



ARKANSAS POWER & LIGHT COMPANY  
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June 8, 1981



2CAN068105

Director of Nuclear Reactor Regulation  
ATTN: Mr. Robert A. Clark, Chief  
Operating Reactors Branch #3  
Division of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: Arkansas Nuclear One - Unit 2  
Docket No. 50-368  
License No. NPF-6  
NRC Request for Information on  
Applicability of Existing Cycle 2  
Physics Reload Analysis to  
Reconstituted Fuel Assemblies  
(File: 2-1510)

Gentlemen:

In response to a verbal question from your staff as to the location of reconstituted assemblies in the Cycle 2 core and whether the existing Cycle 2 Physics Reload Analysis bounds the reconstituted assemblies, the following information is provided.

Five fuel assemblies were reconstituted during the first refueling outage at ANO-2. Guidelines for defective rod replacement during the reconstitution operation were prepared by the Physics group at Combustion Engineering. These guidelines are listed in Table 1.

The five bundles reconstituted and reinserted in the core for Cycle 2 were configured as shown in Figures 1 through 5. Figure 6 shows their core location in Cycle 2. The effect of this reconstitution on the core power distribution in Cycle 2 has been examined by performing a full core 20 PDQ calculation at beginning-of-life with the repaired bundles modelled explicitly. This calculation showed an increase in the maximum one pin-peak for the core of less than 1% from the nominal design. However, due to the number of pin replacements in assembly AKC308, a local power depression occurs in and around this assembly. The maximum reduction in assembly power is approximately 7% located in assembly AKC308.

8106110 372

P

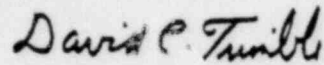
Mr. Robert A. Clark

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COLSS and CECOR, using the incore detector system, will accurately measure the local and core wide power effects caused by the pin replacements. The net effect on the core power distribution is minimal and within the basis of the reload safety analysis and plant operating limits for Cycle 2.

Very truly yours,

A handwritten signature in dark ink, reading "David C. Trimble". The signature is written in a cursive style with a large, stylized "D" and "T".

David C. Trimble  
Manager, Licensing

DCT:RBL:s1

Enclosure

cc: ANO-DCC

TABLE 1. Failed Fuel Rod Replacement Guidelines

| Failed Bundle Type | Allowable Replacement Rods | Constraints                                                                                                                                                         |
|--------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C                  | A Rods                     | None                                                                                                                                                                |
| B                  | A Rods                     | None                                                                                                                                                                |
|                    | Zircaloy Rods              | <ol style="list-style-type: none"> <li>1. no more than 8 per bundle.</li> <li>2. No peripheral locations (but can be exchanged with sound interior pin).</li> </ol> |

