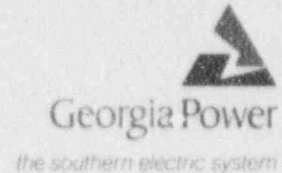


Georgia Power Company
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201
Telephone 205 877-7122

C. K. McCoy
Vice President, Nuclear
Vogtle Project



February 12, 1993

ELV-05217
003035

Docket Nos. 50-424
50-425

TAC Nos. M82724
M82725

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

VOGTLE ELECTRIC GENERATING PLANT
ADDITIONAL INFORMATION TO SUPPORT POWER UPGRATING

Gentlemen:

Georgia Power Company letter ELV-03375 dated February 28, 1992, requested a revision to the operating license for Vogtle Electric Generating Plant (VEGP) Units 1 and 2 that would allow operation at an uprated power level. This letter presents additional information supporting the requested license change and the analysis in ELV-03375.

The additional information concerning the effects of operating at uprated power level on steam generator tubes (SGT) is contained in attachment 1. The change in the SGT minimum acceptable wall thickness from 0.014 inch to 0.016 inch was a result of operating with a reduced steam pressure. The calculation of the revised minimum wall thickness used the same methodology as was previously used. Operation at the uprated condition will result in a slight increase in the number of steam generator tubes that may be susceptible to antivibration bar (AVB) wear (5-10 tubes over the life of the plant). However, no significant increase in the rate of AVB wear is projected. Attachment 4 contains the results of steam generator tube inspections for VEGP.

The additional information concerning the calculation of peak containment pressure is included as attachment 2. The peak containment pressure currently in the Final Safety Analysis Report was calculated at a power level equivalent to the uprated power level reported in ELV-03375. The reductions in the calculated peak containment pressures were due to the use of revised methods for calculating the mass and energy releases to the containment, more accurate accounting of heat sinks, and taking credit for the fan coolers required to be operable according to the current Technical Specifications. The methodology for calculating the mass and energy release and the containment pressures has been previously used for plants of similar design.

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U. S. Nuclear Regulatory Commission

Page 2

The revised calculation of the turbine trip event with conservative assumptions to evaluate the overpressure protection design is described in section 15.2.3.3. of appendix A to enclosure 4 of letter ELV-02166 dated November 29, 1990. Additional information concerning the overpressure protection evaluation is contained in attachment 3. The relief capacity of the safety valves has been evaluated to demonstrate that it is sufficient for the design basis event if reactor scram is initiated on the second safety grade signal from the reactor protection system.

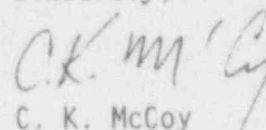
The original licensing basis, the Vantage 5 licensing submittal, and the uprating license submittal determined values for the overpower delta T(OPDT) and overtemperature delta T(OTDT) setpoints using the methodology described in WCAP-8745-P-A. The setpoints were calculated to support the uprated power level in conjunction with the transition to Vantage 5 fuel as documented in ELV-02166. Subsequent to the calculation of the OPDT and OTDT setpoints in support of the Vantage 5 licensing submittal, a more conservative approach was used in the generation of the FDI function of the OTDT setpoint. This resulted in the revised values for the OTDT setpoint presented in the uprating licensing submittal (ELV-03375).

The evaluations contained in our letter ELV-03375 included the effects of operating at a reduced temperature (T hot reduction). The low temperature overpressure protection system and its associated setpoints will not be affected by T hot reduction. The evaluations and analyses performed in support of the application for this license amendment, and presented in our letters ELV-03375 and ELV-02166 including the inadvertent opening of a steam generator relief or safety valve and steam system piping failure utilized methods that have previously been accepted by the NRC for use on the Vogtle Electric Generating Plant (VEGP) or accepted for use by the NRC since the initial licensing of VEGP.

The maximum sump temperature at the time of switchover to recirculation was calculated to be 244°F, which is about 8°F different from the current licensing basis calculation. This value is recorded on page 3-200 of enclosure 5 of letter ELV-03375. This number was used in the reverification of piping stress analyses. Based on this value, it was concluded that the piping stresses will remain within their original acceptance limits.

The above information and the additional information in attachments 1, 2, 3, and 4 is supplemental to the information previously transmitted to the NRC and does not represent any changes to the previously submitted material.

