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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

March 15, 1979

GL-79-14

ALL POWER REACTOR LICENSEES

REGULATORY DOCKET FILE COPY

Gentlemen:

On September 14, 1978, the Nuclear Regulatory Commission established a new Pipe Crack Study Group which was to evaluate recent pipe and safe end cracking experience relative to previous staff conclusions and recommendations. The bases for establishing the new Study Group were (1) the discovery of cracks in the inner surface of large-diameter austenitic stainless steel piping (recirculation lines) in a BWR and (2) questions concerning the capability of ultrasonic detection methods to detect small cracks.

The new PCSG reviewed existing information that either was contained in written records or had been collected through meetings in this country and in foreign countries. The review was in the context of changes occurring since the preparation by the original Pipe Cracking Study Group of NUREG-75/067 "Technical Report--Investigation and Evaluation of Cracking in Austenitic Stainless Steel Piping of Boiling Water Reactor Plants". The conclusions and recommendations of the new Pipe Crack Study Group are presented in the enclosed "Investigation and Evaluation of Stress Corrosion Cracking in Piping of Light Water Reactor Plants", NUREG-0531. This report is for your information and comment. Also enclosed is a copy of a related *Federal Register* Notice.

The NRC staff will review the Study Group report and its conclusions/ recommendations and any comments received about the report. Following this review, the staff will decide what further actions, if any, are required for the licensing and operation of reactors.

Sincerely,

Brian Grimes

Brian K. Grimes, Assistant Director
for Engineering and Projects
Division of Operating Reactors

Enclosures:
1. NUREG-0531
2. Notice

TIA4
CCP

[7590-01-M]

DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

Investigation and Evaluation of Stress Corrosion Cracking in Piping of Light Water Reactor Plants

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Request for public comment on NUREG-0531 "Investigation and Evaluation of Stress Corrosion Cracking in Piping of Light Water Reactor Plants" February 1979.

SUMMARY: On September 14, 1978, the Nuclear Regulatory Commission established a new Pipe Crack Study Group. The Group was to evaluate recent pipe and safe end cracking experience relative to previous staff conclusions and recommendations. The NRC seeks public comment on the report which summarizes the Group's review and conclusions.

DATES: The public comment period expires May 15, 1979.

FOR FURTHER INFORMATION CONTACT:

Darrell G. Eisenhut, Deputy Director for Operating Reactors, Division of Operating Reactors, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. (Phone: 301-492-7221)

SUPPLEMENTARY INFORMATION: In 1975, a Pipe Cracking Study Group was established by the United States Nuclear Regulatory Commission (USNRC) to review intergranular stress-corrosion cracking (IGSCC) in Boiling Water Reactors (BWRs). The Group reported its findings concerning stress-corrosion cracking in by-pass lines and core spray piping of austenitic stainless steel in a report, *Technical Report—Investigation and Evaluation of Cracking in Austenitic Stainless Steel Piping of Boiling Water Reactor Plants* (NUREG-75/067).

During 1978, IGSCC was reported for the first time in large-diameter piping in a BWR. This discovery, together with questions concerning the capability of ultrasonic detection methods to detect small cracks, led to the formation of a new Pipe Crack Study Group (PCSG) by USNRC on September 14, 1978.

The charter of the new PCSG was to specifically address the five following questions:

"1. The significance of the cracks discovered in large-diameter pipes relative to the conclusions and recommendations set forth in the referenced report (NUREG-75/067) and its implementation document, NUREG-0313;

2. Resolution of the concerns raised over the ability to use ultrasonic techniques to detect cracks in austenitic stainless steel;

3. The significance of cracks found in large-diameter sensitized safe ends and any recommendations regarding the current NRC program for dealing with this matter;

4. The potential for stress corrosion cracking in PWRs;

5. Examine the significance of cracking in the Inconel safe ends that has been experienced at the Duane Arnold Operating Facility, and develop any recommendations regarding NRC actions taken or to be taken."

The PCSG limited the scope of the study to BWR and PWR piping and safe ends attached to the reactor pressure vessel. The PCSG reviewed existing information—either that contained in written records or that collected through meetings in this country and in foreign countries. The specific areas considered are presented in the chapters of this report:

- BWR Cracking Experience and Corrective Actions
- PWR Cracking Experience and Corrective Actions
- Metallurgy Associated with Pipe Cracking
- Reactor Coolant Chemistry
- Pipe Configuration and Stress Levels
- Duane Arnold Safe-End Cracking
- Methods of Detecting Cracks
- Significance of Cracks
- Recent Development Relevant to Control and Detection of IGSCC

The review of these topics in the context of changes occurring since the preparation of NUREG-75/067 led to the preparation of specific conclusions and recommendations relevant to the current status of IGSCC, the significance of the problem, and the reliability of detection and measures available to correct or minimize IGSCC in existing and future plants. These conclusions and recommendations are presented in the newly issued PCSG report.

The NRC staff will review the Study Group report and its conclusions/recommendations and the public comments received during this comment period. Following this review, the staff will decide what further actions, if any, are required for the licensing and operation of reactors.

Requests for a single copy of the report should be made in writing to U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Technical Information and Document Control.

Comments on this report should be sent to the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Duputy Director, Division of Operating Reactors. The comment period expires May 15, 1979. Copies of all comments received will be available for examination in the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C.

Dated at Bethesda, Md., this 6th day of March, 1979.

For the Nuclear Regulatory Commission.

VICTOR STELLO, JR.,
Director, Division of Operating Reactors, Office of Nuclear Reactor Regulation.

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