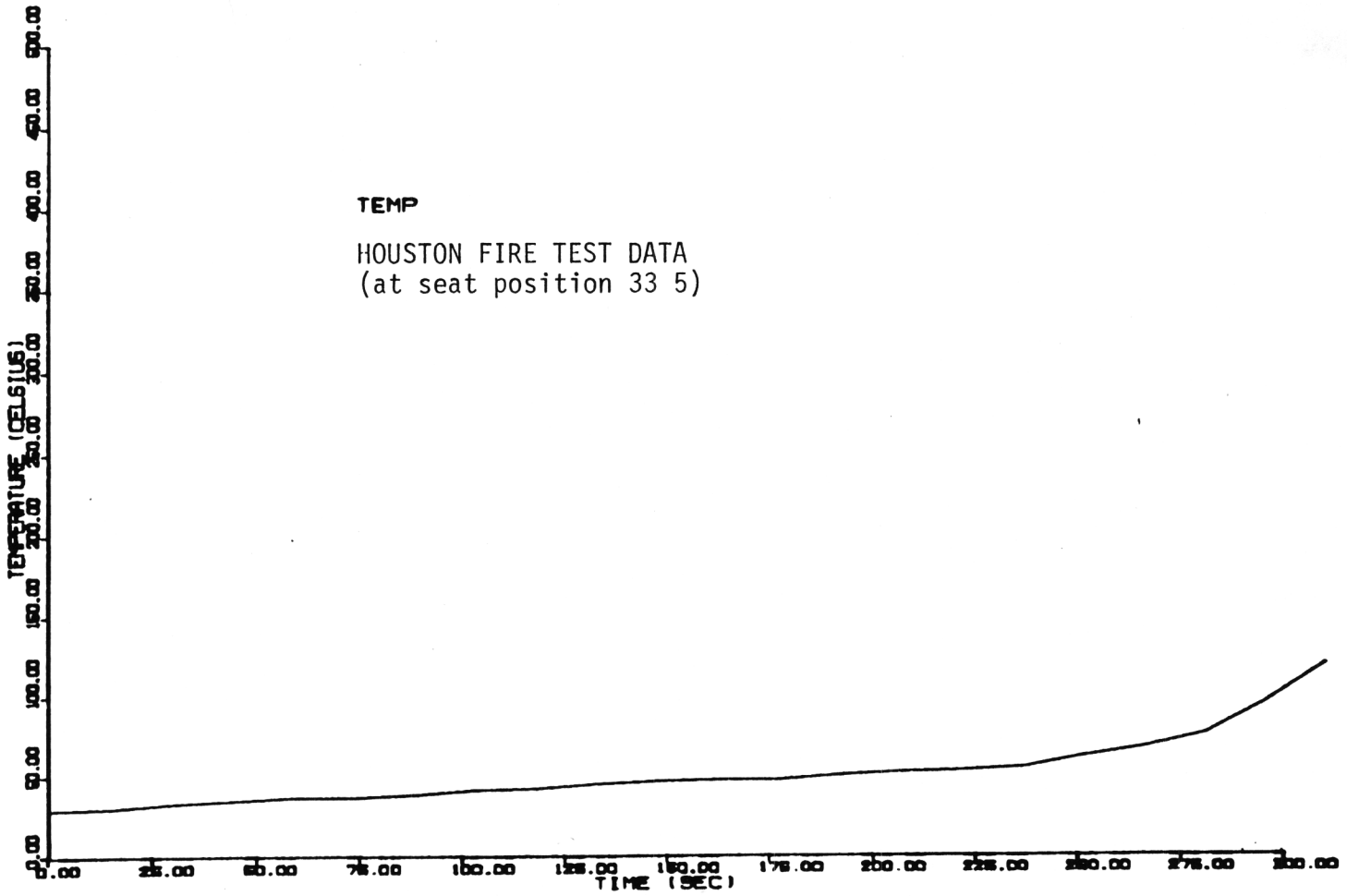
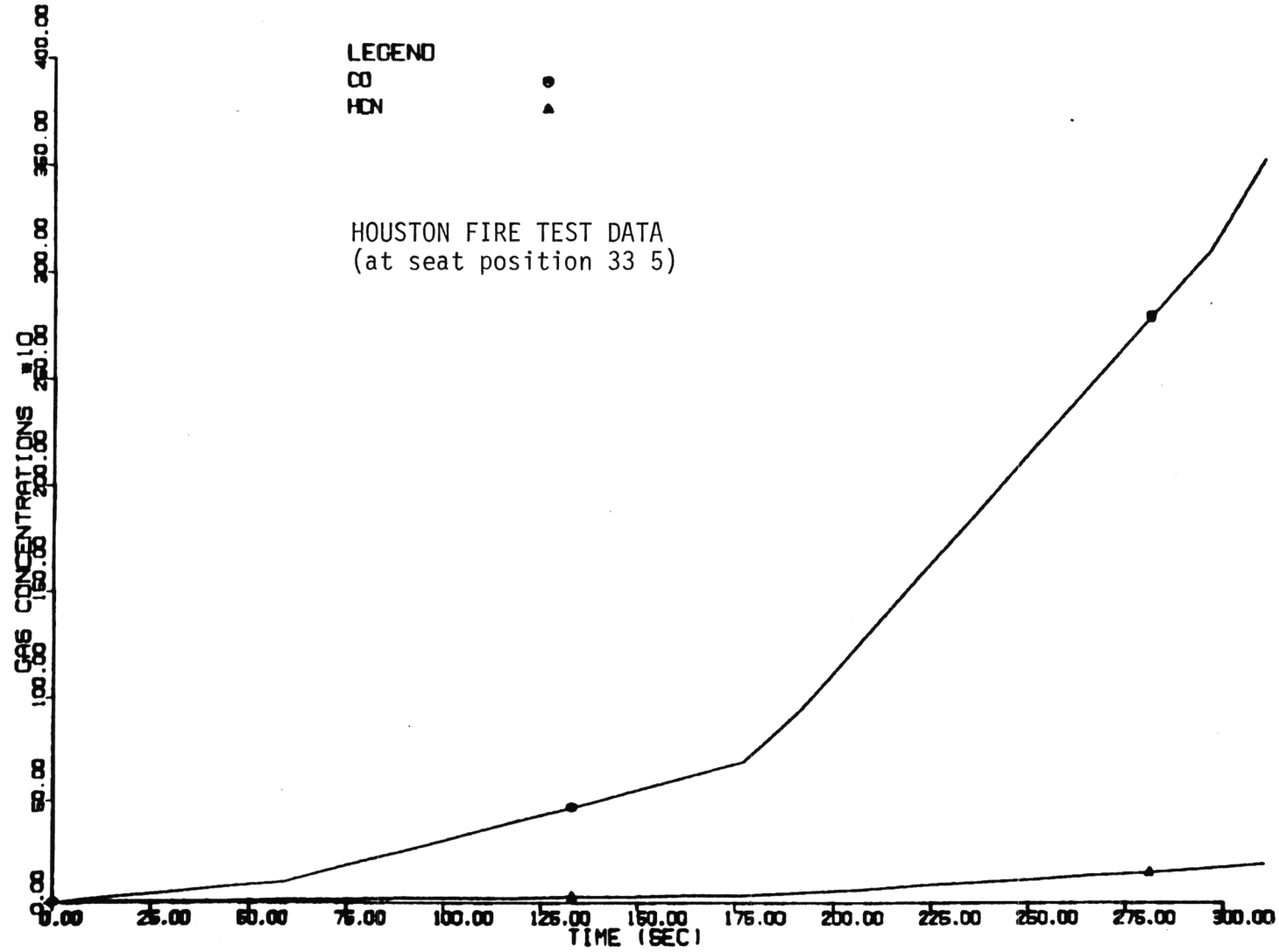
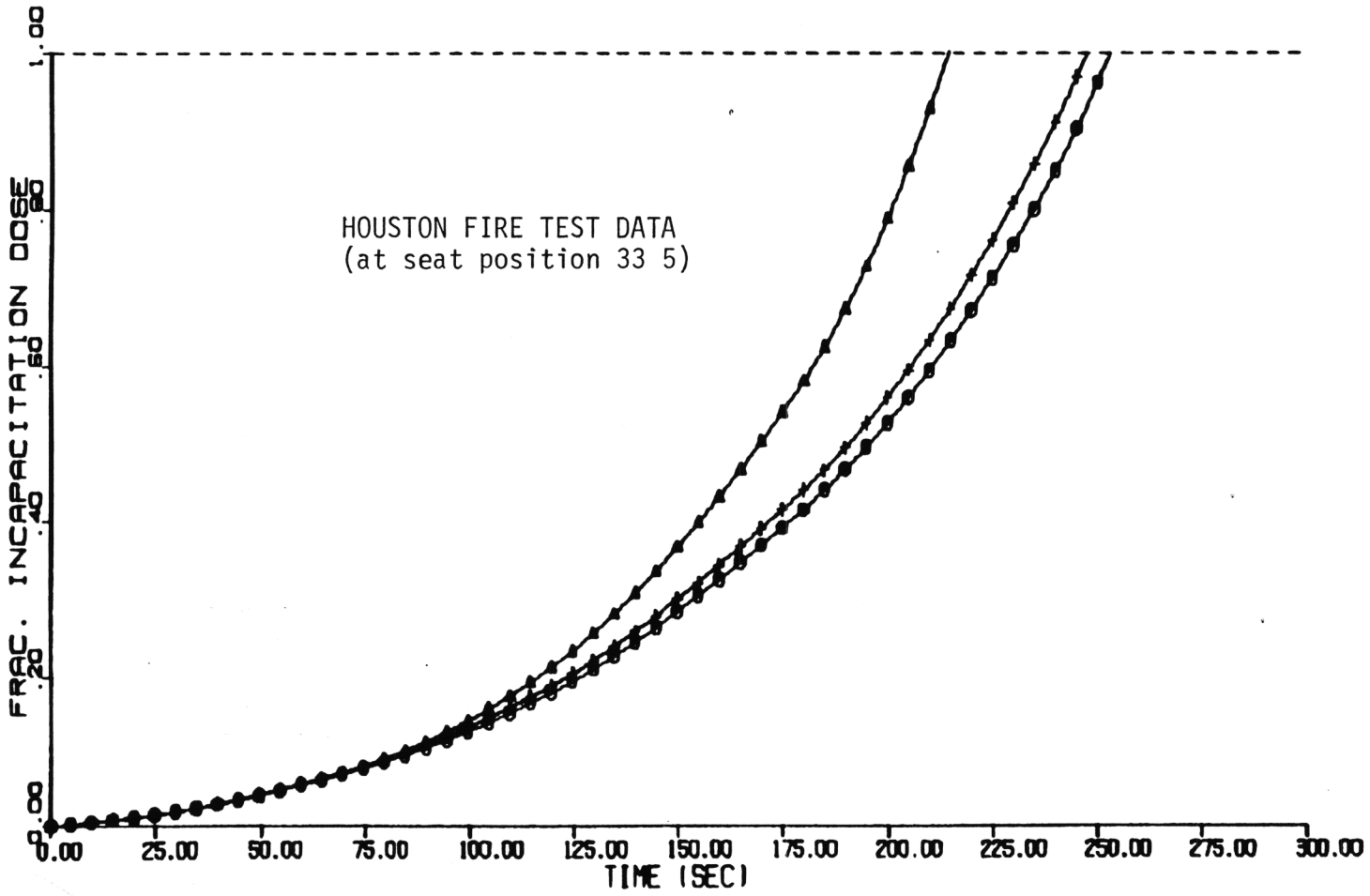
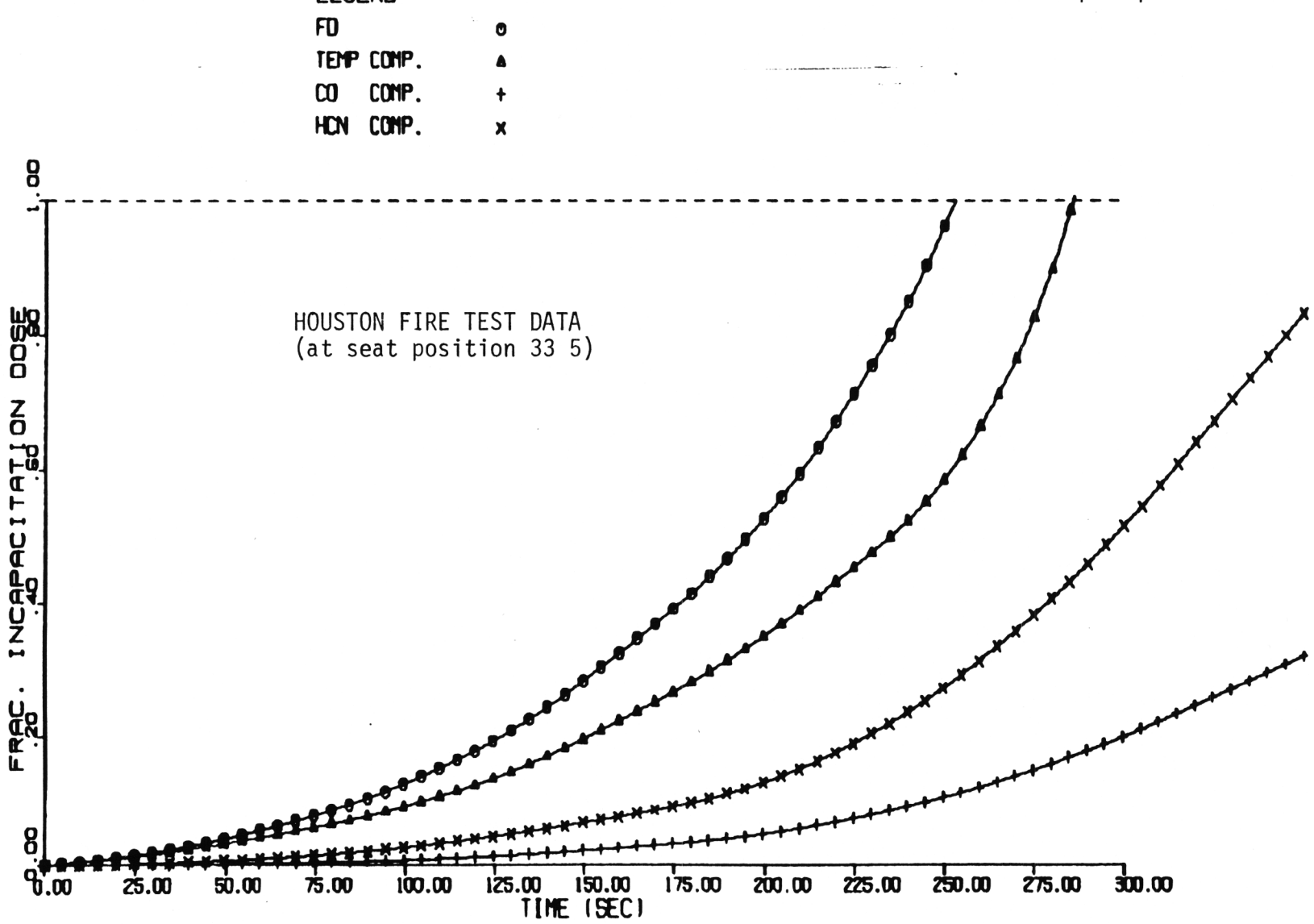
NICK ENGLER'S
PRESENTATION
7/28/83