Sincerely,


C. K. McCoy

CKM/HWM/clr

xc: (See next page)

U. S. Nuclear Regulatory Commission

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Attachments:

1. Steam Generator Tube Effects of Rerating
2. VEGP Containment Analyses
3. Pressurizer Safety Valve Sizing
4. Steam Generator Tube Inspection Results

xc: Georgia Power Company

Mr. W. B. Shipman

Mr. M. Sheibani

NORMS

U. S. Nuclear Regulatory Commission, Washington, D. C.

Mr. D. S. Hood, Licensing Project Manager

U. S. Nuclear Regulatory Commission, Region II

Mr. S. D. Ebnetter, Regional Administrator

Mr. B. R. Bonser, Senior Resident Inspector, Vogtle

ELV-05217

003035

ATTACHMENT 1
STEAM GENERATOR TUBE EFFECTS OF RERATING

1. The minimum acceptable tube wall thickness for VEGP steam generator tubes for the rerated conditions was determined to be 0.016 inch using Regulatory Guide 1.121 guidelines. This compares to a minimum acceptable wall thickness of 0.014 inch for the current Vogtle design conditions. This increase in the minimum acceptable tube wall thickness is due to the decreased steam pressure and resultant increased differential pressure across the tubes for the rerated conditions. The same Regulatory Guide 1.121 methodology was used for both calculations.
2. Wear of the steam generator (SG) tubes at the antivibration bar (AVB) locations is principally dependent on the boundary conditions of the tube (i.e., whether the AVBs provide adequate support of the tubes), which is a statistical issue for the population of tubes affected by the AVBs. Operating experience has shown that a wide range of wear rates may exist among the tubes, and that only a small percentage of tubes will wear sufficiently to require plugging over the operating life of the SG. Although changes in operating conditions may affect the wear rate (change in through wall depth (TWD) on individual tubes), this effect is negligible compared to the variability in tube boundary conditions indicated by operating experience.

Current projections for AVB wear are that no more than 0.6 percent of the tubes in the model F SG may require plugging over the operating life of the tubes. The operating experience of plants (including those which have uprated) with model F SGs is that plugging levels are below the plugging projection. The only exception is a foreign plant in which it was identified that the AVB/U-bend assembly was improperly assembled. Up-rating is estimated to increase the number of tubes requiring plugging due to AVB wear by 10-16 percent; therefore, the upper limit of projected plugging for uprated conditions would be less than 0.7 percent of the tubes.

For the operating model F SGs, in no case has progression of wear at the AVB intersections resulted in tube leakage. An individual tube has experienced a growth rate of approximately 40 percent between inspections over a 3-year time interval in a plant which was previously uprated. For the same plant, the average tube wear growth rate at the AVBs was 3.8 percent/year TWD over a 5-year interval. The structural limit (based on ASME Code criteria) for AVB wear is approximately 75 percent TWD. It is not expected that uprating will have significant effect on the wear growth rate on individual tubes or result in increased potential for through wall wear or primary to secondary leakage at the AVB intersections.

ATTACHMENT 2

VEGP CONTAINMENT ANALYSES

LOSS OF COOLANT ACCIDENT (LOCA)

Double Ended Hot Leg Guillotine (DEHLG)

The current licensing basis FSAR double ended hot leg guillotine break case resulted in a calculated containment peak pressure of 38.24 psig occurring at 18.3 seconds. The Vogtle rerating analysis provided a containment peak pressure of 36.54 psig occurring at 17.3 seconds. The essential differences between the two analyses are as follows:

1. The mass and energy release evaluation model used in performing the FSAR analysis of record is identified and documented in WCAP-8264-P-A. The evaluation model used in performing the VEGP rerate analyses is documented in WCAP-10325-P-A.
 - a) Reactor coolant system temperature uncertainty 60F versus 40F (FSAR)
 - b) RCS pressure 2250 + 50 psi versus 2250 + 30 psi (FSAR)
2. Revised containment structural heat sinks were modeled in completing the rerate analyses. These revised heat sinks were based upon a more accurate but conservative accounting which better reflects the current VEGP design as compared to the data available at the time when the FSAR analyses were being performed.
 - a) Initial containment pressure assumption was 3.0 psig vs 0.3 psig (FSAR)

The duration of the transient (i.e., less than 30 seconds), the mass and energy release and amount of containment structural heat sinks strongly govern the calculated pressure profile.