POOR ORIGINAL

NORTH

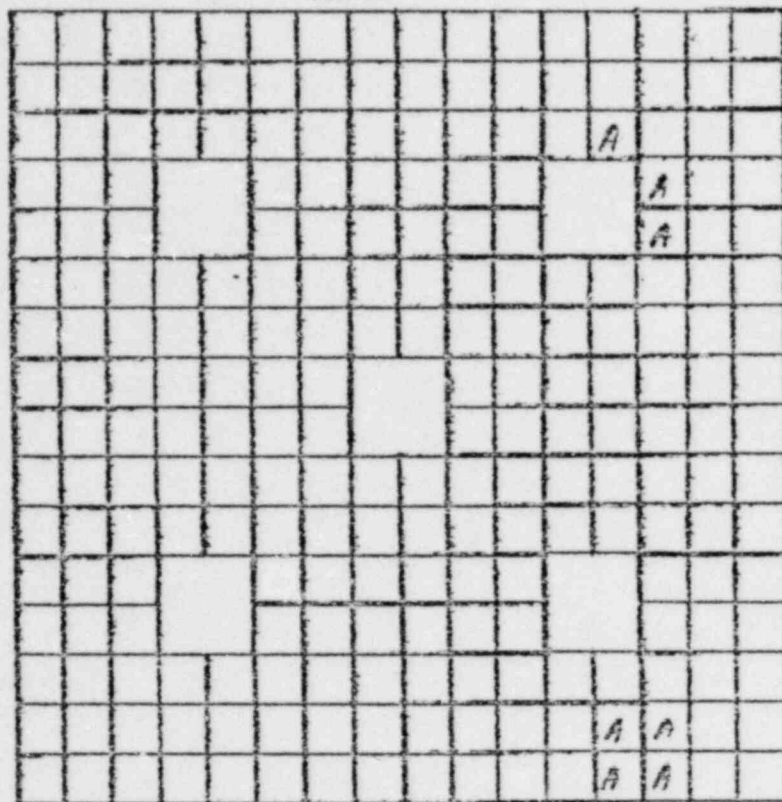


FIGURE 1. ARB045

A, REPLACED  
WITH A<sup>-</sup>  
FUEL ROD

