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FATIGUE USAGE TO DATE FOR REACTOR PRESSURE VESSEL COMPONENTS BRUNSWICK STEAM ELECTRIC PLANT UNIT 1 AND UNIT 2

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1.0 INTRODUCTION

The design of the reactor pressure vessels (RPVs) at Brunswick Units 1 and 2 was performed in accordance with ASME Boiler and Pressure Vessel Code Class 1 requirements. As part of the design evaluation, analysis was performed to show acceptability for cyclic operation. The analysis was based on the projected number of transient cycles over the life of the plant. Any subcomponent of the reactor vessels was acceptable if a fatigue usage factor less than unity was computed. A number of the significant design transients cycles were then reflected in the Plant Technical Specifications to assure that the plant was not operated beyond the number of cycles considered in the design.

Exceeding the cyclic limits established in the Technical Specifications does not necessarily mean that the reactor vessel is approaching its design life. First, there are many conservatisms in design analysis; the designer is only required to show that the fatigue usage factor is less than unity. Second, even though an identified cycle type is listed in the Technical Specifications, it does not mean that cycle type contributes significantly to fatigue usage. Finally, the actual plant operating cycles are generally less severe than those considered in the design analysis.

To address the issue of design versus actual cycles, a fatigue usage update was performed for both units by the General Electric Company in 1983 [1][1]. In this evaluation, it was identified that the controlling locations that needed to be tracked were the RPV studs, refueling bellows, core spray nozzle, feedwater nozzle, and recirculation inlet nozzle. Fatigue usage was predicted up to the end of 1981, and a projection of cycles to the end of a 40 year life was made. The computed usage factors were projected to be less than unity to end of plant life. There was no assessment made for the Unit 2 feedwater nozzles since there were plans underway to replace the safe-ends for the Unit 2 nozzles.

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[1] Numbers in brackets are for references defined in Section 6.

In 1991, the General Electric Company provided further evaluations to show that feedwater inlet sparger seal bypass leakage and cracking in the feedwater bore/blend radius regions could be tolerated [2,3]. Fracture mechanics flaw growth evaluations were conducted to show that flaws would not propagate significantly into the nozzle bore and blend radius regions. This analysis provided an alternate evaluation approach, as compared to calculating usage factors, as a basis for assessing fatigue resistance for the feedwater nozzle bore and blend radius areas. This analysis provided a basis for continued operation, even if it was assumed that cracking had initiated.

In 1991, SI started a project to implement fatigue monitoring at Brunswick using **FatiguePro**, a software package developed for the Electric Power Research Institute [4]. A special version of the software was developed (**FatiguePro CEM**) that would accept a log of cyclic operations (with operating parameters) as an input file [5]. The software was configured for the RPV studs and refueling bellows. The plant cyclic data were transmitted that characterized plant operations from 1982 through 1988 [6]. During the current project, the **FatiguePro CEM** software was expanded to include recirculation inlet nozzles, core spray nozzles and feedwater nozzles [7]. A record of the complete cyclic operations to date was provided so that operations-to-date usage factors could be determined by SI [8,9].

This report documents the use of **FatiguePro CEM** to evaluate the fatigue usage to date at the previously described locations. The results are then used to predict usage for a 40 year operating life.

2.0 DESCRIPTION OF **FatiguePro CEM**

FatiguePro CEM is a computer program that is used to compute the accumulated fatigue usage at a location based upon 1) accumulated number of cycles for various transients and 2) the severity of the transients as quantified by pressure, temperature, etc. By logically interpreting the accumulated cyclic history, a stress time history at the monitored location is derived. After the stress time history is computed, the stress time history is evaluated using the ordered overall range (OOR) cycle counting procedure to arrive at a stress range spectrum [4]. This spectrum is evaluated using the methodology from the ASME Boiler and Pressure Vessel Code for Class 1 Components.

The overall methodology of **FatiguePro** is shown in Figure 2-1. The approach for **FatiguePro CEM** is essentially that developed for **FatiguePro** [4], except the stress time history is developed from information in the component stress reports instead of based upon Green's Functions and Transfer Functions.

With **FatiguePro CEM**, the results included in the design stress reports can be duplicated if the transients are assumed to be at the magnitudes and rates as analyzed in the stress reports. The additional feature that is incorporated into **FatiguePro CEM** is to ratio the design stress report transients based upon the plant parameters observed during actual plant operations. For example, if the thermal stress is proportional to the rate of heatup, then the thermal stress can be modified based upon the actual heatup rate.

The methodology implemented in **FatiguePro CEM** is fully described in the user's manual [7]. The program has been verified in accordance with SI's program for Quality Software. A Verification and Validation (V&V) Report, with appropriate objective evidence of V&V activities, has been provided to CP&L [10].

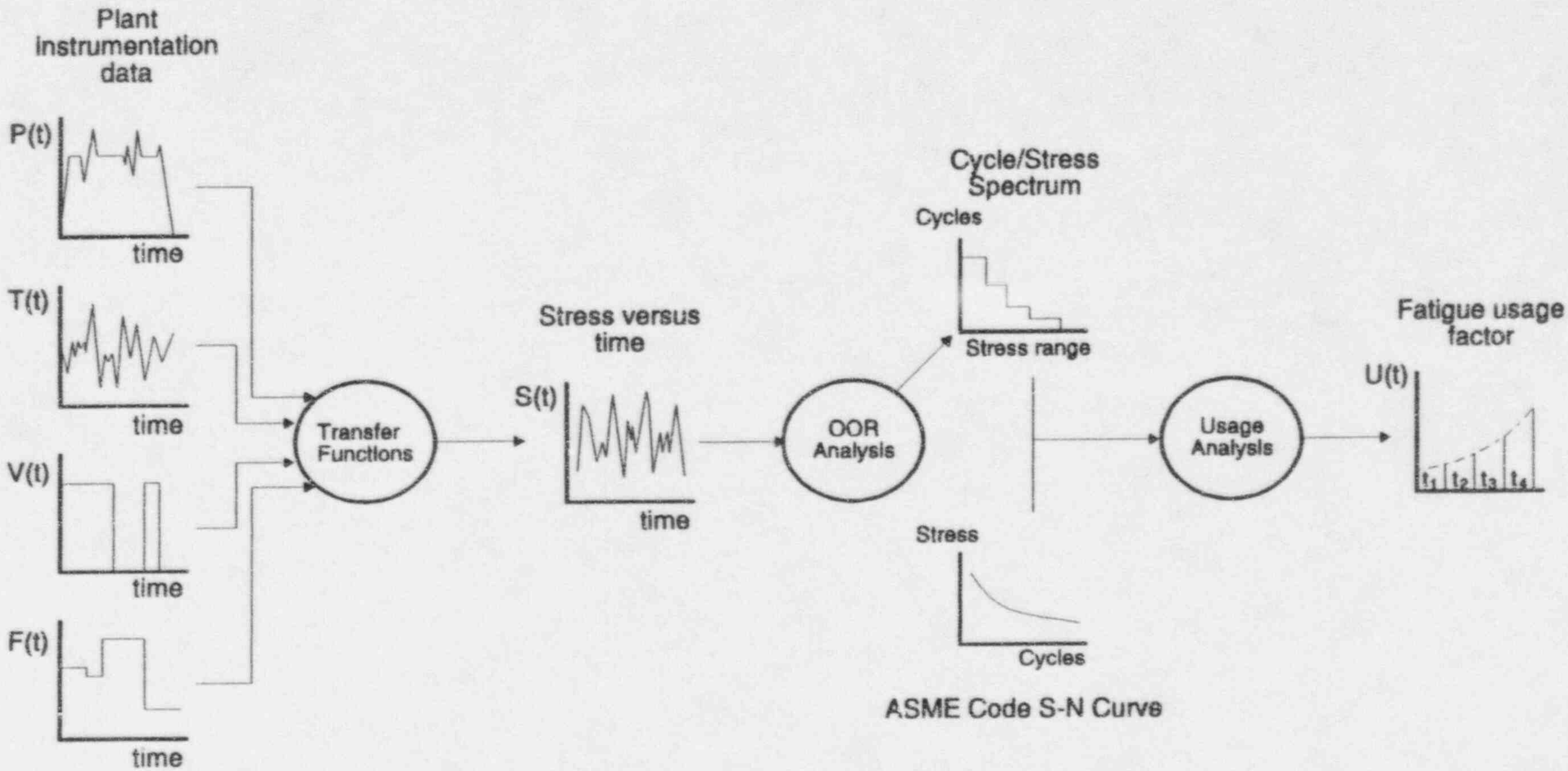

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Figure 2-1. Schematic of **FatiguePro** Monitoring Methodology [4]

3.0 PLANT DATA EVALUATION

Historical plant operating transients have been determined from the original GE evaluation [1] and from subsequent data provided by CP&L [6,8,9]. In general, this data is not completely sufficient to utilize the full capabilities of **FatiguePro CEM**. However, it has been conservatively evaluated so that results of the current analysis will provide a bounding estimate of the usage to date.

Table 3-1 lists the transients that must be counted and considered for the **FatiguePro CEM** evaluation. For each transient type, parameters are defined that affect the stress magnitude occurring at each monitored location. To perform an analysis, cyclic operating history must be evaluated to determine the sequence of events that have occurred, along with an appropriate set of parameters. The determined histories are included for Units 1 and 2 in Appendices A and B respectively.

The detailed evaluations of the input data are provided as calculations separate from this document [11,12].

The following lists some key assumptions that were made in deriving the transient history files:

1. An ASME Hydrotest cycle was included prior to the initial fuel load.

2. Normal operating pressure was taken as 1005 psig.

3. The normal minimum feedwater temperature was taken as 90°F as an average. This was the number assumed in the original vessel stress report.

4. The maximum heatup and cooldown rates of 100°F/hr were used if no other data were available.

5. Normal operating feedwater temperature was assumed to be 420° during normal operation and 265° at the time of shutoff. Feedwater temperature during hot standby and shutdown cycling was taken as 90°F as an average.

6. Five hot standby feedwater injections were assumed during each shutdown as long as a turbine roll had occurred. This number is based upon that used in the design analysis.

7. Heatup and cooldown rates were evaluated based on the maximum temperature change of the recirculation system in any hour. (In a few cases, the saturation temperature at reactor pressure was used when it appeared that recorded recirculation temperature rates of change were not realistic.)

Table 3-1

Definition of Plant Transients and Assumed Design Values

TRANSIENT NAME	DESCRIPTIONS	CHARACTERISTIC PARAMETERS
ASMEHYDRO	Initial Hydrotest of Reactor Vessel	None
BOLTUP	Boltup of Reactor Vessel Head	None
UNBOLT	Removal of Reactor Vessel Head	None
HYDROTEST	Vessel Hydrotest prior to Heatup	Pres(max), Temp(max)
HEATUP	Heatup of Vessel Prior to Turbine Roll	Pres(max), HeatUpRate(max)
TURBROLL	Initiation of Flow to Feedwater Nozzles	Press(max), TFw(min), TFw(ss)
TURBTRIP	Turbine Trip and Recovery	Press(max), TFw(min), TFw(ss)
TTBYPASS	Turbine Trip with Bypass	Press(max), TFw(min), TFw(ss)
FHLOSS	Feedwater Heater Loss	Press(max), TFw(loss), TFw(ss)
FWLOSS	Loss of All Feedwater and Isolation	Press(max), TFw(min), TFw(ss), Nhpci_inj, Nrcic_inj
HOTSBY	Hot Standby Prior to Shutdown	Press(@ Time of Hotsby), TFw(off), TFw(min), N_inj (fw or rcic)
COOLDOWN	Cooldown of Vessel	Press(min), CooldownRate(max), TFw(min)
REFUEL	Refueling Operation	N_level_changes
Note: The above transients are defined on GE Drawing 729E762, Rev. 0 and Table 3-2 of this document		

Table 3-2

Definition of Plant Transients and Assumed Design Values

Values Used for Transient Evaluation (if no data available)	
Pres(max) = 1005 psi	Maximum pressure during cycle (or 1025 for hydrotest)
TFw(min) = 90°F	Minimum feedwater temperature during event
N_inj = 5	Number of FW nozzle injections after hot standby initiated
Nrcic_inj = 3	Number of RCIC injections during loss of feedwater event
Nhpci_inj = 3	Number of HPCI injections during loss of feedwater event
HeatupRate(max) = 100°F/hr	Rate of heatup
TFw(ss) = 420°F	Feedwater temperature during normal operation
TFw(loss) = 265°F	Feedwater temperature during loss of feedwater heater
TFw(off) = 265°F	Feedwater temperature at time of hot standby initiation
Temp(max) = 200°F	Feedwater temperature during hydrotest
Cooldownrate(max) = 100°F/hr	Vessel cooldown rate
Press(min) = 0 psi	Minimum pressure reached during a cooldown
N_level_changes = 3	Number of times that fuel pool level is raised and lowered while vessel head is removed

4.0 RESULTS OF EVALUATION

The history of the cyclic operations at both units was evaluated [11]. Figures 4-1 to 4-5 show the results of analyzing the data with **FatiguePro CEM**. The maximum current usage factor is 0.28 for the refueling bellows at Unit 2. All usage trends generally exhibit a trend of decreasing slope, indicating that the relatively larger rate of transient usage experienced early in plant life is decreasing. The results for each of the operating periods evaluated, and the total usage at each of the locations are shown in Table 4-1 and 4-2.

