

REPORT OF INVESTIGATION INTO SIGNIFICANT
DEFICIENCY CONCERNING INADEQUATE NONDESTRUCTIVE
EXAMINATIONS PERFORMED ON THE
NINE MILE POINT UNIT 2 CONTAINMENT LINER WELDS

INTRODUCTION

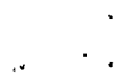
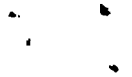
On May 18, 1979, Mr. A. C. Cerne of NRC Region I was informed by telephone that Niagara Mohawk was evaluating a condition which may be a reportable deficiency under 10 C.F.R. 50.55(e). This condition concerned inadequate non-destructive examination of circumferential K-type butt seam welds in the containment liner lower knuckle assembly and the base ring embedment T-welds. Subsequently, on May 24, 1979, Mr. L. Narrow of NRC Region I was notified by telephone that we were expanding our evaluation to include ultrasonic testing of the following:

1. Knuckle Vertical Seam Welds
2. Penetrations - Flued Head to Sleeve Weld
3. Beam Seats
4. Penetrations - Collar to Pipe (T-Weld)
5. Floor Plate
6. Instrument Penetration - Adapter to Sleeve Weld.

DESCRIPTION OF DEFICIENCY

A review of ultrasonic testing records revealed that certain ultrasonic testing methods used on the containment liner were inadequate. Further investigation of the records revealed that it was questionable whether certain ultrasonic testing techniques were properly implemented. The specific areas of the liner affected are listed above and indicated in the attached Figure 1. The nature of the deficiency in each of the eight areas is included with the following corrective action.

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CORRECTIVE ACTION

1. Base Ring T-Weld

The ultrasonic testing technique used was not capable of detecting defects perpendicular to the plate surface. The technique did not provide a full volumetric examination of the welds. As of August 22, 1979, approximately 264 feet of the base ring had been retested utilizing an acceptable ultrasonic testing technique and 22 feet remains to be retested. Numerous rejectable indications have been found. Repairs are scheduled to be completed by June, 1980.

2. Lower Knuckle K-Weld

Investigation revealed that the ultrasonic testing technique used on the circumferential K-weld in the knuckle was not adequate. The technique used was not capable of detecting defects perpendicular to the plate surface. The technique did not provide a full volumetric examination of the welds. The entire K-weld of approximately 285 feet in length was re-examined. Twenty-nine inches of the weld had rejectable indications. These were repaired, re-examined and found to be satisfactory.

3. Knuckle Vertical Seam Welds

After reviewing weld ultrasonic testing records, two field seam welds were found to have improper calibration backup and required re-examination. No unacceptable indications were found upon re-examination.

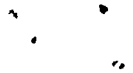
Additionally, when the knuckle cutout replacement weld radiographic testing was reviewed, a small portion of some vertical seam welds was found to have defects. Retesting has been performed for all of the 42 shop seam welds which were originally accepted. Indications were found in 23 of the welds. They were repaired, re-examined and found to be satisfactory.

4. Penetrations. - Flued Head to Sleeve Weld

It was determined that only a small portion of the weld was volumetrically examined using ultrasonic testing. These welds will be 100 percent radiographed where meaningful results can be obtained. Ultrasonic re-examination will be used where radiography cannot be successfully employed. The re-examination is expected to be complete by October, 1979. Repairs will be made if indications are revealed.

5. Beam Seats

Due to the numerous ultrasonic testing indications found in other areas, a sample inspection of beam seat full penetration welds was performed. The majority of the welds in the sample were found to be rejectable. Therefore, 100 percent re-examination was required for all beam seat full penetration welds attached to the primary containment.



5. Beam Seats (Continued)

As of August 14, 1979, 22 out of 33 beam seat welds had been retested. Nineteen were found to have rejectable indications. All repairs and retesting are expected to be completed by September 30, 1979.

6. Penetrations - Collar to Pipe

The suppression chamber penetrations were investigated and it was determined that the ultrasonic testing technique used was not adequate. The ultrasonic techniques performed utilized a 45 degree search angle only and this did not provide a full volumetric examination of the welds. Supplemental ultrasonic testing was determined necessary.

Further investigation of the lower and upper cone penetrations determined that 37 percent of the penetrations required supplemental ultrasonic testing. The remaining 63 percent had proper documentation for the ultrasonic testing. A sample of the remaining 63 percent was examined to ensure that proper techniques were used.

Since the majority of the ultrasonic testing in each sample for the lower and upper cone penetrations and the suppression chamber penetrations was found to be rejectable, 100 percent re-examination will be performed.

As of August 14, 1979, 30 out of 47 suppression chamber penetration welds have been retested with one rejectable indication. On the lower and upper cone, 110 out of the 119 penetration welds were retested; 88 had rejectable indications. The retesting and repairs are expected to be completed by September 30, 1979.

