

January 31, 2018

Docket Nos.: 52-025
52-026

ND-18-0062
10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

**Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Supplement to Request for License Amendment:
Human Factors Engineering Resolution Verification Process Revisions (LAR-17-030S1)**

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) requested in letter ND-17-1588, dated September 29, 2017 [ADAMS Accession Number ML17272A957] an amendment, LAR-17-030, to the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF-92, respectively). The requested amendment proposed to depart from Tier 2* and associated Tier 2 information in the Updated Final Safety Analysis Report (UFSAR) (which includes the plant-specific DCD Tier 2 information).

The requested amendment proposed to depart from UFSAR Tier 2* information regarding resolution of human engineering deficiencies (HEDs) contained in Westinghouse report APP-OCS-GEH-320, "AP1000 Human Factors Engineering Integrated Systems Validation Plan," which is incorporated by reference into the VEGP Units 3 and 4 UFSAR. On January 8, 2018, the NRC provided a request for additional information [ADAMS Accession Number ML18008A254] for LAR-17-030. This letter provides the response to the request additional information and provides a supplement to LAR-17-030.

Enclosure 1 through 6 of SNC letter ND-17-1588 were provided with the original LAR-17-030.

Enclosure 7 provides the responses to the NRC Staff request for additional information.

Enclosure 8 provides the public version of changes to proposed markups provided in the original LAR, LAR-17-030 (Enclosure 2 of SNC letter ND-17-1588). Enclosure 8 is redacted, such that Enclosure 8 may be made available for disclosure to the public. Enclosure 8 replaces Enclosure 2 in its entirety.

Enclosure 9 provides a non-public version of changes to proposed markups provided in the original LAR, LAR-17-030 (Enclosure 3 of SNC letter ND-17-1588). Enclosure 9 includes information that is considered to be proprietary; therefore, **Enclosure 9 is requested to be withheld from disclosure to the public.** Enclosure 9 replaces Enclosure 3 in its entirety.

The information requested to be withheld from public disclosure in Enclosure 9 is identical to the information requested to be withheld in Enclosure 3 of the original LAR 17-030 submittal (Letter ND-17-1588). The affidavit from SNC supporting withholding under 10 CFR 2.390 is provided as Enclosure 5 of ND-17-588. Enclosure 6 of ND-17-1588 is Westinghouse's Proprietary Information Notice, Copyright Notice and CAW-17-4650, Application for Withholding Proprietary Information from Public Disclosure and Affidavit. The affidavit sets forth the basis upon which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations. Accordingly, it is respectfully requested that the information that is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse affidavit should reference CAW-17-4650 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066. Correspondence with respect to proprietary aspects of this letter and its enclosures should also be addressed to Brian H. Whitley at the contact information on the first page this letter.

The supplemental information provided in this LAR supplement does not impact the scope, technical content, or conclusions of the Technical Evaluation, Significant Hazards Consideration Determination, or Environmental Considerations of the original LAR, LAR-17-030, provided in Enclosure 1 of SNC letter ND-17-1588.

This letter contains no regulatory commitments. This letter has been reviewed and determined not to contain security related information.

In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia by transmitting a copy of this letter and its enclosures to the designated State Official.

Should you have any questions, please contact Amy C. Chamberlain at (205) 992-6361.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 31st of January 2018.

Respectfully submitted,



Amy G. Aughtman
Licensing Director, Regulatory Affairs
Southern Nuclear Operating Company

- Enclosures (1 through 6) (Previously submitted with original LAR-17-030 via ND-17-1588)
- 7 Vogtle Electric Generating Plant (VEGP) Units 3 and 4 - Response to NRC Request for Additional Information Regarding the LAR-17-030 Review (LAR-17-030S1)
 - 8 Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Supplement to Proposed Changes to Licensing Basis Documents (LAR-17-030S1).
 - 9 Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Supplement to Proposed Changes to Licensing Basis Documents (**Withheld Information**) (LAR-17-030S1).

