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R S  
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Dr. Clifford Beck, Director  
Office of Government Liaison -  
Regulation US Atomic Energy Commission  
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V. référence  
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Unser Zeichen  
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5303 Würenlingen

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20. 2. 1974

Gegenstand / Objet / Oggetto: Cracks in Feedwater  
Spargers in the KKM Nuclear Station GE-BWR

Dear Dr. Beck,

From the technical press we have some information on difficulties with the feedwater spargers in Millstone.

On the basis of these experiences GE performed a number of checks at KKM on the condition of its spargers during the summer 73 first curtain outage.

As a first test, the pretension of the spargers was checked. It was observed that on 7 out of the total of 8 sparger-halves the initial pretension was almost completely lost (the fixation bolts could be turned relatively easily).

Since the loss of pretension might be due to cracking of the type as observed in Millstone, GE decided to perform a so-called "poor man's dyecheck", which consists of a) prewarming the primary water through decay heat, b) lowering the water level to below the sparger level followed by c) the search for local humid spots on the rapidly drying sparger body. It is worth noting that no cracks were visible by underwater-TV or with binoculars. During this test a number of humid spots were observed, which remained humid for at least half an hour, although the sparger itself dried up rapidly in a few minutes.

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Since the cracks, if real, appeared to be of small size, we had no objections to renewal of operation. It was decided to make a second check during the January '74 second curtain outage.

The indications as observed in January are shown on the attached sketch, which BKW was so kind as to give us for transmittal to your office. The wet spots are marked in red.

The following data may be of interest :

- All humid spots seen in Sept. '73 showed up again, but appeared to be stationary.
- Two additional indications were found, one of these starting from the first flow hole at 135°. This crack appears to be very thin. It is approx. 2 in long.
- The more important cracks (thicker red) have a length of approx. one third of the pipe diameter.
- Again, none of the cracks could be seen under water, either by TV or with binoculars.

We have again permitted resumption of plant operation, since we considered that a) no immediate danger of sparger rupture exists, b) even in case of rupture no direct damage to the core seems possible and c) large asymmetries in flow would probably show up in the neutron flux distribution. A new check is planned for the Summer '74 first refueling shut down.

Since KKM, however, is not a single case, and we have no explanation for the observed cracks, we feel rather worried about the situation. It may become necessary to exchange the spargers some day, but an operation of such magnitude is only justified if the reason for the cracking seems clear and if the problems, arising during the exchange work, can be foreseen.

Consequently we would appreciate any help you might give us. The following items seem to be most important:

1. Millstone:
  - Observations
  - Possible causes
  - Possible design modifications made or intended
  - Removal of first and installation of new spargers (sequence of actions, particular problems, health physics)

2. Observations in other US-Plants.

3. Fundamental treatment:   - AEC Safety Considerations  
                                  - Special tests planned, etc.

As to possible causes, GE has told us they suppose feedwater flow oscillations might have led to vibrations and subsequent fatigue at Millstone. Here at KKM we have an extremely stable feedwater control system, the entire core however, being rather noisy in the upper load range (neutron flux, jet pump flow, occasionally main steam pressure). According to GE, this is apparently normal for the high-power cores.

We intend to keep you informed on any new developments at KKM. Since we have only one BWR-plant here in operation, you will understand that we are most interested in information and assistance from your organisation.

You may also be interested to learn that GE has taken the same steps as at Vermont Yankee to prevent further damage to the fuel channels due to curtain movement by blocking the bypass holes in the lower core grid. The channels were again inspected in January '74 and 11 out of the total of 228 channels (226 replaced by new ones in Sept. '73) were again replaced since they did not meet the acceptance criteria (same as V.Y.).

Yours truly  
NUCLEAR SAFETY DIVISION

(F. Weehuizen)

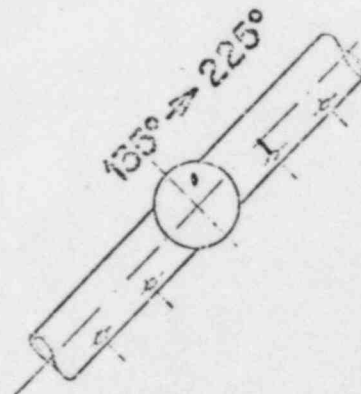
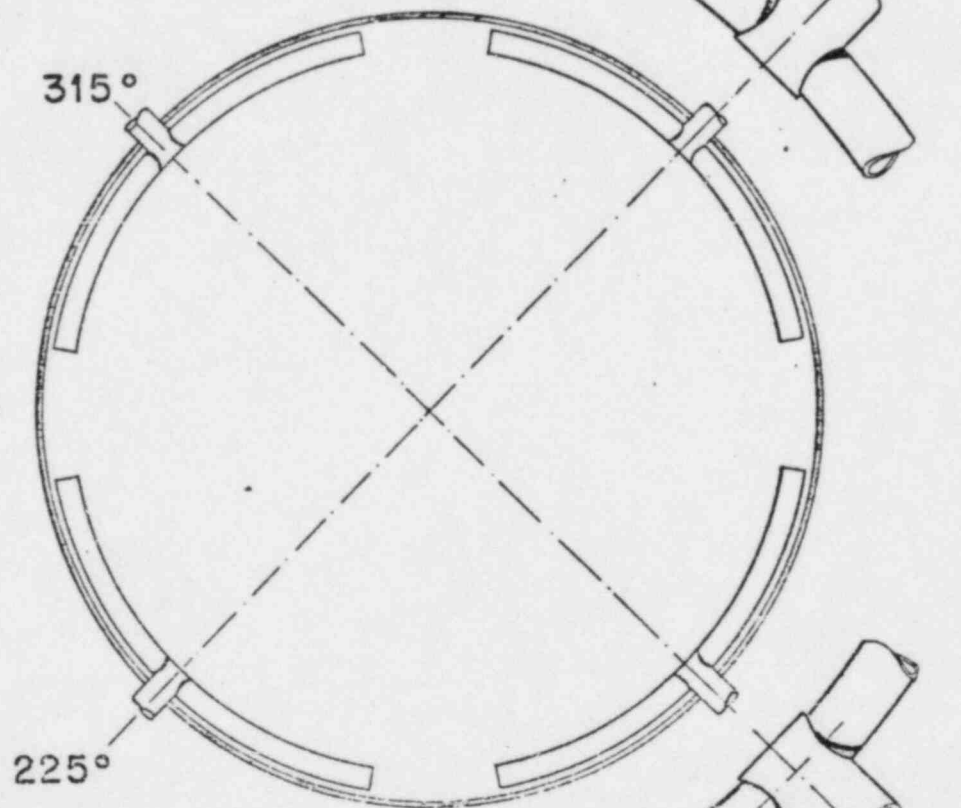
Attached: Sketch prepared by BKW:  
              "Speisewasser-Ringleitung"  
              feuchte Stellen (Wet spots). Tests am 17.1.74  
              (Results of "poor man's dye check").

# SPEISEWASSER- RINGLEITUNG

feuchte Stellen

Tests am 17. 1. 74

Red marks indicate a: humid spots remaining  
after lowering of liquid water  
level and drying of  
spargers



KKM - SE-BWR  
Feedwater - Spargers  
\* Port man's dye check  
of Jan 17, 1974

Bernische Kraftwerke AG  
 Kernkraftwerk Mühleberg  
 Betriebsabteilung

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