P.O. BOX 3100 MIAMI, FLORIDA 33101

Reference 5

FPL
FLORIDA POWER & LIGHT COMPANY

May 31, 1974

Mr. Norman C. Moseley, Director Region II
Directorate of Regulatory Operations
U. S. Atomic Energy Commission
230 Peachtree Street, N. W., Suite 818
Atlanta, Georgia 30303

Dear Mr. Moseley:

TURKEY POINT PLANT
DOCKET NOS. 50-250 AND 50-251
UNIT TRIPS - APRIL 25, 1974

At the request of Mr. Austin Hardin of your staff, we are reporting the tripping of Units 3 and 4 at the Turkey Point Plant.

SUMMARY

About 3:49 p.m., on April 25, 1974, Unit Nos. 3 and 4 generators tripped when both generator circuit breaker protection system relays were energized during functional testing of Unit No. 4 Startup Transformer protection system relays.

Trip of Unit Nos. 3 and 4 turbine-generators caused an automatic trip of both Unit Nos. 3 and 4 reactors. The reactor protection systems and engineered safeguards system equipment performed satisfactorily after the reactors tripped.

There was no equipment damage, abnormal occurrence or unusual event as a result of the unit trips.

Unit No. 3 was returned to service at 5:45 p.m., on April 25, 1974.

Unit No. 4 was returned to service at 5:40 a.m., on April 26, 1974.

UNIT CONDITIONS BEFORE TRIPS

Unit No. 4 Startup Transformer was electrically isolated for functional testing of protection system relays and periodic maintenance on associated equipment. All of the specified

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clearance requests, notifications, authorizations and approvals necessary to begin work on No. 4 Startup Transformer were met. All of the conditions specified in the Technical Specifications for this work were also met.

Unit No. 4 had been operating at 723 MWe (98% R.P.) steady-state power level for several hours before the trip. Unit No. 3 had been operating at 720 MWe (97% R.P.) steady-state power level for several hours.

DESCRIPTION OF OCCURRENCE

No. 4 Startup Transformer protective relays were tested and demonstrated satisfactory operation. However, when the Startup Transformer lockout relay was "reset", current flowed through an unanticipated path ("sneak circuit") and energized Unit No. 4 generator breaker protection system relays. This opened both of the generator breakers on Unit Nos. 3 and 4. Both No. 3 and 4 reactors automatically tripped when the turbine-generators tripped.

The minimum system frequency recorded during the transient was 58.6 Hz. Underfrequency load shedding relays operated to reduce the interconnected system load by automatically opening feeder breakers. Frequency was restored to 60 Hz within six seconds. Interconnected system power flows were returned to normal within twenty minutes. We estimate 99% of FPL's customers were back in service within twenty minutes, though some isolated outages lasted up to an hour. Some short term power interruptions also occurred to customers on other Florida systems as a result of the incident. The instantaneous loss of 1443 MWe, when both Unit Nos. 3 and 4 tripped, is the largest single loss of generation experienced in FPL's system. In comparison to previous system disturbances, customer load was restored faster than any previous occurrence. Refer to Table I for load shedding data.

DESIGNATION OF APPARENT CAUSE OF TRIPS

Review, analysis, and evaluation of Unit Nos. 3 and 4 annunciators, records and Turkey Point Plant switchyard oscillographs concluded that both Unit Nos. 3 and 4 generators breakers operated as a result of the actuation of the generator back-up protection relays during functional testing of Unit No. 4 Startup Transformer relays.

ANALYSIS OF OCCURRENCE

UNIT NO. 3

When No. 3 reactor tripped, the reactor protection system and engineered safeguard system equipment operated properly to place the unit in a safe condition. There was no equipment damage, abnormal occurrence or unusual event as a result of this trip. After the cause of the trip was determined and conditions evaluated as satisfactory, the reactor was returned to service.

No. 3 unit conditions after the unit trip were more conservative than similar incidents analyzed and presented in Section 14 of Turkey Point Unit Nos. 3 and 4 FSAR. Therefore, Unit No. 3 trip did not present any danger to the health and safety of the public.

UNIT NO. 4

When No. 4 reactor tripped, all reactor protection system and engineered safeguards system equipment operated properly to place the unit in a safe condition even though No. 4 Startup Transformer was electrically isolated and normal auxiliary power supply was unavailable. Emergency power supply was supplied by automatic start of both A and B Emergency Diesel-generators. The emergency Diesel-generators continued to operate until No. 4 Startup Transformer was returned to service.

About five minutes after No. 4 reactor tripped, the 1085 psig safety valve on No. 4A Steam Generator main steam line header lifted and did not reseat. Immediate operator actions included additional boration of the reactor coolant system to ensure that adequate reactor shutdown margin was maintained. Feedwater flow to No. 4A Steam Generator was controlled to maintain adequate water level while efforts were made to close the safety valve. When the manual lifting device was removed from the safety valve, the safety valve reseated. (Refer to Figure 1 for details)

Review of Unit No. 4 recorder charts, indicators and annunciators show that No. 4A loop cold leg temperature was reduced to a minimum of 517 F (compared to normal hot shutdown temperature of 547 F) and maintained this temperature for about thirty minutes. No. 4A loop cold leg temperature returned to 547 F within an additional thirty minutes. This rate of temperature change is well within allowable cooldown rates. Nos. 4B and 4C loop cold leg temperatures increased 10 to 15 F to about 565 F after the unit trip, then returned to 547 F within about thirty minutes.

