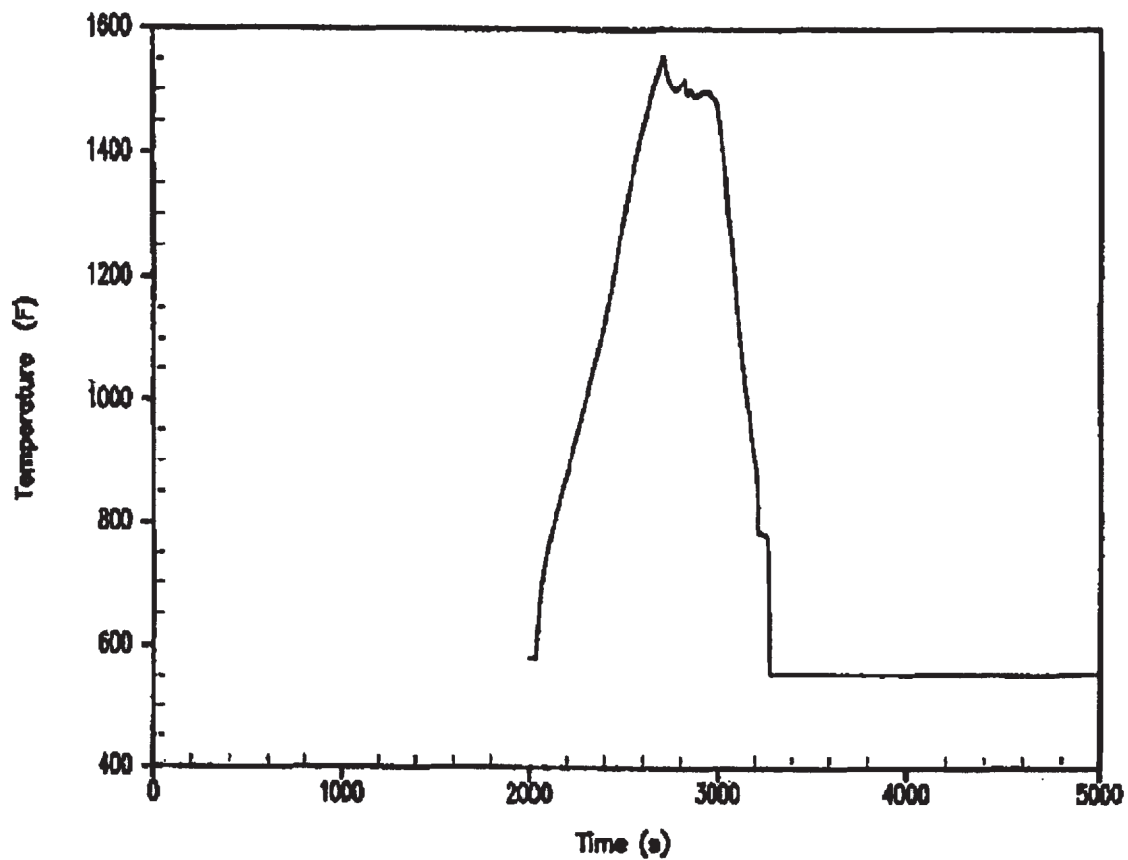
SOUTH TEXAS PROJECT
UNITS 1 & 2

CORE MIXTURE HEIGHT
2-INCH BREAK HIGH LOOP TEMPERATURE
LOW MFW TEMPERATURE

FIGURE 15.6-49

REVISION 11

L1137.111
L1137.CIT



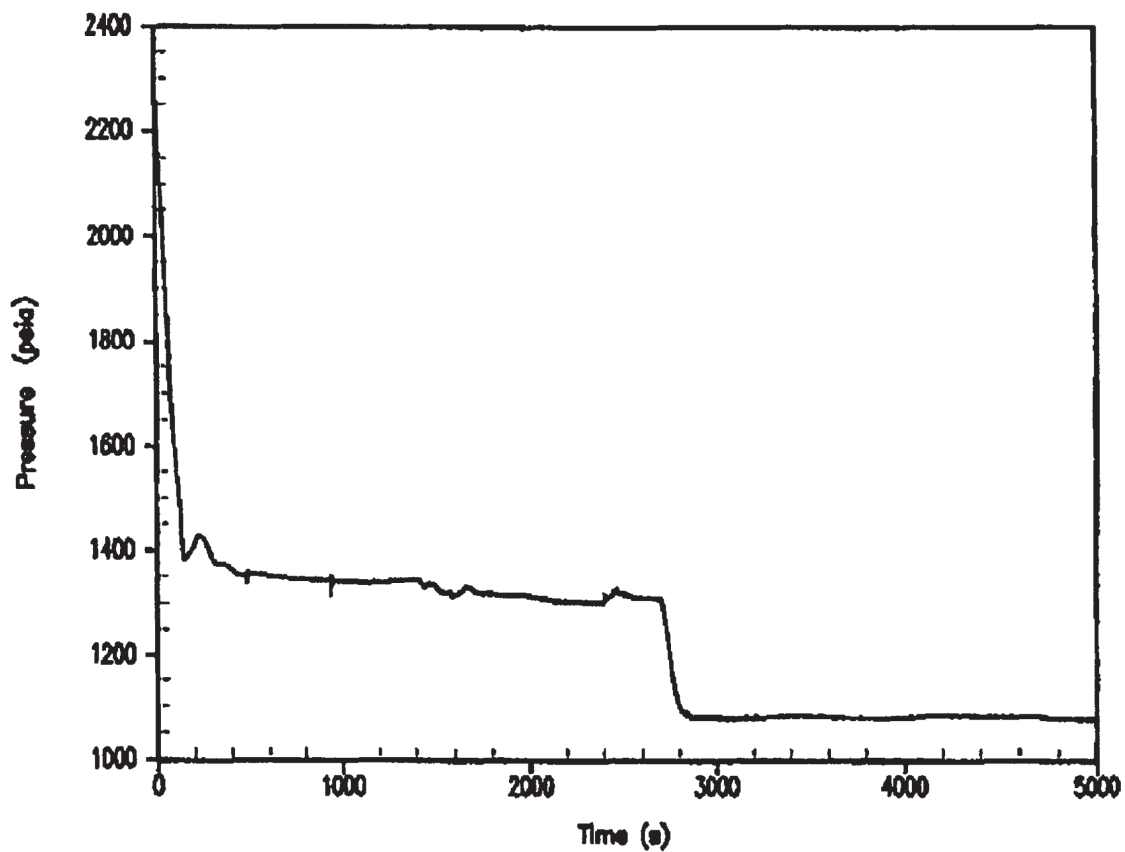
SOUTH TEXAS PROJECT
