

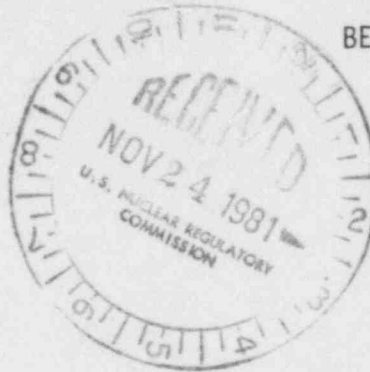
BOSTON EDISON COMPANY
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A. V. MORISI
MANAGER
NUCLEAR OPERATIONS SUPPORT DEPARTMENT

November 17, 1981

BECO. Ltr. #81-256

Mr. Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555



License No. DPR-35
Docket No. 50-293

PNPS Core Spray Sparger Inspection Results

Dear Sir:

Attached please find "Preliminary Report of the Structural Evaluation of the Pilgrim Station Core Spray Sparger Based Upon Results from the October 1981 Remote Visual Inspection" (Attachment B). This report 1) documents our findings, which as recently presented in a meeting with your Staff, demonstrate that no defects with deleterious consequences exist now or in the foreseeable future; and 2) supports our conclusions which eliminate any concerns about sparger performance.

Attachment A provides a detailed description of the equipment utilized, a procedural sequence of inspection techniques, and an addendum describing the identification and subsequent disposition as a concern, of two additional suspect areas discovered during the photographic reproduction processes of our computer enhanced video tapes.

Conclusions

Based on the detailed inspection, evaluation of indications, structural integrity evaluation, fracture mechanics analyses and fluid mechanics evaluations we maintain that the core spray spargers as installed at Pilgrim Station are fully operational. In addition, based on the results of the inspection and the evaluation made by the Level III inspector we will take no maintenance action and will pursue restoring the credit for spray distribution/heat transfer from our core spray system in the near future.

During refueling VI in 1983 an indepth inspection of the spargers similar to the one this outage will be performed and the results evaluated against the 1981 results.

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If during your review of the attached material, you should have any questions or concerns, please do not hesitate to contact us.

Very truly yours,

John H. Fulton
Ser/AVM

Attachments

1981 CORE SPRAY SPARGER INSPECTION

The 1980 inspection of the core spray sparger was performed with a single camera supported from a forty foot pole and two 150 watt under water lights supported from ropes. Due to this arrangement the ability to resolve any significant indications was limited. This resulted in having to characterize many suspect indications as cracks.

To insure that at the time of the 1981 inspection all indications could be readily evaluated, the following equipment was utilized:

- (a) A Support fixture that rigidly supported both cameras and under water lights.
- (b) Two under water cameras equipped with both straight and right angle reviewing capabilities.
- (c) Two 1500-2000 watt under water lights.
- (d) Video tape recording equipment with audio input and output.

Unlike the inspection conducted in 1980 where the resolution of the camera was based on resolving a 1/32 black on an 18% gray card, a one (1) mil wire was utilized.

The inspection fixture was designed (for B.E.Co.) such that one end was set in the four center fuel cells, and could also rotate from this position. The other, where the cameras and lights were located, had a wheel that rolled on the vessel shroud. The cameras and lights were rigidly mounted on the support fixture. Any readjustment of the cameras or lights had to be accomplished out of the vessel.

For the actual inspection - counter weights had to be placed on the fixture to keep it submerged in place. These weights were later repositioned because of the added buoyancy of the sealed lights.

With the balance of the fixture corrected, the assembly was lowered onto its fulcrum pin at the center cell location. The entire assembly was rotated with the use of the refueling grapple.

The video tape and enhancement equipment were located on the 91' level of the reactor building along with the technicians and the level III examiner. Head set communication was available between personnel on the refuel bridge, and the 91' level. This reduced the number of personnel located on the refuel floor, and also reduced the total radiation of the crew.

Since the rotation of the camera fixture was controlled by maneuvering the grapple hook, the scanning speed was estimated to be three (3') feet per minute. The original scheme was to have two cameras mounted one above the other which would allow for viewing the top and center section of each sparger simultaneously. However, because of difficulties with the rotating 90° lens this approach could not be utilized. Instead, a fixed mirror lens was inserted into a single camera. The use of a second camera would have reduced the inspection time by four hours.