In one case (for the Core Spray Nozzle) there is a large jump in usage as shown in Figure 4-3. This is not considered to be realistic, but results because of the conservative way in which the stress analysis data were interpreted. The single jump occurred for a transient in which a rate of temperature decrease below 100°F/Hr could not be justified. The overall usage accumulation rate at this location is very low otherwise.

The data has been compared to the results presented by GE for Unit 1 [1]. Since GE evaluated the data for a Feedwater temperature of 100°F, the analysis was re-run using **FatiguePro CEM** for the period evaluated by GE using this temperature. Results are shown in Table 4-3. The results are very comparable for the RPV Stud, Refueling Bellows and Feedwater nozzle locations. For the other locations, review of the GE report shows that GE did no detailed analysis, but only ratioed the results from the stress report. For the **FatiguePro CEM** evaluation, further analysis was conducted to develop reduced stress ratios. In fact, for the Recirculation Inlet nozzle, the more recent analysis performed by SI for the safe-end replacement was used as the basis [14].

Some relatively simplistic evaluation has been conducted to determine the 40 year usage based on the results determined to date [15]. These are shown in Table 4-4, and were determined by conservatively projecting the usage accumulation from Figures 4-1 to 4-5. Usage is not projected to approach the limit of 1.0 for any location.

Table 4-1

Results from Unit 1 Fatigue Usage Resulting From **FatiguePro CEM** System

Operating Time	Reactor Stud	Refueling Bellows	Recirc. Nozzle	Core Spray Nozzle	FW Nozzle
9/3/75 - 12/4/81	0.07257	0.1041	0.00006918	0.007871	0.1277
12/5/81 - 4/9/89	0.07550	0.09539	0.00005277	0.006535	0.07316
4/10/89 - 4/21/92	0.02265	0.03671	0.00001671	0.002008	0.02195
9/3/75 - 4/21/92	0.1688	0.2325	0.0001452	0.01567	0.2228

Table 4-2

Results from Unit 2 Fatigue Usage Resulting From **FatiguePro CEM** System

Operating Time	Reactor Stud	Refueling Bellows	Recirc. Nozzle	Core Spray Nozzle	FW Nozzle
3/22/75 - 12/20/81	0.07798	0.1110	0.0001025	0.01173	0.04095
12/21/81 - 11/16/88	0.08620	0.011453	0.00006075	0.007899	0.01958
11/17/88 - 4/21/92	0.02634	0.03406	0.00001865	0.02623	0.004366
3/22/75 - 4/21/92	0.1868	0.2852	0.0001813	0.04628	0.06378

Table 4-3

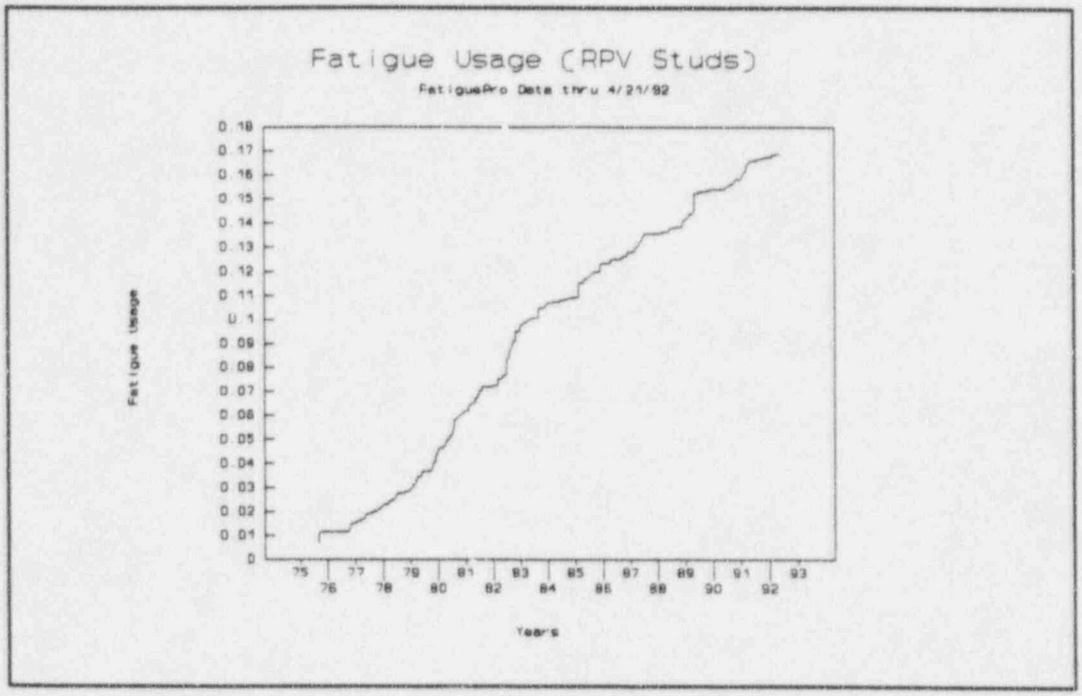
Comparison of Unit 1 GE Reported Usage to **FatiguePro CEM** System (at T_{FW} = 100°F)

	Operating Time	Reactor Stud	Refueling Bellows	Recirc. Nozzle	Core Spray Nozzle	FW Nozzle
FatiguePro CEM	9/3/75 - 12/4/81	0.07258	0.1025	0.0000665	0.007871	0.01140
GE Report	Through Dec'81	0.07500	0.1115	0.02500	0.08600	0.09000

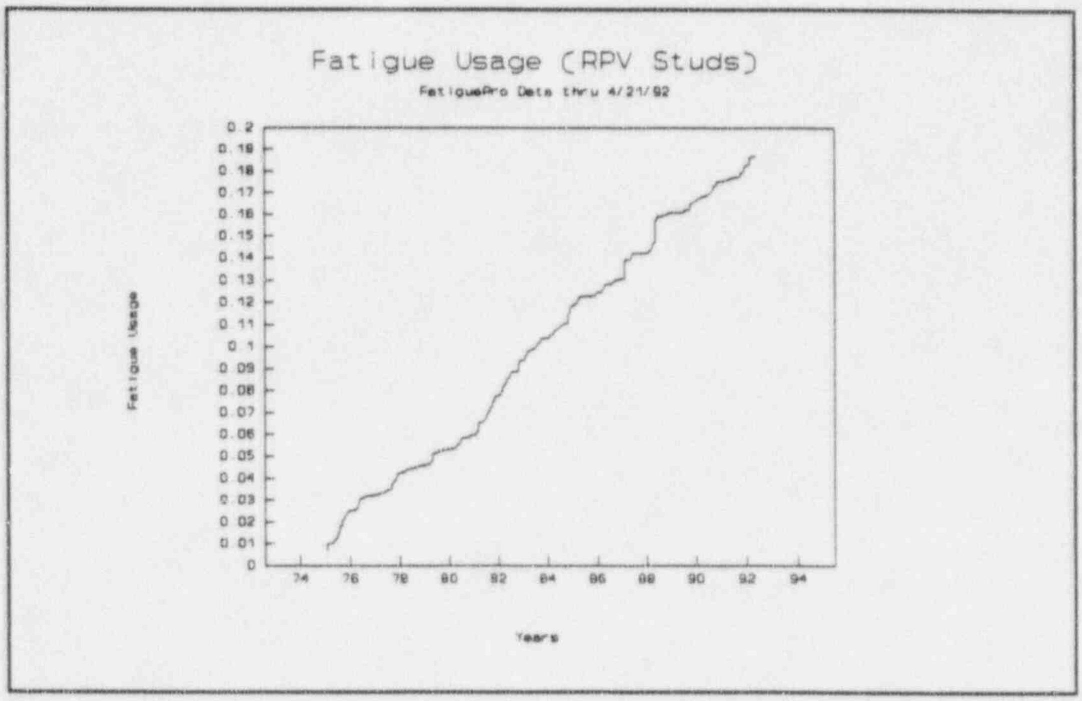
Table 4-4

Projecting Usage for 40 Years

	Reactor Stud	Refueling Bellows	Recirc. Nozzle	Core Spray Nozzle	FW Nozzle
Unit 1	0.36	0.53	0.00035	0.037	0.53
Unit 2	0.41	0.68	0.00043	0.12	0.21