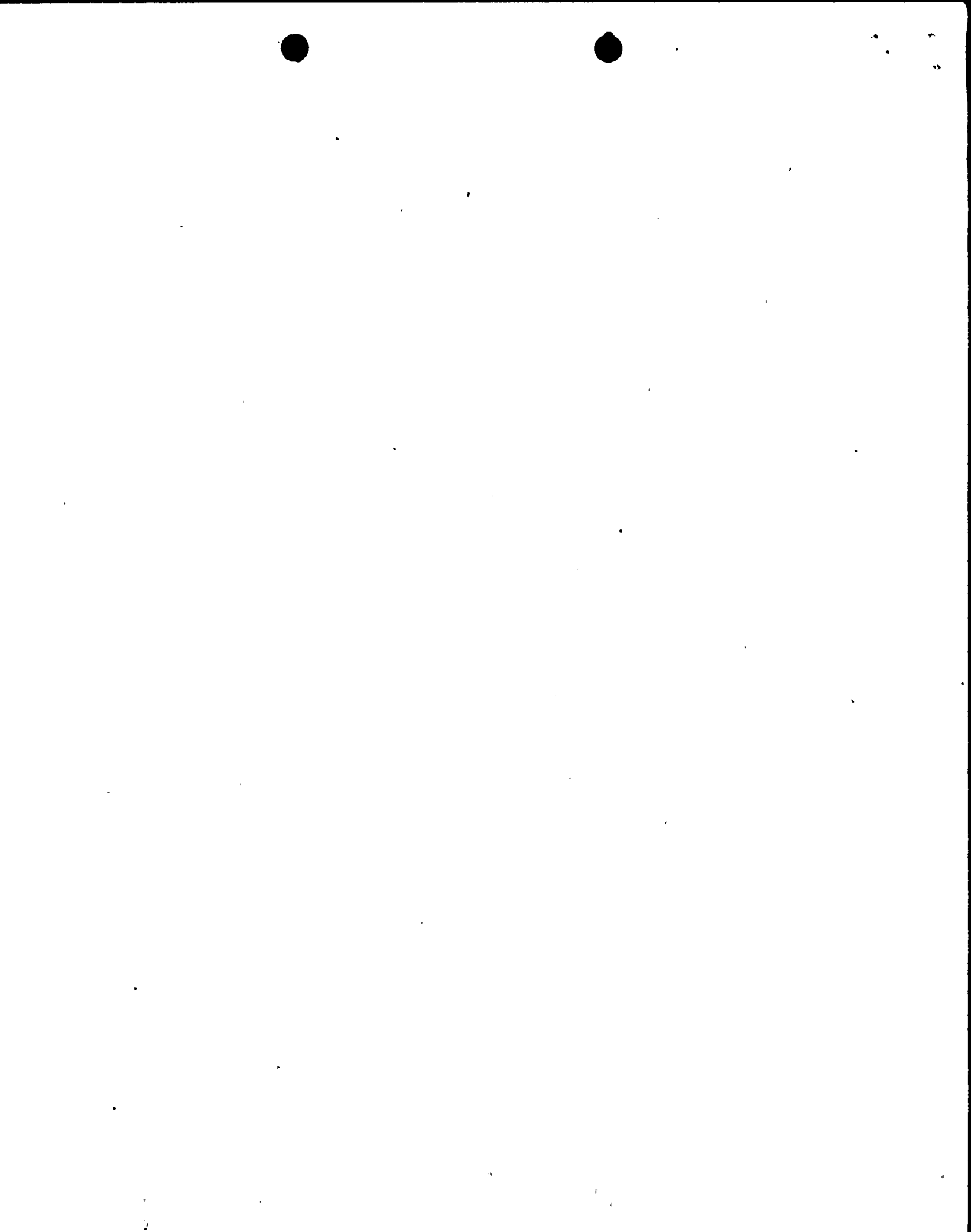
7. Bottom Floor Plate

Review of the ultrasonic testing documentation of the welds in the bottom floor plate has been completed. Approximately 5 percent of the weld documentation has been found to be acceptable. The remaining 95 percent will be ultrasonically retested. The expected completion date is mid-1980.

8. Instrument Penetration - Adapter to Sleeve Weld

A sample will be ultrasonically tested to ensure that the ultrasonic technique used provided a 100 percent volumetric examination of the weld. If the sample reveals an unacceptable number of indications, 100 percent re-examination will be performed. This activity is expected to be completed during September 1979.

In order to preclude the re-occurrence of the problem, technique sheets will be reviewed in conjunction with the performance of ultrasonic testing of containment liner welds.



