TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

February 26, 1982

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Chief
Licensing Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Ms. Adensam:

In the Matter of the Application of) Docket Nos. 50-390
Tennessee Valley Authority) 50-391

In your letter dated January 23, 1982 to H. G. Parris, TVA was requested to provide information in response to NRC question 212.124 on Watts Bar Nuclear Plant. TVA's response was provided by my letter to you dated February 12, 1982. The following information addresses the assumption of a 2-second delay between reactor trip and loss of power as previously specified in TVA's response.

The analysis previously provided addresses the transient response of the critical reactor pressures, coolant flows, and fuel rod temperatures following the abrupt loss of one of the four reactor coolant pumps (RCP) at Watts Bar Nuclear Plant. The results of this accident analysis are provided with and without continued supply of electric power to the remaining three RCPs. The scenario which includes loss of power to the remaining RCPs assumes a 2-second time delay between the reactor trip and the loss of power.

As we understand it, the NRC assumes that at full power a reactor trip signal also causes a simultaneous trip of the high and low pressure turbines. Following a turbine trip at Watts Bar, the shutdown board loads transfer immediately to the common station service transformers (CSST). However, the unit board and RCP loads remain connected to the unit station service transformers (USST) which are supplied from the 22.5-kV generator bus for approximately 30 seconds. As the turbine power decays, the generator begins to motor at synchronous speed but still maintains the bus voltage by normal voltage regulator and exciter action. The power circuit breaker on the high side of the generator step-up transformer removes the motoring generator from the transmission grid only after the unit board and RCP loads have been transferred to the CSSTs.

We have performed several severe turbine-trip transient analysis studies at Watts Bar Nuclear Plant. The accident scenario which Westinghouse has provided assumes as a worst case that a turbine trip at full power causes transmission grid instability and subsequent loss of power to the three remaining RCPs. We do not find this to be true at Watts Bar. None of

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our recent studies show grid instability or result in grid separation following a turbine trip at Watts Bar. None of our studies indicate that any local 500-kV transmission lines will trip out. None of our cases showed voltage or frequency disturbances which could result in tripping any of the remaining RCPs or the source of the grid power which supplies these pumps through the USSTs. The worst case that we found resulted from tripping the turbine of unit 2 at Watts Bar with the Watts Bar-Sequoyah 500-kV transmission line out of service. This leaves Watts Bar unit 2 served by the Roane 500-kV Substation. Voltage and frequency plots for the 500-kV bus at Watts Bar and the 6.9-kV RCP buses during this disturbance are enclosed.

In conclusion, the remaining three RCPs should continue to remain energized for more than two seconds following the abrupt loss of one RCP and the subsequent trip of the reactor and its associated turbine at Watts Bar in the manner postulated in our response.

If you have any questions concerning this matter, please get in touch with D. P. Ormsby at FTS 858-2682.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

