

South Texas 1 Fuel Assembly Inspection Program

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Inspection work was conducted at South Texas Unit 1 by an NSD crew under the direction of PPE engineer John Bury. The inspections were performed between July 10, 1996 and July 26, 1996.

a, b, c

The responsibility for the reduction and verification of individual portions of the inspection program was assigned to various PPE engineers. Their signatures on this document attest that (1) they have independently verified the sections assigned to them; and (2) they concur with the results documented herein. A listing of the individual data reduction and verification assignments is given below:

<u>Inspection Program Section</u>	<u>Originating Engineer</u>	<u>Verifying Engineer</u>
1.0 Background & Objectives	D. Colburn	J. Halligan
2.0 Full Length RCCA Drag Tests	D. Colburn	D. Davis
3.0 Guide Thimble Plug Gage Exams	D. Colburn	J. Halligan
4.0 Guide Thimble Borescope Exams	D. Colburn	D. Davis
5.0 F/A Length Measurements	H. Kunishi	A. Konzel
6.0 Fuel Rod Growth Data	H. Kunishi	A. Konzel
7.0 Fuel Assembly Bow Data	D. Davis	D. Colburn
8.0 Overall Summary	D. Colburn	D. Davis

Signatures On File

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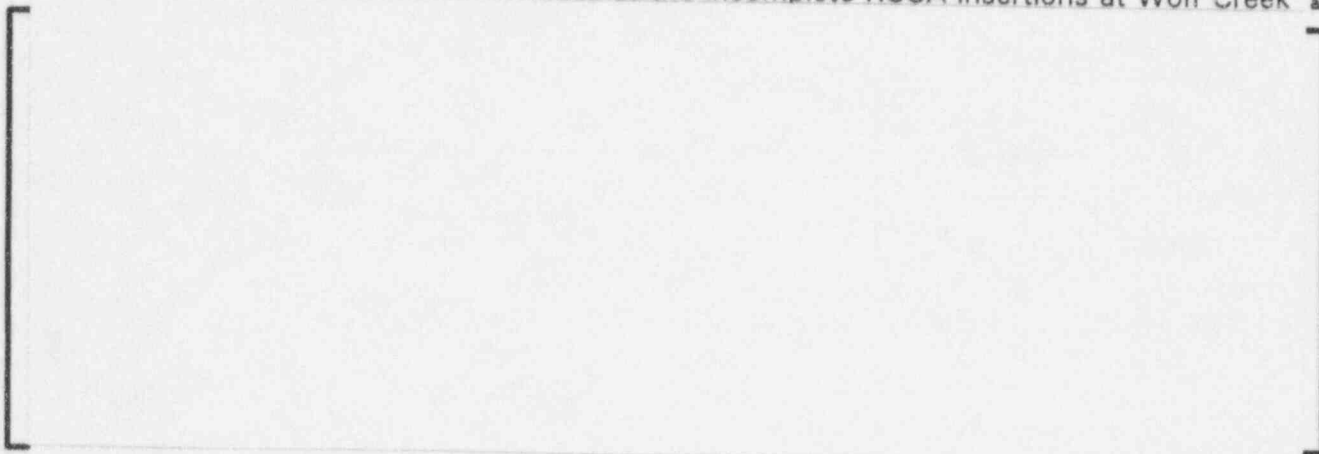
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1.0 Background and Objectives

An RCCA insertion anomaly was experienced at Wolf Creek and South Texas Unit 1. During SCRAMs, several RCCAs did not fully insert. Both plants conducted additional drop tests after the anomaly, and additional RCCAs did not fully insert. A subsequent inspection program concluded that the direct cause of the incomplete RCCA insertions at Wolf Creek a, b, c



The following tests were scheduled to be conducted during the inspection program:

- (1) RCCA Drag Tests;
- (2) Guide Thimble Plug Gage Exams (Single Tube Probe Tests),
- (3) Fuel Assembly Length Measurements;
- (4) Fuel Assembly Bow Measurements
- (5) Fuel Rod-to-Nozzle Gap Measurements; and
- (6) Borescope inspection.

Fuel assembly length measurements and fuel rod-to-nozzle gap measurements were needed to determine if the growth of the fuel assemblies and fuel rods was within the anticipated range.