There was no equipment damage, abnormal occurence, or unusual event as a result of this trip. After the cause of the unit trip was determined, No. 4 Startup Transformer returned to service, and auxiliary power supply restored; the reactor was returned to service.

Comparison of No. 4 reactor conditions after the trip with similar incidents analyzed and presented in Section 14 of Turkey Point Unit Nos. 3 and 4 Final Safety Analysis Report concludes that actual conditions were equal to or more conservative than the conditions assumptions in the Safety Analysis. Therefore, the Unit No. 4 trip did not present any danger to the health and safety of the public.

CORRECTIVE ACTION

Florida Power & Light Company Relay Engineers have recommended that both Unit Nos. 3 and 4 Startup Transformer protective system be modified by installing additional isolation switches and a diode to provide for complete isolation of the primary and the back-up protection system relays during relay tests. This recommended change is being reviewed to obtain approval and authorization necessary to make this change.

If you have further questions about this occurrence, please do not hesitate to call me.

Very truly yours,

A. D. Schmidt
Director of Power Resources

VTC/kmw

cc: Mr. John F. O'Leary
Jack R. Newman, Esquire

FLORIDA POWER & LIGHT COMPANY

TURKEY POINT UNIT NOS. 3 & 4

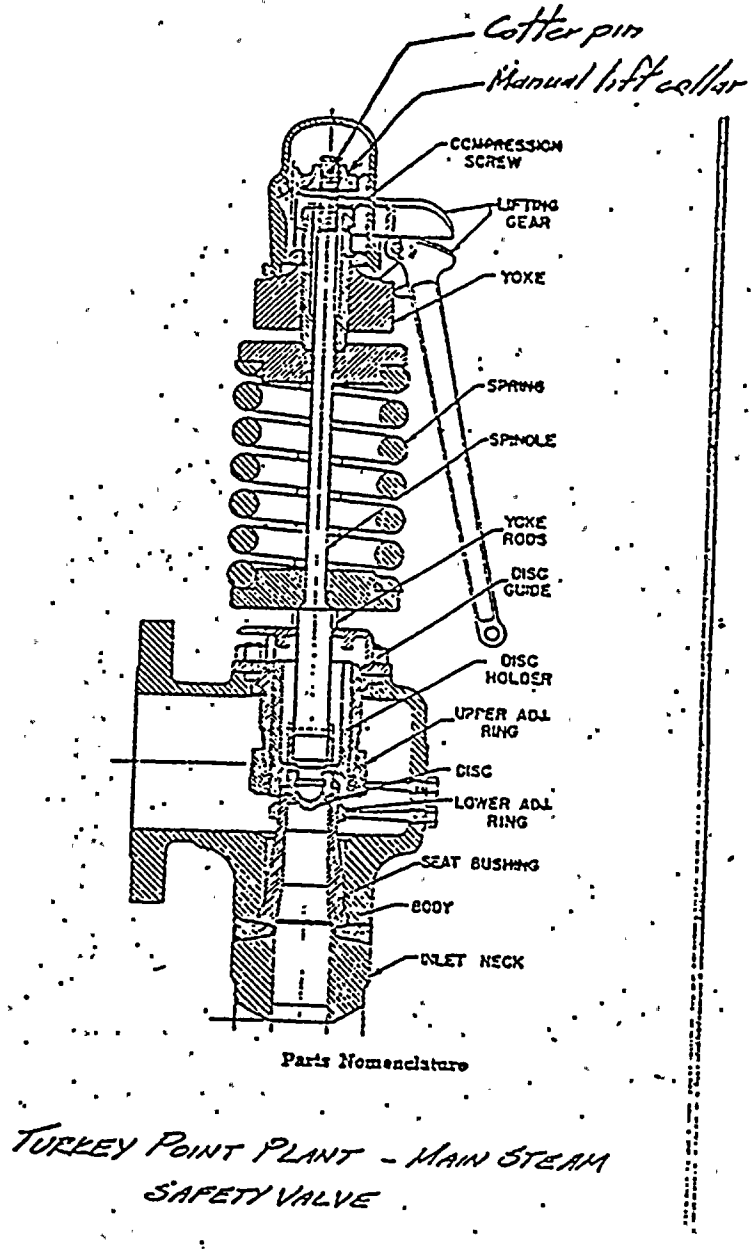
UNIT TRIPS - APRIL 25, 1974

TABLE I

The underfrequency relay trips shed the interconnected system load as follows:

UTILITY	LOAD - MW
Florida Power & Light Company	850
Florida Power Corporation	330
Tampa Electric Company	130
Jacksonville Electric Authority	100
Orlando Utilities Commission	34
City of Lakeland	18
TOTAL	1 462

FIGURE 1



TURKEY POINT PLANT - MAIN STEAM SAFETY VALVE

The failure of the safety valve to reseat after opening was found to be caused by the loss of a cotter key in the safety valve topworks. This cotter key locks the manual lift collar in proper position on the safety valve spindle. When the cotter key vibrated out, the manual lift collar vibrated down and made contact with the manual lifting device. When the safety valve operated, the manual lift collar rotated further down the spindle. This physically prevented the safety valve from reseating as the steam pressure decreased.

The safety valve was reseated by removing the manual lifting arm.

The safety valve was repaired by returned the manual lift collar to its original position, installing a new cotter key, and replacing the manual lifting arm. The safety valve is now operable.