JUN 27 1983

Docket No. 50-271

Mr. J. B. Sinclair
Licensing Engineer
Vermont Yankee Nuclear Power
Corporation
1671 Worcester Road
Framingham, Massachusetts 01701

Dear Mr. Sinclair:

During the current maintenance/refueling outage for the Vermont Yankee Nuclear Power Station inspection of recirculation system piping revealed a number of unacceptable ultrasonic indications. You took corrective action to repair this piping and reported the results of the inspection and analysis including repair procedures in letters to the NRC dated June 3, 1983 and June 9, 1983.

Based on our review of these submittals and related discussions with your staff, we found that the corrective actions you took were acceptable for plant restart, but that additional requirements should be implemented for operation during the next cycle.

By letter dated June 15, 1983, you committed to implement these requirements. Based on these commitments and the acceptability of your corrective actions, plant restart was authorized by letter dated June 16, 1983.

The Commission has issued the enclosed Confirmatory Order, a copy of which is being filed with the Office of the Federal Register for publication.

Sincerely,

Original signed by
D. B. Vassallo

Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosure:
Confirmatory Order

cc w/enclosure
See next page

DIST:					
	Docket File	LPDR	ORB#2 Reading	DEisenhut	ORAB
	SNorris	VRooney	OELD (Cyr)	EJordan	TBarnhart-4
	ACRS-10	OPA-CMiles	NSIC	JTaylor	SECY
	RDiggs	XTRA-5	GRAY	WJohnston	

Previous concurrence copy concurred on by*:

OFFICE	DL:ORB#2	DL:ORB#2	DL:ORB#2	DE:AD:MQE	DL:OR:AD	OELD	D:DL
SURNAME	SNorris*	VRooney*	DVassallo*	WJohnston*	GLainas*	S. BURNS	DEisenhut
DATE	6/17/83	6/20/83	6/20/83	6/22/83	6/20/83	6/23/83	6/23/83

Mr. J. B. Sinclair
Vermont Yankee Nuclear Power Corporation
Vermont Yankee Nuclear Power Station

cc:

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President & Chief Executive Officer
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New England Coalition on Nuclear Pollution
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Mr. Walter Zaluzny
Chairman, Board of Selectman
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Region I Office
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Montpelier, Vermont 05602

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Vermont Public Interest Research Group, Inc.
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Regional Administrator, Region I
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Mr. Richard Saudek, Commissioner
Vermont Department of Public Service
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Montpelier, Vermont 05602

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of VERMONT YANKEE NUCLEAR POWER CORPORATION (Vermont Yankee Nuclear Power Station)	)	Docket No. 50-271

ORDER CONFIRMING LICENSEE COMMITMENTS
ON PIPE CRACK RELATED ISSUES

I.

The Vermont Yankee Nuclear Power Corporation (VYNPC or the licensee) is the holder of Facility Operating License No. DPR-28 which authorizes operation of the Vermont Yankee Nuclear Power Station (Vermont Yankee or the facility) at steady state reactor power levels not in excess of 1593 megawatts thermal. The facility is a boiling water reactor located at the licensee's site in Windham County, Vermont.

II.

During the current 1983 refueling outage at Vermont Yankee, augmented inservice inspection was performed on the recirculation system piping in accordance with Office of Inspection and Enforcement Bulletin 83-02. The original sample size covered 26 welds and was expanded to 60 welds after ultrasonic indications were reported on welds in the original sampling. Welds most likely to crack were selected for inspection. Overall, a total of 34 welds were found to show linear indications which consist of 22 12-inch riser welds, three 22-inch manifold welds, eight 28-inch recirculation welds and one residual heat removal system 24-inch weld. All indications were reported to be parallel to the weld in the heat-affected-zone. The deepest indication reported in the 12-inch riser welds is 50% of wall thickness. The reported indications in the large size pipe welds are relatively shallow and do not exceed 15% of wall thickness.

Evaluation by the licensee submitted by letters dated June 3 and June 9, 1983, indicates that the projected crack sizes, due to intergranular stress corrosion cracking (IGSCC) and fatigue crack growth, in the 12 large-diameter defective welds at the end of the upcoming 12-month fuel cycle are well within the ASME Code limits.

The licensee's evaluation also showed that the 22 12-inch riser welds require weld overlay repair for continued service because their calculated projected cracks would exceed the Code limits at the end of a 12 month fuel cycle.

All 22 of the 12-inch defective riser welds were repaired using the overlay process. The licensee's evaluation showed that each weld overlay design meets the ASME Code Section III requirements including fatigue. The predicted ultimate failure load based on tearing modulus approach is calculated for each overlay design. The ultimate failure load is shown to be at least three times the normal applied loads, which provides a safety margin larger than that inherent in the Code.

The licensee has installed local leak detection sensors of moisture sensitive tapes on seven uninspected 28-inch welds. Those seven welds were selected based on the IGSCC experienced by welds at similar locations in the corresponding loop.