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cc:

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Municipal Electric Authority of Georgia

Mr. J. E. Fuller (w/o enclosure 9)

Mr. S. M. Jackson (w/o enclosure 9)

Dalton Utilities

Mr. T. Bundros (w/o enclosure 9)

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Mr. L. Oriani (w/o enclosures)

Mr. G. Koucheravy (w/o enclosures)

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Mr. D. Hawkins

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Other

Mr. S. W. Kline, Bechtel Power Corporation

Ms. L. A. Matis, Tetra Tech NUS, Inc. (w/o enclosure 9)

Dr. W. R. Jacobs, Jr., Ph.D., GDS Associates, Inc. (w/o enclosure 9)

Mr. S. Roetger, Georgia Public Service Commission (w/o enclosure 9)

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Southern Nuclear Operating Company

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Enclosure 7

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Response to NRC Request for Additional Information

Regarding the LAR-17-030 Review

(LAR-17-030S1)

(This Enclosure consists of five pages, including this cover page)

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Enclosure 7

Response to NRC Request for Additional Information Regarding the LAR-17-030 Review
(LAR-17-030S1)

NRC Question 1:

Please explain whether test participants who will form the crews for ISV retesting will also meet the selection criteria in APP-OCS-GEH-320, Section 4.1.1.

SNC Response to Question 1:

All operators chosen for ISV retest trials will continue to meet the criteria described in section 4.1.1 of APP-OCS-GEH-320.

APP-OCS-GEH-320, Section 7.3, will be revised to clarify that test participants will meet the selection criteria specified in Section 4.1.1. The proposed revision to Section 7.3 is shown below in the proposed revision to UFSAR Appendix 18A, *Human Factors Engineering Licensing Basis Document Changes*.

NRC Question 2:

Please explain the specific changes that will be made to the ISV scenarios that meet the requirements for ISV retesting in APP-OCS-GEH-320, Section 7.3, and explain what, if any, impact the changes will have on the ability to draw conclusions that the changes implemented to address HEDs are effective.

SNC Response to Question 2:

The changes to the scenarios primarily resulted from the plant operating procedure changes that occurred as a result of human engineering deficiency (HED) resolution activities. The ISV retest scenarios continue to create an environment which tests the integrated plant operation and Human System Interface. The initial conditions and portions of scenarios leading to HED portions remain essentially unchanged. As such, the scenario continues to include distractors, workloads, and complexity leading to events under test (i.e., test objectives). The scenarios will continue to meet the same complexity requirements as when they were executed during the original ISV test.

APP-OCS-GEH-320, Section 7.3, will be revised to clarify that changes to scenarios will not affect the ability to draw conclusions that the changes implemented to address HEDs are effective. The proposed revision to Section 7.3 is shown after the response to NRC Question 6 below in the proposed revision to UFSAR Appendix 18A, *Human Factors Engineering Licensing Basis Document Changes*.

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Enclosure 7

Response to NRC Request for Additional Information Regarding the LAR-17-030 Review
(LAR-17-030S1)

NRC Question 3:

Please explain why scenarios used for retesting will meet the criteria in NUREG-0711, Section 8.4.6.2 for performance-based testing instead of the criteria in NUREG-0711, Section 11.4.3 for validation testing.

SNC Response to Question 3:

The Integrated System Validation (ISV) provides a comprehensive human performance-based assessment of the final design of the AP1000® Human-System Interface (HSI) resources, as described in APP-OCS-GEH-320, *AP1000 Human Factors Engineering Integrated System Validation Plan*, Section 1.1. The ISV plan was developed using guidance of NUREG-0711 including performance based validation described in NUREG Section 11.4.3. The ISV retest will continue to use the guidance of both NUREG sections 8.4.6.2 and 11.4.3 criteria.

NRC Question 4:

Please explain whether APP-OCS-GEH-320, Section 6.3.1, needs to be revised to align with Section 7.3. If so, please revise APP-OCS-GEH-320, Section 6.3.1.

SNC Response to Question 4:

No additional changes to Section 6.3.1 are needed. Only one change in APP-OCS-GEH-320, Section 6.3.1, was proposed to clarify the number of times the scenario will be re-run following an ISV test failure. Further changes are not needed as Section 6.3.1 contains the pass/fail criteria for the initial ISV. The retest pass/fail criteria for the retest is defined within the revised Section 7.3.

NRC Question 5:

Please identify the specific scenarios that require retesting in accordance with APP-OCS-GEH-320, and the changes that have been implemented to resolve the significant HEDs identified in these scenarios.

