

RELATED CORRESPONDENCE  
ISHAM, LINCOLN & BEALE  
COUNSELORS AT LAW

ONE FIRST NATIONAL PLAZA FORTY-SECOND FLOOR  
CHICAGO, ILLINOIS 60603

TELEPHONE 312-558-7500 TELEX: 2-5288

WASHINGTON OFFICE  
1050 17TH STREET, N. W.  
SEVENTH FLOOR  
WASHINGTON, D. C. 20036  
202-833-9730



October 15, 1979

Ivan W. Smith, Esq.  
Atomic Safety and Licensing Board  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. Gustave A. Linenberger  
Atomic Safety and Licensing Bd. Panel  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dr. Frederick P. Cowan  
Apt. B-125  
6152 North Verde Trail  
Boca Raton, Florida 33433

Re: Consumers Power Company  
(Midland Plant, Units 1 and 2)  
Docket Nos. 50-329, 50-330

Gentlemen:

Enclosed is an interim \$50.55(e) report which has recently been submitted by Consumers Power Company to the Nuclear Regulatory Commission.

Very truly yours,

*Martha E. Gibbs*  
Martha E. Gibbs

MEG:mc  
cc: Service List  
Enclosures

1396 005

7911270 242

G

SERVICE LIST

RELATED CORRESPONDENCE

Ivan W. Smith, Esq.  
Atomic Safety and Licensing Board  
U.S. Nuclear Regulatory Commn.  
Washington, D.C. 20555

Ms. Mary Sinclair  
5711 Summerset Street  
Midland, Michigan 48640

Mr. Gustave A. Linenberger  
Atomic Safety & Licensing Bd. Panel  
U.S. Nuclear Regulatory Commn.  
Washington, D.C. 20555

Colleen P. Woodhead, Esq.  
Counsel for the NRC Staff  
U.S. Nuclear Regulatory Commn.  
Washington, D.C. 20555

Dr. Frederick P. Cowan  
Apt. B-125  
6152 North Verde Trail  
Boca Raton, Florida 33433

Atomic Safety and Licensing  
Board Panel  
U.S. Nuclear Regulatory Commn.  
Washington, D.C. 20555

Atomic Safety and Licensing  
Appeal Panel  
U.S. Nuclear Regulatory Commn.  
Washington, D.C. 20555

Frank J. Kelly, Esq.  
Attorney General of the  
State of Michigan  
Stewart H. Freeman, Esq.  
Assistant Attorney General  
Gregory T. Taylor, Esq.  
Assistant Attorney General  
Environmental Protection Div.  
720 Law Building  
Lansing, Michigan 48913

Myron M. Cherry, Esq.  
1 IBM Plaza - 4501  
Chicago, Illinois 60611

Mr. C. R. Stephens  
Chief, Docketing and Service  
Section  
Office of the Secretary  
U.S. Nuclear Regulatory Commn.  
Washington, D.C. 20555

Mr. Wendell H. Marshall  
R.F.D. 10  
Midland, Michigan 48640

Grant J. Merritt, Esq.  
Thompson, Nielsen,  
Klaverkamp & James  
4444 IDS Center  
Minneapolis, Minnesota 55402



1396 006



**Consumers  
Power  
Company**

RELATED CORRESPONDENCE

Stephen H. Howell  
Senior Vice President

General Offices: 1945 West Parnall Road, Jackson, Michigan 49201 • (517) 788-0453

September 28, 1979  
Howe-254-79

Mr J G Keppler, Regional Director  
Office of Inspection and 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  
CONTAINMENT BUILDING PRESTRESSING TENDONS

Reference: S H Howell letter to J G Keppler; Midland Nuclear Plant;  
Unit No 1, Docket No 50-329; Unit No 2, Docket No 50-330;  
Containment Building Prestressing Tendons; Serial Howe-226-79;  
dated August 23, 1979

The referenced letter was an interim 50.55(e) report, as is this letter, on tendon wires which were in nonconformance to length requirements. The enclosure provides the status of resolution of this condition.

Another report, either interim or final, will be sent on or before October 31, 1979.

