

# Bechtel Associates Professional Corporation

SUBJECT: MCAR 32 (Issued 7/20/79)  
States Terminal Blocks, Cracked Disconnect Links  
INTERIM REPORT 1, Revised  
DATE: August 10, 1979  
PROJECT: Consumers Power Company  
Midland Plant Units 1 & 2  
Bechtel Job 7220

## Introduction

This report is submitted to provide the interim status and course of action required pursuant to MCAR 32 and Bechtel NCR 2362.

## Description of Discrepancy

During the electrical checkout by CPCo of non-Class 1E startup transformer OX03A, 38 individual disconnect links out of 156 were found to be cracked. The initial failure was identified when, in an attempt to reconnect a circuit after testing, the link failed to make connection. Subsequent investigation by Bechtel on four cubicles in Class 1E 4.16kV switchgear 2A06 revealed seven individual States terminal blocks with cracked disconnect links.

## Probable Cause

Failure of the sliding disconnect links could be attributed to the following:

### 1. Improper Installation

It can be postulated that the cracks may have developed by overtightening the disconnect link screw. In the actual samples taken from the jobsite, the cracks were initially discovered after field testing and retightening of the sliding disconnect link screw. Overtightening would result in a concentration of stress forces at the sharp 90 degree corners of the sliding disconnect link which would in turn result in a stress crack. In an attempt to verify this as a suspect cause, Bechtel field personnel were unable to produce similar cracks in identical sliding disconnect links. Instead of causing a crack in the link, the overtightening resulted in a breaking of the sliding disconnect link screw.

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## 2. Manufacturing Process

The cracks may be the result of a breakdown in the actual fabrication process. Overstresses during shaping and forming could weaken the metal and aid in the development of cracks.

## 3. Defective Material

The material could be out of specification from that which would be required for the manufacturing process to produce an acceptable disconnect link.

### Corrective Action

The subject terminal blocks are used extensively in all major electrical equipment, both Class 1E and non-Class 1E. The terminal blocks are supplied as appurtenances to the major equipment and, therefore, a large number of equipment suppliers are affected.

At this time it is not possible to determine the magnitude of the discrepancy due to the actual construction of the suspect terminal blocks. Performance of a 100% inspection of each sliding disconnect link would require that each terminal block be removed from the associated equipment and be completely disassembled. Due to the location of the disconnect links in the block, a visual inspection of an installed block can only be made on approximately a quarter of the exposed surface of the link.

As a corrective action, the terminal block manufacturer, as well as the major equipment suppliers, will be informed of the deficiency. The terminal block manufacturer will be supplied with a list of all the other equipment suppliers involved, will be requested to evaluate and determine the probable cause, and will be requested to stipulate what corrective actions are to be taken to identify and correct the non-conforming terminal blocks.

### Safety Implication

The identified discrepancy is of a nature that would be suspect to a failure mode. The failure mode would most likely be an electrical circuit disruption and therefore, pending the circuit function, could be classified as a failure of the associated equipment to perform its intended function.

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Based on the potential failure mode and possible safety implication, this discrepancy is considered to be reportable in accordance with the Code of Federal Regulations, Part 50.55(e).

## Forecast Date on Corrective Action

A schedule for the corrective action will be provided in Interim Report 2.

Submitted by: *C. L. Lelki*

Approved by: *[Signature]*

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CS/jt  
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