NORTH

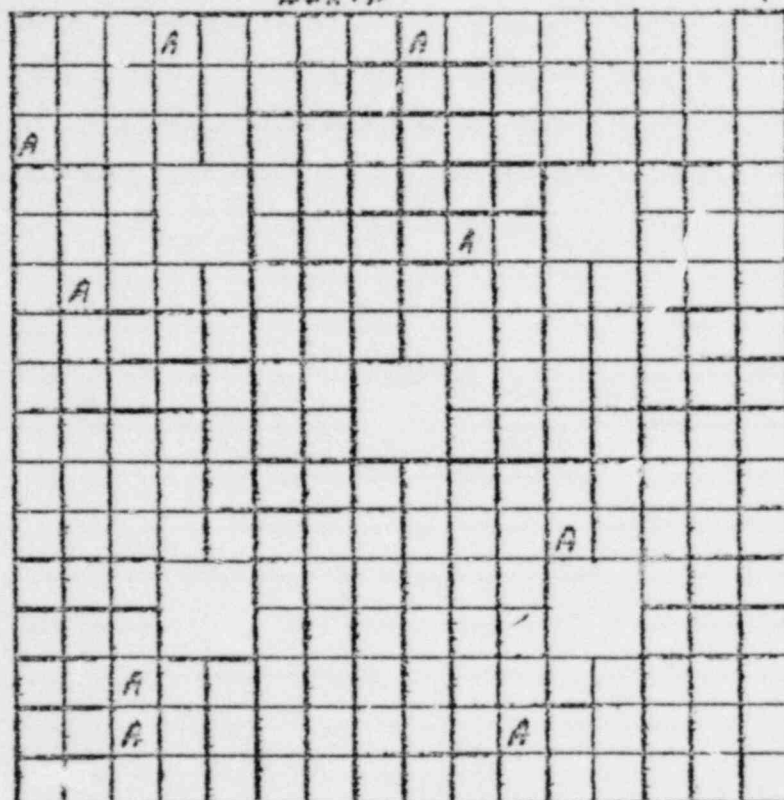


FIGURE 2. ARB02

POOR ORIGINAL

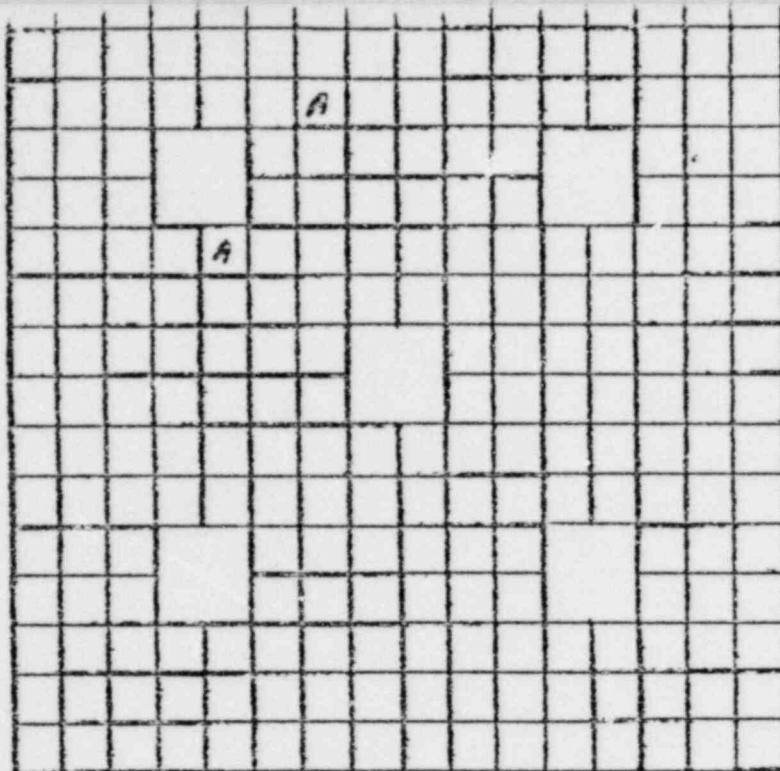