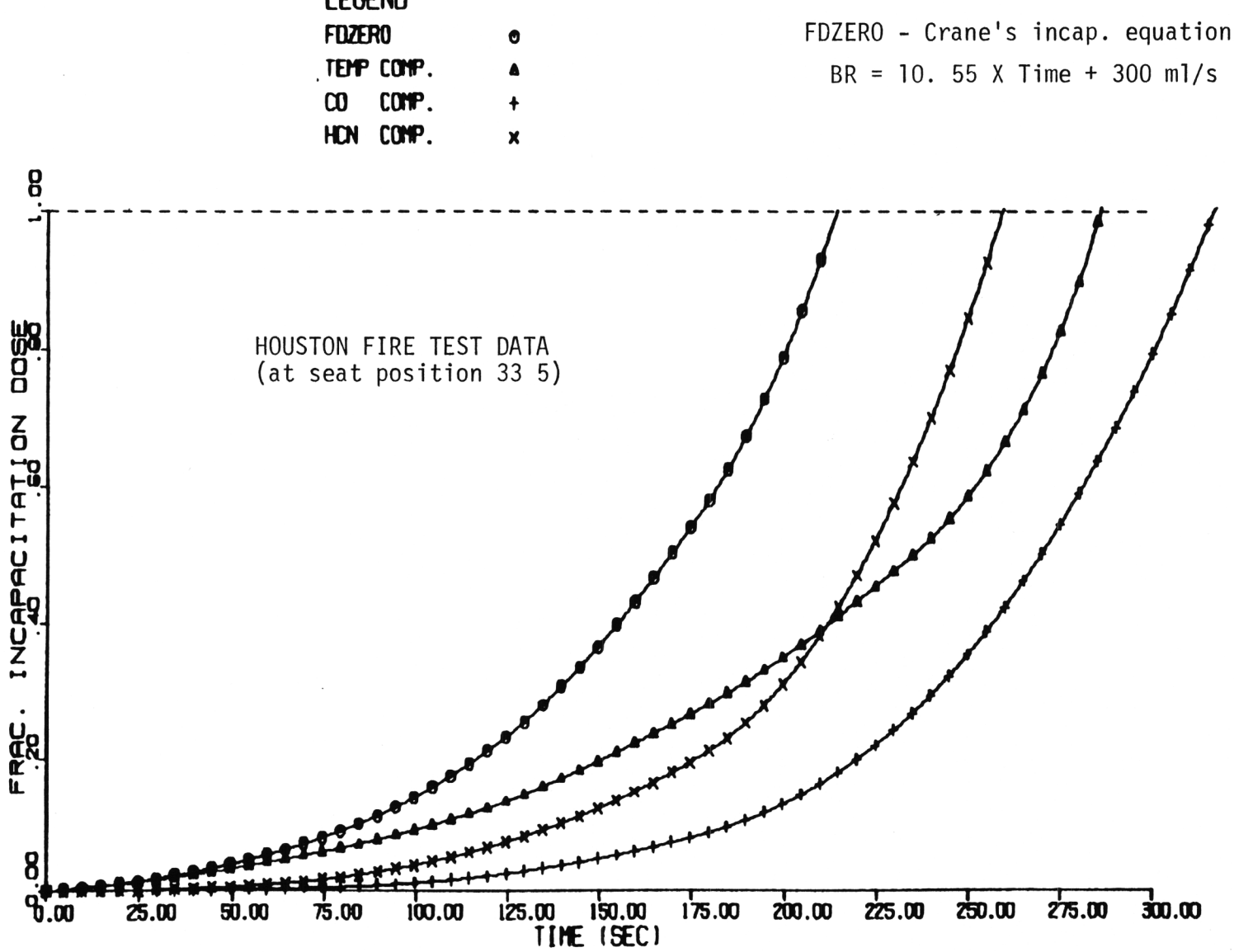
Dick
FYI
Tom

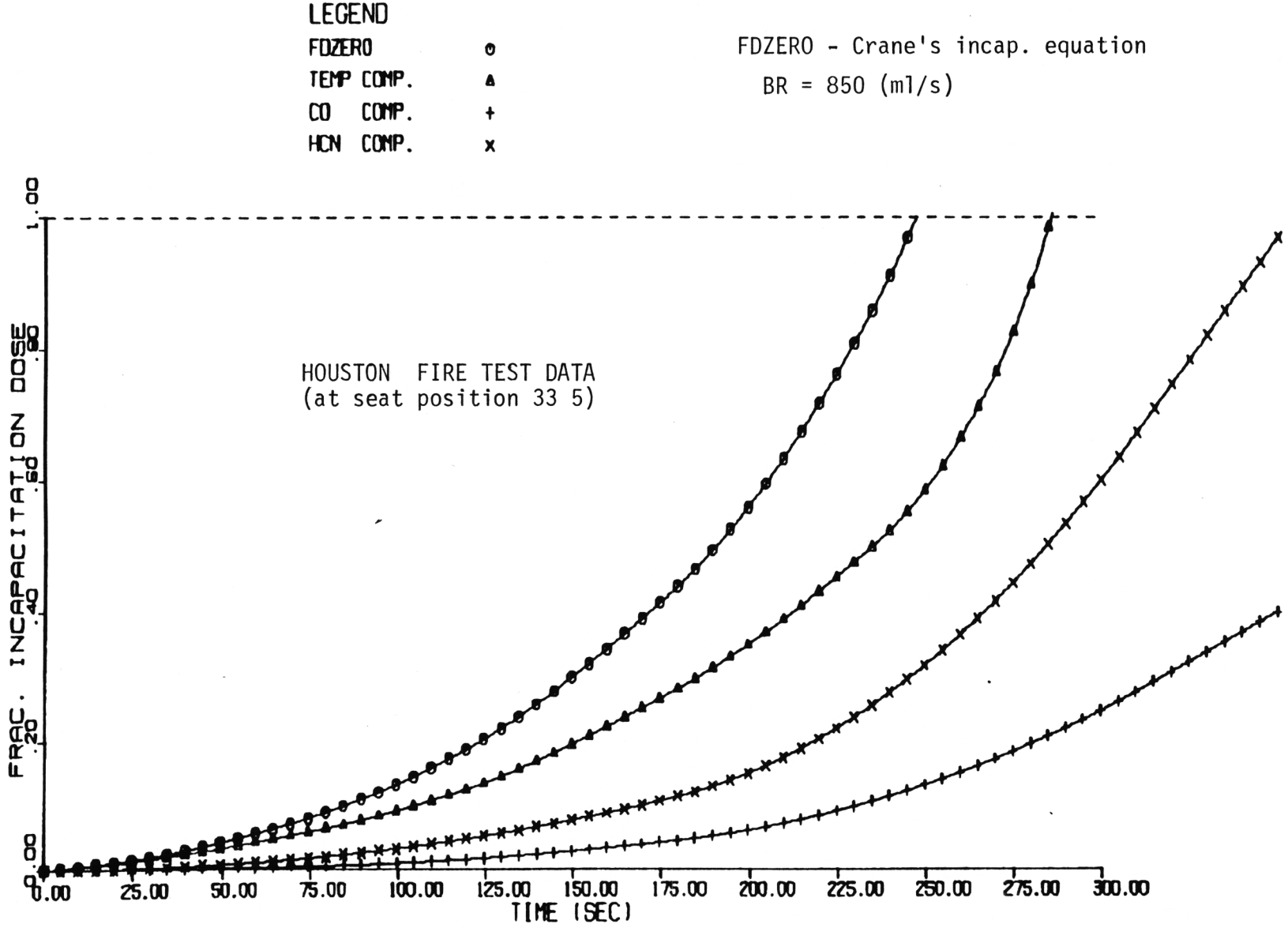


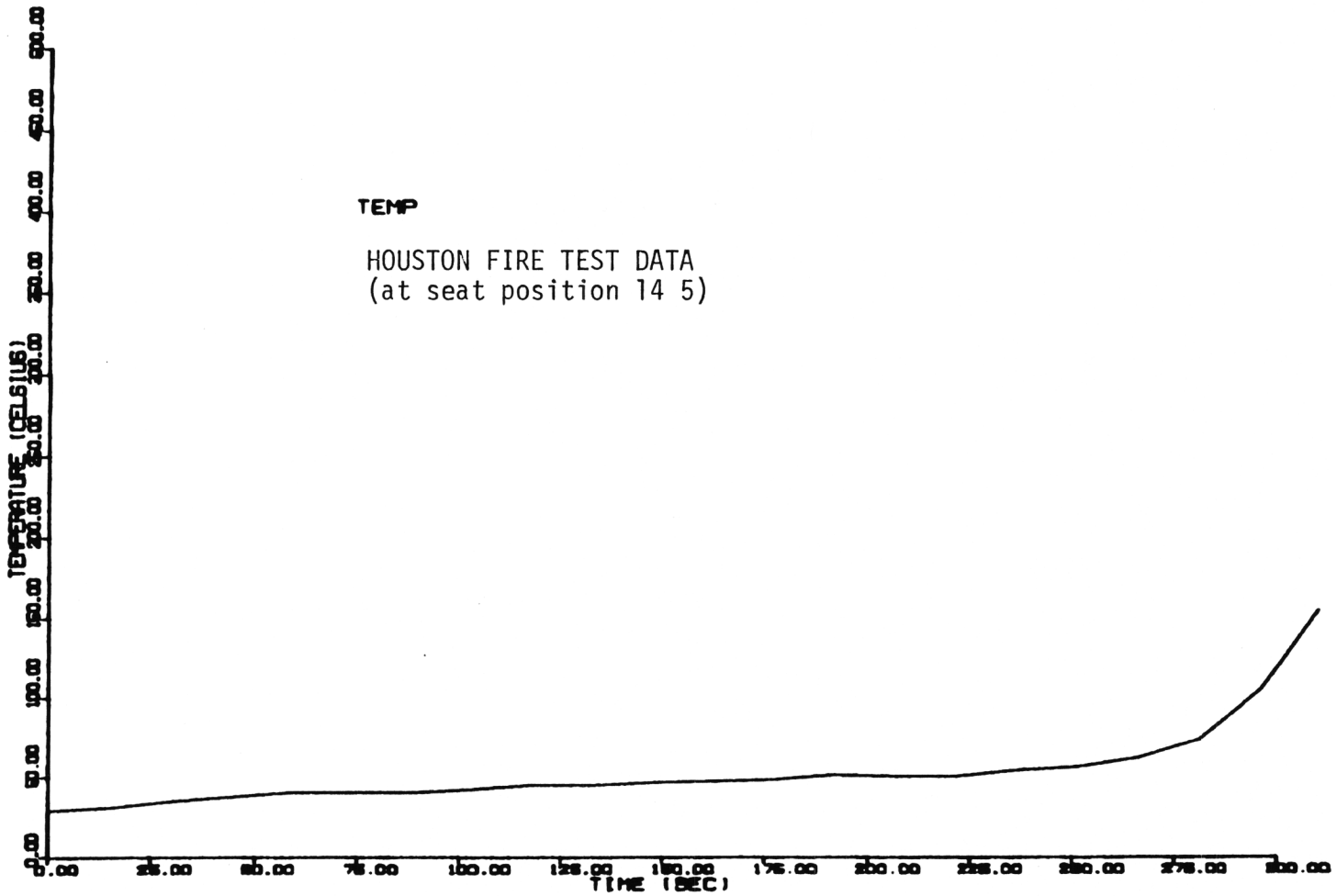

LEGEND
CO
HCN
HOUSTON FIRE TEST DATA
(at seat position 33 5)
GAS CONCENTRATIONS *10
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
400.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

