FRAMATOME
TECHNOLOGIES

April 3, 1997
JHT/97-18

U. S. Nuclear Regulatory Commission
ATTN.: Document Control Desk
Washington, D.C. 20555

Subject: RCCA Insertion Issue

Reference: Letter from J. H. Taylor to U. S. Nuclear Regulatory Commission, Same Subject, JHT/97-8, January 31, 1997.

Gentlemen:

The reference letter provides a summary of the material that was presented to the NRC in a meeting on December 16, 1996. That summary demonstrates with analytical results, measured data, and design comparisons that Framatome Cogema Fuels (FCF) fuel does not exhibit RCCA/CRA insertion problems or associated root causes, and therefore should not be subject to any core management restrictions.

In discussions subsequent to the submittal of the reference, the NRC raised some questions about the proprietary classification of some of the material contained therein. FCF agrees that some of the material may be given a non-proprietary classification. The agreed to changes affect only two pages of the January submittal.

Attachment 1 is the proprietary version of the change pages. The proprietary material in Attachment 1 is enclosed in brackets. An affidavit supporting the proprietary classification of the material was included with the reference letter. Attachment 2 is the non-proprietary version of the changes.

Very truly yours,

CJ McPhatter for

J. H. Taylor, Manager
Licensing Services

cc: J. E. Lyons, NRC
E. W. Weiss, NRC
M. S. Chatterton, NRC
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Attachment 2

Non-Proprietary Change Pages for FCF Letter Report to the NRC
RCCA Insertion Issue

gages were used to inspect for global lateral deformations in the upper guide thimble region. These gages were used for the upper guide thimble inspections. Each gage was allowed to pass through the guide thimble only under its own weight during the inspection.

All guide thimbles inspected accepted the full length control rod gage. Guide thimbles accepted the short and span length gages showing minimal reduction in guide thimble free path diameter and minimal lateral deflection of the guide thimble span. The conclusion from the inspections is that a very small reduction in guide thimble free path diameter occurs (or a small maximum lateral deflection of the guide thimble span). The results apply to fuel assemblies with burnups greater than 50000 MWD/mtU and for fuel assemblies experiencing ~95% of its expected axial load. No change is expected for the small increment in burnup projected for the future. Results for Mark-B fuel would be expected to be comparable given the higher load carrying capability of its guide thimble and comparable design features.

5.6 POWER HISTORY COMPARISONS

FCF has compared the following rodded fuel assembly power histories to those of Wolf Creek cycles 7 and 8:

- Oconee 1 and 3
- ANO Unit 1
- Catawba 1 and 2
- McGuire 1 and 2

Results show that the FCF power histories are similar to, and in some cases even more challenging, than those of Wolf Creek where rod insertion problems have been observed. No accelerated fuel assembly growth, guide thimble distortion, unusual guide thimble corrosion, or RCCA/CRA insertion problems have been observed in FCF fuel with these cycle designs.

6.0 RCCA INSERTION HISTORY

The FCF RCCA/CRA insertion history verifies the advantage of the distinct design differences and data noted above. The trip performance is only a final verification of the data that validates a different fuel assembly structural response with burnup, demonstrating that no insertion problem exists for FCF fuel.

Mark-BW insertion and drag data are primarily based on that taken by Duke Power to

meet the requirements of the NRC Bulletin 96-01. These results show that 1421 successful insertions have been made with 81 of these for fuel assembly burnups greater than 40000 MWD/mtU. The maximum burnup with successful insertion is 53140 MWD/mtU. All Mark-BW trips have resulted in times well below the Tech Spec limit of 2.2 seconds. No significant trend between trip time and burnup is observed. RCCA drag data taken in the spent fuel pool as part of the 96-01 bulletin show that loads are within the previously established limits of 40 lbs above the dashpot and 100 lbs in the dashpot. .

Mark-B insertion data show that 3604 successful insertions have been made since 1990. Of these, 180 are for fuel assembly burnups greater than 40000 MWD/mtU. The maximum burnup with successful insertion is 58400 MWD/mtU. All Mark-B trips have resulted in times well below the Tech Spec limit of 1.66 seconds. No significant trend between trip time and burnup is observed.

RCCA/CRA insertion, trip, and drag data support the conclusion that no RCCA insertion problem exists for the FCF fuel designs for the licensed burnup.

7.0 SURVEILLANCE PROGRAMS

To ensure the safe operation and to continue to monitor the high burnup performance of its fuel, FCF has planned Post-Irradiation Examination (PIE) programs in the fall of 1997 to supplement the December 1996 PIE recently completed. These programs, which are part of FCF's originally planned surveillance, will continue to monitor fuel assembly growth, fuel assembly bow/guide thimble creep, guide thimble corrosion, and fuel rod growth. Additional data reduction of the December 1996 PIE is also in progress with a report scheduled for completion within the first quarter 1997.

FCF will continue to monitor any trends related to its PIE data and RCCA/CRA trip data to ensure that any anomalies are identified and that action can be taken if needed.

Attachment 1

Proprietary Change Pages for FCF Letter Report to the NRC
RCCA Insertion Issue