UNITS 1 & 2

CLAD TEMPERATURE TRANSIENT
2-INCH BREAK HIGH LOOP TEMPERATURE
LOW MFW TEMPERATURE

FIGURE 15.6-50

REVISION 11

L1138.111
L1138.CIT



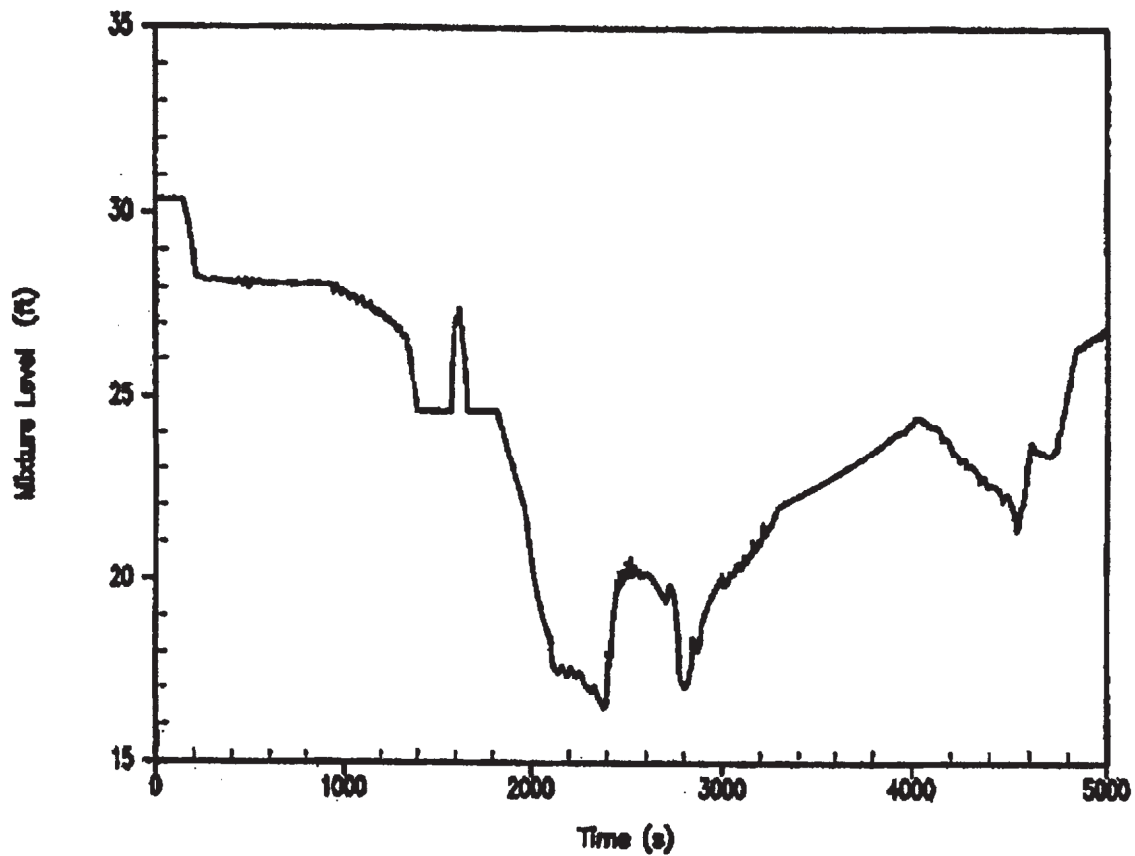
SOUTH TEXAS PROJECT
UNITS 1 & 2

RCS DEPRESSURIZATION TRANSIENT
