



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 12, 1994

Mr. Stanley LaBruna  
Chairman, BWROG Executive  
Oversight Committee  
P.O. Box 236  
Hancocks Bridge, New Jersey 08038

Dear Mr. LaBruna:

SUBJECT: GENERIC QUESTIONS REGARDING CORE SHROUD CRACKING

Enclosed is a set of questions regarding cracking of boiling water reactor core shrouds. These questions are being sent to you as discussed during our telephone conversation on May 10, 1994. An advance copy of these questions was faxed to you on May 10, 1994.

As discussed in our May 10, 1994, telephone conversation, the NRC staff is planning to schedule a meeting with the Boiling Water Reactor Owners Group (BWROG) Executive Oversight Committee during the week of June 13, 1994. I will be contacting you to schedule that meeting. During that meeting, you should be prepared to discuss the BWROG's schedule for providing written responses to these questions.

Please contact me at (301) 504-1409 if you have any questions regarding this matter.

Sincerely,

*Donald S. Brinkman*

Donald S. Brinkman, Senior Project Manager  
Project Directorate I-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosure:  
Generic Questions Regarding  
Core Shroud Cracking

200049

9405240248 940512  
PDR TOPRP EMVGENE  
C PDR

RD-2  
X-RD-10-1  
X-RD-8-2-B+W

DFU

Generic Questions Regarding Core Shroud Cracking

The following questions are generic questions applicable to all U.S. boiling water reactor plants (BWRs). It is requested that they be answered to the extent possible during the upcoming meeting. For those questions that cannot be answered in their entirety during the meeting, a proposed schedule for responding to the questions should be provided.

1. Based on the locations of the cracking discovered in the Dresden and Quad Cities core shrouds, reassess the validity of the inspection recommendations, material susceptibility ranking, etc. contained in SIL 0572, Rev.1, and also in the BWR Owners Group "BWR Core Shroud Evaluation (Report No. GE-NE-523-148-1193)." Taking into account that the cracking was discovered at weld locations that were not considered the most highly susceptible in the referenced documents, provide proposed revisions to the inspection guidance including timing, frequency, methods, and scope of inspections for the core shroud and other reactor vessel internal components.
2. Identify other BWR reactor internals components whose failure by cracking could have an adverse impact on plant safety.
3. Identify the various categories of core shrouds in operation and identify the plants in each of these categories. Categorization should be based on core shroud configuration considering potential failure locations (independent of material cracking susceptibility).
4. For each domestic BWR or category of BWR, based on core shroud configuration, provide an evaluation of the safety significance of a 360° through wall failure at each weld location in the core shroud during normal operation, anticipated transient, and postulated accident conditions. Include evaluation of the design basis loss-of-coolant accident combined with safe-shutdown earthquake loads (LOCA +SSE). This evaluation should address questions such as: (a) estimated potential shroud movement vertically or laterally; (b) control rod scram capability; (c) boron injection capability; (d) short & long term core cooling capability, including core spray capability; and (e) ability to maintain 2/3 core coverage with bypass leakage at various elevations.
5. Evaluate the adequacy of BWR normal operating procedures and operator training with regard to identifying and responding to possible failures of critical reactor internal components.
6. Evaluate the adequacy of BWR emergency procedures and operator training with regard to design basis accident conditions with various postulated core shroud failure modes and resultant by-pass flow.

7. Provide a summary of inspections of core shroud and other reactor internals, as identified in response to question 2, conducted at domestic and foreign BWRs. Include in the summary the methods, scope, and results of these inspections.
8. Describe available inspection methods and procedures (e.g., visual, ultrasonic) for the core shroud and the other reactor internal components identified in response to question 2. Discuss how these techniques and procedures have been qualified including description of any performance demonstration on core shroud mock-ups and the other reactor internals. Discuss how well the mock-ups represent the variety of core shroud configurations in operation. Provide a discussion of the expected reliability and limitations of the inspection methods for these reactor internal components.
9. For each of the components identified in response to question 2, provide proposed guidance for inspection (timing, scope, frequency, method) and acceptance criteria. Provide the basis for the proposed guidance.
10. Describe repair options for various locations in each category of core shroud and for the components identified in response to question 2. Include discussion of actions to achieve ALARA personnel exposure and provide estimates of exposure levels associated with each repair option. Also provide information on the availability of resources (equipment, qualified inspectors, etc.) to perform such inspections.

May 12, 1994

Mr. Stanley LaBruna  
Chairman, BWROG Executive  
Oversight Committee  
P.O. Box 236  
Hancocks Bridge, New Jersey 08038

Dear Mr. LaBruna:

SUBJECT: GENERIC QUESTIONS REGARDING CORE SHROUD CRACKING

Enclosed is a set of questions regarding cracking of boiling water reactor core shrouds. These questions are being sent to you as discussed during our telephone conversation on May 10, 1994. An advance copy of these questions was faxed to you on May 10, 1994.

As discussed in our May 10, 1994, telephone conversation, the NRC staff is planning to schedule a meeting with the Boiling Water Reactor Owners Group (BWROG) Executive Oversight Committee during the week of June 13, 1994. I will be contacting you to schedule that meeting. During that meeting, you should be prepared to discuss the BWROG's schedule for providing written responses to these questions.

Please contact me at (301) 504-1409 if you have any questions regarding this matter.

Sincerely,

Original signed by:

Donald S. Brinkman, Senior Project Manager  
Project Directorate I-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Enclosure:  
Generic Questions Regarding  
Core Shroud Cracking

Distribution:

Central File	RACapra	CCowgill, RGN-I	JTalyor, 17/G/21
NRC & Local PDRs	CVogan	JRoe, 12/G/18	VMcCree, 17/G/21
PDI-1 Reading	DBrinkman	JStrosnider, 7/D/4	WRussell, 12/G/18
SVarga	OGC	TCollins, 8/E/23	FMiraglia, 12/G/18
JCalvo	ACRS (10)	BSheron, 7/D/26	ATHadani, 12/G/18
			LReyes, 12/G/18

by E-mail - All NRR PDs, ADs, and RI-RTV DRP Div. Directors.

LA:PDI-1	PM:PDI-1	BC:EMCB	D:PDI-1		
CVogan	DBrinkman:smm	JStrosnider	RACapra		
5/11/94	5/12/94	5/12/94	5/12/94	1/1	1/1

OFFICIAL RECORD COPY  
FILENAME: LABRUNA.LTR

003051

RD-2  
X-RD-10-1  
X-RD-8-2-B+W

RETURN TO REGULATORY CENTRAL FILES