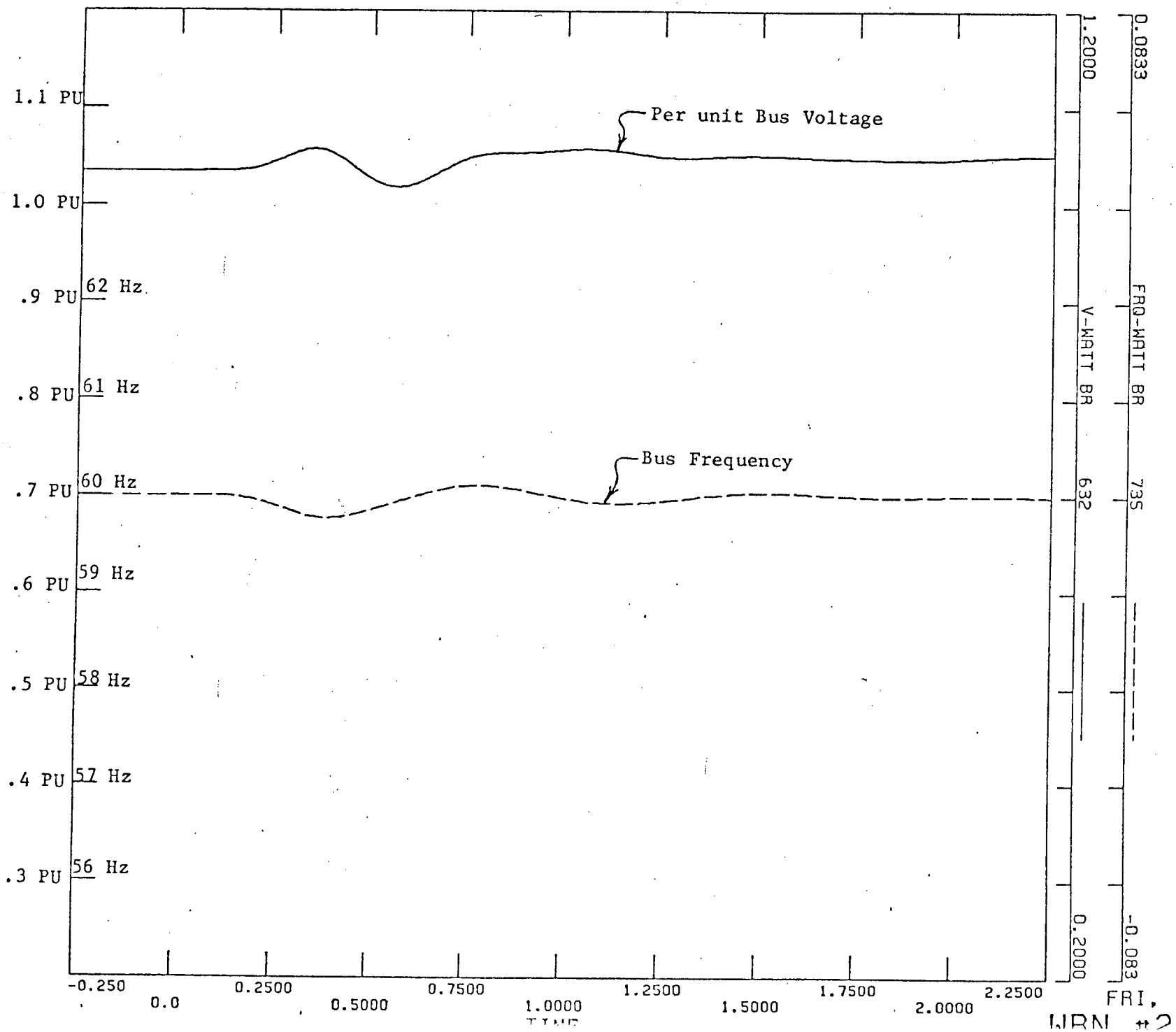
M. R. Wisenburg,
Nuclear Engineer

Sworn to and subscribed before me
this 26th day of Feb. 1982.

Paulette H. White
Notary Public

My Commission Expires 9-5-84

Enclosure
cc: U.S. Nuclear Regulatory Commission
Region II
Attn: Mr. James P. O'Reilly, Regional Administrator
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303



WBN R.W.2 (S88xW1,SS.W) - RCP FAIL @ T=0, TURB TRIP @ T=.06
<WBN-SEQ OUT SLOPE OF PMECH CURVE =0.0 (GCB 2-18-82)
* PLOTTED FROM 0TW1.2 OUTPUT FILE (GCB 2-19-82)
* VOLTAGE & FREQUENCY FOR WORST CASE