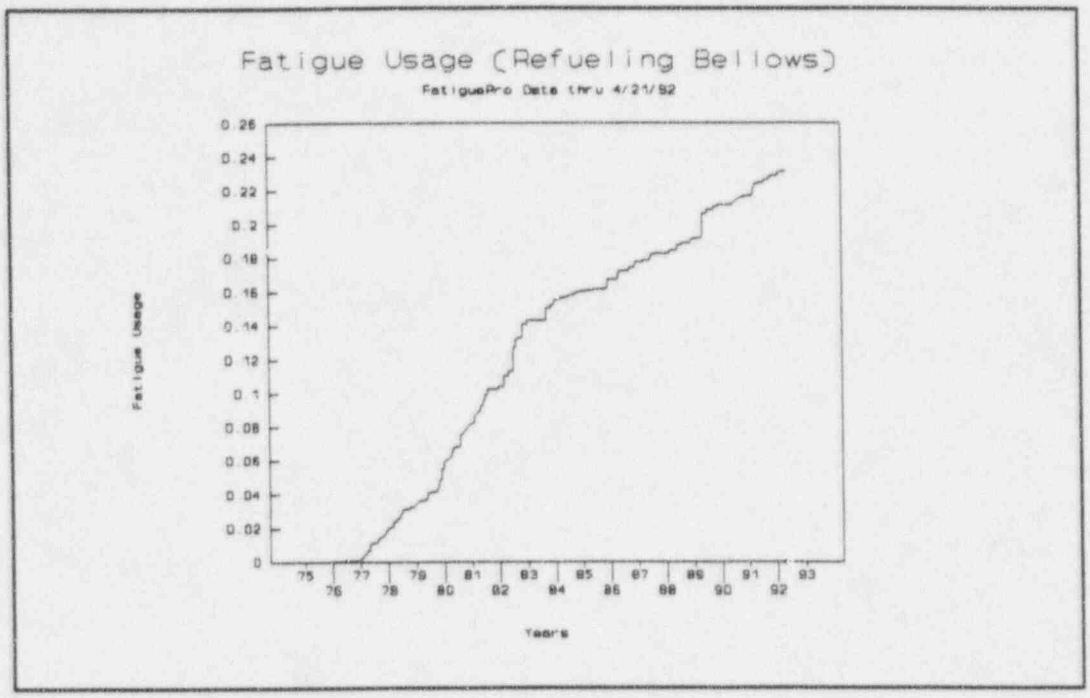


a. Unit 1

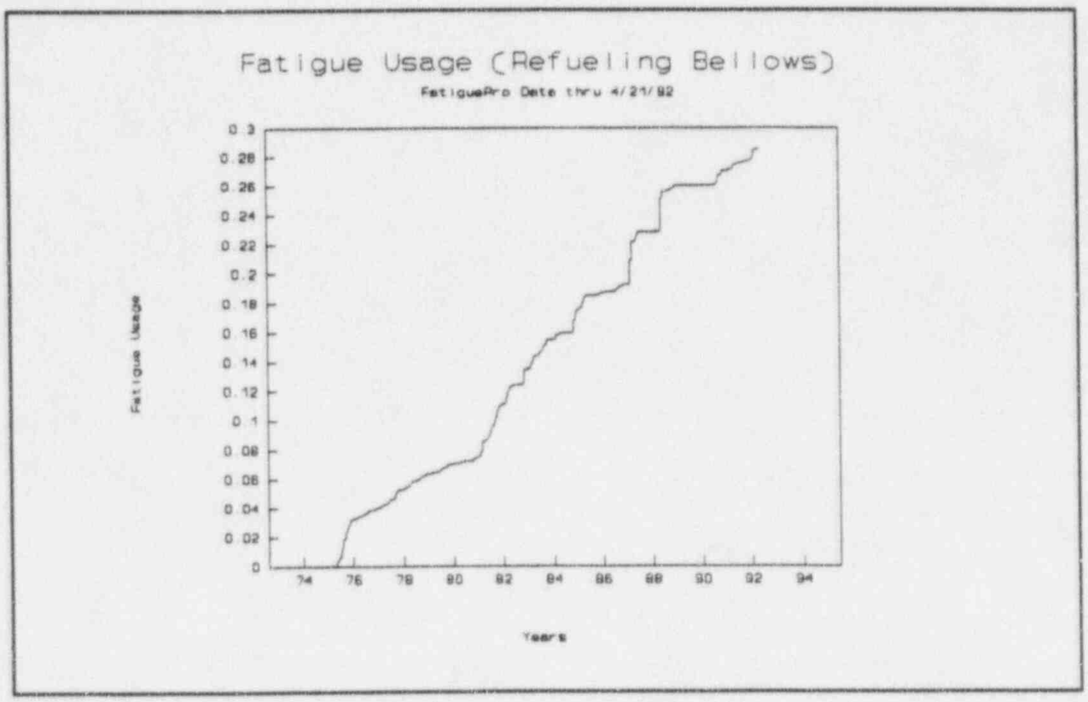


b. Unit 2

Figure 4-1. Reactor Vessel Studs Fatigue Usage to Date

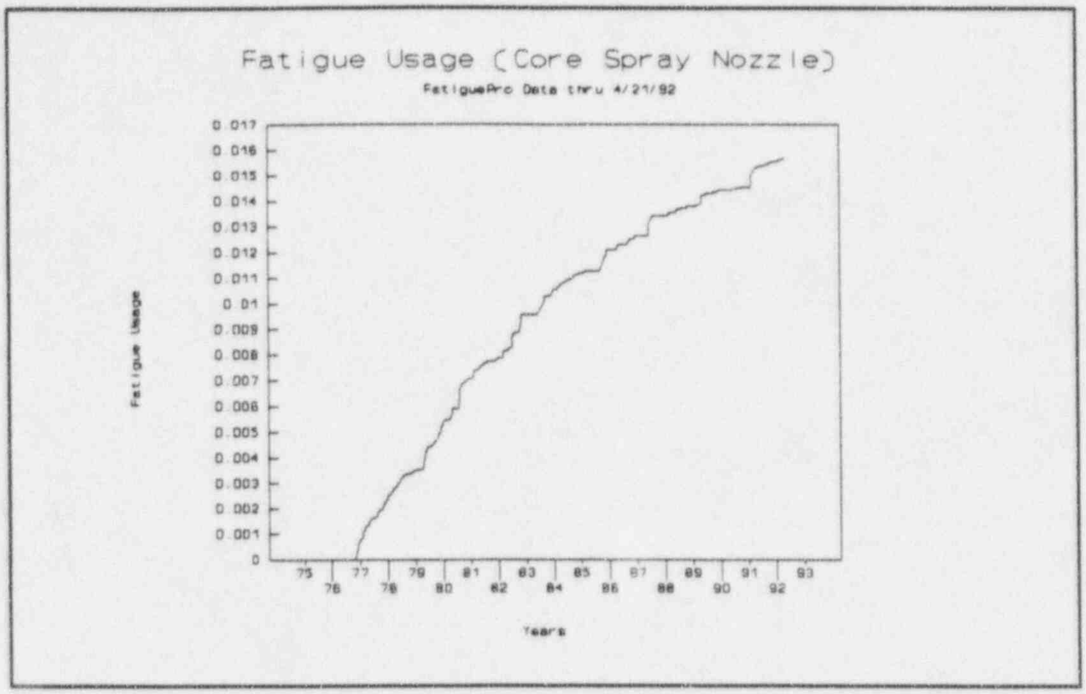


a. Unit 1

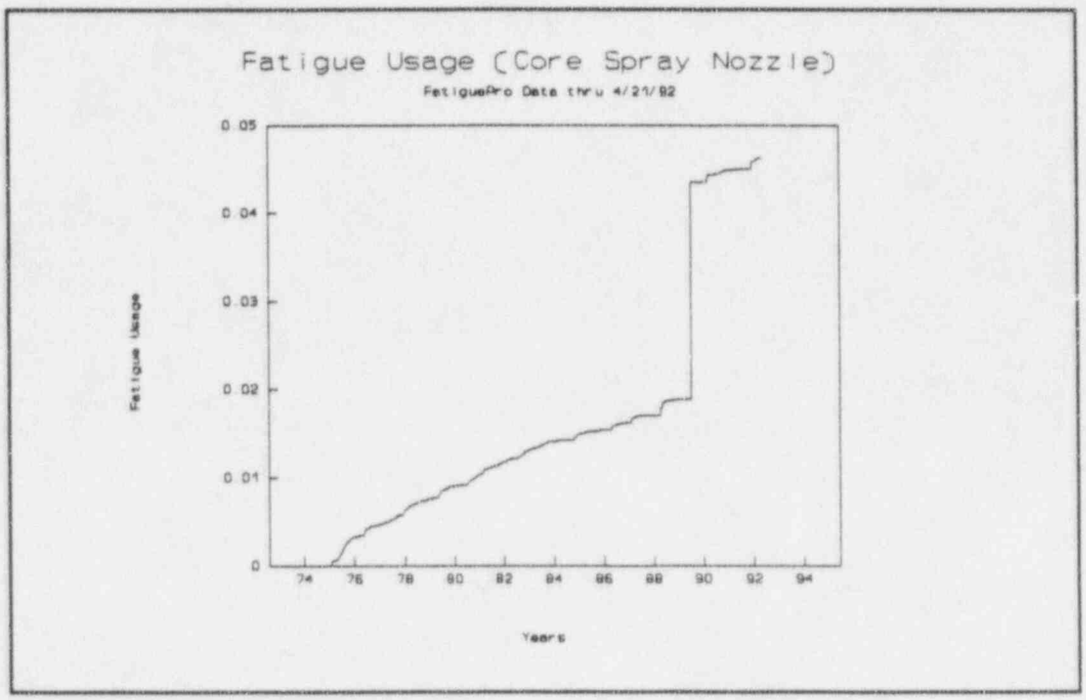


b. Unit 2

Figure 4-2. Refueling Bellows Fatigue Usage to Date

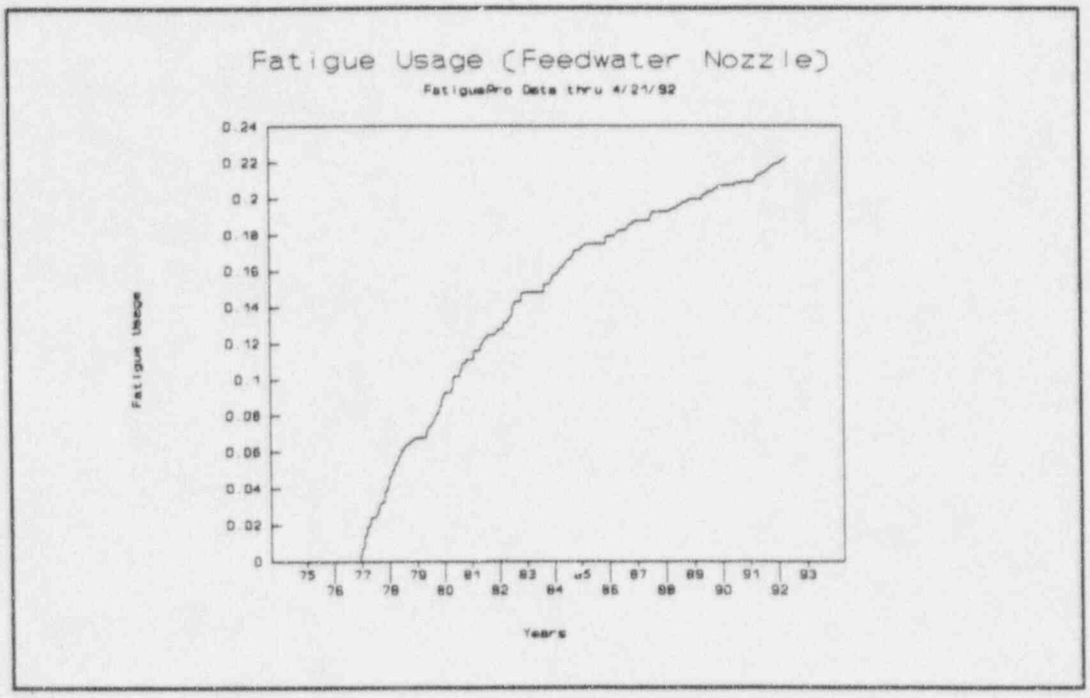


a. Unit 1

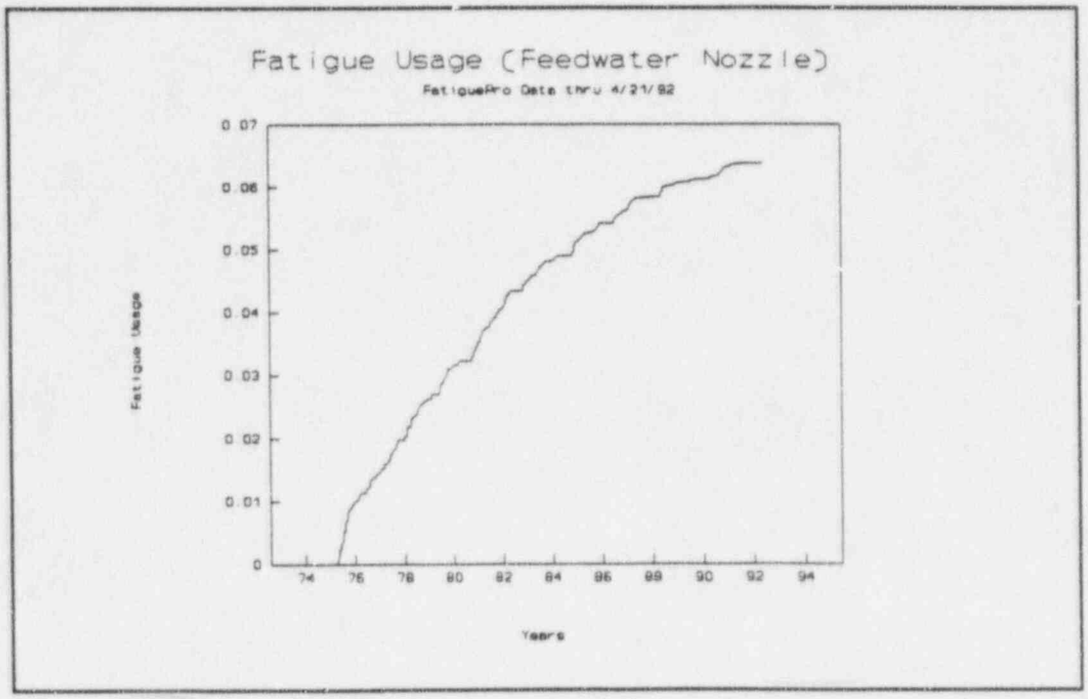


b. Unit 2

Figure 4-3. Core Spray Nozzle Fatigue Usage to Date

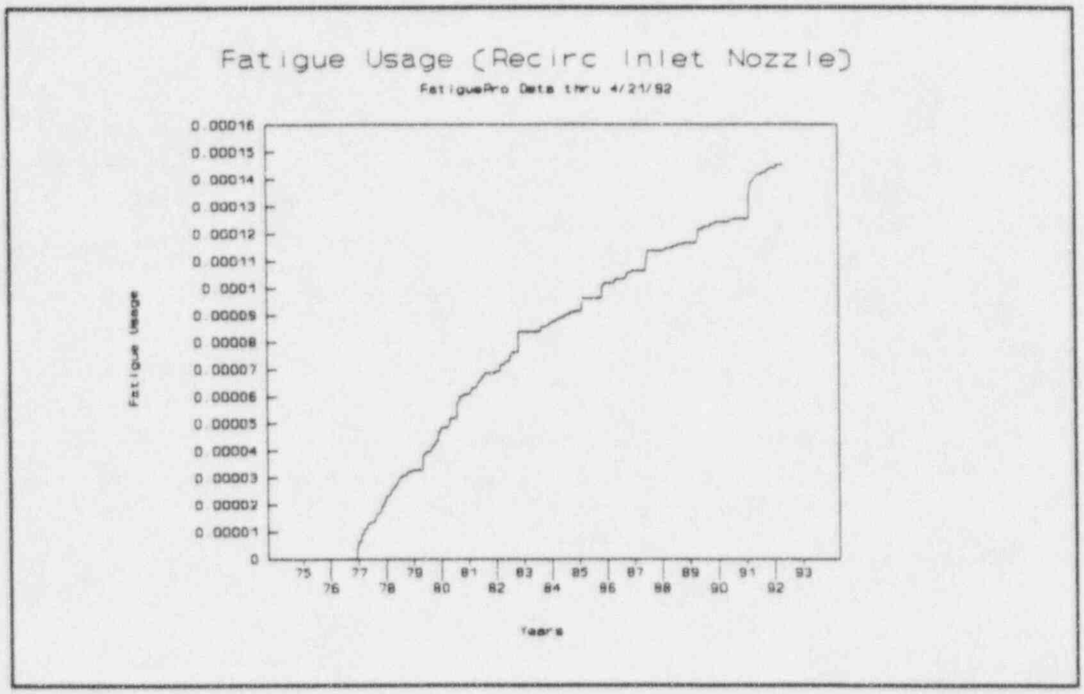


a. Unit 1

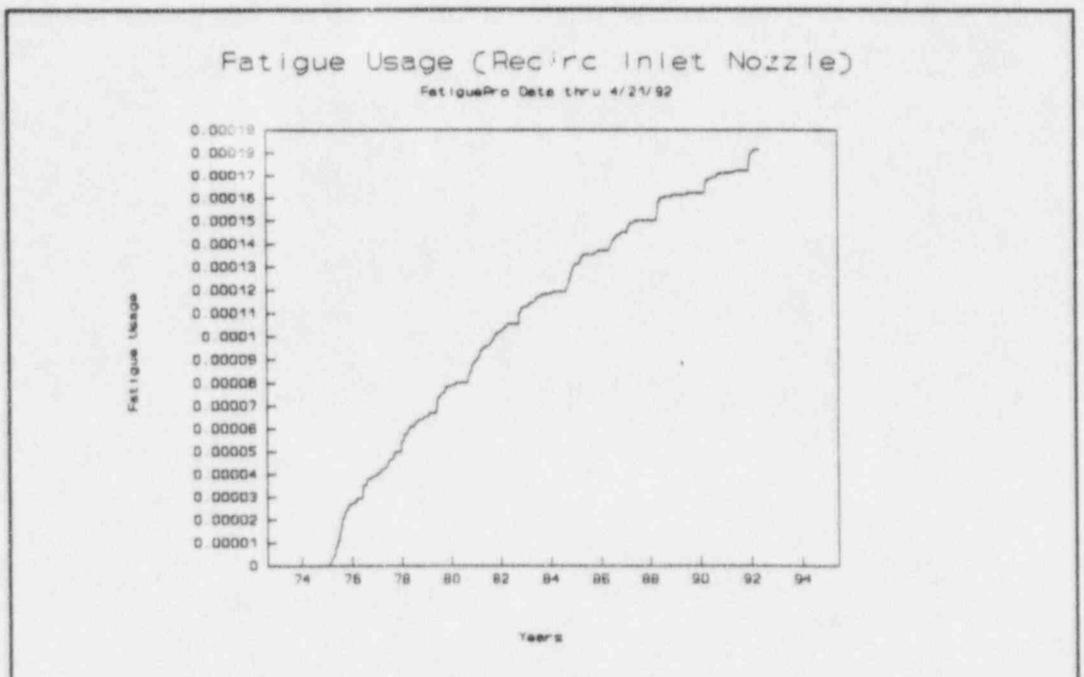


b. Unit 2

Figure 4-4. Feedwater Nozzle Fatigue Usage to Date



a. Unit 1



b. Unit 2

Figure 4-5. Recirculation Inlet Nozzle Fatigue Usage to Date

5.0 DISCUSSION

As part of a project by Structural Integrity Associates (SI) to implement fatigue monitoring software for Brunswick Units 1 and 2, an evaluation has been conducted for the operating history of each unit. These accumulated cyclic operations have been characterized and evaluated with the **FatiguePro CEM** fatigue analysis software. The maximum to date usage factor has been calculated as 0.23 for Unit 1 and 0.28 for Unit 2. Both are less than the value of 1.0 as allowed for design of ASME Boiler and Pressure Vessel Code Class 1 components. Linearly projection of operations for a 40 year life shows that the usage is indicated to remain less than 0.53 for Unit 1 and less than 0.68 for Unit 2. The refueling bellows support is the controlling location.