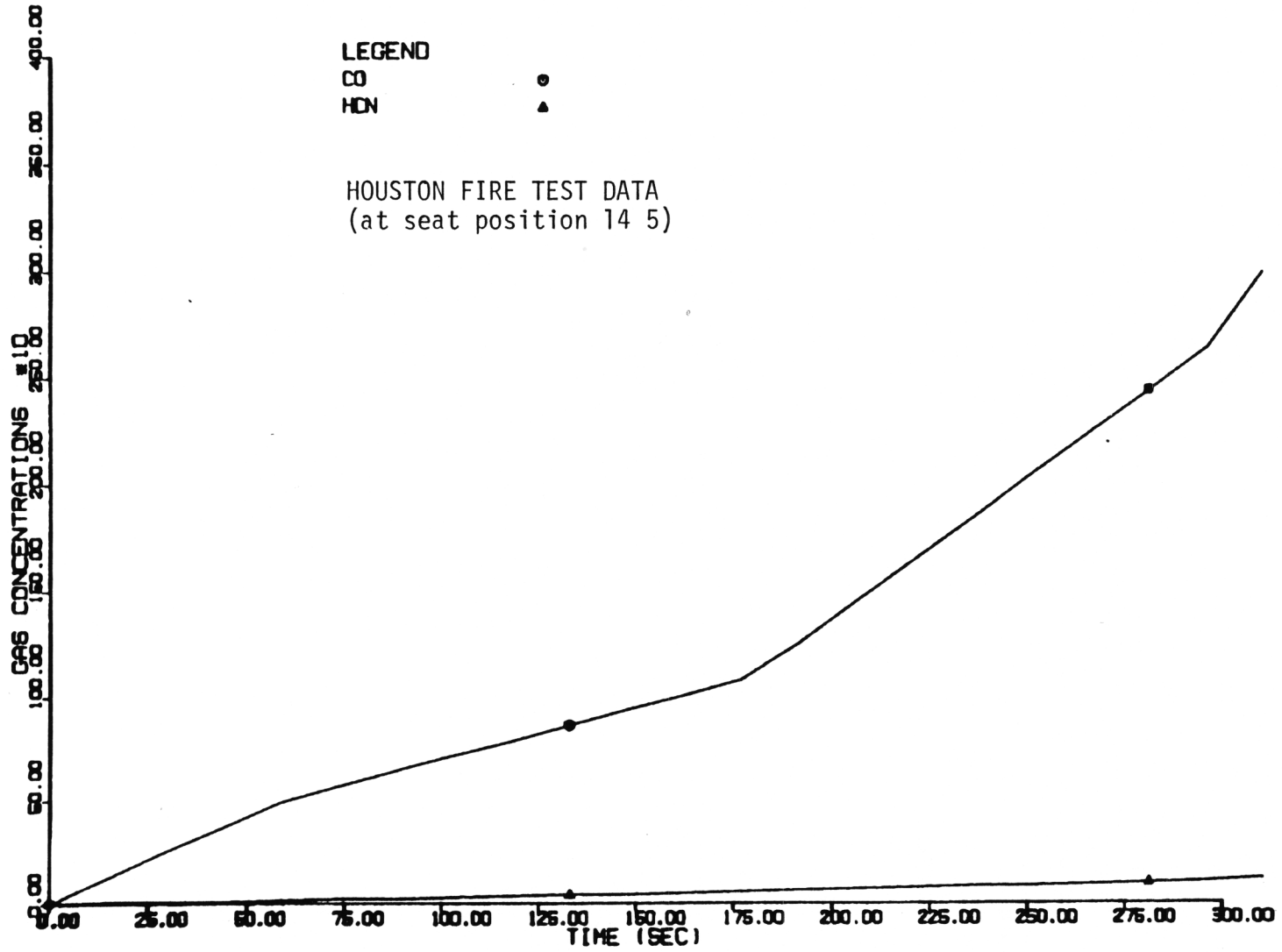

LEGEND
FD
FDZERO BR LINEAR
FDZERO BR CONST.
FD - Sarkos' incap. equation
FDZERO - Crane's incap. equation
BR Linear - BR = 10.55 X Time + 300 (ml/s)
BR Constant - BR = 850 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 33 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

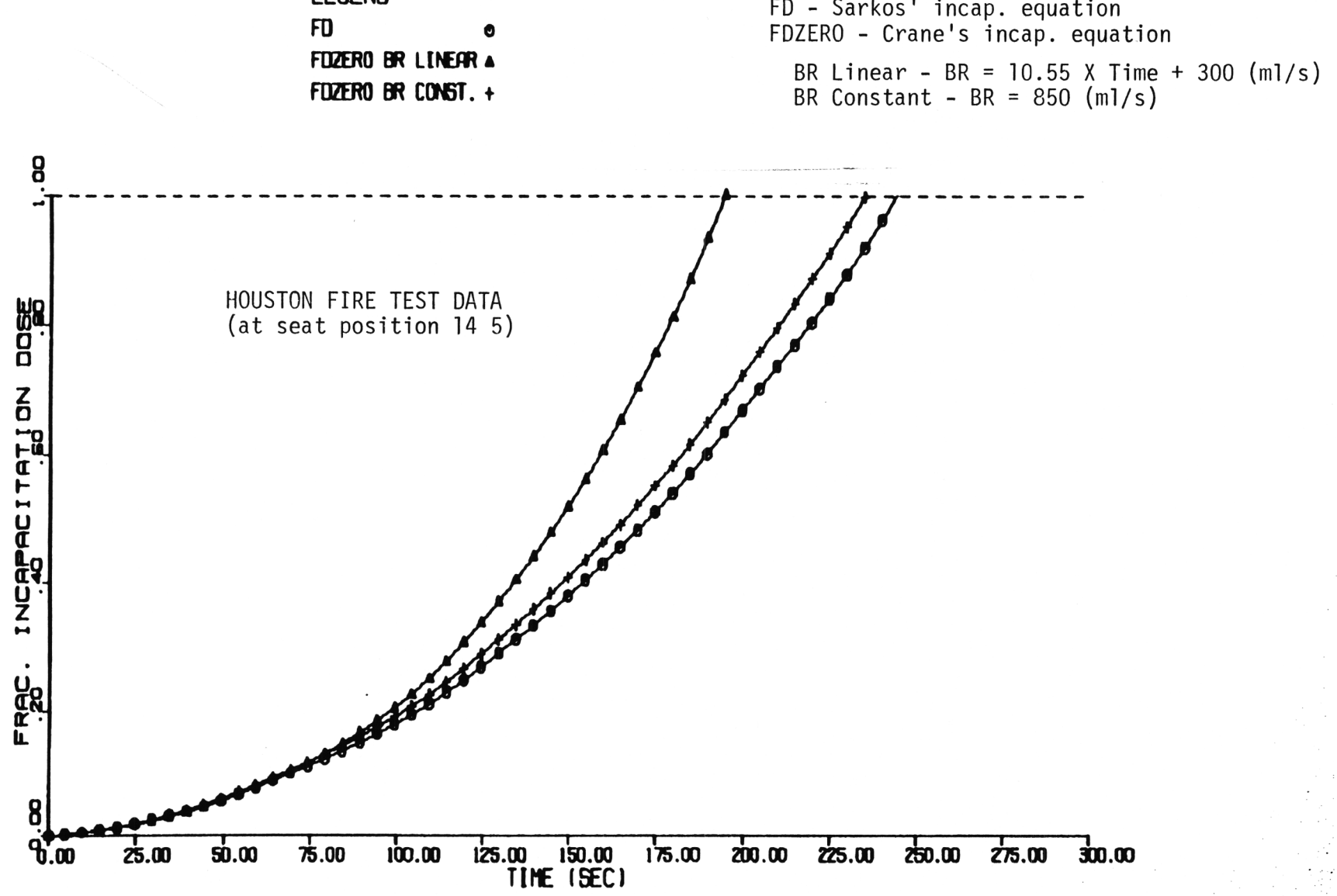

LEGEND
FD o
TEMP COMP. Δ
CO COMP. +
HCN COMP. x
FD - Sarkos' incap. equation
HOUSTON FIRE TEST DATA
(at seat position 33 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

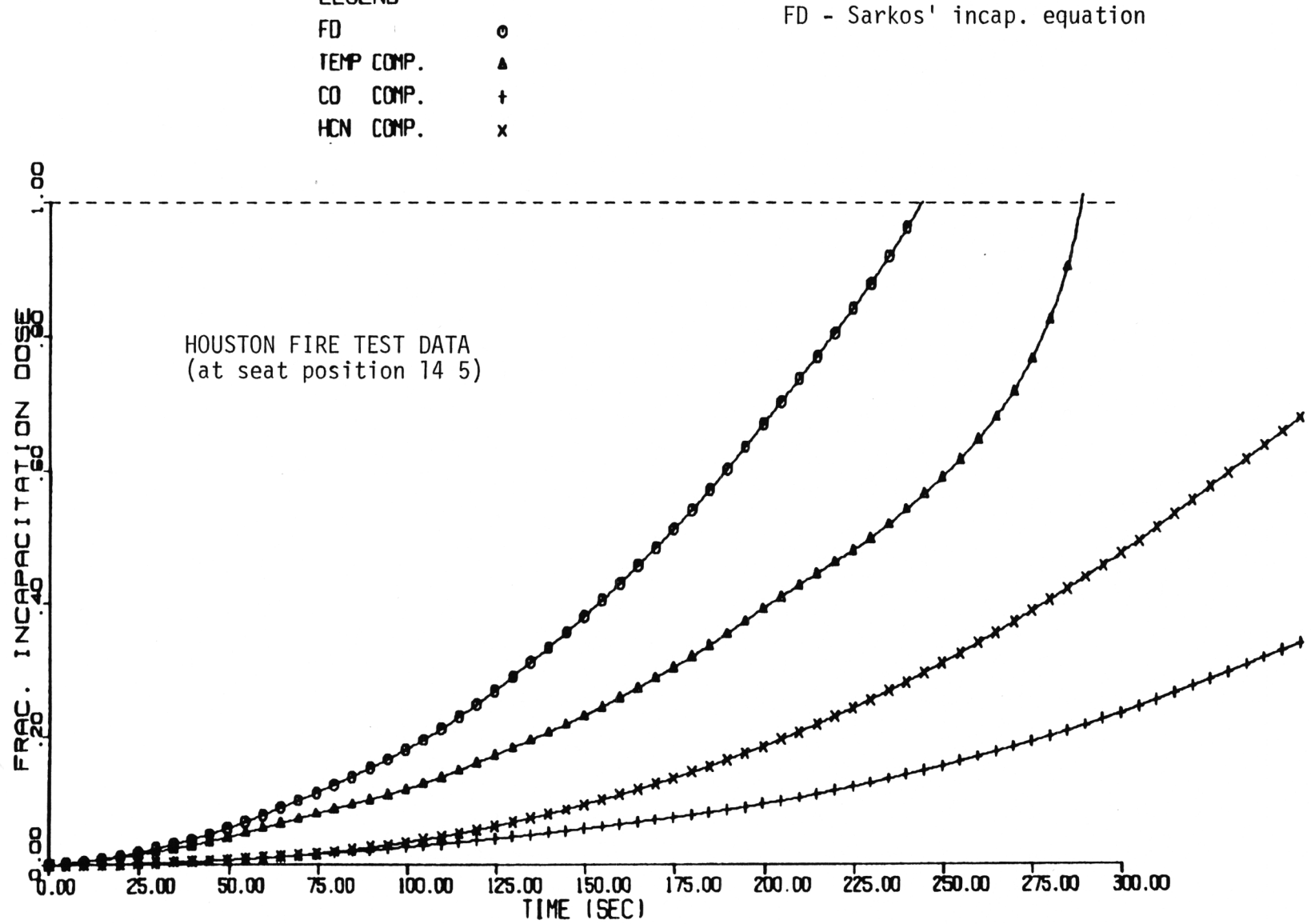

LEGEND
FDZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO - Crane's incap. equation
BR = 10. 55 X Time + 300 ml/s
HOUSTON FIRE TEST DATA
(at seat position 33 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