2-INCH BREAK LOW LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-51

REVISION 11

L1139.111
L1139.CIT



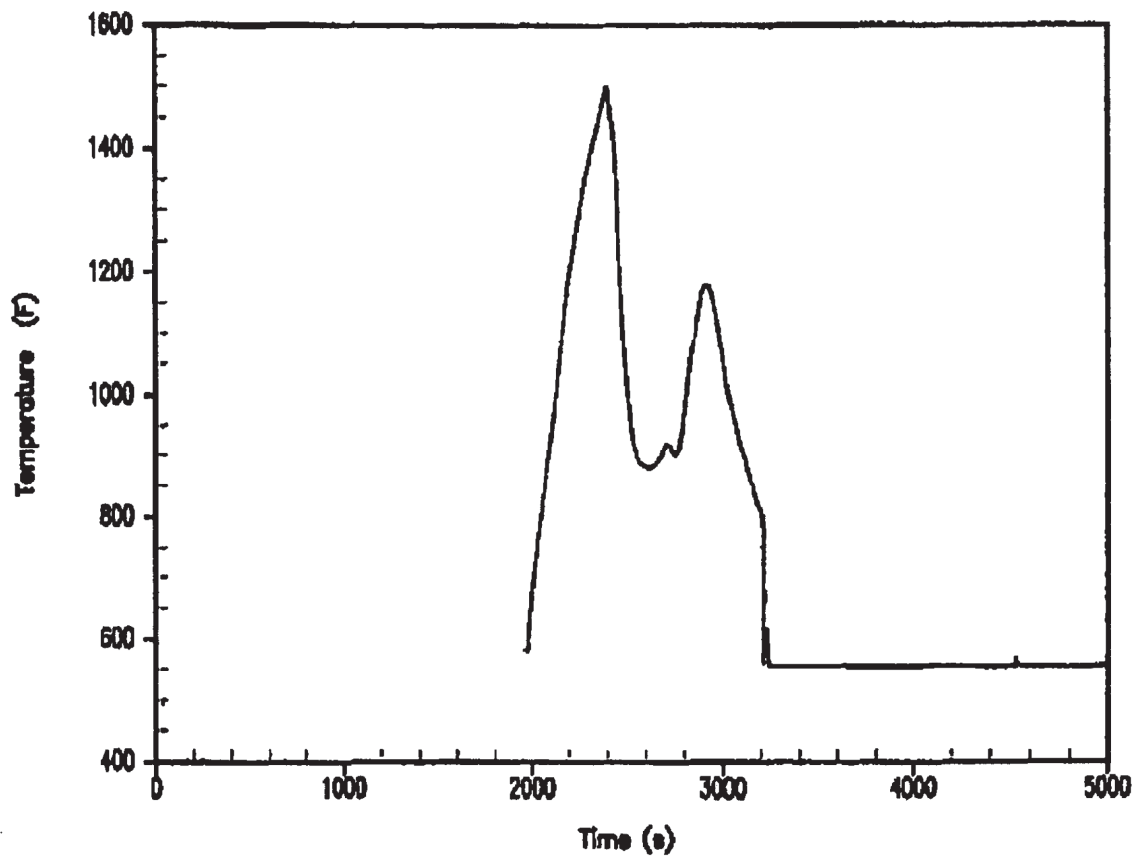
SOUTH TEXAS PROJECT
UNITS 1 & 2

CORE MIXTURE HEIGHT
2-INCH BREAK LOW LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-52