SI believes that the computed usage is very conservative and may be modified in the future. Work is underway at the plant to develop a procedure to collect actual cyclic information for plant transients. This data will then be compiled (as in Appendices A and B) and evaluated with the **FatiguePro CEM** software to provide a continuing update. As more detailed information is collected in the future, it is likely that a lower rate of accumulation of fatigue usage will result. This collected data may be used in the future to reduce the conservatisms contained in the current evaluation.

6.0 REFERENCES

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2. NEDC-30634, "Brunswick Steam Electric Plant, Unit 1 Feedwater Nozzle Fracture Mechanics Analysis", Revision 1, General Electric Company, May 1991.

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5. SIR-92-034, "User's Manual, **FatiguePro** Cycle Evaluation Module - Fatigue Monitoring System for Brunswick Steam Electric Plant", Structural Integrity Associates, Revision 0, June 1992.

6. "Units 1 and 2 Control Operator Log and Shift Foreman Log Worksheet", received from Lee Witcher of CP&L, November 15, 1991.

7. SIR-92-034, "User's Manual, **FatiguePro** Cycle Evaluation Module - Fatigue Monitoring System for Brunswick Steam Electric Plant", Structural Integrity Associates, Revision 1, April 1993.

8. "Transmittal of Unit 1 RPV Thermal Cycling Data", received from E. A. Bishop, February 17, 1993.

9. "Transmittal of Unit 2 RPV Thermal Cycling Data", received from A. M. Lucas, March 2, 1993.

10. SIR-92-035, "Software Validation and Verification Report, Brunswick Unit 1 and 2 CEM Fatigue Monitoring System", Structural Integrity Associates, Revision 0, April 1993.

11. SI Calculations CPL-27Q-303 and -305, "Brunswick Unit 1 Operating Cycle Evaluation", March 19, 1993.

12. SI Calculation CPL-27Q-304 and -306, "Brunswick Unit 2 Operating Cycle Evaluation", March 19, 1993.

13. SI Calculation CPL-27Q-310, "Fatigue Usage Calculation for Brunswick Unit 1 and 2", March 26, 1993.

14. "Design Report for Brunswick, Recirculation N_2 Nozzle Safe-End and Thermal Sleeve Replacement", SI Report SIR-89-033, Rev. 2, July 1989.

15. SI Calculation CPL-27Q-312, "40-Year Fatigue Projection", April 16, 1993.

Appendix A

Brunswick Unit 1 - Accumulated Cycle History

Yr	Mo	Day	Seq.	Transient	Parameters			
75	8	1	1	ASMEHYDRO				
75	8	15	1	BOLTUP				
75	9	3	1	UNBOLT				
76	9	1	1	REFUEL	3			
76	10	1	1	BOLTUP				
76	11	16	1	HYDROTEST	1025	200		
76	11	17	1	HEATUP	1005	30		
76	11	17	2	TURBROLL	1005	90	420	
76	11	18	1	HOTSBY	1005	265	90	0
76	11	18	2	COOLDOWN	0	12	90	
76	11	19	1	HEATUP	1005	5		
76	11	19	2	TURBROLL	1005	90	420	
76	11	27	1	HOTSBY	1005	265	90	5
76	11	27	2	COOLDOWN	0	25	90	
76	12	1	1	HEATUP	1005	50		
76	12	1	2	TURBROLL	1005	90	420	
76	12	5	1	HOTSBY	1005	265	90	5
76	12	5	2	COOLDOWN	0	50	90	
76	12	11	1	HEATUP	1005	50		
76	12	11	2	TURBROLL	1005	90	420	
76	12	26	1	HOTSBY	1005	265	90	5
76	12	26	2	COOLDOWN	0	40	90	
76	12	29	1	HEATUP	1005	35		
76	12	29	2	TURBROLL	1005	90	420	
77	1	1	1	HOTSBY	1005	265	90	5
77	1	1	2	COOLDOWN	0	20	90	
77	1	2	1	HEATUP	1005	20		
77	1	2	2	TURBROLL	1005	90	420	
77	1	4	1	HOTSBY	1005	265	90	5
77	1	4	2	COOLDOWN	0	15	90	
77	1	5	1	HEATUP	1005	34		
77	1	5	2	TURBROLL	1005	90	420	
77	1	7	1	HOTSBY	1005	265	90	5
77	1	7	2	COOLDOWN	0	60	90	
77	1	8	1	HEATUP	1005	40		
77	1	8	2	TURBROLL	1005	90	420	
77	1	14	1	HOTSBY	1005	265	90	5
77	1	14	2	COOLDOWN	0	30	90	
77	1	15	1	HEATUP	1005	25		
77	1	15	2	TURBROLL	1005	90	420	
77	2	3	1	HOTSBY	1005	265	90	5
77	2	3	2	COOLDOWN	0	25	90	
77	2	4	1	HEATUP	1005	40		
77	2	4	2	TURBROLL	1005	90	420	
77	2	21	1	HOTSBY	1005	265	90	5
77	2	21	2	COOLDOWN	0	55	90	
77	2	25	1	HEATUP	1005	55		
77	2	25	2	TURBROLL	1005	90	420	
77	2	26	1	HOTSBY	1005	265	90	0
77	2	26	2	COOLDOWN	0	50	90	
77	2	26	3	HEATUP	1005	60		
77	2	26	4	TURBROLL	1005	90	420	
77	3	17	1	HOTSBY	1005	265	90	5
77	3	17	2	COOLDOWN	0	40	90	
77	3	18	1	HEATUP	1005	45		
77	3	18	2	TURBROLL	1005	90	420	
77	4	1	1	HOTSBY	1005	265	90	5
77	4	1	2	COOLDOWN	0	40	90	
77	4	4	1	HEATUP	1005	40		
77	4	4	2	TURBROLL	1005	90	420	
77	4	6	1	HOTSBY	1005	265	90	5
77	4	6	2	COOLDOWN	0	35	90	
77	4	7	1	HEATUP	1005	30		
77	4	7	2	TURBROLL	1005	90	420	
77	4	27	1	TURBTRIP	1005	90	420	
77	4	27	2	HOTSBY	1005	265	90	5
77	4	27	3	COOLDOWN	0	40	90	

Yr	Mo	Day	Seq.	Transient	Parameters			
77	6	28	1	HEATUP	1005	50		
77	6	28	2	TURBROLL	1005	90	420	
77	7	4	1	HOTSBY	1005	265	90	5
77	7	4	2	COOLDOWN	0	25	90	
77	7	5	1	HEATUP	1005	40		
77	7	5	2	TURBROLL	1005	90	420	
77	7	22	1	HOTSBY	1005	265	90	5
77	7	22	2	COOLDOWN	0	70	90	
77	7	24	1	HEATUP	1005	60		
77	7	24	2	TURBROLL	1005	90	420	
77	7	28	1	HOTSBY	1005	265	90	5
77	7	28	2	COOLDOWN	0	38	90	
77	8	7	1	HEATUP	1005	25		
77	8	7	2	COOLDOWN	0	30	90	
77	8	9	1	HEATUP	1005	48		
77	8	9	2	TURBROLL	1005	90	420	
77	8	28	1	HOTSBY	1005	265	90	5
77	8	28	2	COOLDOWN	0	35	90	
77	8	29	1	HEATUP	1005	30		
77	8	29	2	TURBROLL	1005	90	420	
77	9	30	1	HOTSBY	1005	265	90	5
77	9	30	2	COOLDOWN	0	45	90	
77	10	3	1	HEATUP	1005	25		
77	10	3	2	TURBROLL	1005	90	420	
77	10	4	1	HOTSBY	1005	265	90	0
77	10	4	2	COOLDOWN	0	35	90	
77	10	5	1	HEATUP	1005	40		
77	10	5	2	TURBROLL	1005	90	420	
77	10	14	1	HOTSBY	1005	265	90	5
77	10	14	2	COOLDOWN	0	50	90	
77	10	16	1	HEATUP	1005	70		
77	10	16	2	TURBROLL	1005	90	420	
77	10	29	1	HOTSBY	1005	265	90	5
77	10	29	2	COOLDOWN	0	50	90	
77	10	29	3	HEATUP	1005	30		
77	10	29	4	TURBROLL	1005	90	420	
77	11	13	1	HOTSBY	1005	265	90	5
77	11	13	2	COOLDOWN	0	45	90	
77	11	21	1	HEATUP	1005	58		
77	11	21	2	TURBROLL	1005	90	420	
77	11	22	1	HOTSBY	1005	265	90	0
77	11	22	2	COOLDOWN	0	45	90	
77	11	26	1	HEATUP	1005	60		
77	11	26	2	TURBROLL	1005	90	420	
77	12	3	1	HOTSBY	1005	265	90	5
77	12	3	2	COOLDOWN	0	45	90	
77	12	4	1	HEATUP	1005	45		
77	12	4	2	TURBROLL	1005	90	420	
77	12	16	1	HOTSBY	1005	265	90	5
77	12	16	2	COOLDOWN	0	30	90	
77	12	16	3	HEATUP	1005	48		
77	12	16	4	TURBROLL	1005	90	420	
77	12	21	1	HOTSBY	1005	265	90	5
77	12	21	2	COOLDOWN	0	20	90	
77	12	22	1	HEATUP	1005	40		
77	12	22	2	TURBROLL	1005	90	420	
78	1	13	1	HOTSBY	1005	265	90	5
78	1	13	2	COOLDOWN	0	30	90	
78	1	14	1	HEATUP	1005	35		
78	1	14	2	TURBROLL	1005	90	420	
78	1	19	1	HOTSBY	1005	265	90	5
78	1	19	2	COOLDOWN	0	30	90	
78	1	22	1	HEATUP	1005	60		
78	1	22	2	TURBROLL	1005	90	420	
78	2	13	1	HOTSBY	1005	265	90	5
78	2	13	2	COOLDOWN	0	10	90	
78	2	26	1	HEATUP	1005	44		
78	2	26	2	TURBROLL	1005	90	420	
78	2	27	1	HOTSBY	1005	265	90	0
78	2	27	2	COOLDOWN	0	95	90	
78	2	28	1	HEATUP	1005	75		
78	2	28	2	TURBROLL	1005	90	420	
78	3	13	1	HOTSBY	1005	265	90	5
78	3	13	2	COOLDOWN	0	60	90	
78	3	14	1	HEATUP	1005	60		
78	3	14	2	TURBROLL	1005	90	420	