At the time of the inspection, all but the four center fuel cells were still in the core, which reduced the ability to obtain steep upward views of the lower sparger because of the fuel bundle handles. A total of ten clockwise sweeps of the spargers were required to inspect the accessible areas; two scans for each of the lower sparger and three scans of each upper sparger. This first phase of the inspection was completed in eighteen (18) hours.

The next phase of the examination was to inspect the core spray piping with a hand-held camera and lights. The downcomer annulus region was found to be extremely turbulent which made steadying the camera almost impossible. Despite this problem the inspection results were acceptable to the level III visual examiner.

The third phase of this inspection was to re-examine those areas identified during the 1980 examination. To this end, the inspection was not entirely successful, due to the fact that some of the reported indications could not be located. These were dispositioned as having been either lighting shadows or crud marks. For those indications that were located, the image from the 1980 examination was reproduced and then enhanced. This resulted in classifying six indications as not significant, two as heavy grinding and one as a mechanical mark. To inspect the area between the "B" junction box, and the weldolet of nozzle #25 a separate camera handling rig was prepared which utilized a rotating right angle lens. The lighting for this inspection included a 250 watt, "acorn", light and one 1000 watt "general area light." The cameras and lights were orientated to a position such that shadows were not cast on the inspection surface.

After reviewing the inspection of the "B" junction box it was recommended that the area between the junction box and the nozzle be wire brushed and reinspected. Upon completion of the cleaning, an additional inspection of the area of interest was conducted.

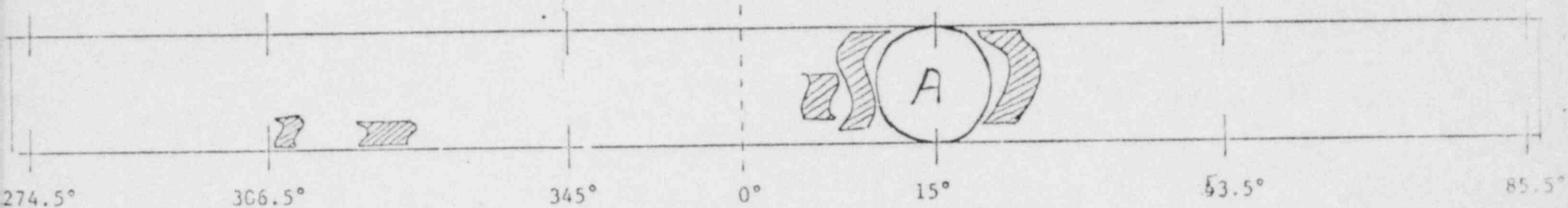
At the conclusion of the evaluation the following results were reported to B.E.Co.:

1. Six indications found during the 1980 inspection were resolved as not significant. Two indications were determined to be heavy grinding, one indication determined to be a mechanical mark and two indications could not be found.

2. One area, "B" header to pipe weld and the area to nozzle 25B appears to have indications (cracks) which when compared to the 1980 results do not appear to have propagated.

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SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

REPORT 1 OF 1



Indications were viewed in the cross hatched areas. These were resolved as not significant.
See R.P. Shimkus' report dated 9 Oct, 1981.

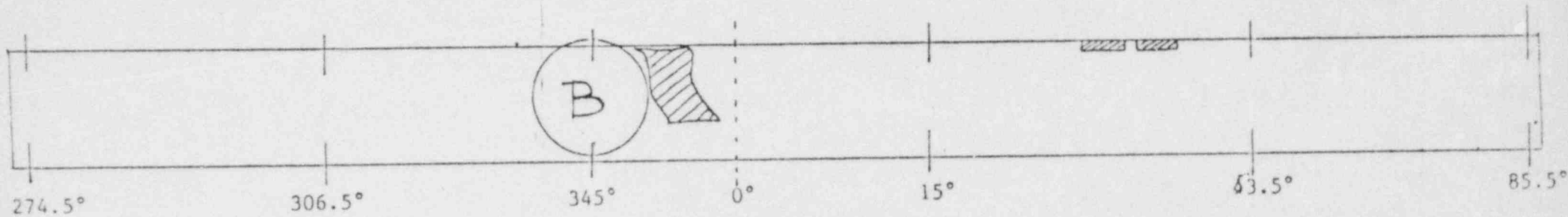
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BOSTON EDISON COMPANY
PILGRIM NUCLEAR POWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

REPORT 1 OF 1



Indications on the 0° side of the junction box determined to be cracks. The area is judged to have stabilized and no further area degradation is expected. What were once thought to be crack-like indications in the heat affected zones adjacent to the weldolats for nozzles 40 & 41 B were resolved as shadows. See R.P. Shimkno' report dated 9 Oct., 1981.