SAFETY IMPLICATIONS

The containment liner is a safety-related structure and is described in Section 12.5.2.7 of the Nine Mile Point Unit 2 PSAR. The function of the liner is to act as a leak tight structure to limit the release of fission products in the event of a postulated accident.

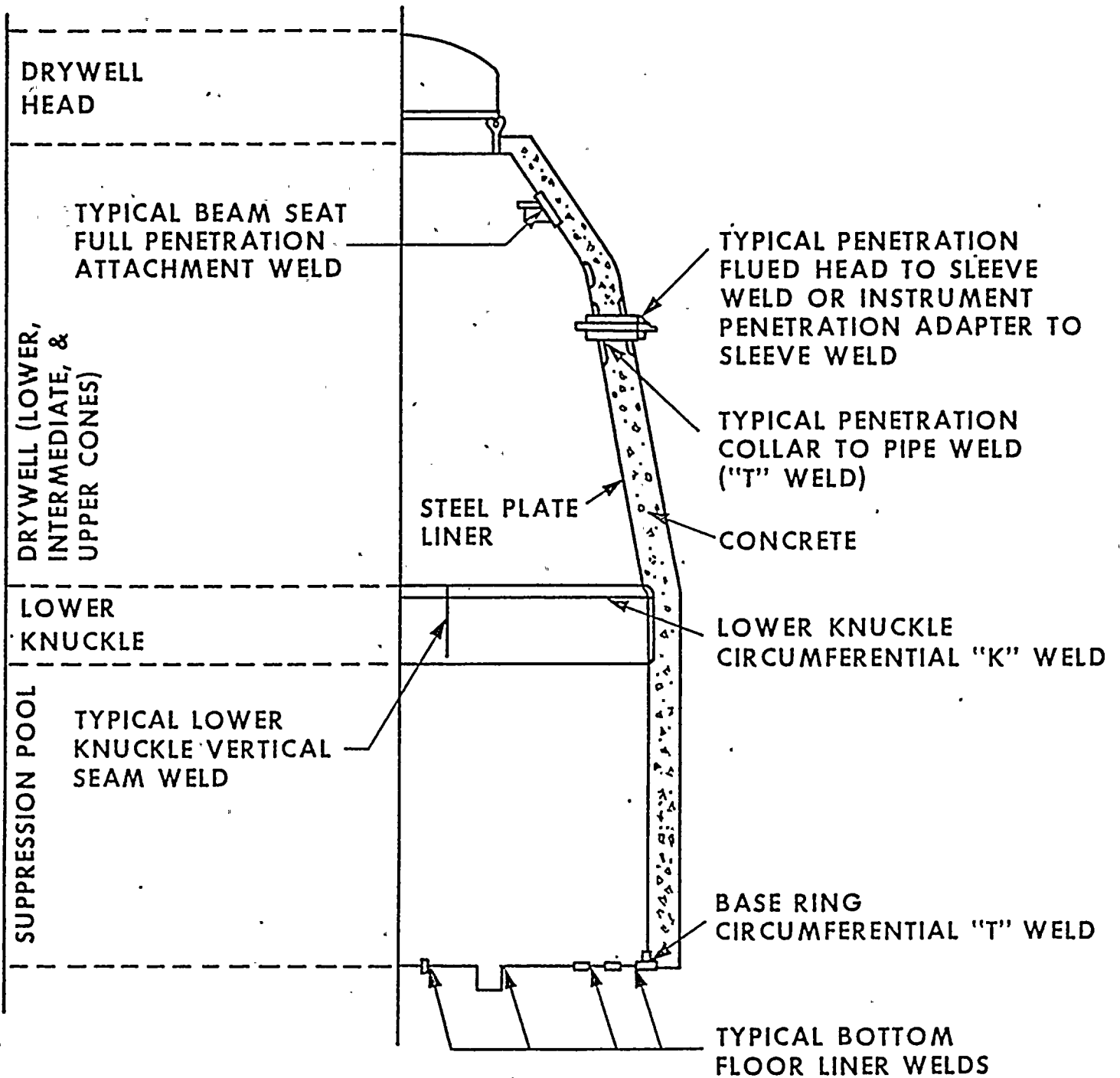
Pre-operational testing performed prior to startup subjects the liner to design pressures. Periodically, additional leak rate testing will be performed to assure the containment meets integrity requirements. Such testing would likely identify deficiencies which could result in increased fission product releases during postulated accident conditions.

To quantify more precisely the consequences of these deficiencies under accident conditions, detailed analyses would be required. Since these deficiencies are being corrected, these analyses will not be performed.



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3
4

FIGURE 1



NMP2 PRIMARY CONTAINMENT LINER