Yr	Mo	Day	Seq.	Transient	Parameters			
78	4	3	1	HOTSBY	1005	265	90	5
78	4	3	2	COOLDOWN	0	30	90	
78	4	5	1	HEATUP	1005	60		
78	4	5	2	TURBROLL	1005	90	420	
78	4	8	1	HOTSBY	1005	265	90	5
78	4	8	2	COOLDOWN	0	35	90	
78	4	8	3	HEATUP	1005	40		
78	4	8	4	TURBROLL	1005	90	420	
78	5	1	1	HOTSBY	1005	265	90	5
78	5	1	2	COOLDOWN	0	55	90	
78	5	2	1	HEATUP	1005	35		
78	5	2	2	TURBROLL	1005	90	420	
78	5	19	1	HOTSBY	1005	265	90	5
78	5	19	2	COOLDOWN	0	28	90	
78	5	23	1	HEATUP	1005	85		
78	5	23	2	TURBROLL	1005	90	420	
78	6	27	1	TURBTRIP	1005	90	420	
78	6	27	2	HOTSBY	1005	265	90	5
78	6	27	3	COOLDOWN	0	25	90	
78	6	28	1	HEATUP	1005	60		
78	6	28	2	TURBROLL	1005	90	420	
78	7	28	1	HOTSBY	1005	265	90	5
78	7	28	2	COOLDOWN	0	25	90	
78	7	28	3	HEATUP	1005	50		
78	7	28	4	TURBROLL	1005	90	420	
78	9	25	1	HOTSBY	1005	265	90	5
78	9	25	2	COOLDOWN	0	30	90	
78	9	30	1	HEATUP	1005	95		
78	9	30	2	TURBROLL	1005	90	420	
78	11	17	1	HOTSBY	1005	265	90	5
78	11	17	2	COOLDOWN	0	20	90	
78	11	19	1	HEATUP	1005	25		
78	11	19	2	TURBROLL	1005	90	420	
79	1	2	1	TURBTRIP	1005	90	420	
79	1	2	2	HOTSBY	1005	265	90	5
79	1	2	3	COOLDOWN	0	20	90	
79	1	15	1	UNBOLT				
79	2	1	1	REFUEL	3			
79	3	29	1	BOLTUP				
79	4	12	1	HYDROTEST	1025	200		
79	4	13	1	HEATUP	1005	38		
79	4	13	2	TURBROLL	1005	90	420	
79	4	14	1	HOTSBY	1005	265	90	0
79	4	14	2	COOLDOWN	0	18	90	
79	4	16	1	HEATUP	1005	60		
79	4	16	2	TURBROLL	1005	90	420	
79	4	17	1	HOTSBY	1005	265	90	
79	4	17	2	COOLDOWN	0	20	90	
79	4	18	1	HEATUP	1005	55		
79	4	18	2	TURBROLL	1005	90	420	
79	5	1	1	HOTSBY	1005	265	90	5
79	5	1	2	COOLDOWN	0	10	90	
79	5	2	1	HEATUP	1005	25		
79	5	2	2	TURBROLL	1005	90	420	
79	5	26	1	TURBTRIP	1005	90	420	
79	5	26	2	HOTSBY	1005	265	90	5
79	5	26	3	COOLDOWN	0	30	90	
79	6	10	1	HEATUP	1005	55		
79	6	10	2	TURBROLL	1005	90	420	
79	7	28	1	HOTSBY	1005	265	90	5
79	7	28	2	COOLDOWN	0	15	90	
79	7	28	3	HEATUP	1005	25		
79	7	28	4	TURBROLL	1005	90	420	
79	8	4	1	HOTSBY	1005	265	90	5
79	8	4	2	COOLDOWN	0	15	90	
79	8	4	3	HEATUP	1005	50		
79	8	4	4	TURBROLL	1005	90	420	
79	8	19	1	HOTSBY	1005	265	90	5
79	8	19	2	COOLDOWN	0	13	90	
79	8	29	1	HEATUP	1005	50		
79	8	29	2	TURBROLL	1005	90	420	
79	9	8	1	HOTSBY	1005	265	90	5
79	9	8	2	COOLDOWN	0	30	90	
79	9	9	1	HEATUP	1005	45		
79	9	9	2	TURBROLL	1005	90	420	

Yr	Mo	Day	Seq.	Transient	Parameters			
79	10	9	1	TURBTRIP	1005	90	420	
79	10	9	2	HOTSBY	1005	265	90	5
79	10	9	3	COOLDOWN	0	6	90	
79	10	9	4	HEATUP	1005	20		
79	10	9	5	TURBROLL	1005	90	420	
79	10	19	1	TURBTRIP	1005	90	420	
79	10	19	2	HOTSBY	1005	265	90	5
79	10	19	3	COOLDOWN	0	20	90	
79	10	24	1	HEATUP	1005	45		
79	10	24	2	TURBROLL	1005	90	420	
79	11	5	1	HOTSBY	1005	265	90	
79	11	5	2	COOLDOWN	0	30	90	
79	11	14	1	HEATUP	1005	65		
79	11	14	2	TURBROLL	1005	90	420	
79	11	14	3	TURBTRIP	1005	90	420	
79	11	14	4	HOTSBY	1005	265	90	0
79	11	14	5	COOLDOWN	0	85	90	
79	11	15	1	HEATUP	1005	80		
79	11	15	2	TURBROLL	1005	90	420	
79	11	20	1	HOTSBY	1005	265	90	5
79	11	20	2	COOLDOWN	0	10	90	
79	11	29	1	HEATUP	1005	70		
79	11	29	2	TURBROLL	1005	90	420	
79	12	1	1	HOTSBY	1005	265	90	5
79	12	1	2	COOLDOWN	0	30	90	
79	12	4	1	HEATUP	1005	60		
79	12	4	2	TURBROLL	1005	90	420	
79	12	12	1	TURBTRIP	1005	90	420	
79	12	12	2	HOTSBY	1005	265	90	5
79	12	12	3	COOLDOWN	0	35	90	
79	12	18	1	HEATUP	1005	60		
79	12	18	2	TURBROLL	1005	90	420	
80	3	23	1	TURBTRIP	1005	90	420	
80	3	23	2	HOTSBY	1005	265	90	5
80	3	23	3	COOLDOWN	0	25	90	
80	3	24	1	HEATUP	1005	25		
80	3	24	2	TURBROLL	1005	90	420	
80	3	31	1	TURBTRIP	1005	90	420	
80	3	31	2	HOTSBY	1005	265	90	5
80	3	31	3	COOLDOWN	0	40	90	
80	4	2	1	HEATUP	1005	50		
80	4	2	2	TURBROLL	1005	90	420	
80	4	5	1	HOTSBY	1005	265	90	5
80	4	5	2	COOLDOWN	0	25	90	
80	4	6	1	HEATUP	1005	55		
80	4	6	2	TURBROLL	1005	90	420	
80	4	8	1	HOTSBY	1005	265	90	5
80	4	8	2	COOLDOWN	0	20	90	
80	4	12	1	HEATUP	1005	70		
80	4	12	2	TURBROLL	1005	90		
80	4	15	1	HOTSBY	1005	265	90	5
80	4	15	2	COOLDOWN	0	30	90	
80	4	17	1	HEATUP	1005	60		
80	4	17	2	TURBROLL	1005	90	420	
80	5	26	1	HOTSBY	1005	265	90	5
80	5	26	2	COOLDOWN	0	35	90	
80	5	28	1	UNBOLT				
80	6	14	1	REFUEL	3			
80	7	1	1	BOLTUP				
80	7	17	1	HYDROTEST	1025	200		
80	7	18	1	HEATUP	1005	50		
80	7	18	2	TURBROLL	1005	90	420	
80	7	21	1	TURBTRIP	1005	90	420	
80	7	21	2	HOTSBY	1005	265	90	5
80	7	21	3	COOLDOWN	0	20	90	
80	7	22	1	HEATUP	1005	50		
80	7	22	2	TURBROLL	1005	90	420	
80	7	23	1	TURBTRIP	1005	90	420	
80	7	23	2	HOTSBY	1005	265	90	0
80	7	23	3	COOLDOWN	0	22	90	
80	8	2	1	HEATUP	1005	5		
80	8	2	2	TURBROLL	1005	90	420	
80	8	5	1	HOTSBY	1005	265	90	5
80	8	5	2	COOLDOWN	0	5	90	
80	8	19	1	HEATUP	1005	55		

Yr	Mo	Day	Seq.	Transient	Parameters			
80	8	19	2	TURBROLL	1005	90	420	
80	8	25	1	HOTSBY	1005	265	90	5
80	8	25	2	COOLDOWN	0	20	90	
80	8	28	1	HEATUP	1005	65		
80	8	28	2	TURBROLL	1005	90	420	
80	10	14	1	TURBTRIP	1005	90	420	
80	10	14	2	HOTSBY	1005	265	90	5
80	10	14	3	COOLDOWN	0	35	90	
80	10	15	1	HEATUP	1005	30		
80	10	15	2	TURBROLL	1005	90	420	
80	12	29	1	TURBTRIP	1005	90	420	
80	12	29	2	HOTSBY	1005	265	90	5
80	12	29	3	COOLDOWN	0	20	90	
81	1	8	1	HEATUP	1005	25		
81	1	8	2	TURBROLL	1005	90	420	
81	1	20	1	HOTSBY	1005	265	90	5
81	1	20	2	COOLDOWN	0	20	90	
81	1	21	1	HEATUP	1005	25		
81	1	21	2	TURBROLL	1005	90	420	
81	1	30	1	TURBTRIP	1005	90	420	
81	1	30	2	HOTSBY	1005	265	90	5
81	1	30	3	COOLDOWN	0	20	90	
81	1	31	1	HEATUP	1005	50		
81	1	31	2	TURBROLL	1005	90	420	
81	3	29	1	TURBTRIP	1005	90	420	
81	3	29	2	HOTSBY	1005	265	90	5
81	3	29	3	COOLDOWN	0	45	90	
81	4	8	1	HEATUP	1005	45		
81	4	8	2	TURBROLL	1005	90	420	
81	4	18	1	HOTSBY	1005	265	90	5
81	4	18	2	COOLDOWN	0	100	90	
81	4	20	1	HEATUP	1005	100		
81	4	20	2	TURBROLL	1005	90	420	
81	5	18	1	HOTSBY	1005	265	90	5
81	5	18	2	COOLDOWN	0	100	90	
81	5	20	1	HEATUP	1005	100		
81	5	20	2	TURBROLL	1005	90	420	
81	6	18	1	HOTSBY	1005	265	90	5
81	6	18	2	COOLDOWN	0	100	90	
81	6	20	1	HEATUP	1005	100		
81	6	20	2	TURBROLL	1005	90	420	
81	7	18	1	HOTSBY	1005	265	90	5
81	7	18	2	COOLDOWN	0	100	90	
81	7	20	1	HEATUP	1005	100		
81	7	20	2	TURBROLL	1005	90	420	
81	11	14	1	HOTSBY	1005	265	90	5
81	11	15	1	COOLDOWN	210	29	90	
81	11	18	1	HEATUP	1005	30		
81	11	18	2	TURBROLL	1005	90	420	
81	12	2	1	HOTSBY	1005	265	90	5
81	12	2	2	COOLDOWN	0	85	90	
81	12	4	1	HEATUP	1005	40		
81	12	4	2	TURBROLL	1005	90	420	
82	2	4	1	HOTSBY	1005	265	90	5
82	2	5	1	COOLDOWN	0	71	90	
82	2	11	1	HEATUP	920	87		
82	2	12	1	COOLDOWN	0	50	90	
82	2	14	1	HEATUP	1005	33		
82	2	14	2	TURBROLL	1005	90	420	
82	2	18	1	TURBTRIP	1005	90	420	
82	2	18	2	HOTSBY	1005	265	90	5
82	2	18	3	COOLDOWN	0	50	90	
82	2	20	1	HEATUP	1005	30		
82	2	20	2	TURBROLL	1005	90	420	
82	4	19	1	HOTSBY	1005	265	90	5
82	4	19	2	COOLDOWN	0	100	90	
82	4	20	1	HEATUP	1005	83		
82	4	20	2	TURBROLL	1005	90	420	
82	5	4	1	FWLOSS	1005	265	420	
82	5	4	2	HOTSBY	1005	265	90	5
82	5	5	1	COOLDOWN	77.6	12	90	
82	5	6	1	HEATUP	1005	80		
82	5	6	2	TURBROLL	1005	90	420	
82	6	1	1	HOTSBY	1005	265	90	5
82	6	1	2	COOLDOWN	89	12	90	

Yr	Mo	Day	Seq.	Transient	Parameters			
82	6	2	1	HEATUP	920	80		
82	6	2	2	TURBROLL	920	90	420	
82	6	2	3	TURBTRIP	920	90	420	
82	6	2	4	TURBTRIP	920	90	420	
82	6	2	5	HOTSBY	920	265	90	0
82	6	2	6	COOLDOWN	84	98	90	
82	6	2	7	HEATUP	700	42		
82	6	2	8	COOLDOWN	40	55	90	
82	6	5	1	HEATUP	1005	40		
82	6	5	2	TURBROLL	1005	90	420	
82	6	5	3	TURBTRIP	1005	90	420	
82	6	7	1	HOTSBY	1005	265	90	5
82	6	7	2	COOLDOWN	85	43	90	
82	6	9	1	HEATUP	1005	34		
82	6	9	2	TURBROLL	1005	90	420	
82	6	27	1	HOTSBY	1005	265	90	5
82	6	28	1	COOLDOWN	0	100	90	
82	6	29	1	HEATUP	1005	100		
82	6	29	2	TURBROLL	1005	90	420	
82	7	10	1	HOTSBY	1005	265	90	5
82	7	11	1	COOLDOWN	0	100	90	
82	7	11	2	HEATUP	1005	100		
82	7	11	3	TURBROLL	1005	90	420	
82	7	16	1	HOTSBY	1005	265	90	5
82	7	17	1	COOLDOWN	0	100	90	
82	8	15	1	UNBOLT				
82	8	20	1	REFUEL	3			
82	9	20	1	BOLTUP				
82	10	7	1	HYDROTEST	1025	200		
82	10	9	1	HEATUP	1005	100		
82	10	9	2	TURBROLL	1005	90	420	
82	10	13	1	HOTSBY	1005	265	90	5
82	10	14	1	COOLDOWN	0	100	90	
82	10	17	1	HEATUP	1005	100		
82	10	17	2	TURBROLL	1005	90	420	
82	10	21	1	HOTSBY	1005	265	90	5
82	10	21	2	COOLDOWN	0	100	90	
82	10	25	1	HEATUP	1005	100		
82	10	25	2	TURBROLL	1005	90	420	
82	12	10	1	HOTSBY	1005	265	90	5
82	12	11	1	COOLDOWN	0	100	90	
82	12	14	1	UNBOLT				
82	12	16	1	REFUEL	3			
83	5	18	1	BOLTUP				
83	8	5	1	HYDROTEST	1006	435		
83	8	8	1	HEATUP	1015	29		
83	8	16	1	TURBROLL	1015	90	420	
83	8	16	2	TURBTRIP	1015	90	420	
83	8	16	3	TURBTRIP	1015	90	420	
83	8	16	4	HOTSBY	1005	265	90	0
83	8	16	5	COOLDOWN	40	55	90	
83	8	25	1	HEATUP	1005	100		
83	8	26	1	TURBROLL	1005	90	420	
83	8	28	1	TURBROLL	1005	90	420	
83	8	29	1	TURBROLL	1005	90	420	
83	10	17	1	HOTSBY	1005	265	90	5
83	10	18	1	COOLDOWN	0	80	90	
83	11	16	1	HEATUP	1005	10		
83	11	18	1	TURBROLL	1005	90	420	
83	11	25	1	HOTSBY	1005	265	90	5
83	11	26	1	COOLDOWN	140	14	90	
83	11	27	1	HEATUP	1005	47		
83	11	28	1	TURBROLL	1005	90	420	
83	12	22	1	TURBTRIP	1005	90	420	
83	12	23	1	HOTSBY	1005	265	90	5
83	12	23	2	COOLDOWN	1	30	90	
83	12	25	1	HEATUP	1005	35		
83	12	25	2	TURBROLL	1005	90	420	
84	1	30	1	HOTSBY	1005	265	90	5
84	1	31	1	COOLDOWN	0	23	90	
84	2	2	1	HEATUP	1005	55		
84	2	3	1	COOLDOWN	127	38	90	
84	2	4	1	HEATUP	1005	65		
84	2	4	2	TURBROLL	1005	90	420	
84	3	2	1	HOTSBY	1005	265	90	5