2.0 Full Length RCCA Drag Tests (Spent Fuel Pool)

a, b, c



a, b, c

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Table 2.1: Fuel Features of South Texas Unit 1 17x17 Fuel Assemblies

a, b, c

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Table 2.2: South Texas Unit 1 Drag Test Data

a, b, c

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Figure 2.1: South Texas 1 Dashpot and Upper Guide Thimble Drag Data



Figure 2.2: South Texas 1 Dashpot Drag and Fast Fluence Data



Figure 2.3: South Texas 1 Upper Guide Thimble Drag and Fast Fluence Data



3.0 Single Tube Probe

Single tube probing was conducted on eleven fuel assemblies at South Texas Unit 1. Assembly burnup and drag test results were used to select the assemblies (Table 3.1). The

a, b, c

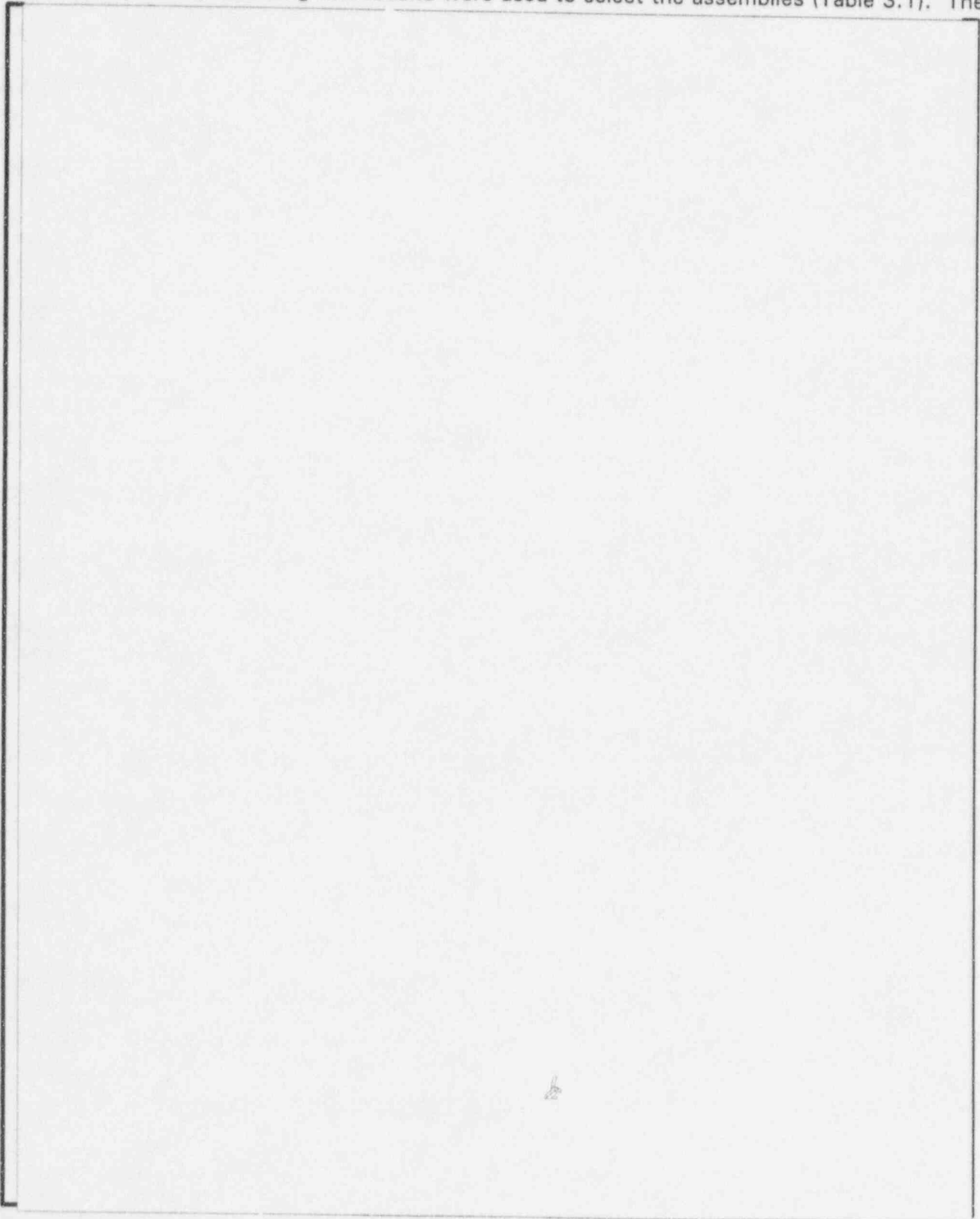


Table 3.1: Single Tube Probe Test Results

a, b, c

4.0 Guide Thimble Borescope Exams

a, b, c



5.0 Fuel Assembly Growth Data

Fuel assembly length measurements were performed on a total of 24 assemblies (3 assemblies from Region C, 2 assemblies from Region E, 17 assemblies from Region F and ^{a, b, c}