*Stephen H. Howell*

WRB/lr

Enclosure: MCAR-33, Interim Report #2, dated September 10, 1979

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

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

1396 007

BCC: JLBacon, M-1085A  
RCBauman, P14-412  
WRBird, JSC-216B  
LHCurtis, Bechtel AA  
JLCorley, Midland  
LADreisbach, Bechtel-Midland  
GSKeeley, P14-408B  
BWMarguglio, JSC-220A  
DEMiller, Midland  
WGMoring, Bechtel AA  
JIRutgers, Bechtel AA  
CAHunt, P14-209B  
GTBlack, Midland  
MEGibbs, IL&B  
File: 0.4.9.30

1396 008

# Bechtel Associates Professional Corporation

SUBJECT: MCAR 33 (issued 7/27/79)

Differential Wire Length of Containment  
Building Prestressing Tendons

## INTERIM REPORT 2

DATE: September 10, 1979

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

### Introduction

This report summarizes Bechtel actions and evaluation regarding the differential length of wires in prestressing tendons.

### Description of Deficiency

During an inspection of the Inryco Wiremil facility on July 19, 1979, Inryco and Bechtel personnel discovered that the back-tension clamp of the wire shear was not functioning during fabrication of tendon H32-246. The electrical panel controlling the tendon fabrication line was examined and the automatic back-tension selector switch was found in the off position for an unknown period of time. The wires for tendon H32-246 were scrapped. Ten percent of the wires (17 wires) for tendon H32-249, produced earlier in the day were removed from the anchor head and examined for length. There was a length differential of  $\pm 1$  inch.

It was unknown whether the back-tension device was in the on or off position when these wires were cut. The switch was turned on, four wires were run to length, sheared, and noted to be as much as 7 inches longer than the wires sheared when the switch was in the off position. A hold was placed by Inryco on all 38 tendons which were fabricated at the Wiremil facility and fabrication was discontinued.

The status of the 38 tendons is as follows:

- 1) Twenty two tendons (7 vertical and 15 horizontal) were shipped to the Midland site. The break-down is as follows:
  - a) Seven vertical tendons were installed.
  - b) Five horizontal tendons were returned to Wiremil upon arrival at Midland.
  - c) Ten horizontal tendons were stored at Midland.

1396 009



# Bechtel Associates Professional Corporation

MCAR 33

Interim Report 2

September 10, 1979

Page 2

- 2) Sixteen tendons (7 vertical and 9 horizontal) were not shipped to Midland. These tendons were stored at the Wiremil facility.

NCR 2373 was issued on July 24, 1979, placing the tendons at the site on hold with QC hold tags attached to each tendon.

The differential wire length problem discovered at the Wiremil facility is in violation with the tendon and wire length tolerances given in the Midland FSAR Subsection 3.8.1.6.3.1 which states, "the differential length of any two wires in the same tendon up to 100 feet wire length is  $\pm 1/16$ -inch and  $\pm 1/8$ -inch for wires longer than 100 feet. Cutting tolerances for overall tendon length is  $\pm 1/2$ -inch up to 100 feet and  $\pm 1$ -inch over 100 feet."

## Investigation

An investigation was initiated at both the Wiremil and Melrose Park facilities by Bechtel and Consumers Power Company personnel in the following areas.

### 1) Manufacturing Processes

#### Melrose Park Facility, Illinois

Melrose Park employs a mechanical fail-safe system such that a constant tension has to be applied to the wire and a mechanical end stop engaged prior to the shearing of the wire. Several attempts at shearing wires at shorter than set lengths were unsuccessful, attesting that the fail-safe mechanics of manufacturing the tendons are effective. Accordingly, the tendons produced at Melrose Park are not affected.

#### Wiremil Facility, Florida

The mechanical operations at Wiremil are different from those at Melrose Park. The wire is drawn from a coil rack, passing through the driving pinch rolls and wire shear. The wire is driven through the runout guide at high speed until it passes a photo-electric cell in front of the catcher assembly. The photo-electric cell activates a brake which slows the wire until it engages the length-gage stop switch in the catcher assembly, which in turn activates the wire clamp. The pinch rollers reverse to back tension the wire and the wire shear automatically cuts the wire. Once the wire enters the catcher assembly, the operations are automatic and nearly simultaneous. The following deficiencies were observed at Wiremil.