Yr	Mo	Day	Seq.	Transient	Parameters			
84	3	3	1	COOLDOWN	0	20	90	
84	3	9	1	HEATUP	1005	30		
84	3	10	1	TURBROLL	1005	90	420	
84	3	30	1	HOTSBY	1005	265	90	5
84	3	31	1	COOLDOWN	0	26	90	
84	4	7	1	HEATUP	1005	5		
84	4	8	1	TURBROLL	1005	90	420	
84	5	26	1	HOTSBY	1005	265	90	5
84	5	26	2	COOLDOWN	8	48	90	
84	5	30	1	HEATUP	1005	55		
84	5	30	2	TURBROLL	1005	90	420	
84	6	10	1	HOTSBY	1005	265	90	5
84	6	10	2	COOLDOWN	0	33	90	
84	6	14	1	HEATUP	1005	60		
84	6	14	2	TURBROLL	1005	90	420	
84	8	1	1	HOTSBY	1005	265	90	5
84	8	1	2	COOLDOWN	0	30	90	
84	8	3	1	HEATUP	1005	45		
84	8	3	2	TURBROLL	1005	90	420	
84	9	9	1	HOTSBY	1005	265	90	5
84	9	10	1	COOLDOWN	0	17	90	
84	9	15	1	HEATUP	1005	60		
84	9	16	1	TURBROLL	1005	90	420	
84	9	17	1	HOTSBY	1005	265	90	5
84	9	18	1	COOLDOWN	106	15	90	
84	9	19	1	HEATUP	1005	89		
84	9	19	2	TURBROLL	1005	90	420	
84	10	29	1	HOTSBY	1005	265	90	5
84	10	29	2	COOLDOWN	0	55	90	
84	12	11	1	HEATUP	1005	20		
84	12	11	2	TURBROLL	1005	90	420	
85	1	24	1	HOTSBY	1005	265	90	5
85	1	24	2	COOLDOWN	0	15	90	
85	1	26	1	HEATUP	1005	198		
85	1	26	2	TURBROLL	1005	90	420	
85	3	29	1	HOTSBY	1005	265	90	5
85	3	30	1	COOLDOWN	0	35	90	
85	4	3	1	UNBOLT				
85	5	3	1	REFUEL	3			
85	8	31	1	BOLTUP				
85	10	29	1	HYDROTEST	1025	200		
85	10	30	1	HEATUP	935	63		
85	11	2	1	COOLDOWN	40	53	90	
85	11	4	1	HEATUP	930	69		
85	11	5	1	TURBROLL	1005	90	420	
85	11	5	2	TURBTRIP	1005	90	420	
85	11	6	1	HOTSBY	1005	265	90	0
85	11	6	2	COOLDOWN	25	85	90	
85	11	7	1	HEATUP	1005	36		
85	11	8	1	TURBROLL	1005	90	420	
85	11	13	1	HOTSBY	1005	265	90	5
85	11	13	2	COOLDOWN	0	37	90	
85	11	16	1	HEATUP	1005	41		
85	11	17	1	TURBROLL	1005	90	420	
86	3	25	1	HOTSBY	1005	265	90	5
86	3	26	1	COOLDOWN	0	39	90	
86	3	31	1	HEATUP	1006	21		
86	3	31	2	TURBROLL	1006	90	420	
86	3	31	3	TURBTRIP	1006	90	420	
86	4	2	1	HOTSBY	1005	265	90	5
86	4	2	2	COOLDOWN	0	100	90	
86	4	7	1	HEATUP	1005	32		
86	4	8	1	TURBROLL	1005	90	420	
86	8	18	1	HOTSBY	1005	265	90	5
86	8	19	1	COOLDOWN	75	28	90	
86	8	20	1	HEATUP	625	45		
86	8	21	1	COOLDOWN	0	53	90	
86	8	23	1	HEATUP	1005	67	90	
86	8	24	1	TURBROLL	1005	90	420	
86	9	12	1	HOTSBY	1005	265	90	5
86	9	13	1	COOLDOWN	160	13	90	
86	9	14	1	HEATUP	1005	100		
86	9	20	1	TURBROLL	1005	90	420	
86	11	14	1	HOTSBY	1005	265	90	5
86	11	15	1	COOLDOWN	0	20	90	

Yr	Mo	Day	Seq.	Transient	Parameters			
86	11	18	1	HEATUP	1005	49		
86	11	18	2	TURBROLL	1005	90	420	
86	11	18	3	TURBTRIP	1005	90	420	
86	12	1	1	FHLOSS	1005	265	420	
87	2	13	1	HOTSBY	1005	265	90	5
87	2	14	1	COOLDOWN	0	40	90	
87	2	18	1	UNBOLT				
87	3	18	1	REFUEL	3			
87	5	6	1	BOLTUP				
87	5	10	1	HYDROTEST	1025	201		
87	6	12	1	HEATUP	1006	132		
87	6	12	2	COOLDOWN	0	10	90	
87	6	13	1	HEATUP	1005	87		
87	6	13	2	TURBROLL	1005	90	420	
87	6	17	1	HOTSBY	1005	265	90	5
87	6	17	2	COOLDOWN	0	53	90	
87	6	21	1	HEATUP	1005	60		
87	6	21	2	TURBROLL	1005	90	420	
87	7	1	1	HOTSBY	1005	265	90	5
87	7	1	2	COOLDOWN	195	11	90	
87	7	3	1	HEATUP	1005	54		
87	7	5	1	TURBROLL	1005	90	420	
88	1	24	1	HOTSBY	1005	265	90	5
88	1	24	2	COOLDOWN	0	60	90	
88	2	21	1	HEATUP	510	44		
88	2	22	1	COOLDOWN	75	40	90	
88	2	22	2	HEATUP	1005	87		
88	2	23	1	TURBROLL	1005	90	420	
88	3	25	1	FHLOSS	1005	265	420	
88	5	21	1	HOTSBY	1005	265	90	5
88	5	21	2	COOLDOWN	0	40	90	
88	5	23	1	HEATUP	1005	11		
88	5	23	2	TURBROLL	1005	90	420	
88	5	23	3	TURBTRIP	1005	90	420	
88	7	13	1	HOTSBY	1005	265	90	5
88	7	14	1	COOLDOWN	0	72	90	
88	7	21	1	HEATUP	1005	60		
88	7	22	1	TURBROLL	1005	90	420	
88	10	21	1	HOTSBY	1005	265	90	5
88	10	21	2	COOLDOWN	0	5	90	
88	10	23	1	HEATUP	1005	22		
88	10	23	2	TURBROLL	1005	90	420	
88	11	10	1	HOTSBY	1005	265	90	5
88	11	10	2	COOLDOWN	0	100	90	
88	11	14	1	UNBOLT				
88	12	25	1	REFUEL	3			
89	2	22	1	BOLTUP				
89	3	17	1	HYDROTEST	1090	200		
89	4	8	1	HEATUP	1005	100		
89	4	9	1	TURBROLL	1005	90	420	
89	4	9	2	TURBTRIP	1005	90	420	
89	4	9	3	HOTSBY	1005	265	90	0
89	4	9	4	COOLDOWN	0	100	90	
89	4	14	1	HEATUP	1005	80		
89	4	15	1	TURBROLL	1005	90	420	
89	4	15	2	TURBTRIP	1005	90	420	
89	4	15	3	TURBTRIP	1005	90	420	
89	4	15	4	TURBTRIP	1005	90	420	
89	6	10	1	HOTSBY	1005	265	90	5
89	6	10	2	COOLDOWN	0	90	90	
89	6	28	1	HEATUP	1005	70		
89	6	30	1	TURBROLL	1005	90	420	
89	9	21	1	HOTSBY	1005	265	90	5
89	9	21	2	COOLDOWN	0	80	90	
89	9	27	1	HEATUP	1005	62		
89	9	28	1	TURBROLL	1005	90	420	
89	11	16	1	HOTSBY	1005	265	90	5
89	11	16	2	COOLDOWN	0	75	90	
89	11	17	1	HEATUP	1006	55		
89	11	18	1	TURBROLL	1005	90	420	
89	12	6	1	FHLOSS	1005	265	420	
90	5	21	1	HOTSBY	1005	265	90	5
90	5	21	2	COOLDOWN	0	65	90	
90	6	11	1	HEATUP	1005	85		
90	6	13	1	TURBROLL	1005	90	420	

Yr	Mo	Day	Seq.	Transient	Parameters			
90	9	27	1	TURBTRIP	1005	90	420	
90	9	27	2	HOTSBY	1005	265	90	5
90	9	27	3	COOLDOWN	0	50	90	
90	10	1	1	UNBOLT				
90	12	30	1	REFUEL	3			
91	1	19	1	BOLTUP				
91	1	25	1	HYDROTEST	1100	178		
91	2	22	1	HEATUP	1005	54		
91	2	26	1	TURBROLL	1005	90	420	
91	2	27	1	TURBTRIP	1005	90	420	
91	3	5	1	TURBTRIP	1005	90	420	
91	3	5	2	HOTSBY	1005	265	90	5
91	3	5	3	COOLDOWN	49	90	90	
91	3	7	1	HEATUP	1005	35		
91	3	8	1	TURBROLL	1005	90	420	
91	3	29	1	HOTSBY	1005	265	90	5
91	3	29	2	COOLDOWN	0	60	90	
91	5	5	1	HEATUP	1005	65		
91	5	7	1	TURBROLL	1005	90	420	
91	7	18	1	HOTSBY	1005	265	90	5
91	7	18	2	COOLDOWN	0	90	90	
91	7	24	1	HEATUP	1005	40		
91	7	26	1	TURBROLL	1005	90	420	
91	9	2	1	HOTSBY	1005	265	90	5
91	9	2	2	COOLDOWN	0	50	90	
91	9	8	1	HEATUP	1005	79		
91	9	9	1	TURBROLL	1005	90	420	
91	10	15	1	HOTSBY	1005	265	90	5
91	10	15	2	COOLDOWN	0	63	90	
91	10	20	1	HEATUP	1005	38		
91	10	21	1	TURBROLL	1005	90	420	
92	1	17	1	HOTSBY	1005	265	90	5
92	1	17	2	COOLDOWN	4	95	90	
92	1	18	1	HEATUP	1005	75		
92	1	20	1	TURBROLL	1005	90	420	
92	2	3	1	FHLOSS	1005	265	420	
92	2	29	1	HOTSBY	1005	265	90	5
92	3	1	1	COOLDOWN	152	35	90	
92	3	4	1	HEATUP	1005	40		
92	3	5	1	TURBROLL	1005	90	420	
92	4	21	1	HOTSBY	1005	265	90	5
92	4	21	2	COOLDOWN	0	73	90	