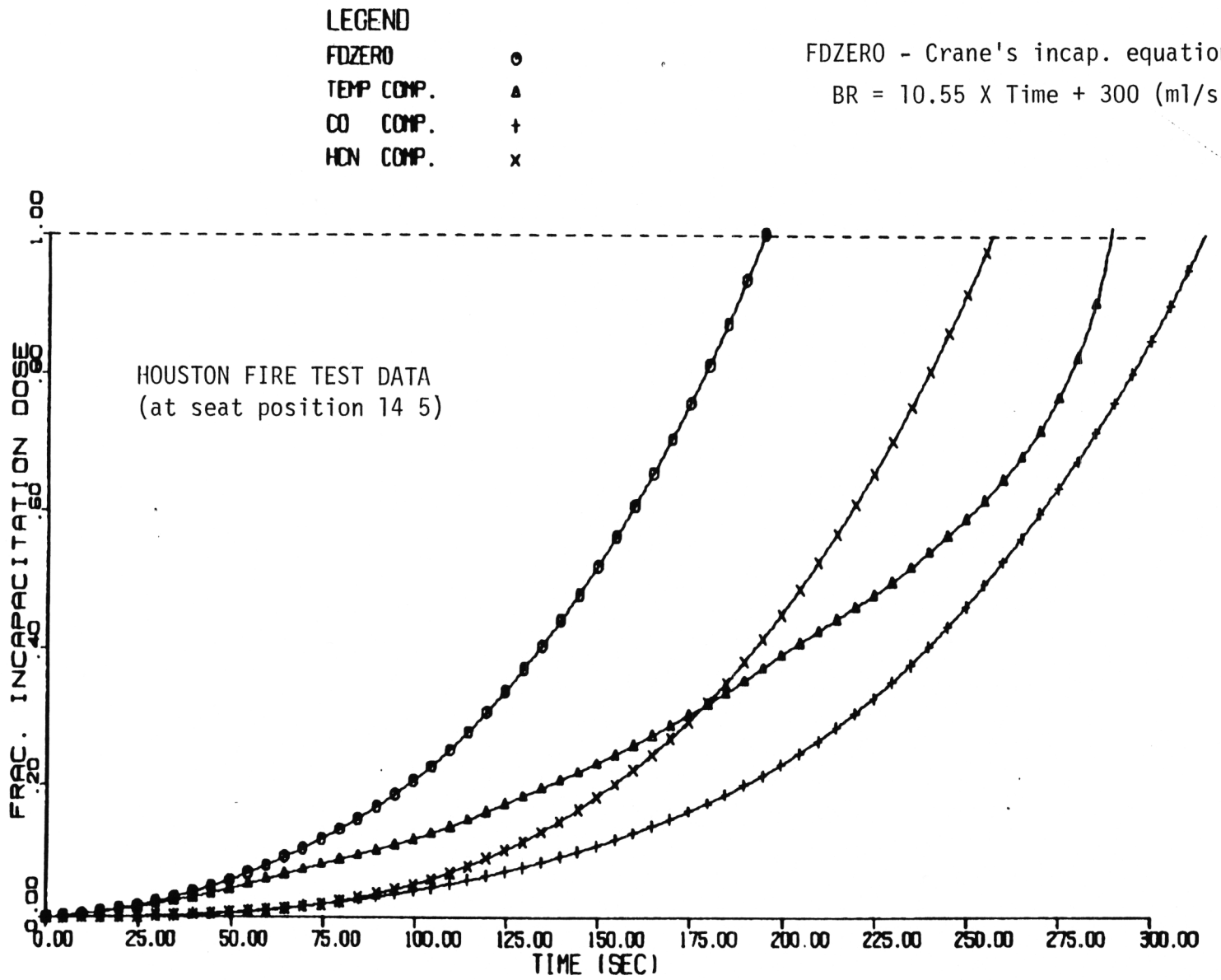

LEGEND
FDZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO - Crane's incap. equation
BR = 850 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 33 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

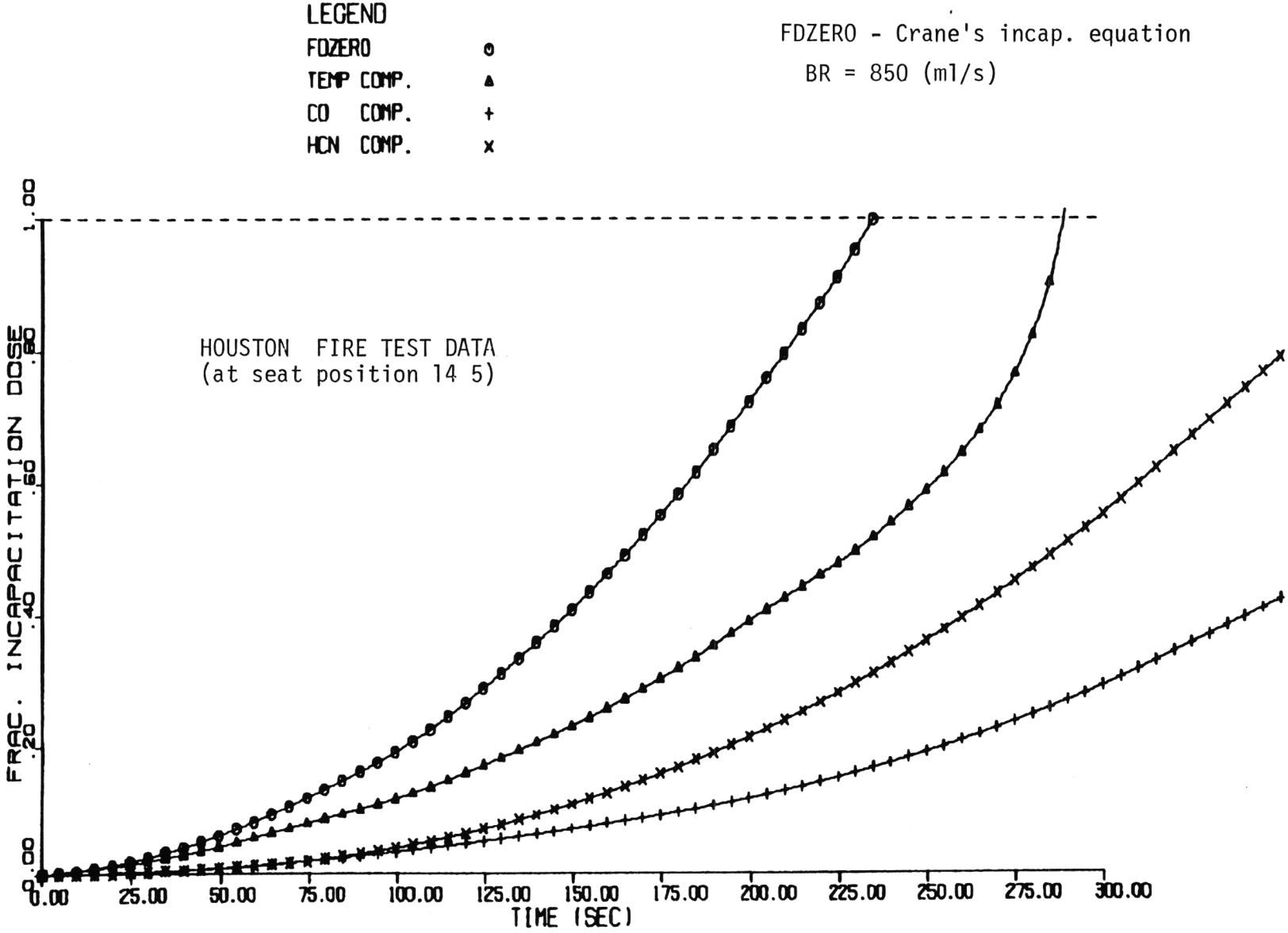

TEMP
HOUSTON FIRE TEST DATA
(at seat position 14 5)
TEMPERATURE (CELSIUS)
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
400.00
450.00
500.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

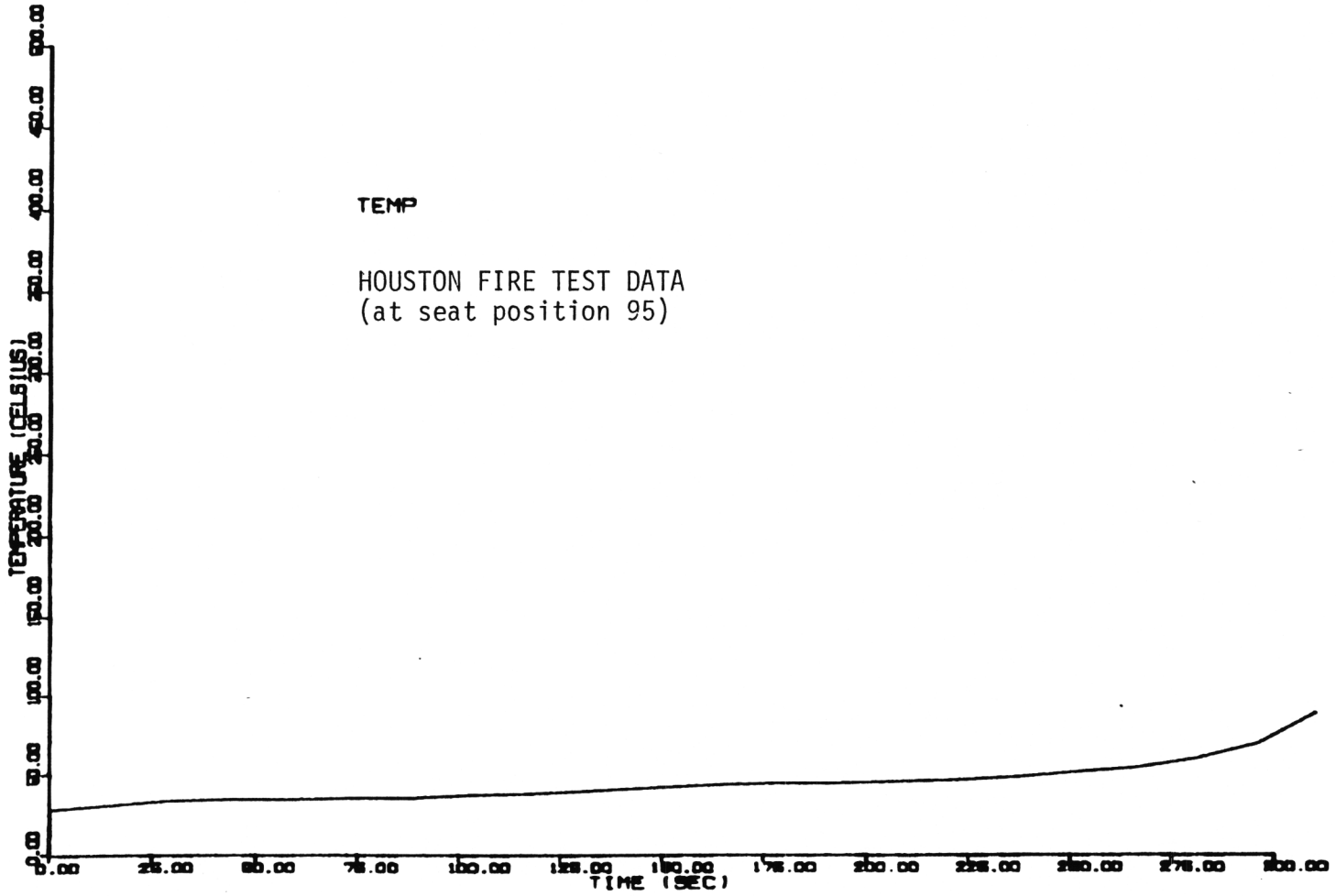

LEGEND
CO
HCN
HOUSTON FIRE TEST DATA
(at seat position 14 5)
GAS CONCENTRATIONS IN PPM
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