Double ended Pump Suction Guillotine (DEPSG)

The current licensing basis FSAR double ended pump suction guillotine break case resulted in a calculated containment peak pressure of 35.62 psig occurring at 1108 seconds. The VEGP rerating analysis provided a containment peak pressure of 34.61 psig occurring at 17.6 seconds. The essential differences between the two analyses are as follows:

1. The mass and energy release evaluation model used in performing the FSAR analysis of record is identified and documented in WCAP-8264-P-A. The evaluation model used in performing the VEGP rerate analyses is documented in WCAP-10325-P-A.
 - a) Reactor coolant system temperature uncertainty 60F versus 40F (FSAR)
 - b) RCS pressure 2250 + 50 psi versus 2250 + 30 psi (FSAR)
 - c) Steam/water mixing model
 - d) 1979 AMS decay heat model

ATTACHMENT 2 (CONTINUED)

VEGP CONTAINMENT ANALYSES

2. Revised containment structural heat sinks were modeled in completing the rerate analyses. These revised heat sinks were based upon a more accurate but conservative accounting which better reflects the current VEGP plant design as compared to the data available at the time when the FSAR analyses were being performed.

a) Initial containment pressure assumption was 3.0 psig vs. 0.3 psig (FSAR)

3. Increased number of fan coolers available. The current FSAR analyses assumed two. The rerate analysis assumed four fan coolers available.

Note that the calculated pressure profile has two peaks. The maximum calculated pressure for the rerated condition occurred at the first peak; it occurred at the second peak for the current licensing basis case.

Main Steam Line Break (MSLB) Containment Integrity

The current licensing basis limiting FSAR case for peak pressure was the 0.14 ft² split at hot shutdown case which resulted in a calculated containment peak pressure of 41.9 psig occurring at 1784 seconds. The VEGP rerating limiting case was the 0.22 ft² double ended rupture without entrainment at 30 percent power. This case produced a peak containment pressure of 32.7 psig occurring at 2177 seconds. The essential differences between the two analyses are as follows:

Containment Model Assumptions:

1. Revised containment structural heat sinks were modeled in completing the rerate analyses. These revised heat sinks were based upon a more accurate but conservative accounting which better reflects the current Vogtle plant design as compared to the data available at the time when the FSAR analyses were being performed.
2. Credit was taken for the operation of 4 of the 8 containment coolers since this is the number of coolers required to be operable by the Technical Specifications.
3. Initial containment pressure assumed was 3.0 psig vs. 0.3 psig (FSAR)

MSLB Mass and Energy Release Assumptions:

1. Main feedwater flow rate - The values used in the rerate analysis are in general greater than what was used in the FSAR analysis.
2. Auxiliary feedwater enthalpy - The current FSAR analysis used 429.5 Btu/lbm and the rerate analysis assumed 101 Btu/lbm.

ATTACHMENT 2 (CONTINUED)

VEGP CONTAINMENT ANALYSES

3. Decay Heat Model - The FSAR analysis used the 1971 model whereas the rerate analysis used the 1979 model.

In general, the containment model used to calculate the containment response following a MSLB inside containment was identical to that used for the LOCA containment integrity analyses. The lower calculated containment peak pressures for the rerate analysis were directly influenced by the increased number of containment fan coolers available (2 to 4) and improved structural heat sink modeling with respect to containment modeling.

ATTACHMENT 3

PRESSURIZER SAFETY VALVE SIZING

It is required that the pressurizer safety valves be designed with sufficient capacity to prevent the RCS pressure from exceeding 110 percent of design pressure following the worst reactor coolant system pressure transient. Justification for the overpressure protection (safety valve sizing) for Westinghouse PWRs is given by the generic analyses presented in WCAP-7769. These generic analyses addressed the full power load rejection resulting from a turbine trip with concurrent loss of main feedwater. The analyses assumed no credit is taken for operation of reactor coolant system relief valves, steam line relief valves, steam dump system, pressurizer level control system, pressurizer spray, or direct reactor trip on turbine trip. Reactor trip is initiated by the second safety-grade signal from the reactor protection system. The generic analyses were performed assuming a core power of 3411 MWt with a 2-percent power uncertainty.

With the recent VEGP uprating submittal, the NRC has questioned the applicability of WCAP-7769 due to the increased power level. Vogtle Electric Generating Plant specific analyses have been performed which demonstrate that the pressurizer safety valves are sufficiently sized at the uprated power (102 percent of 3579 MWt). The analyses demonstrated that when crediting the high pressurizer pressure reactor trip for the loss of load/turbine trip event, 73 percent of the total capacity of the pressurizer safety valves was required. For subsequent reactor trips (i.e., overtemperature ΔT , high pressurizer water level, and low-low steam generator water level), 81 percent of the total capacity of the pressurizer safety valves was required. With respect to the steam generator safety valves, the flow out of the valves did not exceed nominal plant steam flow at any time during the analyzed transients.