REVISION 11

L1140.111
L1140.C1T



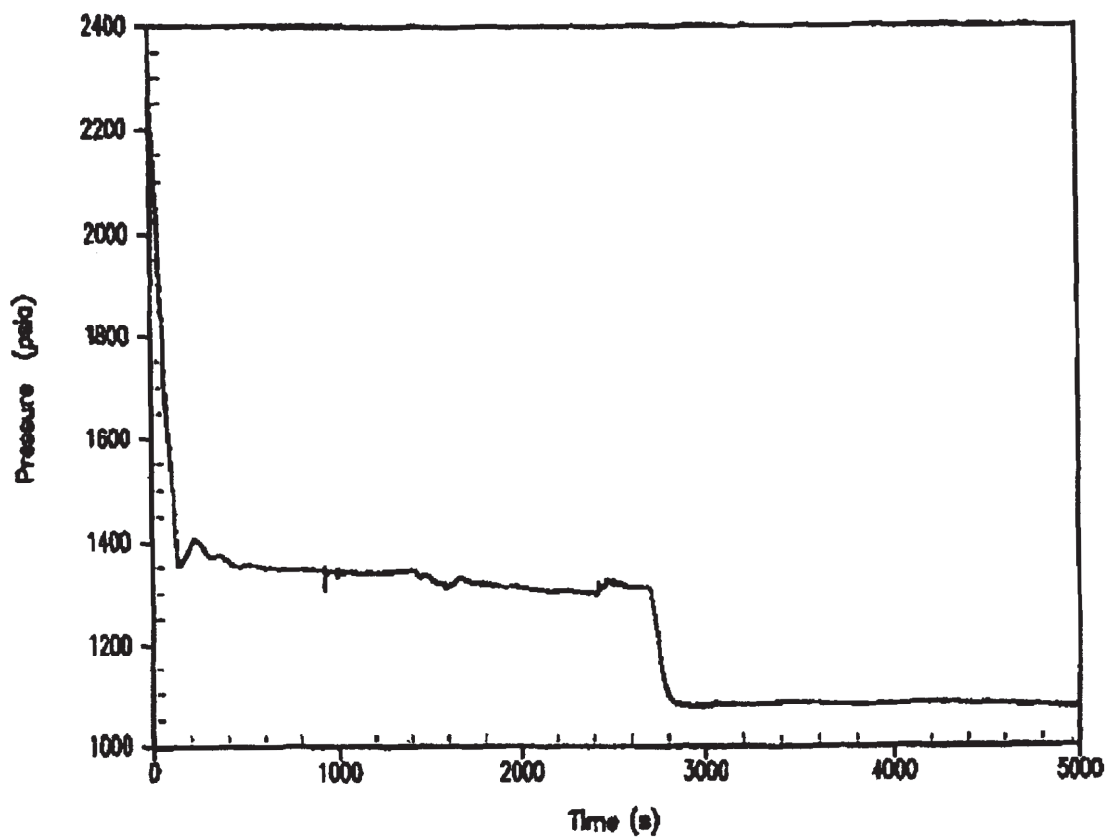
SOUTH TEXAS PROJECT
UNITS 1 & 2

CLAD TEMPERATURE TRANSIENT
2-INCH BREAK LOW LOOP TEMPERATURE
HIGH MFW TEMPERATURE

FIGURE 15.6-53

REVISION 11

L1141.111
L1141.CIT



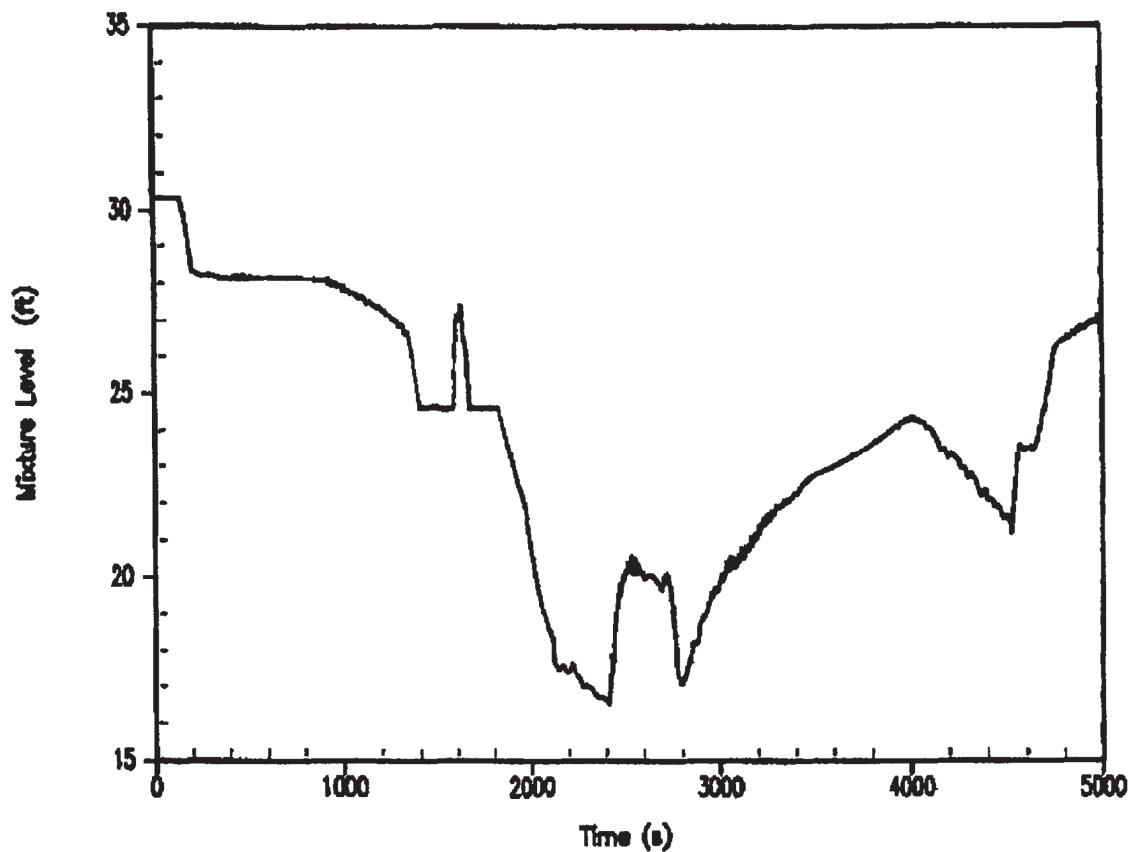
SOUTH TEXAS PROJECT
UNITS 1 & 2

RCS DEPRESSURIZATION TRANSIENT