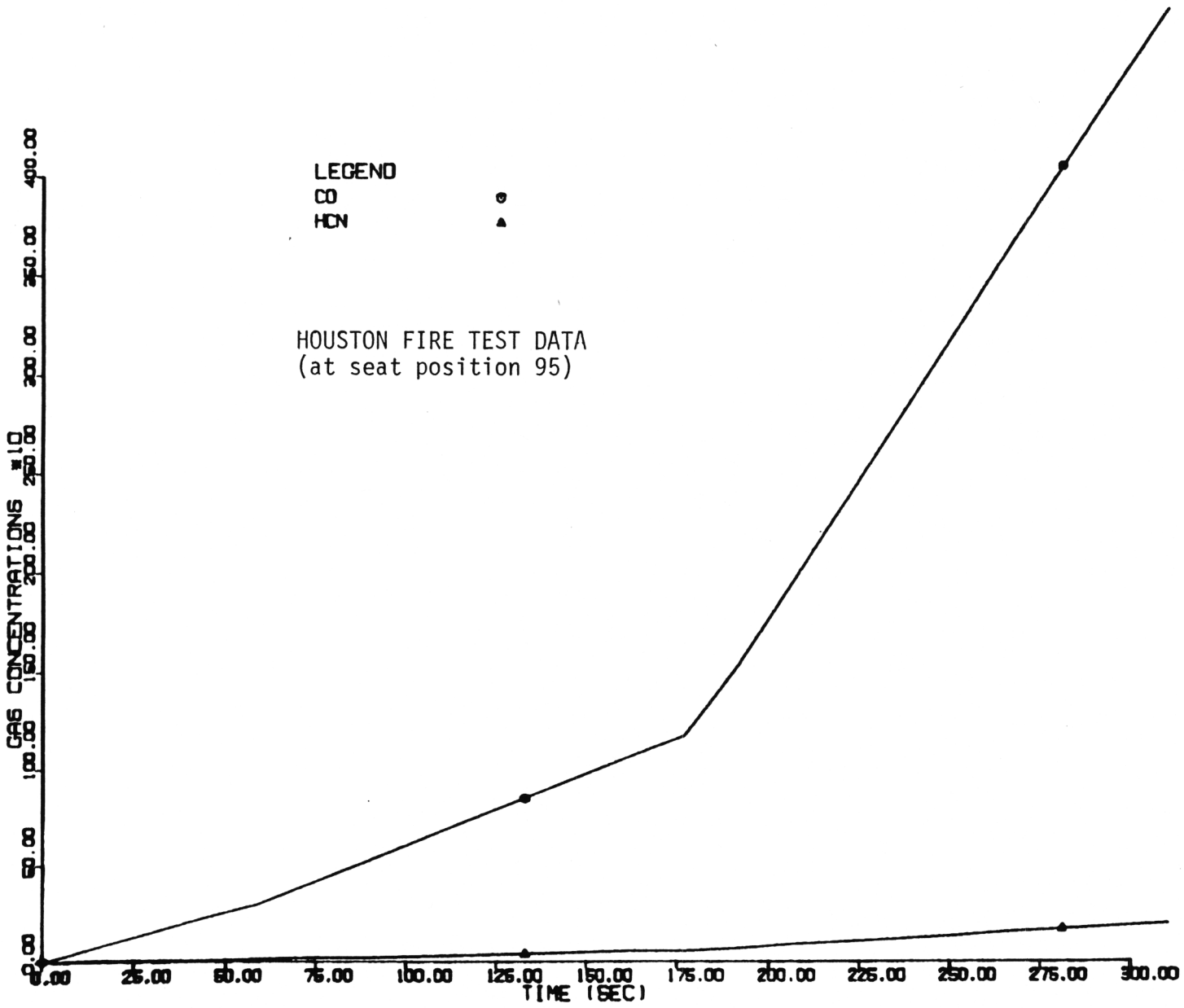

LEGEND
FD
FDZERO BR LINEAR
FDZERO BR CONST.
FD - Sarkos' incap. equation
FDZERO - Crane's incap. equation
BR Linear - BR = 10.55 X Time + 300 (ml/s)
BR Constant - BR = 850 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 14 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

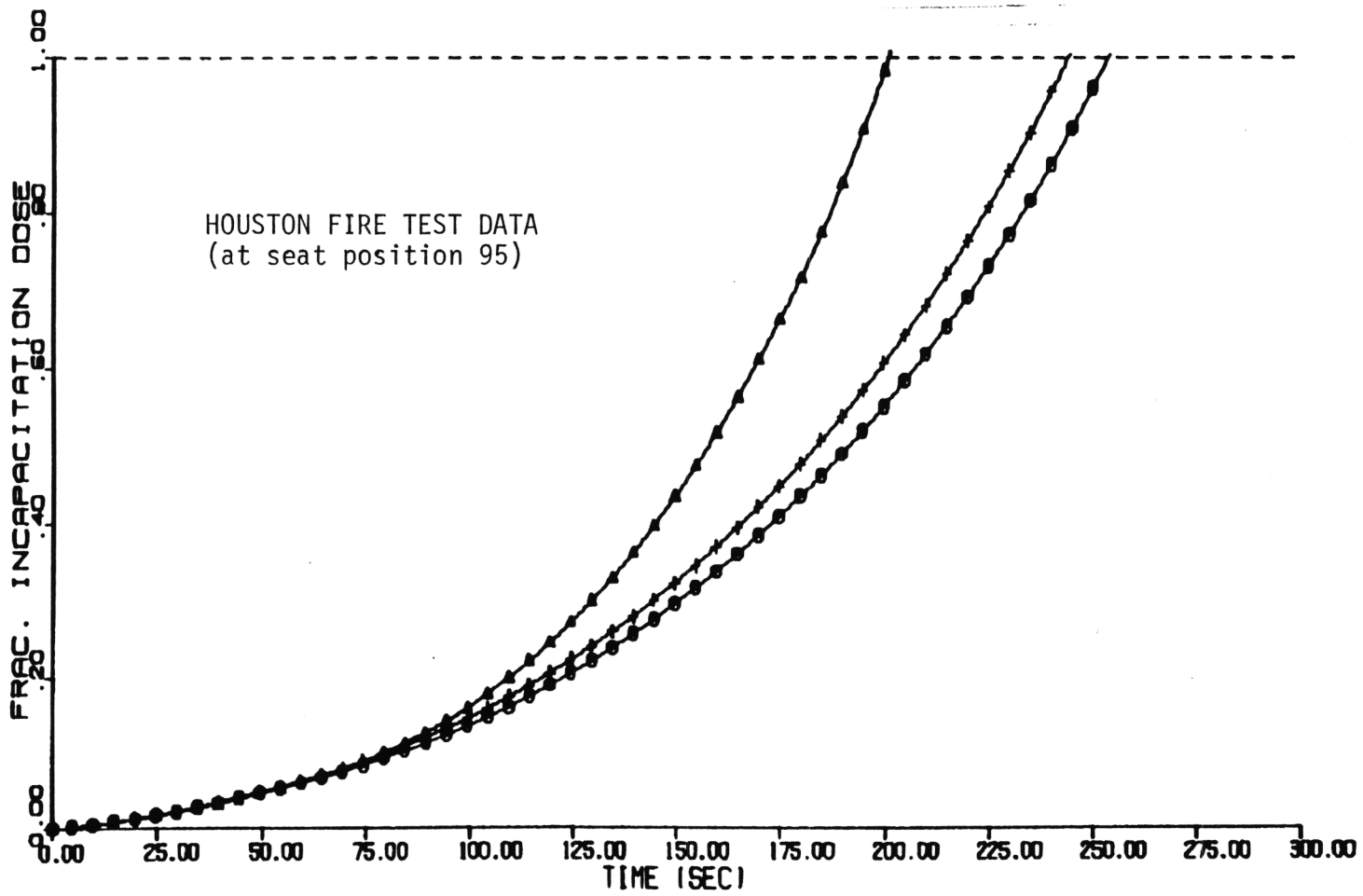

LEGEND
FD
TEMP COMP.
CO COMP.
HCN COMP.
FD - Sarkos' incap. equation
HOUSTON FIRE TEST DATA
(at seat position 14 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

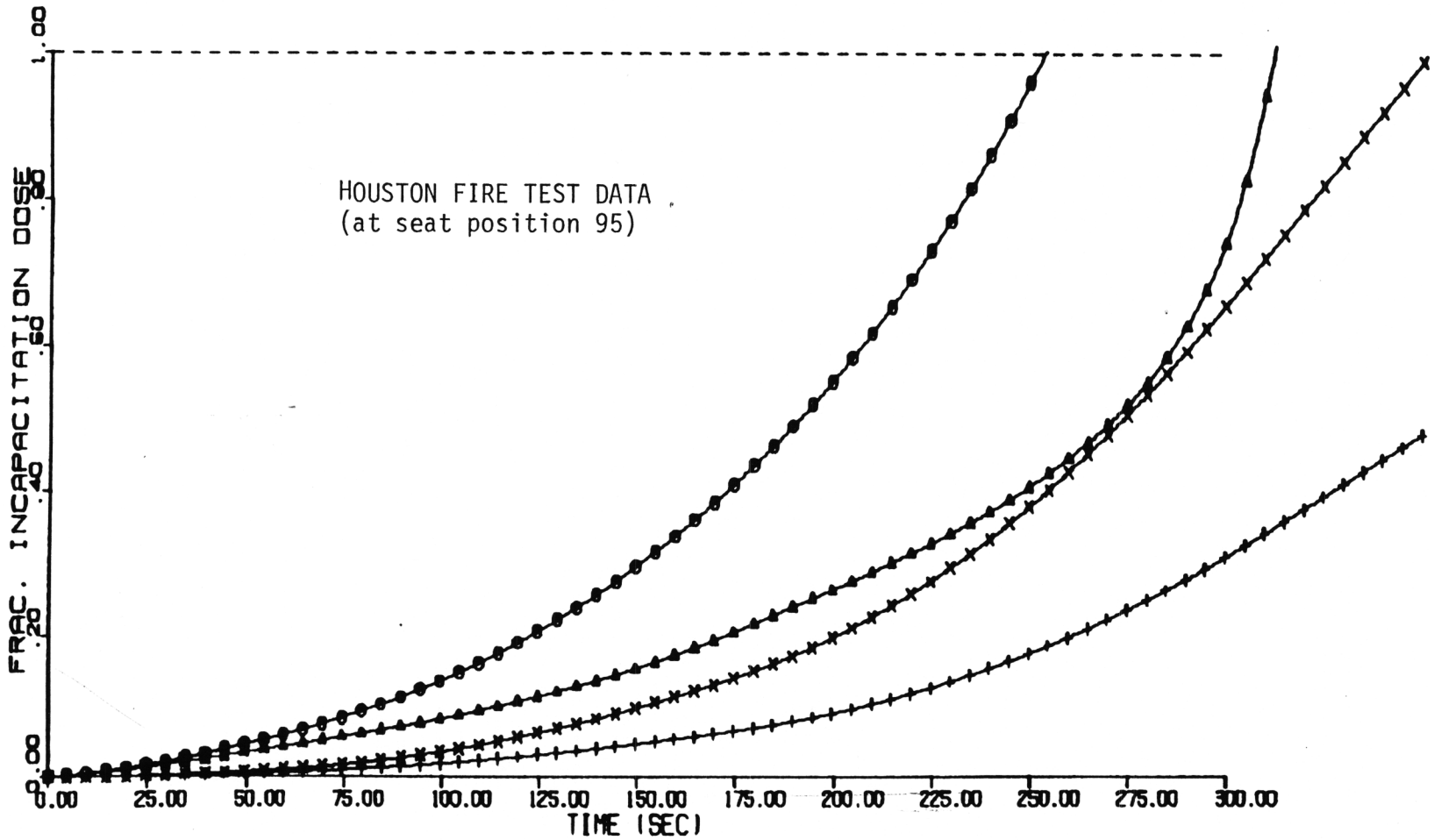

LEGEND
FDZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO - Crane's incap. equation
BR = 10.55 X Time + 300 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 14 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

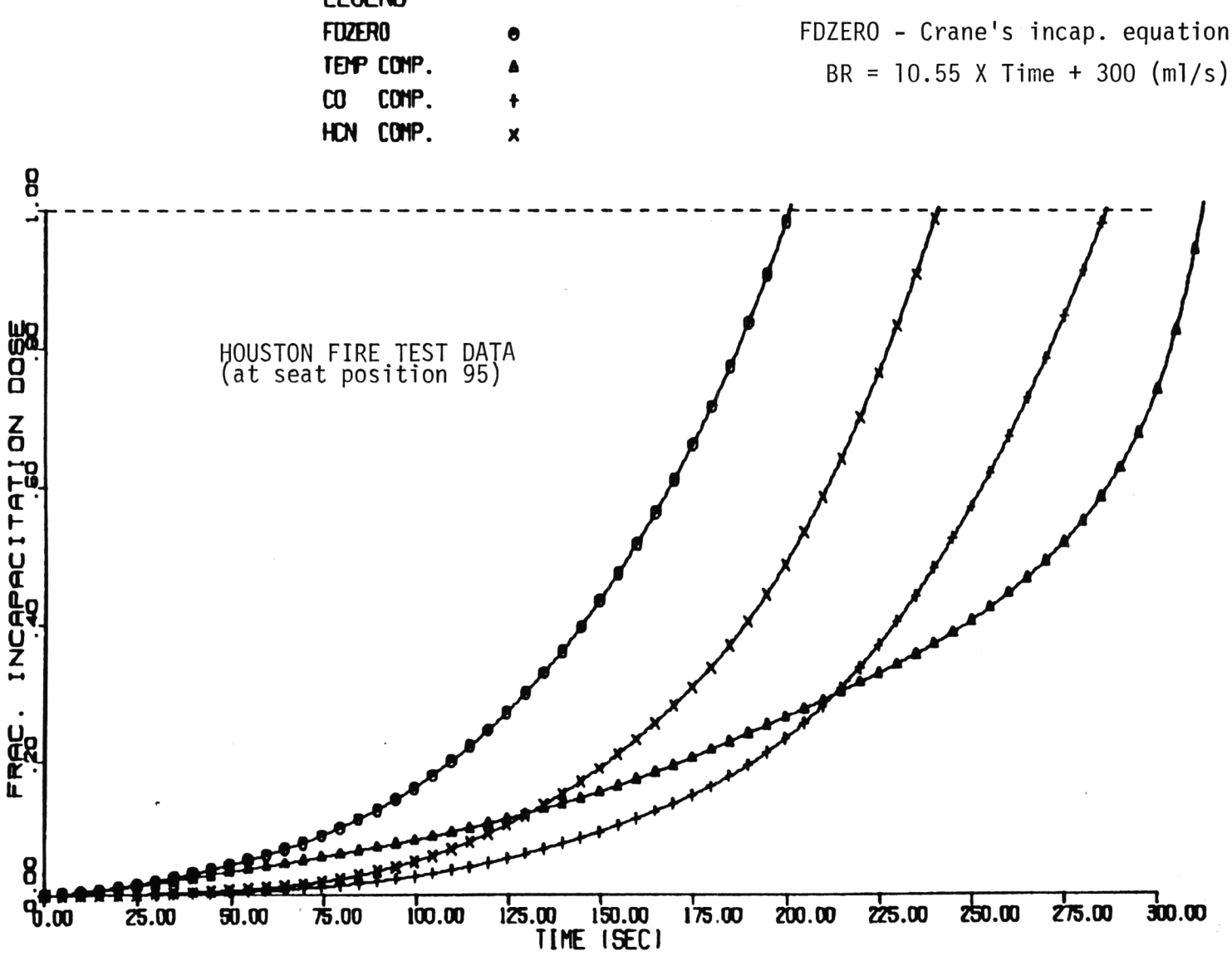

LEGEND
FOZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO - Crane's incap. equation
BR = 850 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 14 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