SNC Response to Question 5:

The HED resolution verification will require retest of five (5) of the original ISV scenarios in accordance with the pass/fail criteria of the ISV. The retest scenarios will be essentially the same as the original set. Minor objectives that are not the focus of retest may be removed in limited instances if they do not impact the flow or complexity of the test setup. The failures and objectives that are removed will not impact the workload or complexity of the scenario. Significant HEDs which led to scenario failure during the ISV have been resolved

through design changes, procedure changes, and/or training. These changes are being evaluated as part of the ISV retest.

APP-OCS-GEH-320, Section 7.3, will be revised to clarify that basis for scenario selection for HED resolution verification and that changes to scenarios will not affect the ability to draw conclusions that the changes implemented to address HEDs are effective. The proposed revision to Section 7.3 is shown after the response to NRC Question 6 below in the proposed revision to UFSAR Appendix 18A, *Human Factors Engineering Licensing Basis Document Changes*.

NRC Question 6:

Please explain how reducing the required number of successful retest results needed to determine the design is validated provides a logical basis for determining the design supports safe plant operation.

SNC Response to Question 6:

The initial ISV report concluded that the Main Control Room and Human System Interface support safe operation since no safety limits were exceeded during the test. HED resolution verification process provides additional margin to safety and resolves risk informed human action (RIHA) failures. The reduction of the number of successful retest results needed to validate the correction of the HEDs associated with ISV scenario failures continues to support safe operation. The ISV test was developed to provide adequate discovery of issues. The objective of the HED resolution verification is to ensure HEDs are documented, tracked, and adequately addressed. The reduction of the number of scenario iterations still fulfills the objective as it demonstrates that the success of representative operating crew is repeatable and not anomalous. This confirms that resolution of the identified ISV HEDs has occurred and are no longer a challenge to completing the objectives of the ISV scenarios. ISV retest observers will continue to monitor to ensure scenario and safety limits are not violated.

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Enclosure 7

Response to NRC Request for Additional Information Regarding the LAR-17-030 Review
(LAR-17-030S1)

Proposed Addition to APP-OCS-GEH-320 / UFSAR Appendix 18A.1:

[Reviewer's Note: The below addition is the only change to Enclosures 2 and 3 of SNC Letter ND-17-1588. The change is shown in context with the original requested licensing basis changes in Enclosures 8 and 9 of this letter.]

The following will be inserted in Section 7.3 after the first paragraph:

The retest subjects meet the criteria described in section 4.1.1.

Significant HEDs which resulted in scenario failure(s) during the ISV are resolved through design changes, procedure changes, and/or training and the scenarios adjusted accordingly. These changes are evaluated as part of the ISV retest and the scenarios continue to create an environment which tests the integrated plant operation and Human System Interface. The initial conditions and portions of scenarios leading to HED portions remain essentially unchanged; as such, the scenario continues to include distractors, workloads and complexity leading to events (i.e. test objectives) under test.

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Enclosure 8

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Supplement to Proposed Changes to Licensing Basis Documents

(Publicly Available Information)

(LAR-17-030S1)

(This Enclosure consists of eight pages, including this cover page)

1. **UFSAR Table 1.6-1, “Material Referenced.”**

Change the information in the Title cell for Westinghouse Topical Report Number APP-OCS-GEH-320, for DCD Section Number 18.11, as follows:

AP1000 Human Factors Engineering Integrated System Validation Plan,]* Revision 6, Westinghouse Electric Company LLC [*(as modified by changes provided in UFSAR Appendix 18A)*]*

2. **UFSAR Section 18.11.2, “References”**

Change the reference information as follows:

[5. *APP-OCS-GEH-320, “AP1000 Human Factors Engineering Integrated System Validation Plan,”*]* Revision 6, Westinghouse Electric Company LLC⁽³⁾ [*(as modified by changes provided in UFSAR Appendix 18A)*]*

3. **UFSAR Chapter 18, “Human Factors Engineering”**

Add a new APPENDIX 18A, “HUMAN FACTORS ENGINEERING LICENSING BASIS DOCUMENT CHANGES,” at the end of the current Chapter 18. UFSAR Appendix 18A is entirely new and presents changes to information in APP-OCS-GEH-320, Revision 6. (Note: This text is all new, and is shown in blue font; however, for clarity, the text that is being added to current text in APP-OCS-GEH-320 is underlined and the text that is being deleted is shown with a strikeout.):

APPENDIX 18A HUMAN FACTORS ENGINEERING LICENSING BASIS DOCUMENT CHANGES

Note: Revised text within the licensing basis document is identified in this appendix with strikethrough font for deleted text, underlined font for new text, and three asterisks (* * *) where text is omitted for clarity.