FIGURE 3. AKE036

A, REPLACED  
WITH "A"  
FUEL ROD

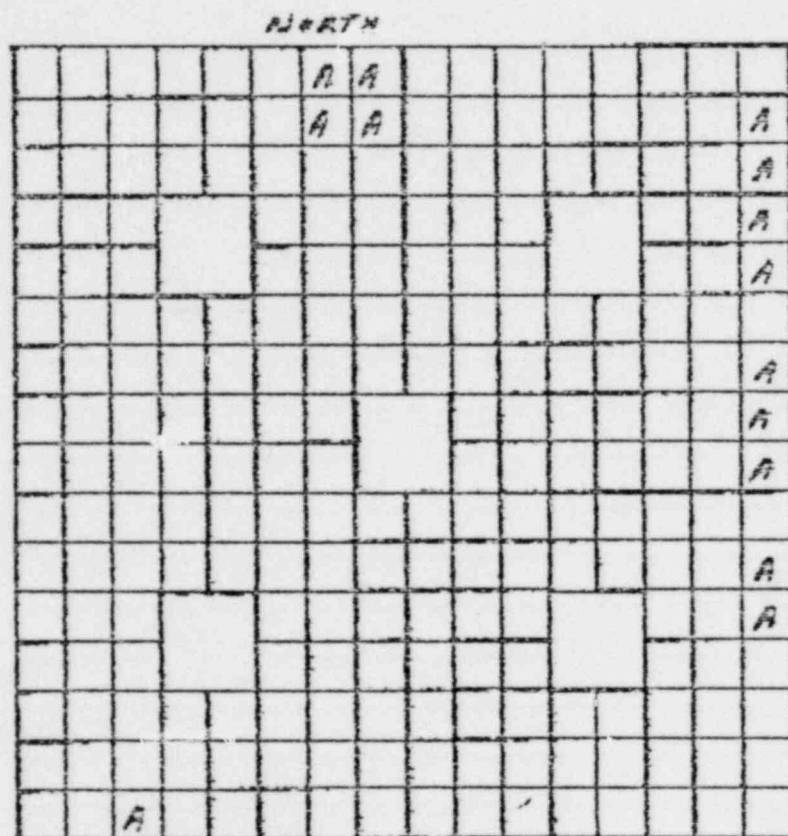
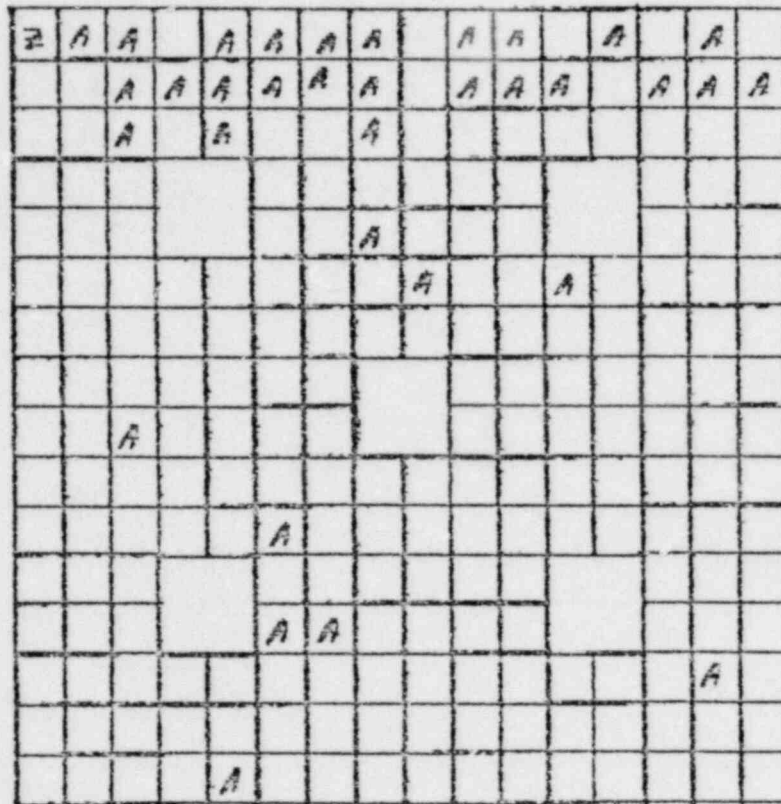