ATTACHMENT 4
STEAM GENERATOR TUBE
INSPECTION RESULTS

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 1 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

```

** 28 13
28 13 5C+17.77 30 27 35

** 24 14
24 14 TSH+8.73 NI 15 NI

** 28 18
28 18 2H+1.42 NI 13 NI

** 45 22
45 22 AV2 NDD 14 17
45 22 AV5 NDD 17 25

** 47 24
47 24 AV2 15 21 24
47 24 AV4 15 21 27
47 24 AV5 NF 13 18

** 47 26
47 26 AV2 NI 10 INR

** 52 33
52 33 AV2 NI NDD 12
52 33 AV3 NI NDD 11

** 54 35
54 35 AV2 NI 18 20
54 35 AV3 NI NF 13
54 35 AV4 NI 21 25
54 35 AV5 NI 17 22
54 35 AV6 NI 14 13

** 40 44
40 44 4H+18.90 16 INR NI

** 41 44
41 44 AV2 NI NF 15
41 44 AV3 NI 18 21

** 42 44
42 44 6H+13.00 26 INR NDD

** 52 44
52 44 AV4 NDD 15 19

** 57 44
57 44 AV5 NDD 17 23

```

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 1 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

57 44 AV6 NDD 11 11

** 57 45

57 45 AV3 NI 11 15

57 45 AV5 NI 12 INR

** 40 47

40 47 AV3 NDD 13 15

40 47 AV4 NDD 13 18

** 34 49

34 49 BPC+6.96 25 29 INR

** 13 52

13 52 3H+19.54 18 17 NI

** 35 52

35 52 BPC+10.30 22 22 MBM

35 52 IC+31.90 MBM 23 MBM

** 55 55

55 55 AV2 NDD 20 29

55 55 AV3 NDD 11 22

55 55 AV4 NDD 18 29

** 35 59

35 59 BPC+18.20 11 INR NI

** 59 67

59 67 7H+4.35 NI UDS NI

** 55 73

55 73 6H+32.48 NI UDS NI

** 46 87

46 87 AV1+20.93 NI UDS NI

** 39 92

39 92 3H+1.03 NI 34 UDS

** 42 104

42 104 AV6 NF 13 INR

** 25 110

25 110 AV5 NI 22 MBM

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 1 *

[illegible]

26 116 AV6 NI 16 14

**	24	117			
24	117	1C+15.31	NI	UDS	MBM
24	117	2C+14.17	NI	26	INF

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 2 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

** 33 12
33 12 2H+16.58 NI UDS NI

** 17 19
17 19 7C+0.00 NI NI UDS

** 25 20
25 20 AV5 NI 20 19

** 17 27
17 27 7C+0.00 NI NI UDS

** 17 29
17 29 7C+1.32 NI UDS NI
17 29 7C-0.06 NI UDS NI

** 14 33
14 33 5H+14.05 NI 21 MBM

** 41 33
41 33 AV4 NI 15 20
41 33 AV5 NI 17 19

** 32 39
32 39 1C+0.00 NI UDS NI

** 29 41
29 41 1C+5.21 NI UDS NI

** 20 44
20 44 3H+34.71 NI 15 NI

** 05 45
05 45 4C+6.11 NI UDS NI

** 25 45
25 45 1C+5.73 NI UDS NI

** 25 46
25 46 1C+5.44 NI UDS NI

** 46 50
46 50 AV1 NI 17 21
46 50 AV2 NI 13 23
46 50 AV4 NI 14 21
46 50 AV5 NI 14 17
46 50 AV6 NI 11 13

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 2 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

```

** 45 56
45 56 AV2      NI 26 19

** 32 60
32 60 5C+6.26  NI 16 MBM

** 08 61
08 61 4H+4.36  NI UDS NI

** 27 62
27 62 6H+21.37 NI 21 MBM

** 55 64
55 64 AV5      NI NDD 16

** 49 69
49 69 2C+17.73 NI 37 36

** 53 83
53 83 AV2      NI 19 21
53 83 AV3      NI 12 14

** 55 83
55 83 AV5      NI NDD 12

** 54 85
54 85 AV5      NI 28 24

** 52 86
52 86 AV2      NI NF 10
52 86 AV3      NI NF 15
52 86 AV4      NI 16 26
52 86 AV5      NI NF 12

** 54 88
54 88 AV5      NI 28 29

** 43 90
43 90 AV3      NI 22 26
43 90 AV4      NI 23 28

** 43 91
43 91 AV2      NI NDD 21
43 91 AV3      NI NDD 14
43 91 AV5      NI NDD 11