Appendix B

Brunswick Unit 2 - Accumulated Cycle History

Yr	Mo	Day	Seq.	Transient	Parameters			
75	1	1	1	ASMEHYDRO				
75	1	2	1	BOLTUP				
75	1	3	1	HYDROTEST	1025	200		
75	3	22	1	HEATUP	1005	38		
75	3	22	2	TURBROLL	1005	90	420	
75	3	24	1	HOTSBY	1005	265	90	5
75	3	24	2	COOLDOWN	0	8	90	
75	3	30	1	HEATUP	1005	40		
75	3	30	2	TURBROLL	1005	90	420	
75	4	1	1	HOTSBY	1005	265	90	5
75	4	1	2	COOLDOWN	0	50	90	
75	4	2	1	HEATUP	1005	59		
75	4	2	2	COOLDOWN	0	25	90	
75	4	3	1	HEATUP	1005	50		
75	4	3	2	TURBROLL	1005	90	420	
75	4	5	1	HOTSBY	1005	265	90	5
75	4	5	2	COOLDOWN	0	60	90	
75	4	6	1	HEATUP	1005	40		
75	4	6	2	TURBROLL	1005	90	420	
75	4	7	1	HOTSBY	1005	265	90	0
75	4	7	2	COOLDOWN	1005	10	90	
75	4	8	1	HEATUP	1005	32		
75	4	8	2	TURBROLL	1005	90	420	
75	4	10	1	HOTSBY	1005	265	90	5
75	4	10	2	COOLDOWN	0	12	90	
75	4	11	1	HEATUP	1005	15		
75	4	11	2	TURBROLL	1005	90	420	
75	4	15	1	HOTSBY	1005	265	90	5
75	4	15	2	COOLDOWN	0	30	90	
75	4	25	1	HEATUP	1005	40		
75	4	25	2	TURBROLL	1005	90	420	
75	4	29	1	HOTSBY	1005	265	90	5
75	4	29	2	COOLDOWN	0	70	90	
75	5	5	1	HEATUP	1005	38		
75	5	5	2	TURBROLL	1005	90	420	
75	5	6	1	HOTSBY	1005	265	90	0
75	5	6	2	COOLDOWN	0	80	90	
75	5	10	1	HEATUP	1005	50		
75	5	10	2	TURBROLL	1005	90	420	
75	5	20	1	HOTSBY	1005	265	90	5
75	5	20	2	COOLDOWN	0	8	90	
75	5	21	1	HEATUP	1005	20		
75	5	21	2	COOLDOWN	0	10	90	
75	5	22	1	HEATUP	1005	25		
75	5	22	2	TURBROLL	1005	90	420	
75	5	27	1	HOTSBY	1005	265	90	5
75	5	27	2	COOLDOWN	0	40	90	
75	5	29	1	HEATUP	1005	35		
75	5	29	2	TURBROLL	1005	90	420	
75	5	31	1	HOTSBY	1005	265	90	5
75	5	31	2	COOLDOWN	0	26	90	
75	6	1	1	HEATUP	1005	25		
75	6	1	2	COOLDOWN	0	10	90	
75	6	2	1	HEATUP	1005	18		
75	6	2	2	TURBROLL	1005	90	420	
75	6	9	1	HOTSBY	1005	265	90	5
75	6	9	2	COOLDOWN	0	8	90	
75	6	10	1	HEATUP	1005	30		
75	6	10	2	TURBROLL	1005	90	420	
75	6	11	1	HOTSBY	1005	265	90	0
75	6	11	2	COOLDOWN	0	40	90	
75	6	12	1	HEATUP	1005	80		
75	6	12	2	TURBROLL	1005	90	420	
75	6	14	1	HOTSBY	1005	265	90	5
75	6	14	2	COOLDOWN	0	8	90	
75	6	14	3	HEATUP	1005	45		
75	6	14	4	TURBROLL	1005	90	420	
75	6	15	1	HOTSBY	1005	265	90	0
75	6	15	2	COOLDOWN	0	40	90	
75	6	17	1	HEATUP	1005	30		

Yr	Mo	Day	Seq.	Transient	Parameters			
75	6	17	2	TURBROLL	1005	90	420	
75	6	25	1	HOTSBY	1005	265	90	5
75	6	25	2	COOLDOWN	0	30	90	
75	6	27	1	HEATUP	1005	38		
75	6	27	2	TURBROLL	1005	90	420	
75	6	30	1	TURBTRIP	1005	90	420	
75	6	30	2	HOTSBY	1005	265	90	5
75	6	30	3	COOLDOWN	0	34	90	
75	7	1	1	HEATUP	1005	40		
75	7	1	2	TURBROLL	1005	90	420	
75	7	2	1	TURBTRIP	1005	90	420	
75	7	2	2	HOTSBY	1005	265	90	0
75	7	2	3	COOLDOWN	0	30	90	
75	7	12	1	HEATUP	1005	70		
75	7	12	2	TURBROLL	1005	90	420	
75	7	14	1	HOTSBY	1005	265	90	5
75	7	14	2	COOLDOWN	0	45	90	
75	7	15	1	HEATUP	1005	35		
75	7	15	2	TURBROLL	1005	90	420	
75	7	20	1	HOTSBY	1005	265	90	5
75	7	20	2	COOLDOWN	0	30	90	
75	7	21	1	HEATUP	1005	50		
75	7	21	2	TURBROLL	1005	90	420	
75	7	22	1	HOTSBY	1005	265	90	0
75	7	22	2	COOLDOWN	0	20	90	
75	7	22	3	HEATUP	1005	45		
75	7	22	4	TURBROLL	1005	90	420	
75	7	25	1	HOTSBY	1005	265	90	5
75	7	25	2	COOLDOWN	0	30	90	
75	7	26	1	HEATUP	1005	45		
75	7	26	2	TURBROLL	1005	90	420	
75	7	27	1	HOTSBY	1005	265	90	0
75	7	27	2	COOLDOWN	0	30	90	
75	7	27	3	HEATUP	1005	36		
75	7	27	4	TURBROLL	1005	90	420	
75	8	5	1	HOTSBY	1005	265	90	5
75	8	5	2	COOLDOWN	0	15	90	
75	8	6	1	HEATUP	1005	25		
75	8	6	2	TURBROLL	1005	90	420	
75	8	14	1	HOTSBY	1005	265	90	5
75	8	14	2	COOLDOWN	0	20	90	
75	8	15	1	HEATUP	1005	55		
75	8	15	2	TURBROLL	1005	90	420	
75	8	16	1	HOTSBY	1005	265	90	5
75	8	16	2	COOLDOWN	0	45	90	
75	8	20	1	HEATUP	1005	40		
75	8	20	2	TURBROLL	1005	90	420	
75	8	24	1	TURBTRIP	1005	90	420	
75	8	24	2	HOTSBY	1005	265	90	5
75	8	24	3	COOLDOWN	0	50	90	
75	8	30	1	HEATUP	1005	60		
75	8	30	2	TURBROLL	1005	90	420	
75	9	5	1	HOTSBY	1005	265	90	5
75	9	5	2	COOLDOWN	0	50	90	
75	9	22	1	HEATUP	1005	60		
75	9	22	2	TURBROLL	1005	90	420	
75	9	29	1	HOTSBY	1005	265	90	5
75	9	29	2	COOLDOWN	0	60	90	
75	9	30	1	HEATUP	1005	40		
75	9	30	2	TURBROLL	1005	90	420	
75	10	15	1	TURBTRIP	1005	90	420	
75	10	15	2	HOTSBY	1005	265	90	5
75	10	15	3	COOLDOWN	0	30	90	
75	10	16	1	HEATUP	1005	18		
75	10	16	2	COOLDOWN	0	30	90	
75	10	17	1	HEATUP	1005	25		
75	10	17	2	TURBROLL	1005	90	420	
75	11	9	1	TURBTRIP	1005	90	420	
75	11	9	2	HOTSBY	1005	265	90	5
75	11	9	3	COOLDOWN	0	20	90	
75	11	9	4	HEATUP	1005	25		
75	11	9	5	TURBROLL	1005	90	420	
75	12	27	1	HOTSBY	1005	265	90	5
75	12	27	2	COOLDOWN	0	30	90	
75	12	28	1	HEATUP	1005	45		
75	12	28	2	TURBROLL	1005	90	420	
76	1	19	1	HOTSBY	1005	265	90	5

Yr	Mo	Day	Seg.	Transient	Parameters			
76	1	19	2	COOLDOWN	0	45	90	
76	1	20	1	HEATUP	1005	25		
76	1	20	2	TURBROLL	1005	90	420	
76	2	2	1	HOTSBY	1005	265	90	5
76	2	2	2	COOLDOWN	0	45	90	
76	2	3	1	HEATUP	1005	50		
76	2	3	2	TURBROLL	1005	90	420	
76	2	16	1	HOTSBY	1005	265	90	5
76	2	16	2	COOLDOWN	0	20	90	
76	2	18	1	HEATUP	1005	45		
76	2	18	2	TURBROLL	1005	90	420	
76	3	19	1	HOTSBY	1005	265	90	5
76	3	19	2	COOLDOWN	0	40	90	
76	4	5	1	UNBOLT				
76	4	8	1	REFUEL	3			
76	4	24	1	BOLTUP				
76	5	1	1	HYDROTEST	1025	200		
76	5	24	1	HEATUP	1005	50		
76	5	24	2	COOLDOWN	0	25	90	
76	5	24	3	HEATUP	1005	50		
76	5	24	4	TURBROLL	1005	90	420	
76	5	28	1	HOTSBY	1005	265	90	5
76	5	28	2	COOLDOWN	0	30	90	
76	5	30	1	HEATUP	1005	45		
76	5	30	2	TURBROLL	1005	90	420	
76	7	3	1	HOTSBY	1005	265	90	5
76	7	3	2	COOLDOWN	0	45	90	
76	7	6	1	HEATUP	1005	30		
76	7	6	2	TURBROLL	1005	90	420	
76	7	11	1	HOTSBY	1005	265	90	5
76	7	11	2	COOLDOWN	0	60	90	
76	7	13	1	HEATUP	1005	48		
76	7	13	2	TURBROLL	1005	90	420	
76	7	15	1	HOTSBY	1005	265	90	5
76	7	15	2	COOLDOWN	0	25	90	
76	7	18	1	HEATUP	1005	45		
76	7	18	2	TURBROLL	1005	90	420	
76	7	28	1	HOTSBY	1005	265	90	5
76	7	28	2	COOLDOWN	0	20	90	
76	7	29	1	HEATUP	1005	12		
76	7	29	2	TURBROLL	1005	90	420	
76	9	2	1	HOTSBY	1005	265	90	5
76	9	2	2	COOLDOWN	0	40	90	
76	9	7	1	HEATUP	1005	40		
76	9	7	2	TURBROLL	1005	90	420	
76	10	16	1	HOTSBY	1005	265	90	5
76	10	16	2	COOLDOWN	0	14	90	
76	10	27	1	HEATUP	1005	45		
76	10	27	2	TURBROLL	1005	90	420	
76	11	9	1	HOTSBY	1005	265	90	5
76	11	9	2	COOLDOWN	0	50	90	
76	12	10	1	HEATUP	1005	45		
76	12	10	2	TURBROLL	1005	90	420	
76	12	18	1	HOTSBY	1005	265	90	5
76	12	18	2	COOLDOWN	0	35	90	
76	12	18	3	HEATUP	1005	35		
76	12	18	4	TURBROLL	1005	90	420	
77	1	7	1	HOTSBY	1005	265	90	5
77	1	7	2	COOLDOWN	0	40	90	
77	1	8	1	HEATUP	1005	45		
77	1	8	2	TURBROLL	1005	90	420	
77	2	14	1	HOTSBY	1005	265	90	5
77	2	14	2	COOLDOWN	0	55	90	
77	2	16	1	HEATUP	1005	45		
77	2	16	2	TURBROLL	1005	90	420	
77	2	23	1	HOTSBY	1005	265	90	5
77	2	23	2	COOLDOWN	0	40	90	
77	2	24	1	HEATUP	1005	35		
77	2	24	2	TURBROLL	1005	90	420	
77	4	5	1	HOTSBY	1005	265	90	5
77	4	5	2	COOLDOWN	0	50	90	
77	4	6	1	HEATUP	1005	40		
77	4	6	2	TURBROLL	1005	90	420	
77	4	15	1	HOTSBY	1005	265	90	5
77	4	15	2	COOLDOWN	0	50	90	
77	5	6	1	HEATUP	1005	40		
77	5	6	2	TURBROLL	1005	90	420	