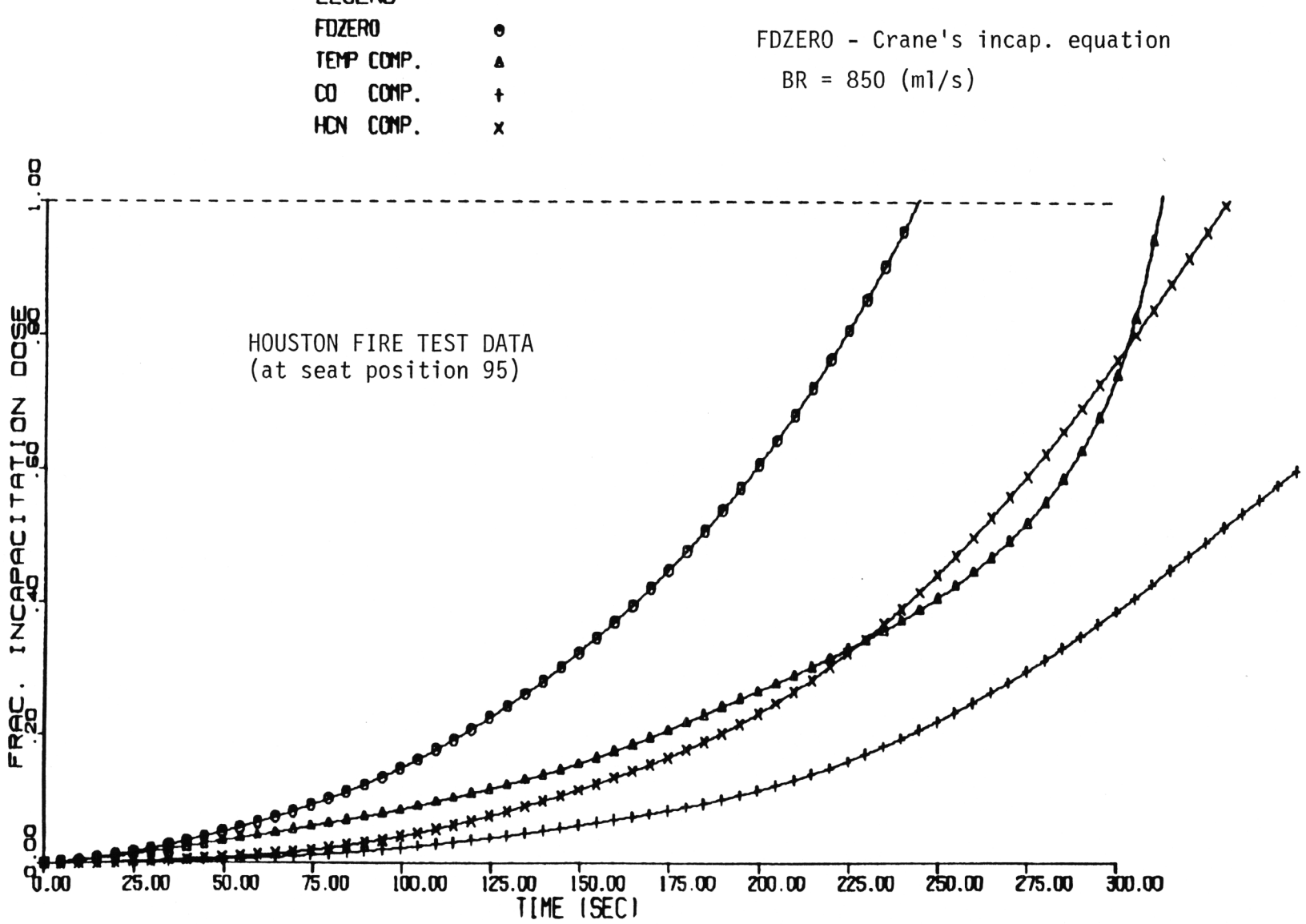

TEMP
HOUSTON FIRE TEST DATA
(at seat position 95)
TEMPERATURE (CELSIUS)
0.00
50.00
100.00
150.00
200.00
250.00
300.00
350.00
400.00
450.00
500.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

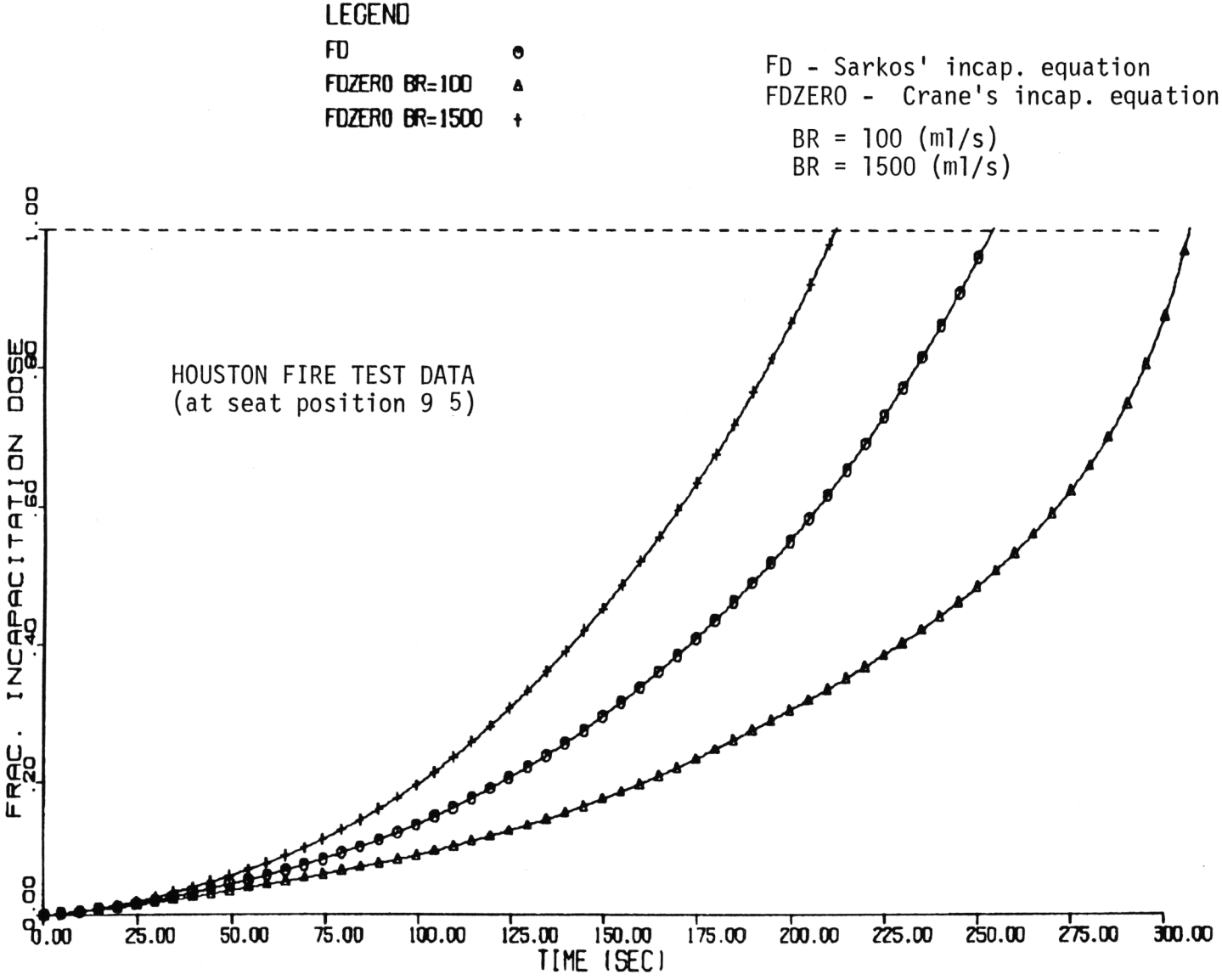

LEGEND
CO
HCN
HOUSTON FIRE TEST DATA
(at seat position 95)
GAS CONCENTRATIONS x10
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

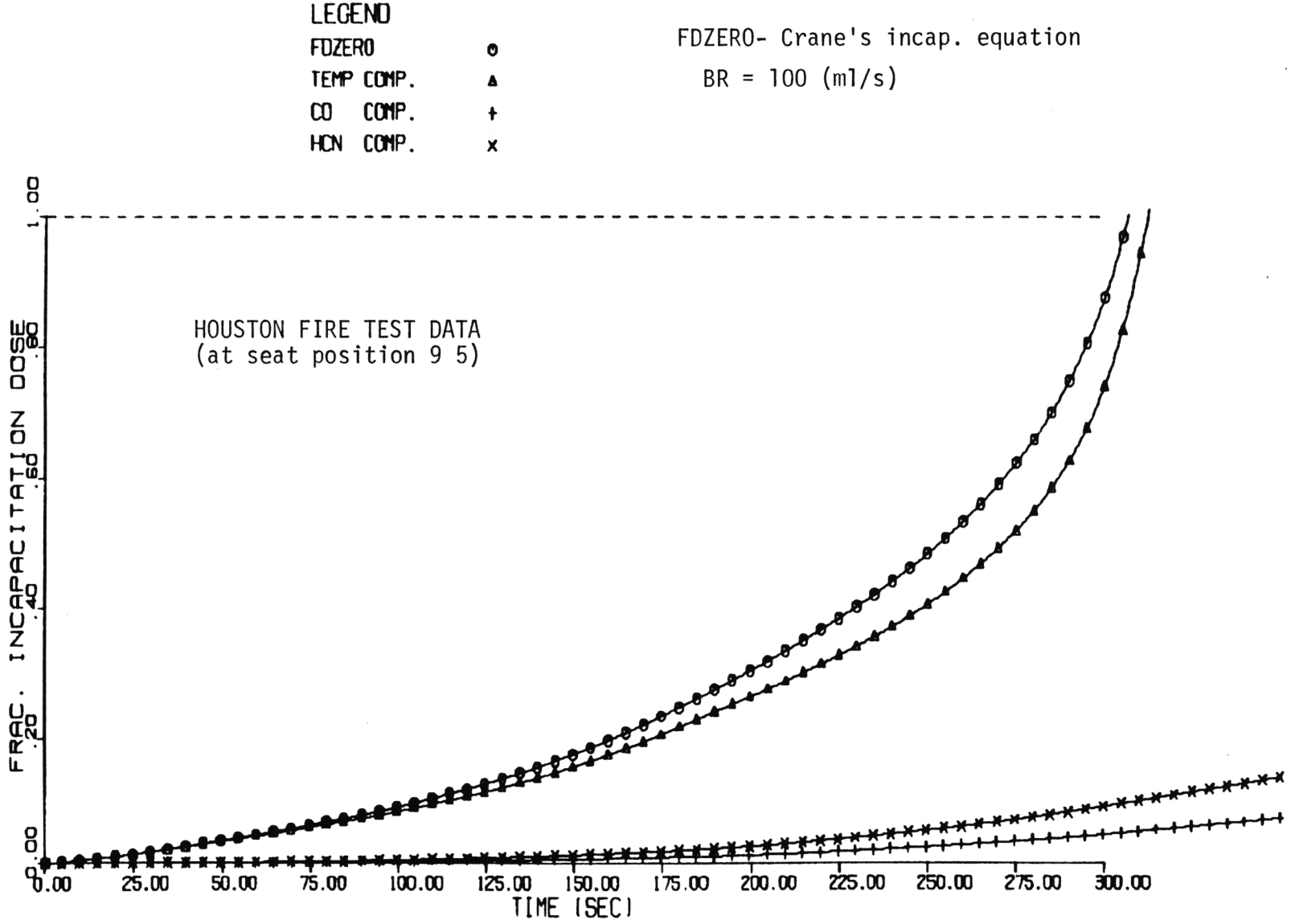

LEGEND
FD
FDZERO BR LINEAR
FDZERO BR CONST.
FD - Sarkos' incap. equation
FDZERO - Crane's incap. equation
BR Linear - BR = 10.55 X Time + 300 (ml/s)
BR Constant - BR = 850 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 95)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