2-INCH BREAK LOW LOOP TEMPERATURE
LOW MFW TEMPERATURE

FIGURE 15.6-54

REVISION 11

L1142.111
L1142.CIT



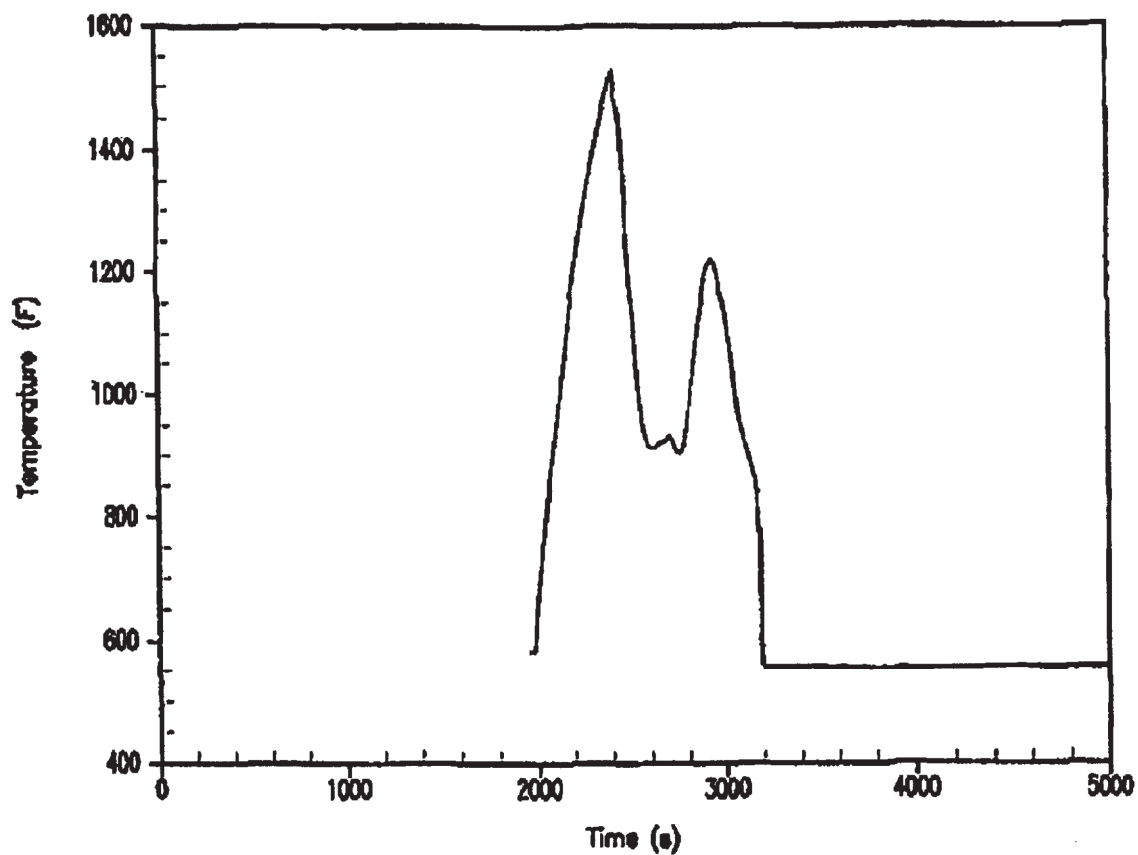
SOUTH TEXAS PROJECT
UNITS 1 & 2

CORE MIXTURE HEIGHT
2-INCH BREAK LOW LOOP TEMPERATURE
LOW MFW TEMPERATURE

FIGURE 15.6-55

REVISION 11

L1143.111
L1143.CIT