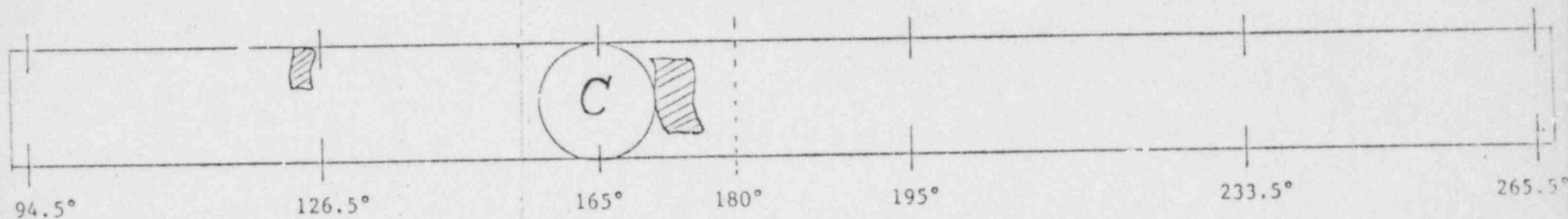
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PILGRIM NUCLEAR POWER STATION
SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION

REPORT 1 OF 1



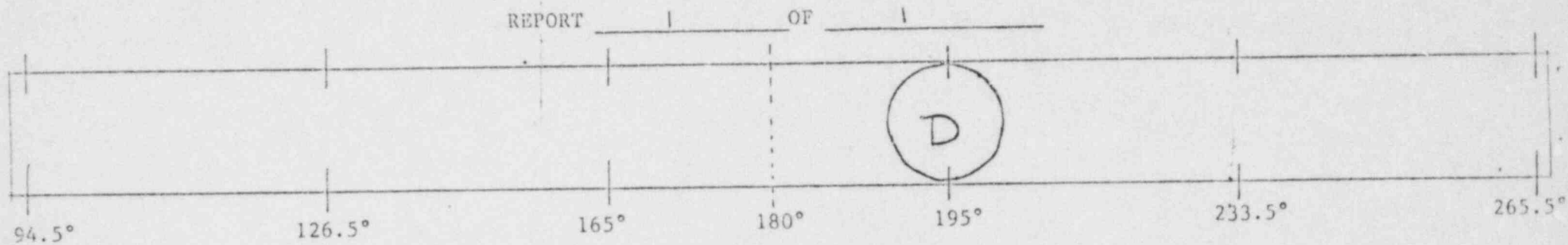
Indications were found in the cross-hatched areas. All were resolved as not significant. See R.P. Shimkus' report dated 9 Oct, 1981

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SUMMARY OF CORE SPRAY SPARGER INDICATIONS
AS NOTED DURING VISUAL EXAMINATION



No significant indications. See R.P. Shimkus' report dated 9 Oct, 1981

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ADDENDUM TO THE PRELIMINARY CORE SPRAY SPARGER REPORT

During the enhancement process, two areas were determined to have linear indications that were not previously detected at the time of the visual inspection. These indications are identified as being located at the "A" junction box and the 41B Nozzle.

Copies of these enhanced photographs were sent to Southwest Research Institute for evaluation. Mr. Shimkus reviewed the photographs from which data sheets numbered 390513-A and 290514 were prepared for inclusion into the preliminary report. The results of Mr. Shimkus's evaluation indicate that there is a crack at the "A" junction box (See Photographs 5-39, 5-40, 5-41, and 5-42). Aptech has also provided a sizing criteria for this indication, and concludes that no hazardous growth will take place and that clamping is not required.

The second indication identified at the 41B Nozzle has been evaluated by Mr. Shimkus as being non-relevant and no further action was required at this time.

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