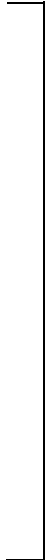
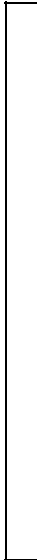
Proprietary information is bracketed and labeled with lower case alphabetic code letters outside the brackets to indicate the criteria or basis on which the proprietary determination was made.

18A.1 [*APP-OCS-GEH-320, AP1000 Human Factors Engineering Integrated System Validation Plan*]

The UFSAR incorporates by reference Tier 2 document APP-OCS-GEH-320, AP1000 Human Factors Engineering Integrated System Validation Plan. See*

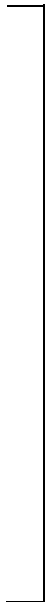
Table 1.6-1. APP-OCS-GEH-320, Revision 6, includes the following revisions and additions as indicated by strikethroughs and underlines.

- *Revise Section 6.3.1, Pass/Fail Criteria, as follows:*



(a,c)

- *Revise Section 7.3, ADDRESSING HEDS AND RE-TEST REQUIREMENTS, as follows:*



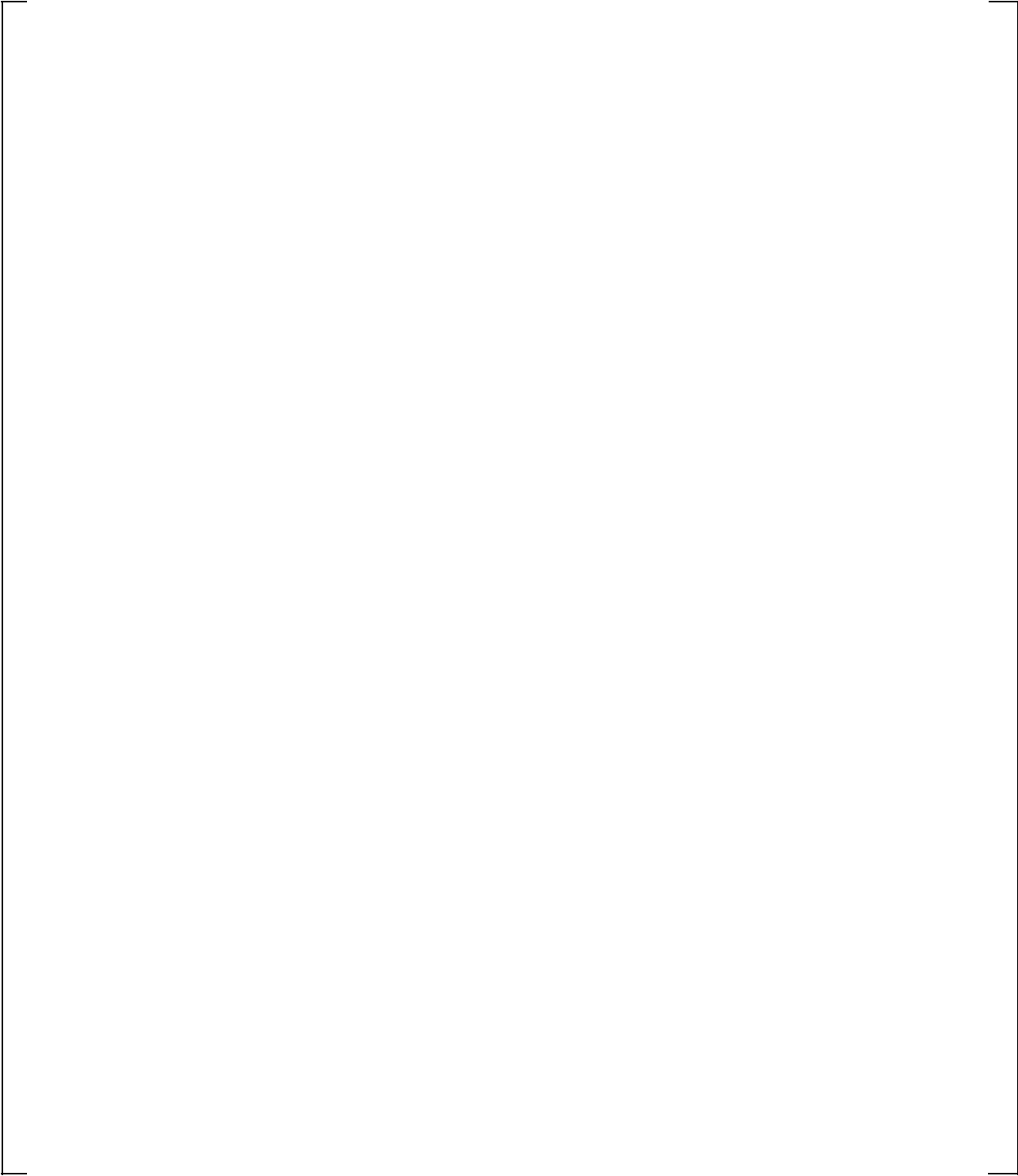
(a,c)