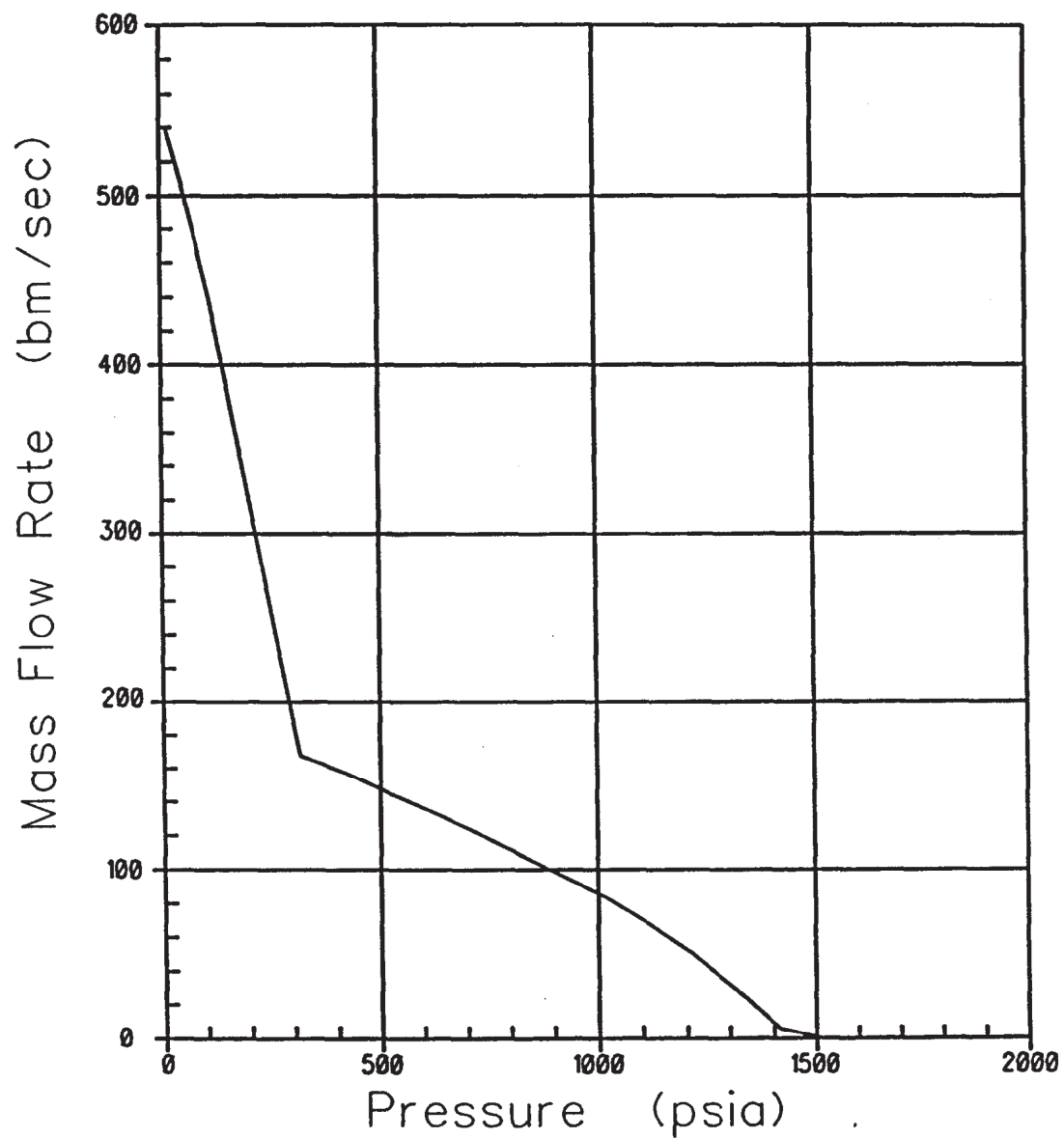
SOUTH TEXAS PROJECT
UNITS 1 & 2

CLAD TEMPERATURE TRANSIENT
2-INCH BREAK LOW LOOP TEMPERATURE
LOW MFW TEMPERATURE

FIGURE 15.6-56

REVISION 11

L1144.111
L1144.CIT

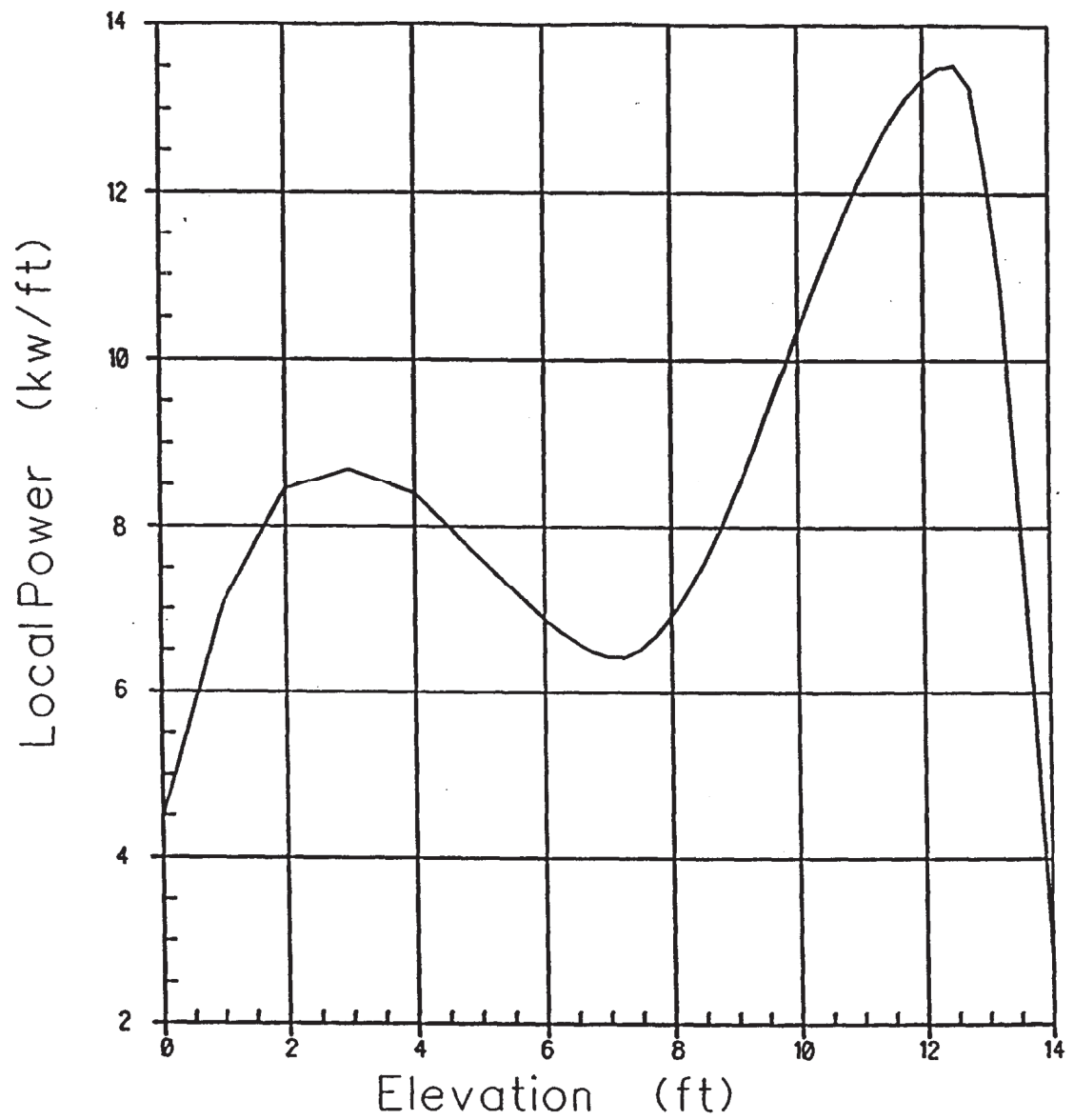


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UNITS 1 & 2

SMALL BREAK SAFETY INJECTION FLOW
