

James W Cook
Vice President, Midland Project

General Offices: 1945 West Parnall Road, Jackson, Michigan 49201 • (517) 788-0640

September 19, 1980

Mr J G Keppler, Regional Director
Office of Inspection & Enforcement
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND NUCLEAR PLANT
UNIT NO 1, DOCKET NO 50-329
UNIT NO 2, DOCKET NO 50-330
HELBA RESTRAINT DESIGN
FILE: 0.4.9.41 UFI: 73*10*01 SERIAL: 8830

This letter confirms the 50.55(e) item concerning HELBA Restraint Design, reported by telephone call to R Knop, USNRC Region III, Glen Ellyn, IL, on August 21, 1980.

The attachments to this letter describe the conditions and actions taken concerning this item.

Another report, either interim or final, will be sent on or before December 1, 1980.

James W. Cook

WRB/lr

- Attachment: 1) Management Corrective Action Report (MCAR-1), Report No 40, dated August 21, 1980
- 2) MCAR-40, Interim Report 1, High Energy Line Break Analysis (HELBA), Pipe Whip Restraint Designs, dated September 11, 1980

CC: Director of Office of Inspection & Enforcement
Att: Mr Victor Stello, USNRC (15)

✓ Director of Office of Management
Information and Program Control, USNRC (1)

R Cook, USNRC Resident Inspector
Midland Nuclear Plant (1)

*B019
S111*

8009250

284

5

QUALITY ASSURANCE PROGRAM
MANAGEMENT CORRECTIVE ACTION REPORT
MCAR-1

Attachment 1
Serial: 8830

JOB NO: 722911302 QNO: 1.102 REPORT NO: 40
DATE: 8/21/80

I DESCRIPTION* (Including References):

Contrary to the requirements of FSAR 3.6.2.2 and the referenced sections of BN-TOP-2, steady state rather than peak thrust forces were used in the design of Q-listed pipe whip restraints. Design documents have been released for construction/fabrication purposes and most of the restraints have been installed.

RECOMMENDED ACTION* (Optional):

- The high energy line break analysis (HELBA) group to develop and provide the civil and plant design disciplines with data necessary to perform a reanalysis of the pipe whip restraint designs to assure their compliance with FSAR subsection 3.6.2.2.

REFERRED TO: Engineering Construction QA Management _____
 Procurement

ISSUED BY: *Archie L. Bach* 8/21/80
Project QA Engineer Date
for **L.A. DREISBACH** PQAE

II REPORTABLE DEFICIENCY: Potentially Reportable
 NO YES

NOTIFIED CLIENT: *deleted*
M. J. ... *deleted*
Project Manager Date

III CAUSE:

CORRECTIVE ACTION TAKEN:

AUTHORIZED BY: _____
Date

- | | | |
|--------------------------|----------------------|--------------------|
| AAPO DISTRIBUTION | PROJ DISTRIBUTION | OTHER DISTRIBUTION |
| MGR OF CONSTRUCTION | CHIEF CONSTR OC ENGR | MGR OF QA - TPO |
| MGR OF ENGINEERING | CLIENT | GPD - QA MGR |
| MGR OF PROCUREMENT | PFOCE | LAPD - QA MGR |
| MGR OF PROJ OPERATIONS | PROJECT CONSTR MGR | SFPD - QA MGR |
| MGR OF QUALITY ASSURANCE | PROJECT ENGINEER | |
| CONSTRUCTION MGR | PROJECT MGR | |
| ENGINEERING MGR | PROJ PROCUREMENT MGR | |
| SUPPLIER QUALITY MGR | SITE MGR | |
| QA SUPERVISOR | | |

FORMAL REPORT TO CLIENT _____
(if Section II Applies) Date

CORRECTIVE ACTION IMPLEMENTED

VERIFIED BY _____
Project QA Engineer Date

*Describe in space provided and attach reference document

RECOMMENDED ACTION continued

2. The plant design discipline to develop and provide plastic hinge lengths for the reanalysis of the pipe whip restraint designs.
3. The civil discipline to review affected pipe whip restraint design documents, considering the peak thrust forces, to assure that they shall perform adequately during a high energy pipe rupture. If necessary revise design documents.
4. Have the cognizant Chief Engineers office review the HELBA group assumptions and work processes to determine if other similar potential problems exist.
5. If thru the review process certain pipe whip restraints are identified as requiring modification, notify Construction, Quality Control and the PQAE. This notification should be provided as soon as practical after the necessary modification is identified.
6. Investigate and identify the root cause and provide corrective action to preclude recurrence.
7. Develop and submit a written report to the PQAE for coordination with Consumers Power Company containing available information on or before 9/11/80.