FIGURE 4. AKC203

POOR ORIGINAL



NORTH



A, REPLACED  
WITH "A"  
FUEL ROD

E, REPLACED  
WITH SOLID  
BIRC ROD

FIGURE 5. AKC308

FIGURE 6  
AND-2 CYCLE 2  
FULL CORE LOADING PATTERN

|    | A           | B                  | C                  | D                  | E                  | F                  | G                  | H                  | J                  | K                  | L                  | M                  | N                  | P                  | Q           |
|----|-------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|
| 1  |             |                    |                    |                    |                    | 01<br>D016         | 02<br>D031         | 03<br>D008         | 04<br>D005         | 05<br>D033         |                    |                    |                    |                    |             |
| 2  |             |                    |                    | 06<br>D032         | 07<br>D028         | 08<br>C414<br>112  | 09<br>C206         | 10<br>C309<br>175  | 11<br>C201<br>151  | 12<br>C401<br>126  | 13<br>D037         | 14<br>D029         |                    |                    |             |
| 3  |             | 15<br>D023         | 16<br>C208<br>002  | 17<br>C416         | 18<br>B031<br>018  | 19<br>C212         | 20<br>B001<br>171  | 21<br>C209         | 22<br>B053<br>022  | 23<br>C402         | 24<br>C207         | 25<br>D002         |                    |                    |             |
| 4  | 26<br>D011  | 27<br>C306<br>067  | 28<br>C503<br>015  | 29<br>B017<br>029  | 30<br>D106         | 31<br>B030<br>031  | 32<br>D109         | 33<br>B032<br>033  | 34<br>D105         | 35<br>B106<br>035  | 36<br>C501<br>025  | 37<br>C210<br>081  | 38<br>D026         |                    |             |
| 5  | 39<br>D034  | 40<br>C412<br>014  | 41<br>B041<br>041  | 42<br>C101         | 43<br>B009<br>043  | 44<br>B006<br>009  | 45<br>B008<br>104  | 46<br>B003<br>011  | 47<br>B021<br>047  | 48<br>C108         | 49<br>B029<br>045  | 50<br>C413<br>006  | 51<br>D006         |                    |             |
| 6  | 52<br>D039  | 53<br>C411<br>005  | 54<br>B043<br>054  | 55<br>D117         | 56<br>B011<br>056  | 57<br>D112         | 58<br>B023<br>058  | 59<br>D102         | 60<br>B049<br>060  | 61<br>D111         | 62<br>B035<br>062  | 63<br>D118         | 64<br>B002<br>064  | 65<br>C405<br>001  | 66<br>D029  |
| 7  | 67<br>D030  | 68<br>C214<br>024  | 69<br>C210<br>139  | 70<br>B033<br>070  | 71<br>B042<br>068  | 72<br>B101<br>072  | 73<br>C104<br>053  | 74<br>B022<br>133  | 75<br>C103<br>012  | 76<br>B010<br>076  | 77<br>B013<br>000  | 78<br>B037<br>078  | 79<br>C205         | 80<br>C213<br>016  | 81<br>D004  |
| 8  | 82<br>D007  | 83<br>C305<br>096  | 84<br>B007<br>084  | 85<br>D113         | 86<br>B027<br>090  | 87<br>D114         | 88<br>B048<br>092  | 89<br>B105<br>159  | 90<br>B020<br>086  | 91<br>D101         | 92<br>B026<br>088  | 93<br>D108         | 94<br>B045<br>094  | 95<br>C303<br>082  | 96<br>D021  |
| 9  | 97<br>D012  | 98<br>C208<br>162  | 99<br>C203<br>051  | 100<br>B034<br>100 | 101<br>B104<br>098 | 102<br>B038<br>102 | 103<br>C102        | 104<br>B102<br>166 | 105<br>C105<br>045 | 106<br>B025<br>125 | 107<br>B005<br>106 | 108<br>B015<br>110 | 109<br>C216<br>108 | 110<br>C207<br>039 | 111<br>D001 |
| 10 | 112<br>D017 | 113<br>C406<br>177 | 114<br>B032<br>114 | 115<br>D107        | 116<br>B051<br>116 | 117<br>D104        | 118<br>B028<br>118 | 119<br>D116        | 120<br>B024<br>120 | 121<br>D115        | 122<br>B036<br>122 | 123<br>D120        | 124<br>B012<br>124 | 125<br>C405        | 126<br>D010 |
| 11 | 127<br>D027 | 128<br>C403<br>172 | 129<br>B054<br>129 | 130<br>C102        | 131<br>B052<br>131 | 132<br>B004<br>167 | 133<br>B050<br>074 | 134<br>B047<br>169 | 135<br>B019<br>135 | 136<br>C106<br>008 | 137<br>B102<br>137 | 138<br>C415        | 139<br>D024        |                    |             |
| 12 | 140<br>D009 | 141<br>C312<br>057 | 142<br>C502<br>153 | 143<br>B016<br>143 | 144<br>D110        | 145<br>B105<br>145 | 146<br>D103        | 147<br>B014<br>147 | 148<br>D119        | 149<br>B018        | 150<br>C504<br>149 | 151<br>C304        | 152<br>D022        |                    |             |
| 13 | 153<br>D035 | 154<br>C302<br>174 | 155<br>C408        | 156<br>B046<br>026 | 157<br>C211        | 158<br>B040        | 159<br>C202        | 160<br>B044        | 161<br>C410        | 162<br>C201        | 163<br>D024        |                    |                    |                    |             |
| 14 | 164<br>D019 | 165<br>D014        | 166<br>C407<br>052 | 167<br>C215        | 168<br>C311        | 169<br>C204        | 170<br>C404        | 171<br>D002        | 172<br>D010        |                    |                    |                    |                    |                    |             |
| 15 | 173<br>D018 | 174<br>D013        | 175<br>D015        | 176<br>D020        | 177<br>D038        |                    |                    |                    |                    |                    |                    |                    |                    |                    |             |

A  
B  
C

\* ASSEMBLY SERIAL NUMBER ORIENTATION

A = ASSEMBLY LOCATION

B = ASSEMBLY SERIAL NUMBER (LAST FOUR DIGITS)

C = LOCATION OF ASSEMBLY IN PREVIOUS CYCLE

POOR ORIGINAL