



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO MASONRY WALL DESIGN, IE BULLETIN 80-11

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-220

1.0 INTRODUCTION

In the course of conducting inspections at the Trojan Nuclear Plant, Portland General Electric Company determined that some concrete masonry walls did not have adequate structural strength. Further investigation indicated that the problem resulted from errors in engineering judgment, a lack of established procedures and procedural details, and inadequate design criteria. Because of the implication of similar deficiencies at other operating plants, the NRC issued IE Bulletin 80-11 on May 8, 1980.

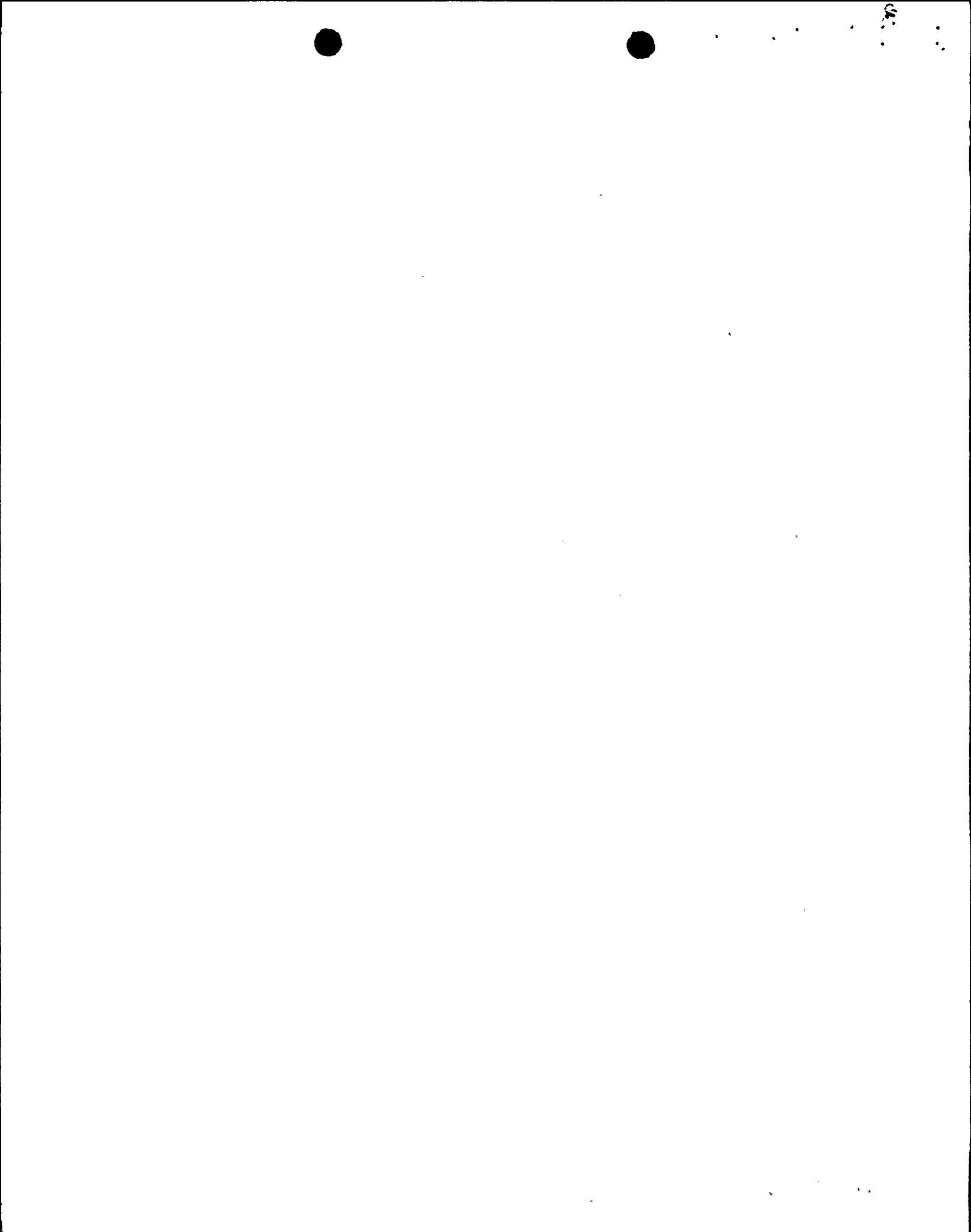
IE Bulletin 80-11 required licensees to identify plant masonry walls and their intended functions. Licensees were also required to present reevaluation criteria for the masonry walls with the analyses to justify those criteria. If modifications were proposed, licensees were to state the methods and schedules for the modifications.