RATE VERSUS RCS PRESSURE

FIGURE 15.6-57

REVISION 6

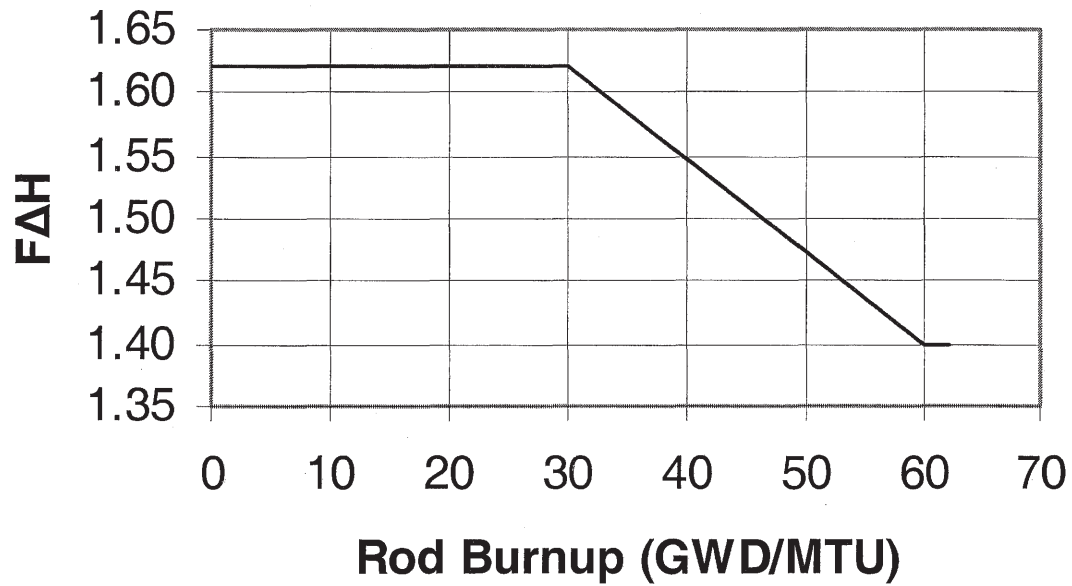


SOUTH TEXAS PROJECT
UNITS 1 & 2

SMALL BREAK POWER SHAPE

FIGURE 15.6-58

REVISION 6



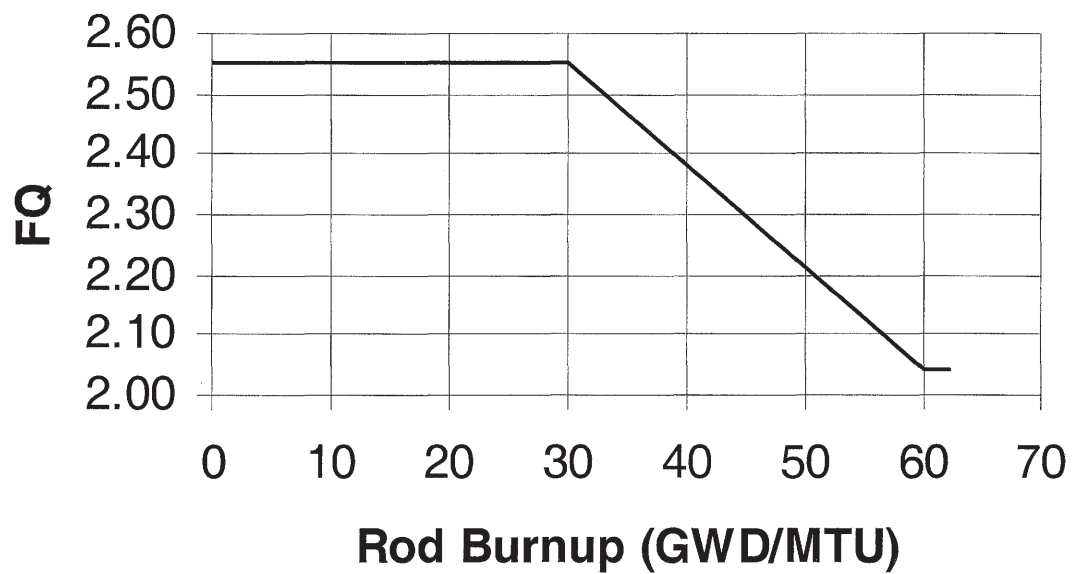
- Includes Uncertainties
- Hot Assembly Average Power (P_{HA}) follows the same burn down since it is a function of $F_{\Delta H}$.

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**$F_{\Delta H}$ Peaking Factors Assumed in
the Evaluation of TCD**

Figure 15.6-59

Revision 17



- Includes Uncertainties

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

**F_Q Peaking Factors Assumed in
the Evaluation of TCD**

Figure 15.6-60 Revision 17