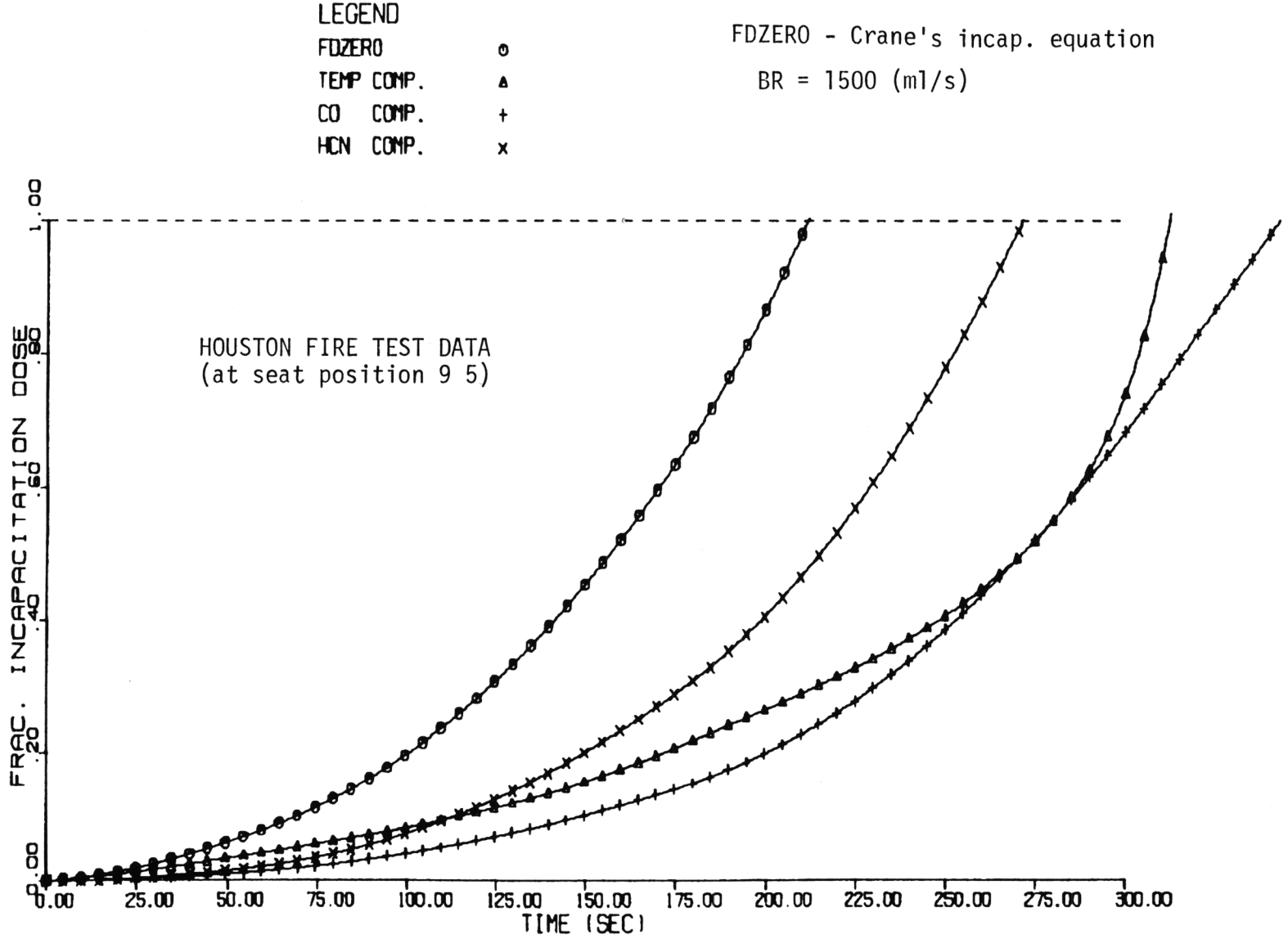

LEGEND
FD
TEMP COMP.
CO COMP.
HCN COMP.
FD - Sarkos' incap. equation
HOUSTON FIRE TEST DATA
(at seat position 95)
FRAC. INCAPACITATION DOSE
.00
.20
.40
.60
.80
1.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

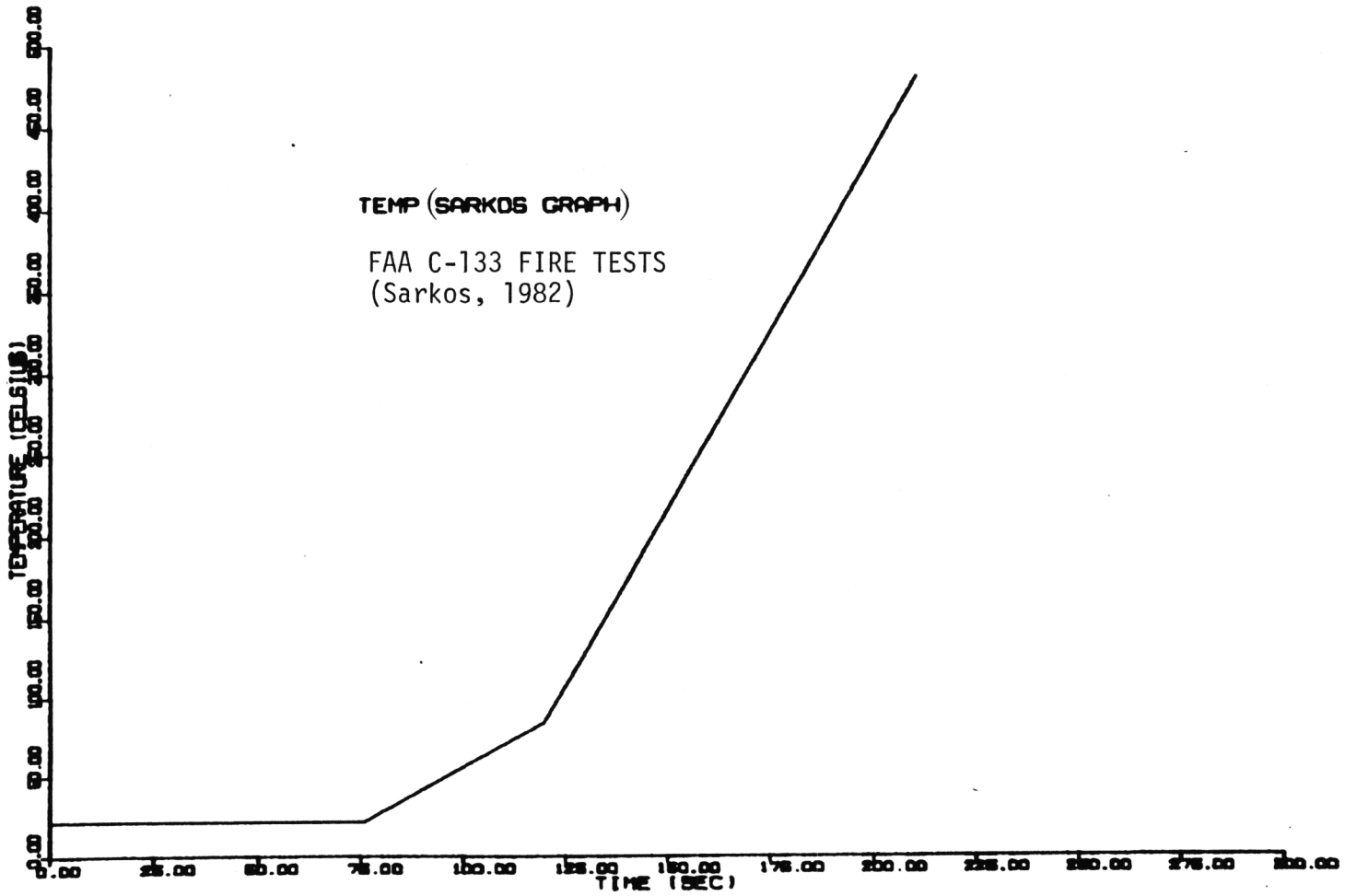

LEGEND
FDZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO - Crane's incap. equation
BR = 10.55 X Time + 300 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 95)
FRAC. INCAPACITATION DOSE
TIME (SEC)
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00

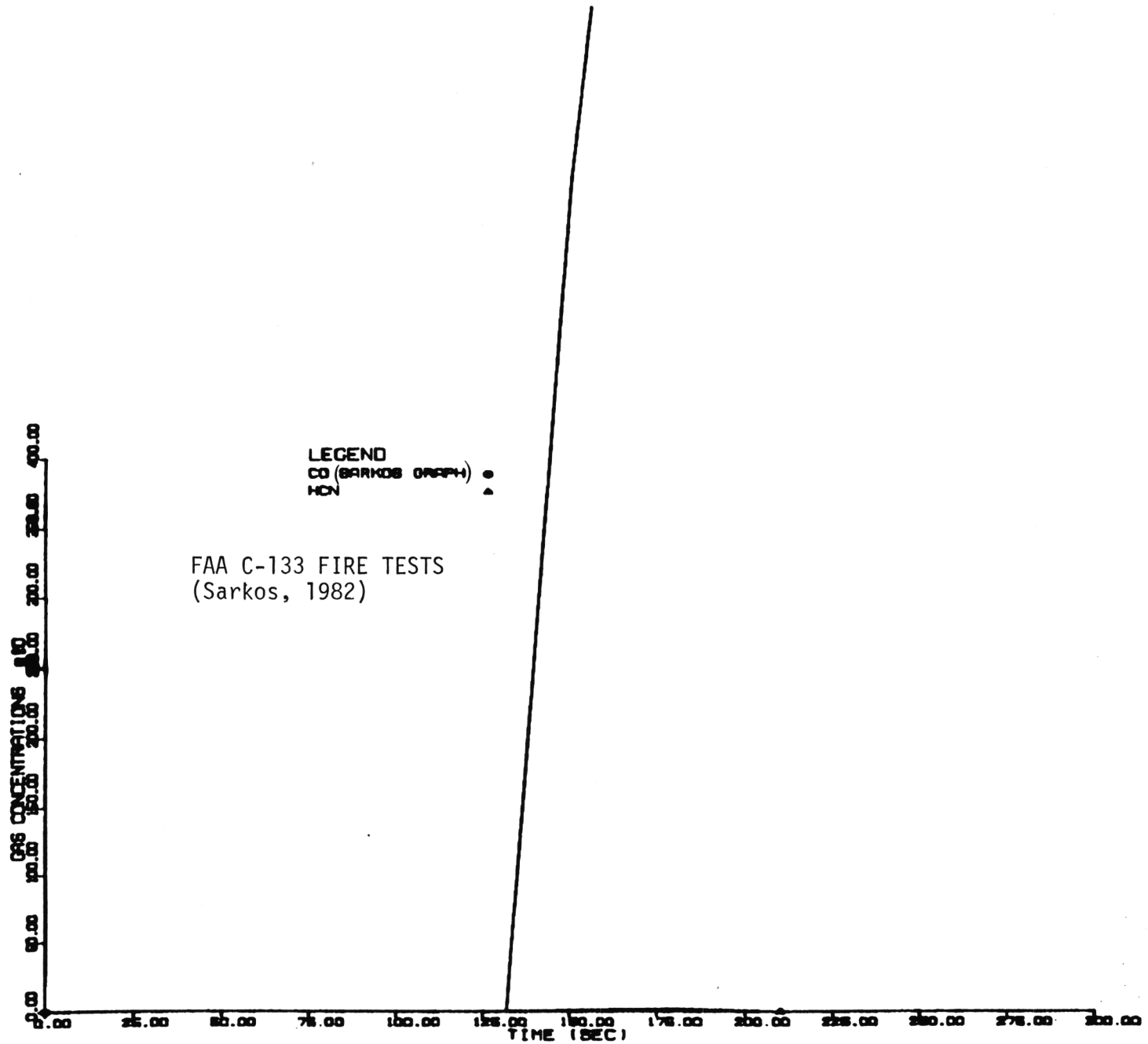

LEGEND
FDZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO - Crane's incap. equation
BR = 850 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 95)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

