Exelon Generation

Three Mile Island Unit 1
Route 441 South, P.O. Box 480
Middletown, PA 17057

Telephone 717-948-8000

10 CFR 21.21(a)(1)

December 28, 2015

TMI-15-133

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Three Mile Island Nuclear Station, Unit 1
Renewed Facility Operating License No. DPR-50
NRC Docket No. 50-289

Subject: Part 21 Notification Due To Breaker Defect

In accordance with Title 10 of the Code of Federal Regulations (10 CFR) Part 21, "Reporting of Defects and Noncompliance," Exelon Generation is providing the required written notification of a failure to comply that resulted in the failure of a breaker to fully open when demanded while in operation in a safety related application. The enclosure to this letter provides the information required in 10 CFR 21.21(d)(4).

There are no regulatory commitments contained in this letter.

If you have any questions concerning this submittal, please contact David Atherholt, Three Mile Island Regulatory Assurance Manager, at (717) 948-8364.

Respectfully,

/s/ E. W. Callan Jr. /lls

E. W. Callan Jr.
Site Vice President, Three Mile Unit 1
Exelon Generation Co, LLC

cc: USNRC Administrator, Region I
USNRC Senior Resident Inspector, TMI-1

Enclosure: Part 21 Notification of Westinghouse Corporate Deviation From Procurement Specifications

IE19
NRR

(1) Name and address of the individual or individuals informing the Commission.

Edward W. Callan Jr.
Site Vice President – Three Mile Island Nuclear Station
2625 River Road
Middletown, PA. 17057

(ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

Three Mile Island Nuclear Station Unit 1
Renewed Facility Operating License No. DPR-50
NRC Docket No. 50-289

Basic component Containing Defect:
Westinghouse 480V DB-25 electrically operated breaker

(iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

Westinghouse Electric Company
1000 Westinghouse Drive
New Stanton, Pennsylvania 15672

(iv) Nature of the defect or failure to comply and safety hazard which is created or could be created by such defect or failure to comply:

Nature of the failure to comply:

On 12/04/07 following four years of service, Three Mile Island (TMI) maintenance personnel performed a scheduled preventive maintenance (PM) activity on the breaker. During the PM the operating mechanism was found "hung up". The breaker was successfully cycled several times during the PM performance; however, due to the jamming/hanging up of the operating mechanism during the PM, the breaker was shipped to Westinghouse for repair. The breaker was sent to Westinghouse for repair under PO# 80-025057. The breaker was disassembled by Westinghouse and several components were replaced as documented by Westinghouse Report 40026506. A formal causal investigation was not performed; however, the breaker was verified to operate properly and meet all critical design requirements. In addition, the Westinghouse report documents that lubricant 53701AN was applied to the auxiliary switch contacts. The breaker was returned to TMI in July 2008.

Following failure of the breaker to fully open on October 5, 2015, troubleshooting and disassembly was performed at the TMI maintenance shop with a Westinghouse witness. Upon determination that the auxiliary switch had failed, the auxiliary switch assembly was sent to

Powerlabs for failure analysis. At Powerlabs, it was determined that the middle auxiliary switch of the breaker had no lubrication on the stationary and non-stationary contacts. This deviation from the refurbishment specification is defined as the basic failure to comply.

Safety Hazard:

The cause of breaker failure was determined to be from a lack of lubrication of the middle auxiliary switch contacts. The lack of lubrication of the middle auxiliary switch contacts resulted in increased friction between the moving contacts of the middle auxiliary switch and the auxiliary switch phenolic rotor leading to failure (broken piece) of the phenolic rotor. The broken piece of the phenolic rotor jammed in the auxiliary switch contacts that applied a torque to the tripper bar which allowed a single phase ("C") to open but prevented the "A" and "B" phases from opening. The failure of the breaker to fully open resulted in the energized component, "A" train of the Decay Heat Closed Cooling Water System motor (DC-P-1A), to experience "single phasing" (e.g., loss of a single phase of power) which resulted in an increase in motor current. The increase in current ultimately led to a failure of motor insulation causing phase-to-phase and phase-to-ground faults. The fault caused the motor to catch fire. An operator attempted to manually open the breaker. The mechanical binding of the breaker caused the Shunt Trip Actuation (STA) coil to remain energized. This led to damage in the STA coil and resulted in smoke and flames observed. Manual operation of the breaker trip button failed to open the breaker. This required Operations to de-energized the safety related 480V bus to remove power from the failed breaker. De-energizing the safety related 480V bus resulted in entering a significant station risk condition and multiple Limiting Conditions for Operation (LCOs) for de-energized equipment.

The Alert Emergency Class notification was made to the NRC Operations Center (Event Number 51455) on October 5, 2015. This report is being submitted pursuant to the requirements of 10CFR21.21(a)(1).

(v) The date on which the information of such defect or failure to comply was obtained.

The failure analysis report from Powerlabs was received on October 28, 2015.

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

TMI contracted with Westinghouse to refurbish breakers. The extent of condition at TMI includes all electrically operated DB-25 and DB-50 breakers which have similar auxiliary switch designs. The investigation team ranked these breakers based on environment, duty cycle, and risk-significance associated with the component. Based on this assessment, a total of 19 breakers were selected for visual inspections of the auxiliary switches for adequate lubricant and any evidence of cracking. A majority of these inspections will be completed prior to the end of 2015 with a few proposed for 2016 windows of opportunity.

(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

The immediate corrective action was to replace the pump motor and circuit breaker.

TMI Procurement Engineering is to revise the purchase order clause to specifically address lubrication of all 3 auxiliary switches. Incorporate any relevant operating experience on breaker failure into specific purchase order clauses. This is to be completed by 03/31/16.

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

Operating experience communication report ICES #320054 was provided through INPO nuclear network.

(ix) In the case of an early site permit, the entities to whom an early site permit was transferred.

This event does not involve an early site permit.