```

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 2 *

ROW CLMN LOCATIO 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

** 40 93
40 93 AV2 NI 13 14

** 50 94
50 94 AV4 NI NF 10
50 94 AV5 NI 20 24

** 47 99
47 99 AV2 NI 11 10

** 32 102
32 102 6H+30.40 NI 34 UDS

** 41 102
41 102 AV5 NI 12 12

** 42 102
42 102 AV5 NI 10 19
42 102 AV6 NI NF 12

** 43 102
43 102 AV3 NI 28 33
43 102 AV5 NI 15 22
43 102 AV6 NI NF 12

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 3 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

** 17 10
17 10 7H+1.30 NI 37 MBM

** 38 16
38 16 AV2 NI 15 19
38 16 AV5 NI 14 17
38 16 AV6 NI 24 26

** 39 17
39 17 AV3 NI 16 19
39 17 AV4 NI NF 12
39 17 AV6 NI NF 11

** 40 17
40 17 AV3 NI 33 39
40 17 AV4 NI 12 17
40 17 AV5 NI NF 15
40 17 AV6 NI NF 12

** 37 18
37 18 7H+1.07 NI UDS UDS

** 42 27
42 27 AV5 NI NDD 15

** 50 28
50 28 AV4 NI 24 27
50 28 AV5 NI 13 19
50 28 AV6 NI NF 13

** 40 30
40 30 AV5 NI 20 18

** 39 35
39 35 AV3 NI 13 INR

** 40 35
40 35 AV4 NI NF 12

** 45 40
45 40 AV5 NI 20 14

** 30 42
30 42 AV6+16.94 NI 38 INR

** 42 43
42 43 AV5 NI 19 12

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 3 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 G7THRTE

** 35 44
35 44 AV6+17.57 NI 35 UDS

** 42 50
42 50 AV2 NI NF 16
42 50 AV3 NI 13 INF
42 50 AV4 NI 22 24

** 34 51
34 51 TSH+5.23 NI 11 NI

** 44 51
44 51 7H+4.97 NI 31 34

** 48 54
48 54 AV6 NI 18 MBM

** 45 58
45 58 AV2 NI NF 18
45 58 AV3 NI 32 31
45 58 AV4 NI 25 22
45 58 AV6 NI NF 17

** 45 59
45 59 AV2 NI 19 22
45 59 AV3 NI 09 20
45 59 AV4 NI 21 23
45 59 AV5 NI 12 18

** 21 62
21 62 2C+8.29 NI 31 MBM

** 45 62
45 62 AV3 NI 10 15
45 62 AV4 NI 15 23

** 55 66
55 66 7C+7.69 NI UDS NI
55 66 7H+6.74 NI UDS NI

** 59 66
59 66 7H+7.54 NI UDS NI

** 45 67
45 67 2C+8.49 NI 28 MDM

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 3 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