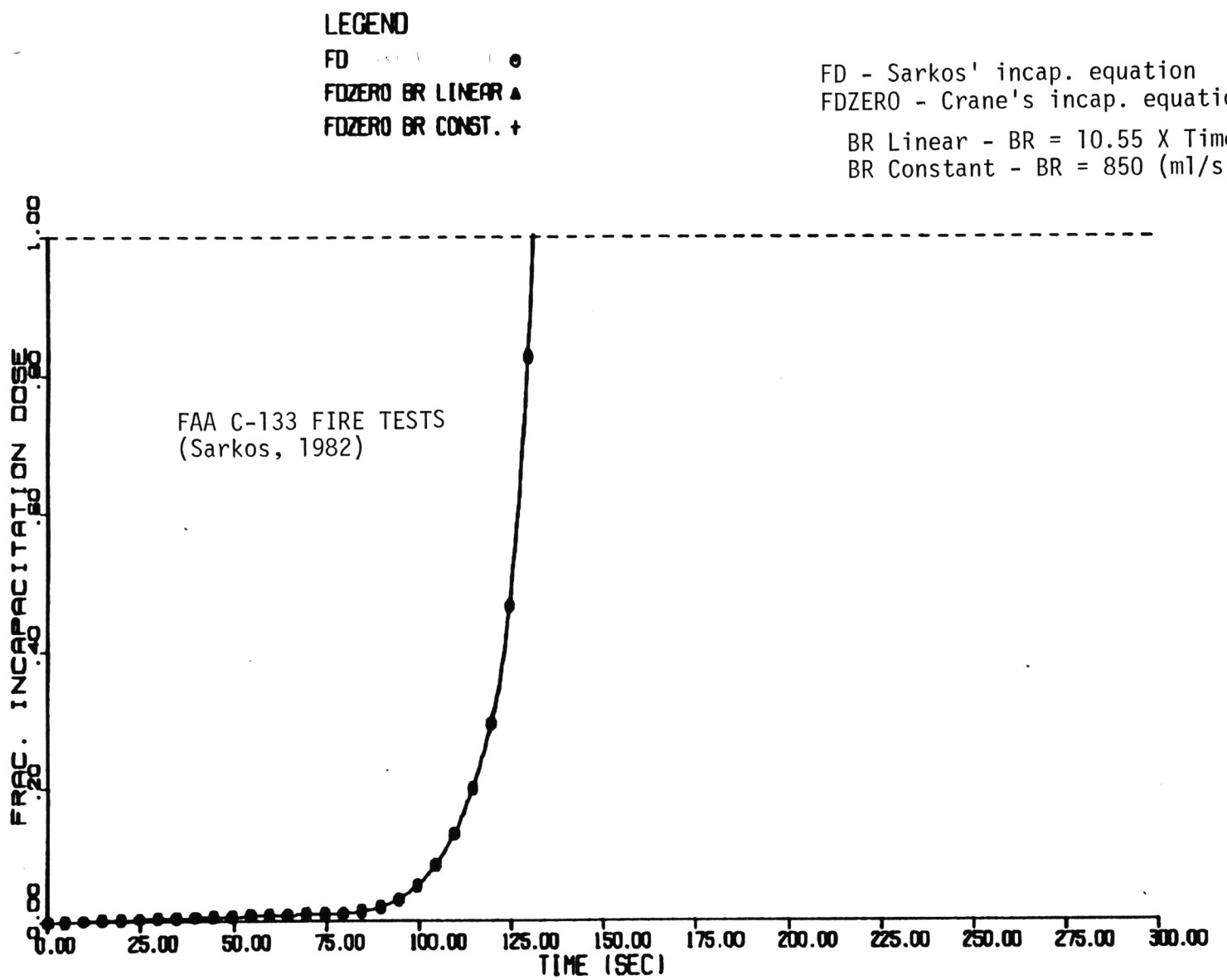

LEGEND
FD
FDZERO BR=100
FDZERO BR=1500
FD - Sarkos' incap. equation
FDZERO - Crane's incap. equation
BR = 100 (ml/s)
BR = 1500 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 9 5)
FRAC. INCAPACITATION DOSE
0.00
.20
.40
.60
.80
1.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

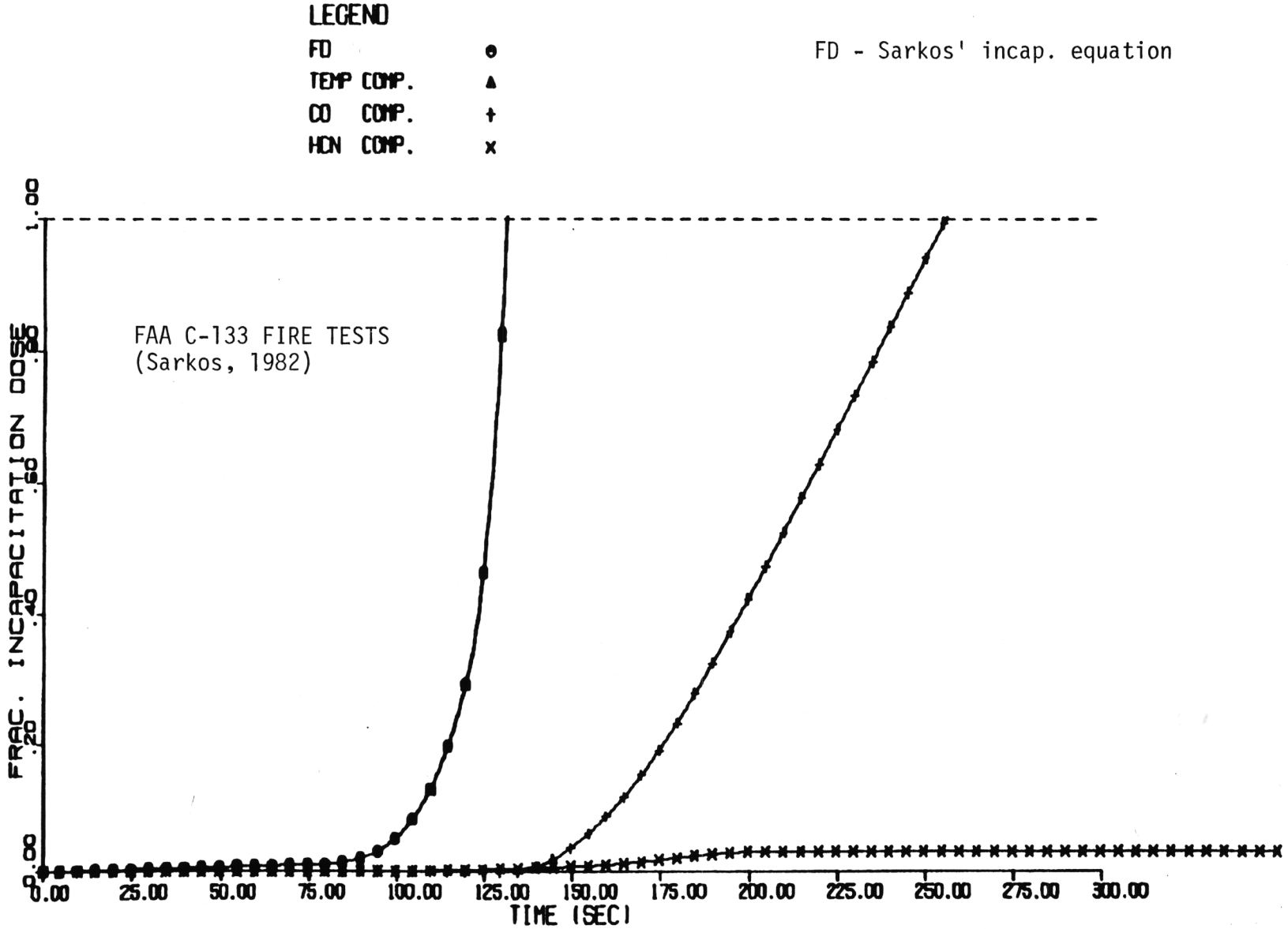

LEGEND
FDZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO- Crane's incap. equation
BR = 100 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 9 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)

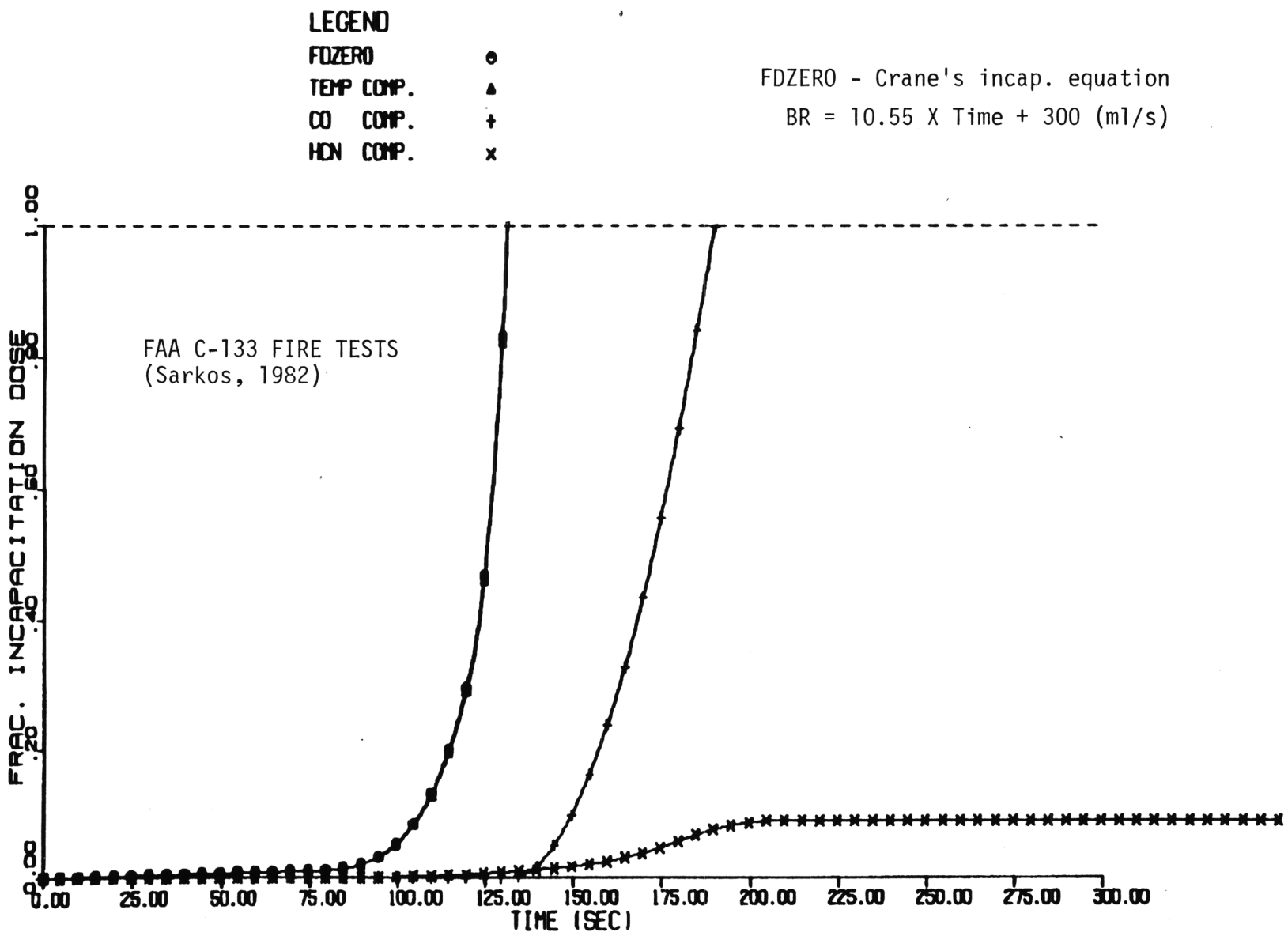

LEGEND
FDZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO - Crane's incap. equation
BR = 1500 (ml/s)
HOUSTON FIRE TEST DATA
(at seat position 9 5)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)


TEMP (SARKOS GRAPH)
FAA C-133 FIRE TESTS
(Sarkos, 1982)
TEMPERATURE (CELSIUS)
TIME (SEC)


LEGEND
CO (SARKOS GRAPH)
HCN
FAA C-133 FIRE TESTS
(Sarkos, 1982)
GAS CONCENTRATIONS
TIME (SEC)


LEGEND
FD
FDZERO BR LINEAR
FDZERO BR CONST.
FD - Sarkos' incap. equation
FDZERO - Crane's incap. equation
BR Linear - BR = 10.55 X Time + 300 (ml/s)
BR Constant - BR = 850 (ml/s)
FAA C-133 FIRE TESTS
(Sarkos, 1982)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)


LEGEND
FD
TEMP COMP.
CO COMP.
HCN COMP.
FD - Sarkos' incap. equation
FAA C-133 FIRE TESTS
(Sarkos, 1982)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)


LEGEND
FDZERO
TEMP COMP.
CO COMP.
HCN COMP.
FDZERO - Crane's incap. equation
BR = 10.55 X Time + 300 (ml/s)
FAA C-133 FIRE TESTS
(Sarkos, 1982)
FRAC. INCAPACITATION DOSE
1.00
.80
.60
.40
.20
0.00
0.00
25.00
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00
250.00
275.00
300.00
TIME (SEC)