1396 010

# Bechtel Associates Professional Corporation

MCAR 33

Interim Report 2

September 10, 1979

Page 3

- a) The switch controlling the back-tension device was situated on the control panel enabling it to be switched to the off position inadvertently by the operator.
- b) The end stop limit switch had a built-in tolerance which may have allowed wires to be cut to lengths exceeding acceptable variance tolerance.
- c) The end clamp assembly had the possibility of allowing the wire to slip during back-tensioning, due to a structural defect (weld crack) in the end clamp assembly and possible low air pressure.

## 2) Quality Control Procedures

At the Melrose Park facility, differential wire length was checked periodically by Inryco personnel; however, no data was recorded. No such checks were made at the Wiremil facility. A QC program change has been made to check and record differential wire lengths (see corrective action for details). The duties of QC and production personnel were not well-defined at the Wiremil facility. Bechtel also expressed concern regarding other areas of Inryco's quality program. Further investigation was to be accomplished by Bechtel's quality program verification.

## Safety Implications

Project engineering's investigation indicates that the quality assurance program used at the Wiremil facility broke down. The differential wire lengths in a tendon will cause wire stresses in excess of the design values. The safety margin of the containment structure is thus reduced from the design conditions as stated in the FSAR. Therefore, the deficiency is considered reportable under 10 CFR 50.55(e). However, the situation probably would not have an adverse effect on plant safety for the following reasons:

- 1) A tendon is subjected to the maximum stress during the initial prestressing operation, when they are stressed to 80% of the ultimate strength. Therefore, if a tendon can withstand the initial prestressing force, it will not fail during any design condition.
- 2) Since a tendon experiences the highest stress level during the initial prestressing operation, wires that are overstressed may break. The condition would have been detected as a part of specification requirements for broken wire.

1396 011

# Bechtel Associates Professional Corporation

MCAR 33  
Interim Report 2  
September 10, 1979  
Page 4

- 3) During the prestressing operation, the jacking force is monitored with calibrated gages and the tendon elongations are checked against calculated values. Any abnormality would be detected and corrective measures would be made.

## Corrective Action

The deficiencies in the manufacturing processes observed at Wiremil are corrected as follows.

- 1) The back-tension device has been put in an on position and the switch removed from the control panel to prevent it from being turned off.
- 2) The end stop limit switch has been replaced by a switch with 0.057-inch tolerance.
- 3) The end clamp assembly has been structurally reinforced, and a pressure regulator has been added to ensure constant air pressure.

To preclude any system deficiencies from being left undetected for undetermined periods of time, a quality control inspection procedure, QC 5.1.1, was developed by Inryco. The procedure describes a method and frequency with which to measure and record the differential lengths of two wires sheared on the tendon production line. The procedure was approved by Bechtel on August 17, 1979, and had been implemented at the Melrose Park and Wiremil facilities. The areas of concern in Inryco's quality program at Wiremil were addressed during a Bechtel supplier quality department's quality program verification. Inryco's resolution was found to be satisfactory and the hold on the tendon production at Wiremil was lifted.

## Disposition

- 1) Inryco will submit a tendon length correction procedure for evaluation by Bechtel for the 7 vertical tendons installed.
- 2) If Inryco's tendon length correction procedure is successful in eliminating the excessive wire differentials in the 7 installed vertical tendons, then the 7 vertical tendons which are being held at Wiremil may be corrected using the same method.

1396 012



# Bechtel Associates Professional Corporation

MCAR 33

Interim Report 2.

September 10, 1979

Page 5

- 3) The ten horizontal tendons stored at Midland were returned to Wiremil on the week of September 10, 1979. All 24 horizontal tendons fabricated at Wiremil will not be used as originally intended. The materials may be reworked for fabrication of shorter vertical tendons.

Submitted by:

Approved by:

Consurrence by:

EAR/js

9/4/2

.1396 013