** 55 67
55 67 7C+7.33 NI UDS NI

** 58 67
58 67 7H+6.65 NI UDS NI

** 55 68
55 68 7C+7.29 NI UDS NI

** 36 72
36 72 7H+3.38 NI UDS NI

** 49 72
49 72 AV3 NI 25 24

** 55 73
55 73 7H+6.63 NI UDS NI

** 55 82
55 82 AV2 NI 11 19
55 82 AV3 NI 17 29
55 82 AV4 NI NF 15
55 82 AV5 NI 16 22

** 55 83
55 83 AV4 NI 26 30
55 83 AV5 NI 19 27
55 83 AV6 NI 16 17

** 53 84
53 84 AV3 NI 13 15
53 84 AV4 NI 17 21

** 21 85
21 85 7C-1.15 NI UDS NDD

** 50 85
50 85 6H+25.15 NI 18 NI

** 54 86
54 86 AV6 NI 12 18

** 53 88
53 88 AV4 NI 23 30
53 88 AV5 NI NF 16

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 3 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

```

** 54 88
54 88 AV1      NI 11

** 45 92
45 92 AV5      NI 12 INR

** 49 94
49 94 AV4      NI 17 25
49 94 AV5      NI 14 21

** 50 94
50 94 AV3      NI NF 15
50 94 AV5      NI 11 18
50 94 AV6      NI NF 14

** 47 97
47 97 AV3      NI NF 14
47 97 AV4      NI 27 31

** 48 97
48 97 AV3      NI 23 30
48 97 AV4      NI 19 24

** 47 98
47 98 AV3      NI 17 24
47 98 AV4      NI NF 19
47 98 AV5      NI 14 25

** 47 99
47 99 AV4      NI 16 23
47 99 AV5      NI 15 25

** 31 101
31 101 7C-0.67 NI UDS NI

** 41 102
41 102 AV2      NI NF 12
41 102 AV3      NI 20 24
41 102 AV4      NI 11 16

** 44 102
44 102 AV4      NI 12 INR

** 39 104
39 104 AV5      NI 11 14

```

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 3 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE

** 41 105
41 105 AV1 NI 16 16
41 105 AV2 NI 19 INR

** 39 107
39 107 AV2 NI 15 15

** 36 110
36 110 AV5 NI 13 14

** 32 112
32 112 AV1 NI NDD 11
32 112 AV5 NI NDD 20
32 112 AV6 NI NDD 12

* GROWTH RATE *
* UNIT : STEAM GENERATOR NO. 4 *

ROW CLMN LOCATION 1R, 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

```

** 27 09
27 09 AV5      NDD 14 14

** 24 18
24 18 3H+1.10  10 MBM NI

** 17 23
17 23 7C+1.58  NI UDS NI

** 17 24
17 24 7C+1.70  NI UDS NI

** 05 31
05 31 3H+11.78 17 MBM NI

** 31 35
31 35 5C+28.10 16 INR NI

** 37 35
37 35 AV4+8.30 16 MBM NI

** 41 36
41 36 3H+15.40 21 MBM NDD

** 44 39
44 39 5H+1 .74 26 MBM NDD

** 50 40
50 40 AV2      NI NF 12
50 40 AV3      NI 14 19
50 40 AV4      NI 21 27
50 40 AV5      NI NF 11

** 43 42
43 42 5C+0.70 19 INF NI

** 20 43
20 43 5H+16.65 NI UDS NI

** 45 60
45 60 4C+22.01 13 14 NI

** 35 61
35 61 1H+14.40 17 MBM NI

** 47 64
47 64 7C+5.37  NI UDS NI

```

* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 4 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE
=====

** 50 72
50 72 5C+15.20 18 INF NI

** 57 75
57 75 3H+14.05 NDD 26 MBM

** 52 77
52 77 5H+2.60 18 MBM NI

** 11 78
11 78 TSC+39.60 15 INR NI
11 78 TSH+32.40 19 INR NI

** 40 87
40 87 AV4 NDD 10 15
40 87 AV5 NDD 11 15

** 44 96
44 96 AV3 NI 21 17
44 96 AV4 NI 11 15
44 96 AV6 NI 10 10

** 37 101
37 101 AV5+4.20 17 MBM NI

** 42 102
42 102 AV3 18 17 19
42 102 AV4 28 17 18

** 43 102
43 102 AV3 19 22 23
43 102 AV4 NF 17 24

** 44 102
44 102 AV3 25 35 39
44 102 AV4 NF 18 29
44 102 AV5 16 28 29

** 38 107
38 107 AV3 NF 17 17
38 107 AV4 NF 12 13
38 107 AV5 16 18 21

** 37 108
37 108 AV3 NI 19 21
37 108 AV5 NI NF 15

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* GROWTH RATE *
* UNIT 1 STEAM GENERATOR NO. 4 *

ROW CLMN LOCATION 1R1 1R2 1R3 1R4 1R5 1R6 1R7 1R8 1R9 1R10 GRTHRTE

** 27 113
27 113 6C+36.35 NI 24 NF

** 21 117
21 117 2C+25.90 17 INR NI

** 17 119
17 119 5H+26.10 16 INR NI

* GROWTH RATE *
* UNIT 2 STEAM GENERATOR NO. 1 *

ROW CLMN LOCATION 2R1 2R2 2R3 2R4 2R5 2R6 2R7 2R8 2R9 2R10 GRTHRTE

```

** 30 10
30 10 AV6      10 13

** 31 12
31 12 AV5      12 INR

** 37 15
37 15 BPH+10.60 18 NI

** 36 17
36 17 AV2      NF 14
36 17 AV6      13 14

** 42 20
42 20 AV2      NDD 12

** 34 25
34 25 AV1      15 15

** 25 26
25 26 1C+0.00  DI MBM

** 48 26
48 26 AV3      NF 12
48 26 AV4      17 18

** 48 28
48 28 AV2      NDD 10

** 50 28
50 28 AV3      13 16
50 28 AV4      NF 17
50 28 AV6      NF 11

** 53 33
53 33 AV4      13 14

** 54 41
54 41 6C+26.26 27 23
54 41 6C+27.24 31 29

** 57 53
57 53 AV6      NDD 11

** 47 65
47 65 7C-1.12  28 29