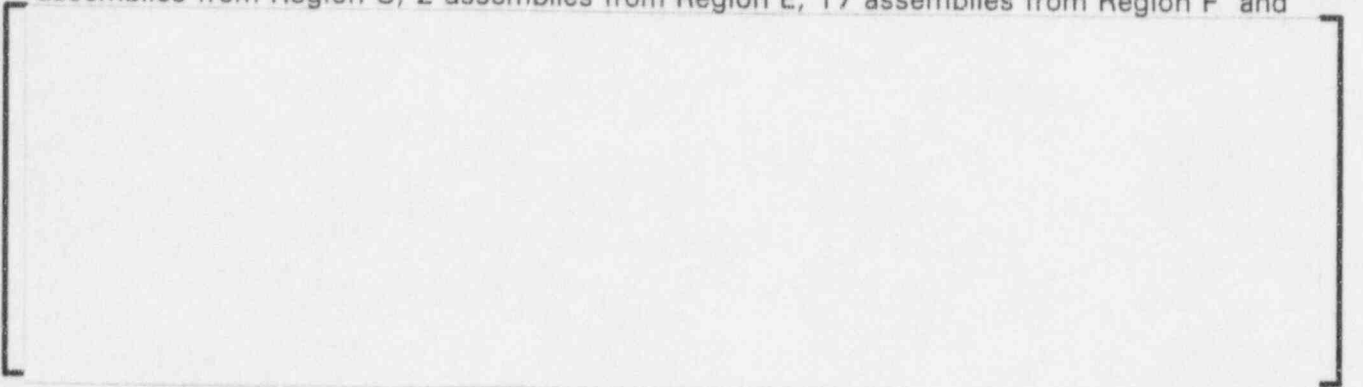


Figure 5.1: Recent Assembly Growth Data

a, b, c

6.0 Fuel Rod Growth Data

The axial gaps between the peripheral rods and the assembly nozzles were measured from the low magnification TV tapes of 9 South Texas Unit 1 assemblies to determine fuel rod growth. The assemblies were C28, E10, E31, F26, F32, F37, F41, R27 and R31.