- *Insert the following after the first paragraph of Section 7.3:*

The retest subjects meet the criteria described in section 4.1.1.

Significant HEDs which resulted in scenario failure(s) during the ISV are resolved through design changes, procedure changes, and/or training and the scenarios adjusted accordingly. These changes are evaluated as part of the ISV retest and the scenarios continue to create an environment which tests the integrated plant operation and Human System Interface. The initial conditions and portions of scenarios leading to HED portions remain essentially unchanged; as such, the scenario continues to include distractors, workloads and complexity leading to events (i.e. test objectives) under test.

(a,c)



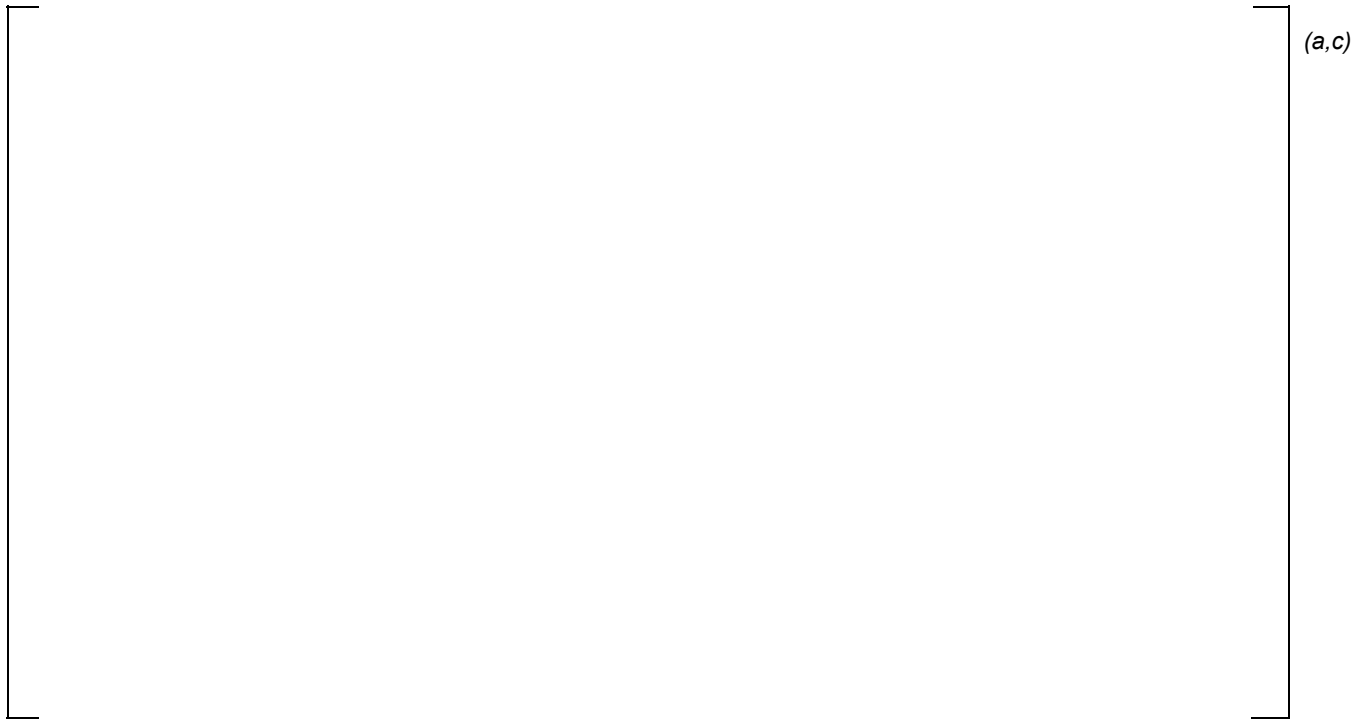
(a,c)