```


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* GROWTH RATE *
* UNIT 2 STEAM GENERATOR NO. 1 *

ROW CLMN LOCATION 2R1 2R2 2R3 2R4 2R5 2R6 2R7 2R8 2R9 2R10 GRTHRTE
=====

** 54 86
54 86 1H+1.53 17 17

** 42 104
42 104 AV2 NDD 14

** 27 105
27 105 TSC+10.45 25 MBM

* GROWTH RATE *

* UNIT 2 STEAM GENERATOR NO. 2 *

[illegible]

** 34 12
34 12 7H+3.51 RPC UDS

39 17 7H+2.49 16 NDD

** 42 19
42 19 AV3 13 INR

43 20
43 20 AV2 NDD 13

43 32
43 32 7C+0.44 12 NI

54 38
54 38 AV4 14 13

39 46 6H+36.67 34 30

30 47 6H+23.22 14 NI

**	59	55		
	59	55	AV1	15 11
	59	55	AV4	14 11

43 64
43 64 AV1 20 17

47 65
47 65 AV4 16 12

07 66 6H+17.84 16 NI

59 66
59 66 AV1 15 INF

50	67	AV2	16	24
50	67	AV4	NF	16

58 69
58 69 AV4 MBM 14

* GROWTH RATE *
* UNIT 2 STEAM GENERATOR NO. 2 *

ROW CLMN LOCATION 2R1 2R2 2R3 2R4 2R5 2R6 2R7 2R8 2R9 2R10 GRTHRTE

** 57 71
57 71 6H+22.05 18 INR

** 53 86
53 86 AV3 NF 12
53 86 AV4 NF 12
53 86 AV5 25 29

** 41 91
41 91 6H+10.11 13 NI

** 25 97
25 97 6H-4.02 10 NI

** 48 98
48 98 AV3 NF 21
48 98 AV4 33 33

* GROWTH RATE *
* UNIT 2 STEAM GENERATOR NO. 3 *

ROW CLMN LOCATION 2R1 2R2 2R3 2R4 2R5 2R6 2R7 2R8 2R9 2R10 GRTHRTE

```

** 34 13
34 13 AV5 13 11

** 32 15
32 15 AV2 NDD 15

** 32 16
32 16 AV2 14 INR

** 34 17
34 17 6C+35.03 29 28

** 44 21
44 21 AV2 14 12
44 21 AV4 17 14

** 32 22
32 22 6C+18.14 20 19
32 22 6C+19.28 14 12

** 45 22
45 22 AV3 15 14

** 47 24
47 24 AV2 13 15
47 24 AV4 11 11

** 47 25
47 25 AV2 14 16

** 49 39
49 39 6H+33.97 32 30

** 31 61
31 61 2C+23.19 10 NI

** 38 62
38 62 AV6+4.73 20 ANR

** 49 65
49 65 6H+10.67 12 NI

** 47 66
47 66 6H+11.51 23 UDS

** 41 72
41 72 6H+14.77 10 NI

```



```
*****
*                                *
*      GROWTH RATE              *
*                                *
*      UNIT 2 STEAM GENERATOR NO. 3  *
*                                *
*****
```