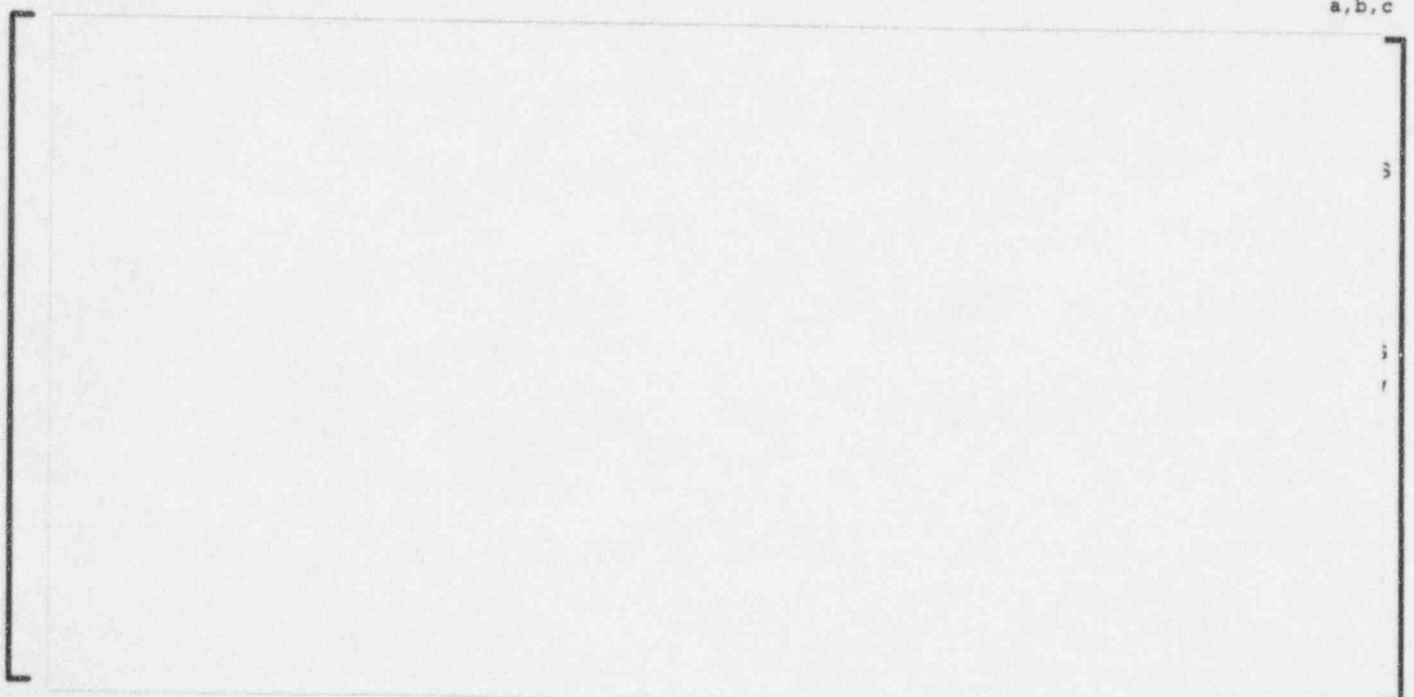
a, b, c



Figure 6.1: Recent Rod Growth Data



7.0 Fuel Assembly Bow Data



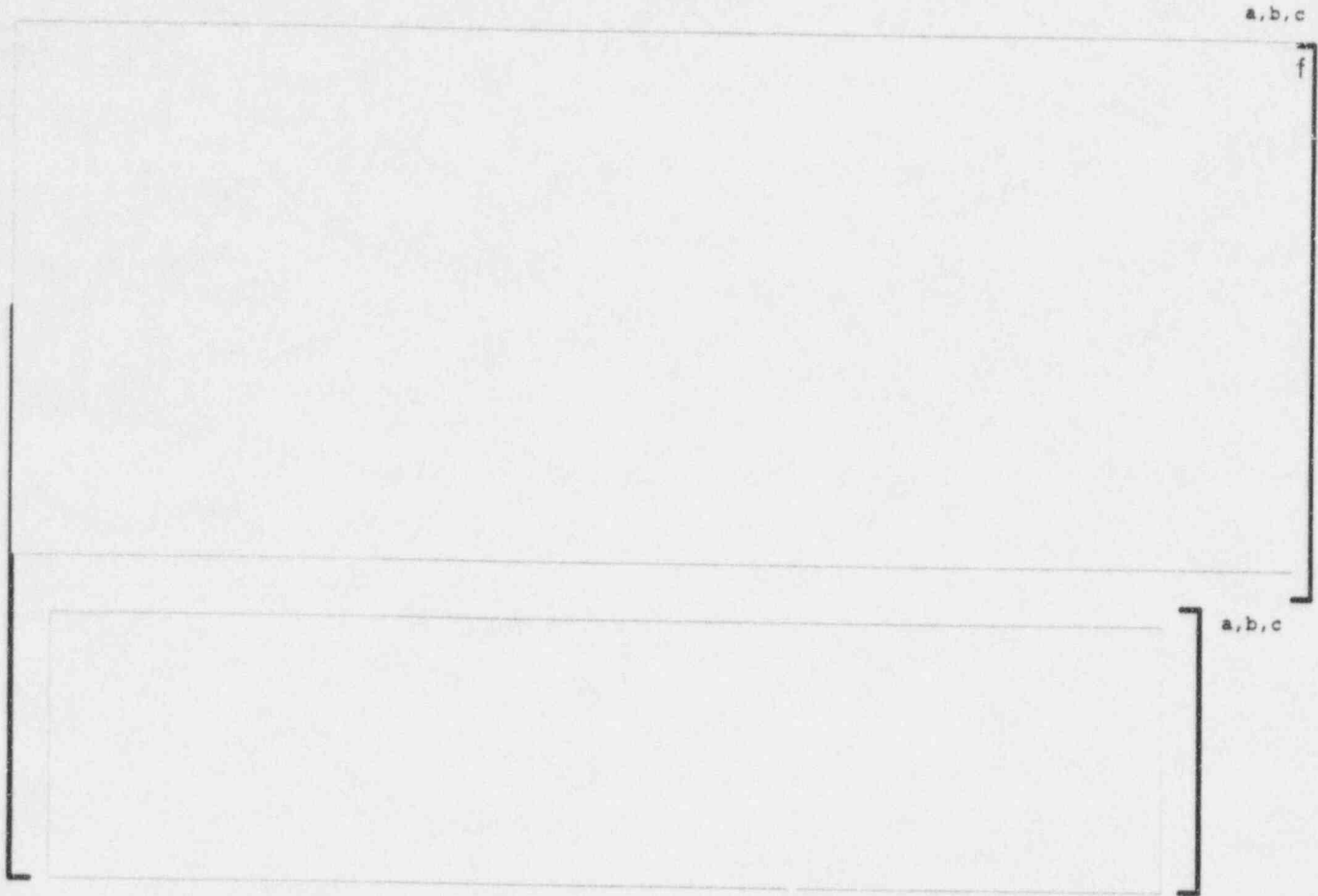


Figure 7.1: South Texas 1 Assembly Bow Data - (Vector Added)



8.0 Summary

The growth of the fuel assemblies and fuel rods measured at South Texas Unit 1 is consistent ^{a, b, c}

Appendix A: South Texas 1 Fuel Assembly Drag Trace

a, b, c

Appendix B: South Texas 1 Assembly Growth Data

a,b,c



Appendix C
Fuel Rod Growth Data
for
South Texas 1

SOUTH TEXAS 1

a,b,c

SOUTH TEXAS 1

8.0.2

SOUTH TEXAS 1

A.D.C.

SOUTH TEXAS 1

a.d.c.

SOUTH TEXAS 1

A B C

SOUTH TEXAS 1

2.0.2

SOUTH TEXAS 1

a. b. c.

SOUTH TEXAS 1

4.0.2

SOUTH TEXAS 1

A.D.C.