The Staff has reviewed the licensee's submittals including analysis of weld overlay design and the calculation of IGSCC crack growth to support the continuing service for a 12-month fuel cycle with the 22 overlay repaired 12-inch riser welds and the 12 unrepaired large diameter (20-inch) defective welds.

The Staff has performed independent calculations of crack growth on the worst circumferential crack among the 12 large diameter defective welds. The calculated final crack depth at the end of a 12-month period meets the Code limit with adequate margin. Based on the staff's calculations and review of the licensee's analyses, we conclude that the continuous service of the 12 large diameter defective welds without repair for one 12-month fuel cycle is acceptable because the Code design margin is maintained.

The Staff has reviewed the licensee's weld overlay design calculations, and agrees with its conclusions that the standard overlay used will provide adequate reinforcement and crack growth inhibition for at least the next fuel cycle of operation.

III.

Although the conservative calculations discussed above indicate that the cracks in the 12 large diameter unreinforced welds will not progress to the point of leakage during the next fuel cycle, and very wide margins are expected to be maintained over crack growth which could compromise safety, uncertainties in crack sizing and growth rate still remain. Further, not all welds were examined, and significant cracks could be present in welds that were not examined.

Because of these uncertainties, we have determined that monitoring requirements in the containment for unidentified leakage should be modified to reflect new limiting conditions for operation and surveillance requirements. These enhanced surveillance measures will provide adequate assurance that possible cracks in pipes will be detected before growing to a size that will compromise the safety of the plant.

The Staff still has some concern regarding the long-term growth of small IGSCC cracks that may be present, but may not have been detected during the recently completed inspection. Therefore, the Staff requires that plans for inspection or modification of the recirculation and other reactor coolant pressure boundary piping systems during the next refueling outage be submitted for staff review at least three months before the start of the next refueling outage.

By letter dated June 15, 1983 the licensee committed to the above described conditions on leakage monitoring and early submittal of inspection and/or modification plans. I have determined that the public health and safety requires that this commitment for improved leakage monitoring and early submittal of inspection and/or modification plans should be formalized by an immediately effective Order.

IV.

Accordingly, pursuant to Sections 103, 161i, 161o and 182 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Parts 2 and 50, IT IS HEREBY ORDERED EFFECTIVE IMMEDIATELY THAT:

1. The licensee shall operate the reactor in accordance with

requirements on coolant leakage in Attachment A in lieu of the present requirements in Section 3.6.C of the Technical Specifications.

2. Plans for inspection and/or modification of the recirculation and other reactor cooling pressure boundary piping systems during the next refueling outage shall be submitted for NRC review at least three months before the start of the next refueling outage.

V.

The licensee may request a hearing within twenty (20) days of the date of publication of this Order in the Federal Register. A request for hearing shall be addressed to the Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D. C. 20555. A copy shall also be sent to the Executive Legal Director at the same address. A REQUEST FOR A HEARING SHALL NOT STAY THE IMMEDIATE EFFECTIVENESS OF THIS ORDER.

If a hearing is requested by the licensee, the Commission will issue an Order designating the time and place of any such hearing. If a hearing is held concerning this Order, the issue to be considered at the hearing shall be whether the licensee should comply with the requirements set forth in Section IV of this Order.

This Order is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 27th day of June 1983.

COOLANT LEAKAGE

1. During power operation, reactor coolant system leakage into the primary containment shall be limited to:

   a. 5 GPM unidentified leakage when averaged over the previous 24 hour period;

   b. 20 GPM identified leakage when averaged over the previous 24 hour period;

2. Any time the reactor is in the run mode, reactor coolant system leakage into the primary containment from unidentified sources shall be limited to:

   a. 2 GPM increase in unidentified leakage within the previous 24 hour period (see Note 1).

3. If the requirements of item 1. cannot be met, initiate action as follows:

   a. With any reactor coolant system leakage greater than any one of the limits specified in item 1.a. or b. reduce the leakage rate to within the limits or be in at least hot shutdown in 12 hours and in cold shutdown in the next 24 hours.

4. If the requirements of item 2. cannot be met, initiate action as follows:

   a. With any increase in unidentified leakage of ≥ 2 GPM, averaged over the previous 24 hour period, identify the source of leakage or be in at least hot shutdown in 12 hours and in cold shutdown in the next 24 hours.

5. Both the drywell sump and air sampling systems shall be operable during power operation. From and after the date that one of these systems is made or found inoperable for any reason, reactor operation is permissible only during the succeeding 7 days.

6. If the requirements of item 5. cannot be met, an orderly shutdown shall be initiated and the reactor brought to a cold shutdown condition within 24 hours.

NOTE 1 - During the first 24 hours in the run mode following startup, the limits of item 2. may be waived provided the requirements of item 1. are met.

COOLANT LEAKAGE (Surveillance)

Reactor Coolant system leakage shall be demonstrated to be within the limits of items 1 and 2.by checking and logging the leakage collected in the primary containment floor and equipment sumps at least once per 4 hours. In addition, the primary containment atmosphere activity shall be checked and logged at least once per 8 hours.