[illegible]

```

**  41    80
   41    80  6H+38.70   14  NI

```

* GROWTH RATE *
* UNIT 2 STEAM GENERATOR NO. 4 *

ROW CLMN LOCATION 2R1 2R2 2R3 2R4 2R5 2R6 2R7 2R8 2R9 2R10 GRTHRTE
=====

** 07 05
07 05 5H+30.33 07 NI

** 13 15
13 15 5H+20.15 24 23

** 44 21
44 21 AV2 NF 12
44 21 AV3 17 18
44 21 AV5 NF 12
44 21 AV6 NF 11

** 01 23
01 23 TSC+5.63 23 MBM

** 48 25
48 25 AV3 NDD 16
48 25 AV4 NDD 12
48 25 AV5 NDD 19

** 52 33
52 33 AV5 20 20

** 54 35
54 35 AV5 NDD 21
54 35 AV6 NDD 13

** 54 37
54 37 AV6 NDD 12

** 35 38
35 38 6H+37.78 29 32

** 53 43
53 43 AV3 18 21
53 43 AV5 NF 13

** 52 50
52 50 TSH+11.96 23 MBM

** 50 55
50 55 AV3 NF 12

** 44 59
44 59 AV3 NDD 11

* GROWTH RATE *
* UNIT 2 STEAM GENERATOR NO. 4 *

ROW CLMN LOCATION 2R1 2R2 2R3 2R4 2R5 2R6 2R7 2R8 2R9 2R10 GRTHRTE
.. .. .

** 39 64
39 64 AV3 16 20

** 53 66
53 66 5C+1.36 16 NI

** 50 67
50 67 AV4 NDD 18

** 59 67
59 67 AV3 17 16

** 51 73
51 73 AV2 21 28
51 73 AV3 14 25
51 73 AV4 15 22
51 73 AV5 14 24
51 73 AV6 NF 13

** 31 83
31 83 4H+32.55 23 MBM

** 43 83
43 83 AV3 NF 19
43 83 AV4 16 24

** 49 83
49 83 AV6+1.47 15 NI

** 44 85
44 85 AV3 NDD 10

** 45 91
45 91 7H+4.57 RPC UDS

** 30 94
30 94 6H+37.00 10 NI

** 22 105
22 105 7H+1.98 RPC UDS

** 21 115
21 115 7C+0.71 UDS UDS

** 10 121
10 121 5C+34.67 UDS UDS

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PLUGGED TUBES

U	SG #	ROW	CLM	OTG	DATE	SPT	INCHS	%	HEAT	NUMBER	REMARKS
1	1	28	37	1	10-88	4C	38.00	39	NX2387	I-600	
1	1	28	37	1	10-88	5H	07.00	39	NX2387	I-600	
1	1	28	37	3	09-91				NX6977HK	I-690, REPLACED I-600	

** UNIT 1 SG 1

1	1	28	37	1	10-88	4C	38.00	39	NX2387	I-600
1	1	28	37	1	10-88	5H	07.00	39	NX2387	I-600
1	1	28	37	3	09-91				NX6977HK	I-690, REPLACED I-600

** UNIT 1 SG 2

1	2	54	87	2	03-90	5AV	00.00	45	NX6441HK	I-690
1	2	53	90	2	03-90	3AV	00.00	38	NX6441HK	I-690
1	2	50	95	2	03-90	5AV	00.00	39	NX6441HK	I-690
1	2	40	106	2	03-90	3AV	00.00	39	NX6441HK	I-690

** UNIT 1 SG 3

1	3	3	33	0					UNKNOWN	AT W SHOP
1	3	23	108	0					UNKNOWN	AT W SHOP

** UNIT 1 SG 4

1	4	2	23	0					UNKNOWN	AT W SHOP
1	4	32	67	0					UNKNOWN	AT W SHOP
1	4	32	77	0					UNKNOWN	AT W SHOP
1	4	32	82	0					UNKNOWN	AT W SHOP

** UNIT 2 SG 1

2	1	1	1	P	08-88	TEC	04.37	89	NX2387	I-600
2	1	1	1	P	08-88	TEC	05.41	51	NX2387	I-600
2	1	27	42	P	08-88	TSH	00.00	SM	NX2387	I-600
2	1	27	42	P	08-88	TSH	00.35	TH	NX2387	I-600

** UNIT 2 SG 2

2	2	51	32	0					UNKNOWN	AT W SHOP
2	2	2	48	0					UNKNOWN	AT W SHOP
2	2	5	48	0					UNKNOWN	AT W SHOP
2	2	16	103	0					UNKNOWN	AT W SHOP

** UNIT 2 SG 3

2	3	25	102	0					UNKNOWN	AT W SHOP
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** UNIT 2 SG 4

2	4	3	35	0					UNKNOWN	AT W SHOP
2	4	12	36	0					UNKNOWN	AT W SHOP
2	4	8	56	0					UNKNOWN	AT W SHOP
2	4	16	57	0					UNKNOWN	AT W SHOP
2	4	48	64	0					UNKNOWN	AT W SHOP
2	4	23	67	0					UNKNOWN	AT W SHOP
2	4	22	90	0					UNKNOWN	AT W SHOP
2	4	24	93	0					UNKNOWN	AT W SHOP