In response to IE Bulletin 80-11, Niagara Mohawk Power Corporation (the licensee) performed an analysis of the masonry walls at Nine Mile Point Unit 1 (NMP-1). The licensee responded to IE Bulletin 80-11 in submittals dated July 8, 1980 and November 10, 1980, describing the status of masonry walls at NMP-1. The licensee provided additional information in a submittal dated June 14, 1982. Following conference calls on October 21, 1982 and December 14, 1982, the licensee determined that a reanalysis of the walls was in order due to the lack of consideration of high energy line break effects in the first analysis and a revised technical position on Dur-O-Wal. A meeting was held on April 27, 1983 between Niagara Mohawk and the staff in which the licensee provided additional information regarding the status of its masonry wall review, previous staff questions, and the design criteria for the wall reanalysis. As a result of this meeting, the staff indicated additional questions on the reanalysis criteria in the meeting minutes dated May 13, 1983. In response, the licensee provided a submittal dated June 24, 1983 containing the "Design Criteria for the Re-Analysis of Safety-Related Masonry Walls, Nine Point Mile Point Unit 1." Finally, the licensee provided additional information in a letter dated June 21, 1984 regarding the masonry wall reanalysis and the licensee's test program.

2.0 EVALUATION

The findings reported in this safety evaluation are based on the attached Technical Evaluation Report (TER), prepared by Franklin Research Center (FRC)

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as a contractor to NRC. This TER contains the details of construction techniques used, technical information reviewed, acceptance criteria, and technical findings with respect to masonry wall construction at NMP-1. The staff has reviewed this TER and concurs with its technical findings. The following is our summary of the major technical findings:

1. The licensee has identified a total of 75 safety-related masonry wall systems at NMP-1. (A wall system is defined as a single wall or combination of walls in close proximity to each other.) All of these safety-related masonry walls have been qualified on the basis of the working stress criteria when subject to loads other than pressurization loads resulting from a postulated event of a high energy line break. The issue of pressure loads is discussed in item 3 below.
2. As presented in Section 3-1 of the TER, the licensee's working stress criteria, as applied in the evaluation of the NMP-1 walls, are consistent with the staff acceptance criteria delineated in Appendix A of the TER. Therefore, it is concluded that NMP-1 walls are structurally adequate to withstand imposed loadings other than high energy line break loads.
3. Thirty walls in the turbine and reactor buildings are subject to pressurization loads in the event of a high energy line break. The licensee has undertaken a "leak-before-break" program to show that an instantaneous, open ended, high energy line break will not occur and, therefore, the masonry walls should not be evaluated for instantaneous pressure loads. The staff is currently reviewing the "leak-before-break" concept in a general rule-making context and will determine its applicability to the situation at NMP-1 at a later date (note that these walls are qualified for other design basis loads including seismic effects).
4. Nine walls at NMP-1 have been modified. These modifications included the addition of bracing at the top of the wall to provide lateral seismic resistance and to ensure a pinned support and the addition of steel beams and columns across the wall face to reduce the span length. One wall required the removal of a pipe bearing force at the point where the pipe penetrated the wall. The licensee's modifications are found acceptable as the modified walls comply with the staff acceptance criteria.

3.0 CONCLUSION

Based on the above findings, the staff concludes that, with the exception of 30 walls which are currently under staff review for the applicability of the "leak-before-break" concept (a rule-making consideration), Items 2(b) and 3 of IE Bulletin 80-11 have been fully implemented at NMP-1 and that there is reasonable assurance that the safety-related masonry walls at NMP-1 will withstand the specified design load conditions without impairment of (a) wall integrity or (b) the performance of the required safety functions.

Principal Contributor: N. Chokshi

Dated: March 13, 1986