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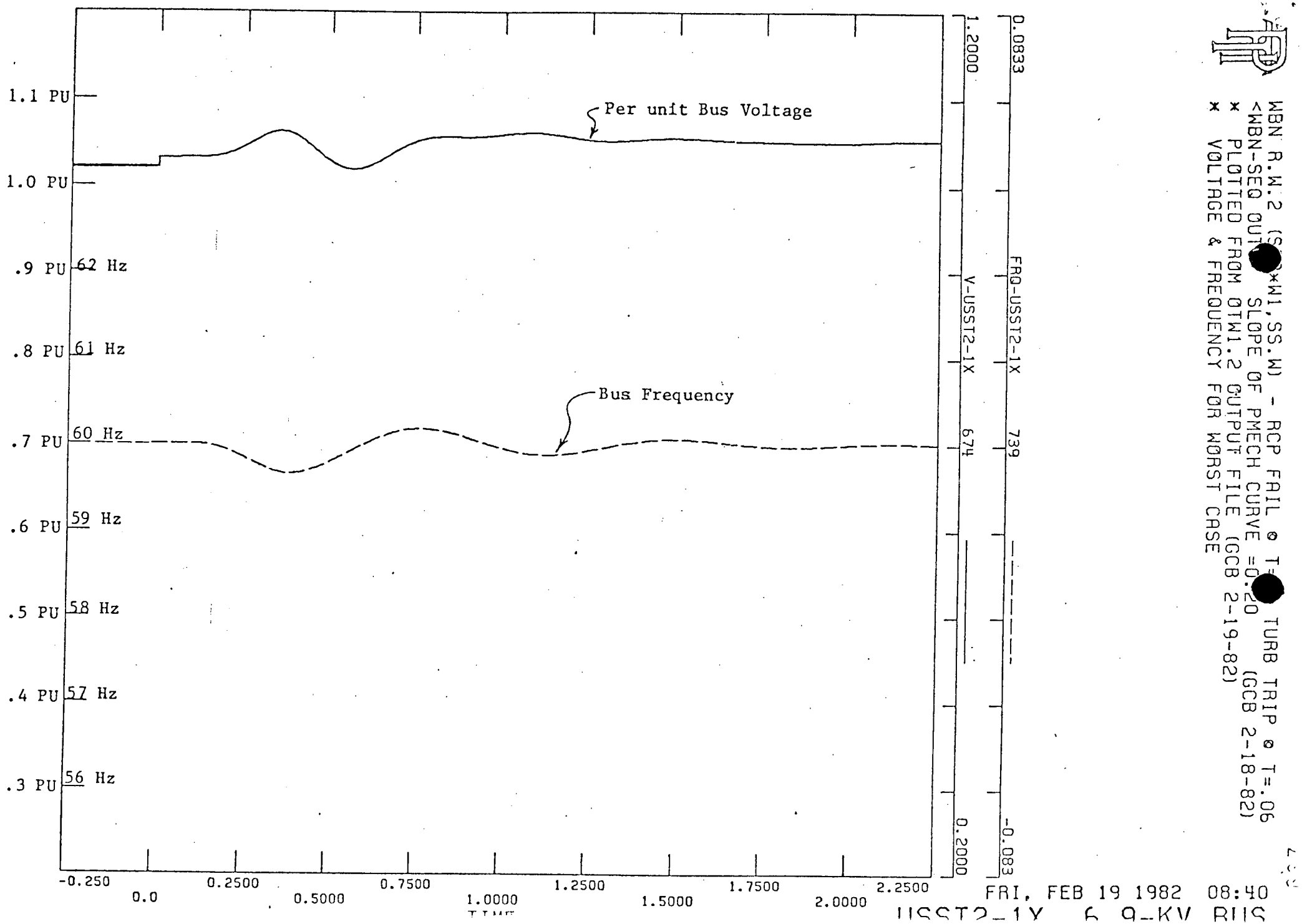
WBN #2 500-KV BUS


WBN R.W.2 (S*W1,SS.W) - RCP FAIL @ T=
<WBN-SEQ OUT SLOPE OF PMECH CURVE =0.20 (GCB 2-18-82)
* PLOTTED FROM OTW1.2 OUTPUT FILE (GCB 2-19-82)
* VOLTAGE & FREQUENCY FOR WORST CASE
TURB TRIP @ T=.06
1.1 PU
1.0 PU
.9 PU 62 Hz
.8 PU 61 Hz
.7 PU 60 Hz
.6 PU 59 Hz
.5 PU 58 Hz
.4 PU 57 Hz
.3 PU 56 Hz
Per unit Bus Voltage
Bus Frequency
1.2000
0.0833
V-USST2-1X
FRQ-USST2-1X
674
739
0.2000
-0.083
-0.250
0.0
0.2500
0.5000
0.7500
1.0000
1.2500
1.5000
1.7500
2.0000
2.2500
TIME
FRI, FEB 19 1982 08:40
USST2-1X 6.9-KV BUS