Bechtel Associates Professional Corporation

011918

SUBJECT: MCAR 40 (issued 8/21/80)
High-Energy Line Break Analysis (HELBA),
Pipe Whip Restraint Designs

INTERIM REPORT 1

DATE: September 11, 1980

PROJECT: Consumers Power Company
Midland Plant Units 1 and 2
Bechtel Job 7220

Introduction

This report is submitted regarding the interim status and actions pursuant to the subject MCAR.

Description of Discrepancy

FSAR Section 3.6.2.2 states that the analysis of the thrust forces which result in the event of a pipe rupture is described in BN-TOP-2. Contrary to the intent of BN-TOP-2, the steady-state thrust forces rather than the transient peak thrust forces were used in the energy balance techniques for the design of HELBA pipe whip restraints (see attachment, Figure B). Design documents have been released for construction/fabrication and most of the restraints have been installed.

Cause

The cause of this discrepancy has been identified as a misinterpretation of the requirements of BN-TOP-2.

Safety Implication

The safety-related function of a pipe whip restraint is to limit pipe movement following a high-energy line break to prevent unacceptable damage to essential systems or components. Designing the restraint using the steady-state thrust force instead of the higher transient thrust force could compromise this safety function. The size of the restraints may be inadequate for the increased loads, and/or their location may be inadequate as a higher thrust force may cause the plastic hinge length to decrease outside the range of the restraint. This deficiency, were it to have remained uncorrected, may have adversely affected the safety of operations at the Midland plant if certain types of accidents were to occur.

Analytical Reevaluation Action

The affected restraints are being reevaluated using conservative thrust force time-histories input to energy balance and/or time history methods as described in BN-TOP-2.

Bechtel Associates Professional Corporation

011918

MCAR 40
Interim Report 1
September 11, 1980
Page 2

Corrective Action

Corrective action depends upon the results of the analytical reevaluation.

Forecast Dates

The next interim report is scheduled to be issued by November 21, 1980.

Reportability

This condition was reported by Consumers Power Company to the NRC as a potential 10 CFR 50.55(e) reportable condition on August 21, 1980. A 30-day report is due to be sent to the NRC on September 20, 1980.

Submitted by:

J. A. Clements

Approved by:

E. M. Hunter for L. H. Curtis

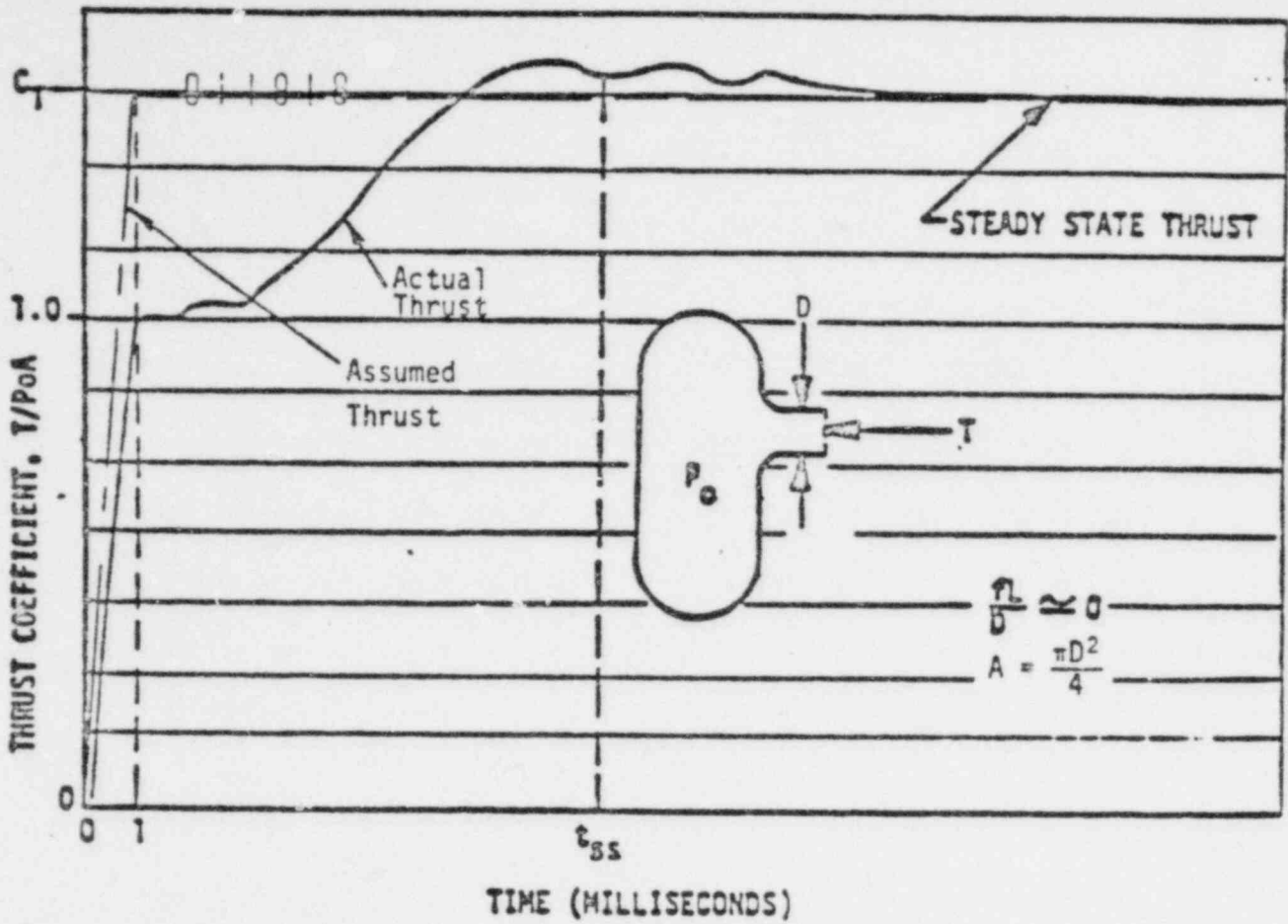
Concurrence by:

K. D. Bailey

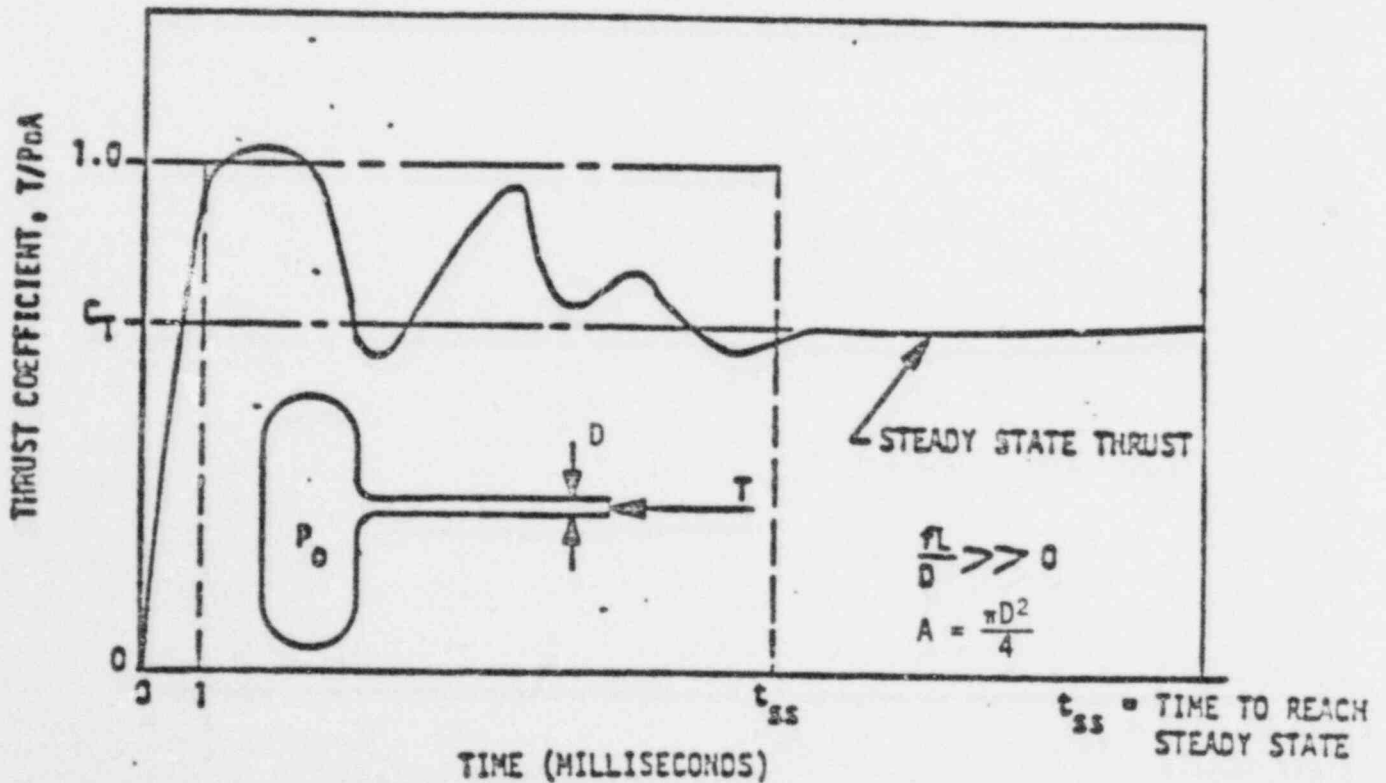
^{JAC}
JAC/LHS/bjm
9/3/7

POOR ORIGINAL

TYPICAL THRUST FORCE TRANSIENTS



A. Thrust Force Transient, Very Low Friction Flow



B. Thrust Force Transient, Friction Flow