Appendix D
Fuel Assembly Bow Data
for
South Texas 1

Figure D.1: South Texas 1 Fuel Assembly F26 Bow Data - Direct View

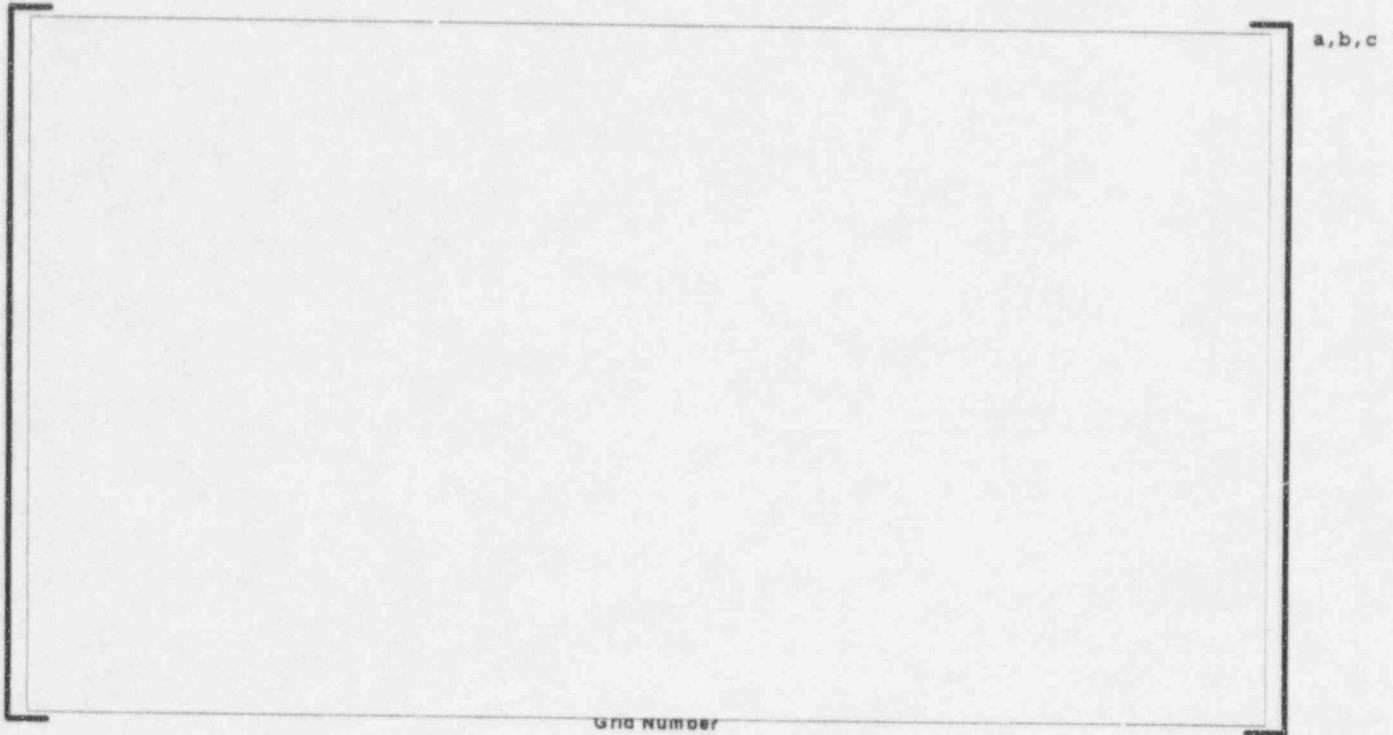


Figure D.2: South Texas 1 Fuel Assembly F32 Bow Data - Direct View

