



January 26, 2000  
RC-00-0020

Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12  
LICENSEE EVENT REPORT (LER 1999-014-00)  
KAOWOOL FIRE BARRIERS OUTSIDE 10CFR50 APPENDIX R  
DESIGN BASIS

**Gary J. Taylor**  
Vice President  
Nuclear Operations

Attached is Licensee Event Report No. 1999-014-00, for the Virgil C. Summer Nuclear Station (VCSNS). This report describes testing performed on Kaowool triple wrap fire barriers. This issue is being reported per 10 CFR 50.73(a)(2)(ii)(B).

Should you have any questions, please call Mrs. April Rice at (803) 345-4232.

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Very truly yours,

Gary J. Taylor

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RTS (O-C-99-1520)  
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DMS (RC-00-0020)

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IE22

**LICENSEE EVENT REPORT (LER)**

|  |   |                           |
|--|---|---------------------------|
| <b>FACILITY NAME (1)</b><br>Virgil C. Summer Nuclear Station | <b>DOCKET NUMBER (2)</b><br>0 5 0 0 0 3 9 5 | <b>PAGE (3)</b><br>1 of 3 |
|--|---|---------------------------|

**TITLE (4)**  
Kaowool Fire Barriers Outside 10CFR50 Appendix R Design Basis

| EVENT DATE (5) |     |      | LER NUMBER (6) |                   |                 | REPORT DATE (7) |     |      | OTHER FACILITIES INVOLVED (8) |               |
|----------------|-----|------|----------------|-------------------|-----------------|-----------------|-----|------|-------------------------------|---------------|
| MONTH          | DAY | YEAR | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH           | DAY | YEAR | FACILITY NAME                 | DOCKET NUMBER |
| 12             | 29  | 99   | 1999           | -- 014            | -- 00           | 01              | 26  | 2000 |                               | 05000         |
|                |     |      |                |                   |                 |                 |     |      |                               |               |

|                                |  |                   |                   |                   |   |  |  |  |  |  |
|--------------------------------|--|-------------------|-------------------|-------------------|---|--|--|--|--|--|
| <b>OPERATING MODE (9)</b><br>1 | <b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)</b> |                   |                   |                   |   |  |  |  |  |  |
| <b>POWER LEVEL (10)</b><br>100 | 20.2201(b)   | 20.2203(a)(2)(v)  | 50.73(a)(2)(i)    | 50.73(a)(2)(viii) |   |  |  |  |  |  |
|                                | 20.2203(a)(1)  | 20.2203(a)(3)(i)  | X 50.73(a)(2)(ii) | 50.73(a)(2)(x)    |   |  |  |  |  |  |
|                                | 20.2203(a)(2)(i)   | 20.2203(a)(3)(ii) | 50.73(a)(2)(iii)  | 73.71             |   |  |  |  |  |  |
|                                | 20.2203(a)(2)(ii)  | 20.2203(a)(4)     | 50.73(a)(2)(iv)   | OTHER             |   |  |  |  |  |  |
|                                | 20.2203(a)(2)(iii)   | 50.36(c)(1)       | 50.73(a)(2)(v)    |                   | Specify in Abstract below or in NRC FORM 366A |  |  |  |  |  |
|                                | 20.2203(a)(2)(iv)  | 50.36(c)(2)       | 50.73(a)(2)(vii)  |                   |   |  |  |  |  |  |

**LICENSEE CONTACT FOR THIS LER (12)**

|  |  |
|--|--|
| <b>NAME</b><br>A. R. Rice<br>Manager, Nuclear Licensing & Operating Experience | <b>TELEPHONE NUMBER (Include Area Code)</b><br>(8 0 3) 3 4 5 - 4 2 3 2 |
|--|--|

**COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)**

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| B     | KP     | CBL5      | BO15         | YES                |       |        |           |              |                    |
|       |        |           |              |                    |       |        |           |              |                    |

|  |  |           |  |                                      |     |      |
|--|--|-----------|--|--------------------------------------|-----|------|
| <b>SUPPLEMENTAL REPORT EXPECTED (14)</b> |  |           |  | <b>EXPECTED SUBMISSION DATE (15)</b> |     |      |
| X  | <b>YES</b><br>(If yes, complete EXPECTED SUBMISSION DATE). | <b>NO</b> |  | MONTH                                | DAY | YEAR |
|  |  |           |  | 04                                   | 01  | 2000 |

**ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)**

On December 28, 1999, Virgil C. Summer Nuclear Station (VCSNS) commissioned testing on Kaowool triple wrap fire barriers. The testing was conducted to confirm the fire resistance rating of typical plant specific design considerations.