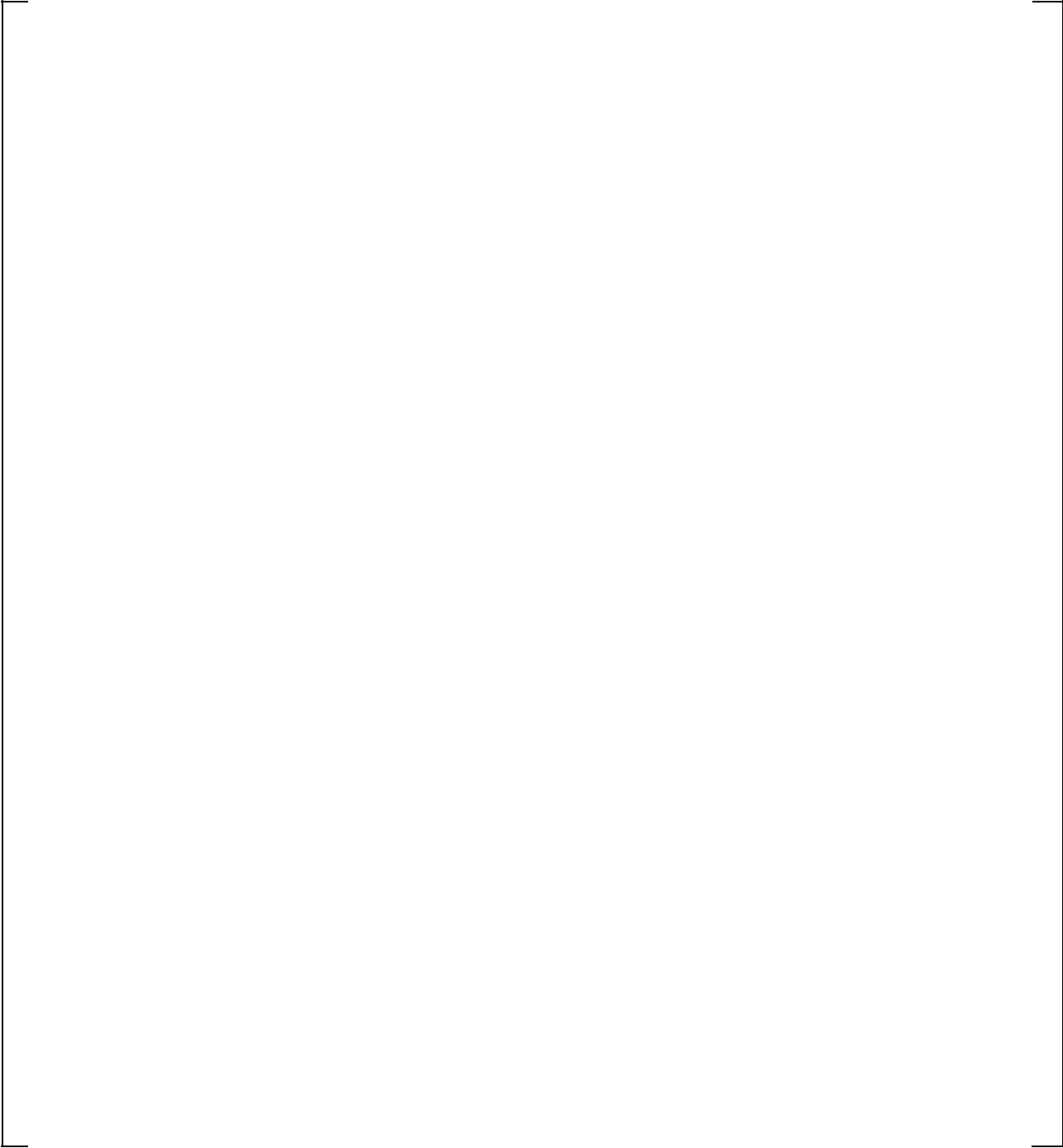
* * *

(a,c)



Figure 7.3-1. Flow Diagram for Re-Run and Re-Test Requirements





(a,c)