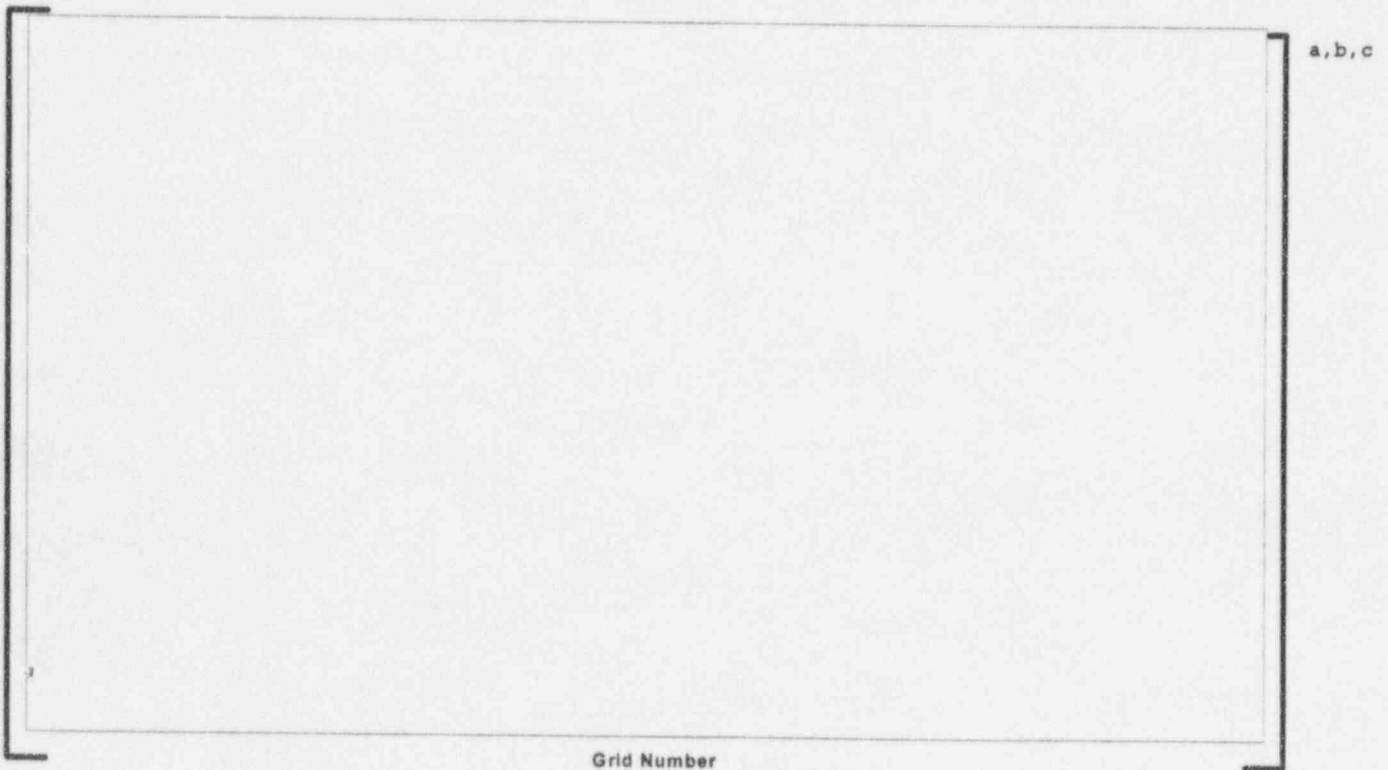


Figure D.3: South Texas 1 Fuel Assembly F37 Bow Data - Direct View

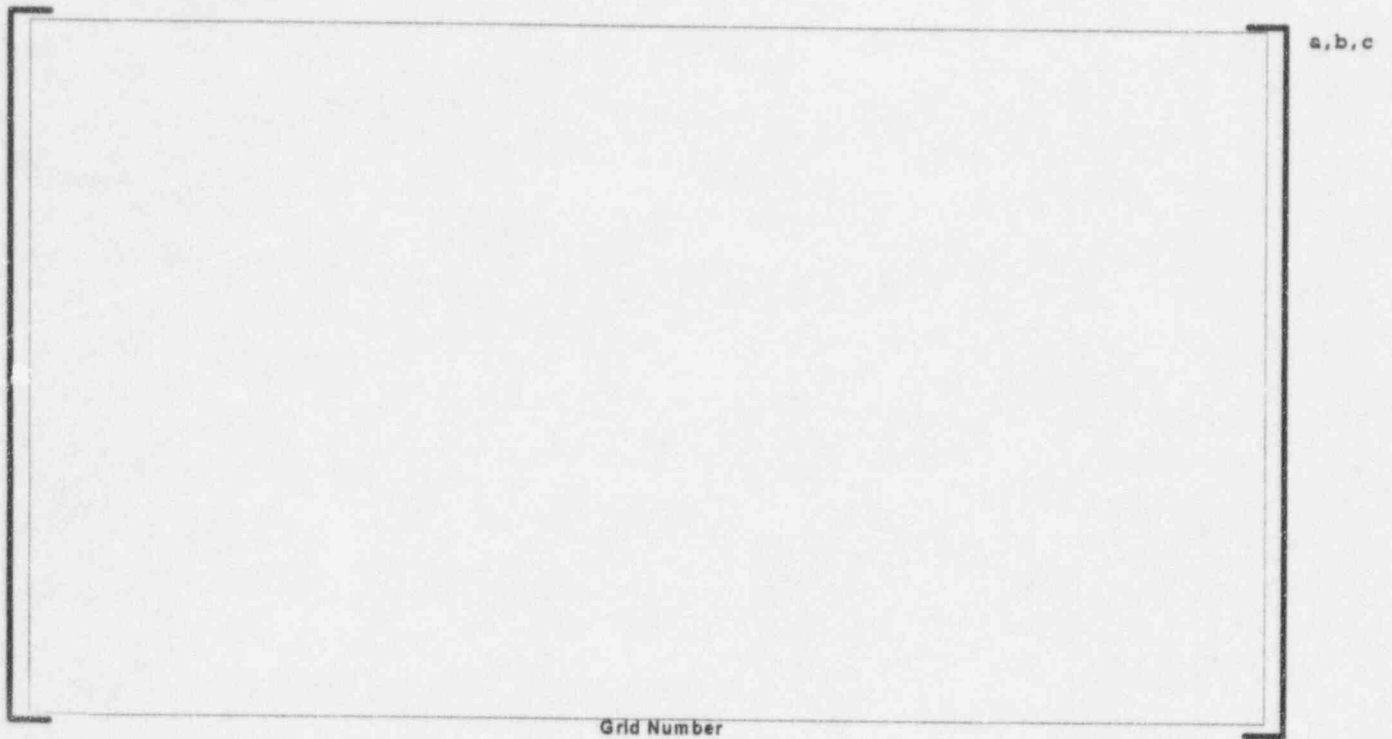


Figure D.4: South Texas 1 Fuel Assembly F41 Bow Data - Direct View