On December 29, 1999, engineering personnel determined, from a review of preliminary test data, that some as installed applications may not meet the current regulatory requirements for maintaining one train free of fire damage for one hour. Station Condition Evaluation Report (CER) 99-1520 was generated to document this event and to track actions for resolution.

Engineering personnel are continuing to evaluate the test data to ascertain the actual impact of the test results on the adequacy of existing plant configurations to meet these performance requirements.

VCSNS has implemented compensatory actions (fire watches) as a conservative measure, for all Kaowool Fire Barriers that are needed to achieve and maintain post-fire safe shutdown in accordance with Appendix R of 10CFR50.48. Adjustments to these compensatory actions and any corrective actions will be based on the results of further engineering evaluation.

**LICENSEE EVENT REPORT (LER)**

TEXT CONTINUATION

| FACILITY NAME (1)            | DOCKET NUMBER (2) | LER NUMBER (6) |                   |                 | PAGE (3) |
|------------------------------|-------------------|----------------|-------------------|-----------------|----------|
| V. C. Summer Nuclear Station | 05000395          | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER | 2 of 3   |
|                              |                   | 1999           | 014               | 00              |          |

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**PLANT IDENTIFICATION**

Westinghouse - Pressurized Water Reactor

**EQUIPMENT IDENTIFICATION**

Kaowool Fire Barrier for Electrical Cables

**IDENTIFICATION OF EVENT**

Testing of Kaowool triple wrap fire barriers demonstrates that some applications do not meet design requirements.

**EVENT DATE**

December 29, 1999

**REPORT DATE**

January 26, 2000

**CONDITIONS PRIOR TO EVENT**

Mode 1, 100% power

**DESCRIPTION OF EVENT**

Virgil C. Summer Nuclear Station (VCSNS) commissioned fire-endurance testing to be performed on Kaowool triple wrap fire barriers on December 28, 1999. A large scale 1-hour test was conducted at the Omega Test Labs in San Antonio, Texas. The testing was conducted on representative sample conduits and cable trays, in typical VCSNS configurations, to confirm the fire resistance rating of these barriers and verify our existing design and licensing basis. This testing was being performed as a voluntary initiative at the request of the NRC as discussed in SECY 99-204, "Kaowool and FP-60 Fire Barriers."

Engineering personnel determined, on December 29, 1999, that preliminary results indicate that some applications may not meet the current regulatory requirements for maintaining one train free of fire damage for a one hour duration (10 CFR 50 Appendix R, Section III.G.2.)

**LICENSEE EVENT REPORT (LER)**

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| V. C. Summer Nuclear Station | 05000395          | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER | 3 of 3   |
|                              |                   | 1999           | 014               | 00              |          |

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ANALYSIS

Some limited cable failures were identified. The limited failures were experienced in small cable, conduit, and tray applications installed in open-air configurations (not running along wall or ceiling). Other applications; large conduit, tray, and surface mounted conduit performed satisfactorily, based on a preliminary review of the test data.

VCSNS has a total of 30 Kaowool triple wrap applications that are required for Appendix R. The 30 Kaowool applications are limited to 18 separate fire areas/zones. Of the 18 fire areas, 14 have fire loads less than the current designed fire rating of the enclosure with the other four located in cable chases that have automatic fire suppression. Additionally, 16 of the affected fire areas, have acceptable core damage frequency, as calculated during Phase 1 of the IPEEE evaluation, with the remaining 2 found acceptable during Phase 2 by fire modeling.

Engineering personnel are continuing to evaluate the test data and are comparing the tested configurations to actual plant configurations. This evaluation of specific Kaowool applications will include a risk assessment based on the test data and fire hazards analysis to determine if as-installed barriers provide an adequate level of fire protection.

IMMEDIATE ACTIONS

VCSNS has implemented compensatory actions (roving fire watches) for all 30 Appendix R Kaowool triple wrap applications (18 fire areas/zones) as a conservative and precautionary measure.

LONG TERM CORRECTIVE ACTIONS

Additional actions will be taken based on the results of the engineering evaluation. During this review, VCSNS will consider NRC staff recommendations to address affected areas as noted in SECY-99-204. An update on actions being taken will be provided in a supplemental report scheduled to be submitted by April 1, 2000.