

ROCHESTER GAS AND ELECTRIC CORPORATION • 89 EAST AVENUE, ROCHESTER, N.Y. 14649

KEITH W. AMISH
SENIOR VICE PRESIDENT
ELECTRIC AND STEAM

TELEPHONE
AREA CODE 716 546-2700

October 31, 1973



Mr. John F. O'Leary, Director
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: Abnormal Occurrences
73-9 Excessive Cooldown Rate
73-10 Malfunction of Safety Injection Pump Suction
transfer from Boric Acid Storage Tanks to
Refueling Water Storage Tank
R. E. Ginna Nuclear Power Plant, Unit No. 1
Docket No. 50-244

Dear Mr. O'Leary:

In accordance with Technical Specification Section 6.6.2a, the
attached reports of Abnormal Occurrences numbers 73-9 and 73-10
are hereby submitted.

Additional information and further action taken by Rochester Gas
and Electric Corporation will be reported as information becomes
available.

Very truly yours,

A handwritten signature in cursive script that reads "Keith W. Amish".

Keith W. Amish

Attachments

xc: Mr. J. P. O'Reilly

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ATTACHMENT 1

Report Number: 50-244/73-9

Report Date: October 31, 1973

Occurrence Date: October 21, 1973

Facility: R. E. Ginna Nuclear Power Plant, Unit No. 1
Docket No. 50-244

Identification of Occurrence: Excessive Cooldown Rate

Condition Prior to Occurrence: Steady State Power at 435 MWe net

Description of Occurrence: Instability of the transmission system and loss of outside power to Ginna Station occurred on October 21, 1973 at approximately 0552 hours resulting in a reactor trip. The sequence of this loss occurred as follows:

Of the four 115 Kv transmission lines from Ginna Station (Nos. 908, 911, 912 and 913), Circuit 912 had been taken out of service at 0512 hours for safety reasons for construction on a new substation. Circuits 767 and 751 (34.5 Kv) were supplying auxiliary power for the station. A ground fault on Circuit 908 caused the loss of this line, leaving only Circuits 911 and 913 in service. The system demand during the early morning was light compared to the generator output and electrical power swings caused Circuits 911 and 913 to trip which isolated the plant's substation (13A) from the 115 Kv system. The loss of the four 115 Kv circuits overloaded Circuit 759 which was supplying Circuit 751 and it burned open at a remote location. The loss of outside power on Circuit 751 plus loss of all power from Station 13A which supplies power to Circuit 767 resulted in a loss of all outside power to Ginna Station.

From analysis of the electrical recordings and computer printouts, it is concluded that an electrical disturbance on the instrument buses within the plant was created during the loss of power which caused an overpower delta temperature reactor trip signal to trip the reactor. The loss of outside power also generated a turbine trip signal.

A "lo-lo steam generator level" signal in both steam generators caused automatic start of both steam and motor driven feedwater pumps. The automatic start of these pumps resulted in ambient temperature water from the condensate storage tanks being pumped into the steam generators. The operator recognized that the steam generator levels were increasing, secured the motor driven auxiliary pump and sent an auxiliary operator to secure the steam driven auxiliary pump by tripping the governor valve. Further review revealed that an additional signal was generated by the loss of outside power on buses 11A and 11B which placed the steam driven auxiliary pump in service. This signal remains in effect until the "loss of outside power" signal is cleared and thereby prevents operator action from the main control board. The pump can only be stopped locally. The cooling down of the secondary system cooled down the reactor coolant system to the point that the safety injection signal

was generated by a combination of low pressurizer pressure and level. The initiation of safety injection caused borated water to be pumped into the reactor coolant system.

Investigation into the cooldown rate as indicated by the strip chart recorders revealed that the cooldown rate as defined in the Technical Specifications, Section 3.1.2.1 Cooldown Item b., may have been exceeded. The cooldown rate is difficult to determine accurately due to the loss of instrument buses which disabled various indicators and recorders for a short period of time. Reconstruction of the information on the recorders when power was restored indicated that the change in temperature in the reactor coolant cold leg was approximately 85°F in approximately 10 minutes. For this short period of time, the rate was in excess of the 100°F/hr. limit and is therefore reportable as an abnormal occurrence as defined in Section 1.9b, "Violation of a limiting condition for operation established in the Technical Specifications."

Designation of Apparent Cause of Occurrence: Loss of outside power was due to procedures permitting Ginna Station to generate 435 MWe when one transmission line was out. This condition also led to instrument bus disturbances which generated false "lo-lo steam generator level" signals for both generators and automatically started both steam and motor-driven auxiliary feed pumps.

Analysis of Occurrence: The Electric System Planning and Operation Department of Rochester Gas and Electric has determined that loss of outside power was due to a power instability condition caused by low electrical system demand.

Westinghouse was contacted to determine what possible deleterious effect the rapid cooldown could have had on the reactor vessel. Their initial analysis and comparison with similar instances at other facilities indicate stress levels to be acceptable and the effect of this one cooldown cycle to be insignificant in the allowable fatigue life of the vessel.

With the exception of the instrument bus disturbances which generated inaccurate signals, no equipment malfunction or operator error was apparent.

Corrective Action: The Electric System Planning and Operation Superintendent has ordered that whenever any transmission circuit from Ginna Station (Nos. 908, 911, 912 and 913) is out of service, the Ginna Station electric load shall be reduced to 240 MWe net. Initial analysis has determined that the system should be stable with two lines out with the plant output as high as 300 MWe on the generator. The Plant Superintendent has issued similar orders to Ginna Station operators for power reduction on the occasion of line outages.

The Plant Operations Review Committee is reviewing the Ginna Station Emergency Procedure E-4 (Station Blackout Operation) to incorporate experience gained as a result of this occurrence.

The Engineering Department and Westinghouse are reviewing the logic for the operation and control of the auxiliary feedwater pumps in view of the rapid filling of the steam generators during this occurrence.

Westinghouse has been requested to provide a written report on the effects of the cooldown to the primary system.

The Plant Operations Review Committee reviewed this occurrence and determined that there were no unresolved safety questions. The Nuclear Safety Audit and Review Board reviewed the occurrence and the action taken and concurred with the Plant Operations Review Committee.

Failure Data: There have been no previous instances of loss of power to Ginna Station due to electrical system instability.