Yr	Mo	Day	Seq.	Transient	Parameters			
77	5	7	1	HOTSBY	1005	265	90	0
77	5	7	2	COOLDOWN	0	40	90	
77	5	8	1	HEATUP	1005	30		
77	5	8	2	TURBROLL	1005	90	420	
77	5	21	1	HOTSBY	1005	265	90	5
77	5	21	2	COOLDOWN	0	45	90	
77	5	22	1	HEATUP	1005	45		
77	5	22	2	TURBROLL	1005	90	420	
77	5	31	1	HOTSBY	1005	265	90	5
77	5	31	2	COOLDOWN	0	45	90	
77	5	31	3	HEATUP	1005	25		
77	5	31	4	TURBROLL	1005	90	420	
77	6	14	1	HOTSBY	1005	265	90	5
77	6	14	2	COOLDOWN	0	30	90	
77	6	15	1	HEATUP	1005	50		
77	6	15	2	TURBROLL	1005	90	420	
77	7	15	1	HOTSBY	1005	265	90	5
77	7	15	2	COOLDOWN	0	35	90	
77	7	18	1	HEATUP	1005	45		
77	7	18	2	TURBROLL	1005	90	420	
77	7	31	1	HOTSBY	1005	265	90	5
77	7	31	2	COOLDOWN	0	30	90	
77	8	1	1	HEATUP	1005	40		
77	8	1	2	TURBROLL	1005	90	420	
77	8	15	1	HOTSBY	1005	265	90	5
77	8	15	2	COOLDOWN	0	40	90	
77	8	16	1	HEATUP	1005	35		
77	8	16	2	TURBROLL	1005	90	420	
77	8	17	1	TURBTRIP	1005	90	420	
77	8	17	2	HOTSBY	1005	265	90	0
77	8	17	3	COOLDOWN	0	45	90	
77	8	19	1	HEATUP	1005	30		
77	8	19	2	TURBROLL	1005	90	420	
77	9	4	1	HOTSBY	1005	265	90	5
77	9	4	2	COOLDOWN	0	55	90	
77	9	6	1	HEATUP	1005	43		
77	9	6	2	TURBROLL	1005	90	420	
77	9	8	1	HOTSBY	1005	265	90	5
77	9	8	2	COOLDOWN	0	35	90	
77	9	9	1	HEATUP	1005	10		
77	9	9	2	TURBROLL	1005	90	420	
77	9	10	1	HOTSBY	1005	265	90	0
77	9	10	2	COOLDOWN	0	45	90	
77	9	20	1	UNBOLT				
77	10	25	1	REFUEL	3			
77	11	25	1	BOLTUP				
77	12	1	1	HYDROTEST	1025	200		
77	12	23	1	HEATUP	1005	45		
77	12	23	2	TURBROLL	1005	90	420	
77	12	27	1	HOTSBY	1005	265	90	5
77	12	27	2	COOLDOWN	0	25	90	
77	12	30	1	HEATUP	1005	40		
77	12	30	2	TURBROLL	1005	90	420	
78	1	2	1	HOTSBY	1005	265	90	5
78	1	2	2	COOLDOWN	0	35	90	
78	1	2	3	HEATUP	1005	45		
78	1	2	4	TURBROLL	1005	90	420	
78	1	6	1	HOTSBY	1005	265	90	5
78	1	6	2	COOLDOWN	0	22	90	
78	1	9	1	HEATUP	1005	65		
78	1	9	2	TURBROLL	1005	90	420	
78	1	17	1	HOTSBY	1005	265	90	5
78	1	17	2	COOLDOWN	0	23	90	
78	1	17	3	HEATUP	1005	45		
78	1	17	4	TURBROLL	1005	90	420	
78	1	31	1	HOTSBY	1005	265	90	5
78	1	31	2	COOLDOWN	0	20	90	
78	1	31	3	HEATUP	1005	30		
78	1	31	4	TURBROLL	1005	90	420	
78	3	5	1	HOTSBY	1005	265	90	5
78	3	5	2	COOLDOWN	0	30	90	
78	3	6	1	HEATUP	1005	60		
78	3	6	2	TURBROLL	1005	90	420	
78	3	13	1	HOTSBY	1005	265	90	5
78	3	13	2	COOLDOWN	0	25	90	
78	3	14	1	HEATUP	1005	50		
78	3	14	2	TURBROLL	1005	90	420	

Yr	Mo	Day	Seq.	Transient	Parameters			
78	3	23	1	HOTSBY	1005	265	90	5
78	3	23	2	COOLDOWN	0	75	90	
78	3	24	1	HEATUP	1005	45		
78	3	24	2	TURBROLL	1005	90	420	
78	3	29	1	HOTSBY	1005	265	90	5
78	3	29	2	COOLDOWN	0	10	90	
78	4	3	1	HEATUP	1005	65		
78	4	3	2	TURBROLL	1005	90	420	
78	4	7	1	HOTSBY	1005	265	90	5
78	4	7	2	COOLDOWN	0	45	90	
78	4	9	1	HEATUP	1005	35		
78	4	9	2	TURBROLL	1005	90	420	
78	6	3	1	HOTSBY	1005	265	90	5
78	6	3	2	COOLDOWN	0	30	90	
78	6	11	1	HEATUP	1005	45		
78	6	11	2	TURBROLL	1005	90	420	
78	6	13	1	HOTSBY	1005	265	90	5
78	6	13	2	COOLDOWN	0	15	90	
78	6	21	1	HEATUP	1005	30		
78	6	21	2	TURBROLL	1005	90	420	
78	7	3	1	HOTSBY	1005	265	90	5
78	7	3	2	COOLDOWN	0	30	90	
78	7	5	1	HEATUP	1005	30		
78	7	5	2	TURBROLL	1005	90	420	
78	7	18	1	HOTSBY	1005	265	90	5
78	7	18	2	COOLDOWN	0	45	90	
78	7	19	1	HEATUP	1005	10		
78	7	19	2	TURBROLL	1005	90	420	
78	8	18	1	HOTSBY	1005	265	90	5
78	8	18	2	COOLDOWN	0	30	90	
78	8	21	1	HEATUP	1005	55		
78	8	21	2	TURBROLL	1005	90	420	
78	9	6	1	HOTSBY	1005	265	90	5
78	9	6	2	COOLDOWN	0	65	90	
78	9	22	1	HEATUP	1005	68		
78	9	22	2	TURBROLL	1005	90	420	
78	11	6	1	HOTSBY	1005	265	90	5
78	11	6	2	COOLDOWN	0	60	90	
78	11	9	1	HEATUP	1005	18		
78	11	9	2	TURBROLL	1005	90	420	
78	11	10	1	HOTSBY	1005	265	90	0
78	11	10	2	COOLDOWN	0	8	90	
78	11	12	1	HEATUP	1005	40		
78	11	12	2	TURBROLL	1005	90	420	
79	1	8	1	HOTSBY	1005	265	90	5
79	1	8	2	COOLDOWN	0	25	90	
79	1	9	1	HEATUP	1005	50		
79	1	9	2	TURBROLL	1005	90	420	
79	1	29	1	HOTSBY	1005	265	90	5
79	1	29	2	COOLDOWN	0	20	90	
79	1	29	3	HEATUP	1005	45		
79	1	29	4	TURBROLL	1005	90	420	
79	3	3	1	HOTSBY	1005	265	90	5
79	3	3	2	COOLDOWN	0	22	90	
79	3	30	1	UNBOLT				
79	4	2	1	REFUEL	3			
79	4	18	1	BOLTUP				
79	5	1	1	HYDROTEST	1025	200		
79	5	14	1	HEATUP	1005	40		
79	5	14	2	TURBROLL	1005	90	420	
79	5	21	1	HOTSBY	1005	265	90	5
79	5	21	2	COOLDOWN	0	15	90	
79	5	22	1	HEATUP	1005	25		
79	5	22	2	TURBROLL	1005	90	420	
79	5	23	1	HOTSBY	1005	265	90	0
79	5	23	2	COOLDOWN	0	15	90	
79	5	23	3	HEATUP	1005	40		
79	5	23	4	TURBROLL	1005	90	420	
79	5	25	1	HOTSBY	1005	265	90	5
79	5	25	2	COOLDOWN	0	30	90	
79	5	26	1	HEATUP	1005	50		
79	5	26	2	TURBROLL	1005	90	420	
79	6	12	1	HOTSBY	1005	265	90	5
79	6	12	2	COOLDOWN	0	20	90	
79	6	13	1	HEATUP	1005	45		
79	6	13	2	TURBROLL	1005	90	420	
79	6	30	1	HOTSBY	1005	265	90	5

Yr	Mo	Day	Seq.	Transient	Parameters			
79	6	30	2	COOLDOWN	0	45	90	
79	7	4	1	HEATUP	1005	60		
79	7	4	2	TURBROLL	1005	90	420	
79	7	19	1	HOTSBY	1005	265	90	5
79	7	19	2	COOLDOWN	0	25	90	
79	7	21	1	HEATUP	1005	40		
79	7	21	2	TURBROLL	1005	90	420	
79	7	31	1	HOTSBY	1005	265	90	5
79	7	31	2	COOLDOWN	0	20	90	
79	8	2	1	HEATUP	1005	50		
79	8	2	2	TURBROLL	1005	90	420	
79	9	1	1	HOTSBY	1005	265	90	5
79	9	1	2	COOLDOWN	0	25	90	
79	9	5	1	HEATUP	1005	52		
79	9	5	2	TURBROLL	1005	90	420	
79	9	7	1	HOTSBY	1005	265	90	5
79	9	7	2	COOLDOWN	0	15	90	
79	9	8	1	HEATUP	1005	50		
79	9	8	2	TURBROLL	1005	90	420	
79	9	12	1	HOTSBY	1005	265	90	5
79	9	12	2	COOLDOWN	0	25	90	
79	9	13	1	HEATUP	1005	55		
79	9	13	2	TURBROLL	1005	90	420	
79	9	14	1	HOTSBY	1005	265	90	0
79	9	14	2	COOLDOWN	0	25	90	
79	9	14	3	HEATUP	1005	55		
79	9	14	4	TURBROLL	1005	90	420	
79	11	19	1	HOTSBY	1005	265	90	5
79	11	19	2	COOLDOWN	0	22	90	
79	11	20	1	HEATUP	1005	45		
79	11	20	2	TURBROLL	1005	90	420	
79	12	16	1	HOTSBY	1005	265	90	5
79	12	16	2	COOLDOWN	0	30	90	
80	1	3	1	HEATUP	1005	40		
80	1	3	2	TURBROLL	1005	90	420	
80	2	13	1	HOTSBY	1005	265	90	5
80	2	13	2	COOLDOWN	0	30	90	
80	2	14	1	HEATUP	1005	45		
80	2	14	2	TURBROLL	1005	90	420	
80	3	1	1	HOTSBY	1005	265	90	5
80	3	1	2	COOLDOWN	0	40	90	
80	4	1	1	UNBOLT				
80	5	1	1	REFUEL	3			
80	6	1	1	BOLTUP				
80	8	1	1	HYDROTEST	1025	200		
80	9	10	1	HEATUP	1005	30		
80	9	10	2	TURBROLL	1005	90	420	
80	9	15	1	HOTSBY	1005	265	90	5
80	9	15	2	COOLDOWN	0	25	90	
80	9	16	1	HEATUP	1005	25		
80	9	16	2	TURBROLL	1005	90	420	
80	9	19	1	HOTSBY	1005	265	90	5
80	9	19	2	COOLDOWN	0	10	90	
80	9	22	1	HEATUP	1005	25		
80	9	22	2	TURBROLL	1005	90	420	
80	10	11	1	HOTSBY	1005	265	90	5
80	10	11	2	COOLDOWN	0	25	90	
80	10	12	1	HEATUP	1005	40		
80	10	12	2	COOLDOWN	0	10	90	
80	10	13	1	HEATUP	1005	55		
80	10	13	2	TURBROLL	1005	90	420	
80	10	28	1	HOTSBY	1005	265	90	5
80	10	28	2	COOLDOWN	0	27	90	
80	10	29	1	HEATUP	1005	80		
80	10	29	2	TURBROLL	1005	90	420	
80	11	13	1	HOTSBY	1005	265	90	5
80	11	13	2	COOLDOWN	0	25	90	
80	11	14	1	HEATUP	1005	45		
80	11	14	2	TURBROLL	1005	90	420	
80	11	18	1	HOTSBY	1005	265	90	5
80	11	18	2	COOLDOWN	0	17	90	
80	11	18	3	HEATUP	1005	17		
80	11	18	4	TURBROLL	1005	90	420	
80	12	5	1	HOTSBY	1005	265	90	5
80	12	5	2	COOLDOWN	0	35	90	
80	12	12	1	HEATUP	1005	40		
80	12	12	2	TURBROLL	1005	90	420	

Yr	Mo	Day	Seq.	Transient	Parameters			
80	12	16	1	HOTSBY	1005	265	90	5
80	12	16	2	COOLDOWN	0	25	90	
80	12	18	1	HEATUP	1005	40		
80	12	18	2	TURBROLL	1005	90	420	
81	1	7	1	HOTSBY	1005	265	90	5
81	1	7	2	COOLDOWN	0	20	90	
81	1	8	1	HEATUP	1005	8		
81	1	8	2	TURBROLL	1005	90	420	
81	1	10	1	TURBTRIP	1005	90	420	
81	1	10	2	HOTSBY	1005	265	90	5
81	1	10	3	COOLDOWN	0	10	90	
81	1	10	4	HEATUP	1005	50		
81	1	10	5	TURBROLL	1005	90	420	
81	2	14	1	HOTSBY	1005	265	90	5
81	2	14	2	COOLDOWN	0	40	90	
81	2	20	1	HEATUP	1005	30		
81	2	20	2	TURBROLL	1005	90	420	
81	2	24	1	TURBTRIP	1005	90	420	
81	2	24	2	HOTSBY	1005	265	90	5
81	2	24	3	COOLDOWN	0	30	90	
81	2	25	1	HEATUP	1005	40		
81	2	25	2	TURBROLL	1005	90	420	
81	2	26	1	TURBTRIP	1005	90	420	
81	2	26	2	HOTSBY	1005	265	90	0
81	2	26	3	COOLDOWN	0	25	90	
81	2	26	4	HEATUP	1005	60		
81	2	26	5	TURBROLL	1005	90	420	
81	3	5	1	HOTSBY	1005	265	90	5
81	3	5	2	COOLDOWN	0	23	90	
81	4	10	1	HEATUP	1005	45		
81	4	10	2	TURBROLL	1005	90	420	
81	4	12	1	HOTSBY	1005	265	90	5
81	4	12	2	COOLDOWN	0	25	90	
81	4	16	1	HEATUP	1005	75		
81	4	16	2	TURBROLL	1005	90	420	
81	6	6	1	TURBTRIP	1005	90	420	
81	6	6	2	HOTSBY	1005	265	90	5
81	6	6	3	COOLDOWN	0	25	90	
81	6	6	4	HEATUP	1005	100		
81	6	6	5	TURBROLL	1005	90	420	
81	6	25	1	HOTSBY	1005	265	90	5
81	6	25	2	COOLDOWN	0	100	90	
81	6	25	3	HEATUP	1005	100		
81	6	25	4	TURBROLL	1005	90	420	
81	7	20	1	HOTSBY	1005	265	90	5
81	7	20	2	COOLDOWN	0	100	90	
81	7	20	3	HEATUP	1005	100		
81	7	20	4	TURBROLL	1005	90	420	
81	8	10	1	HOTSBY	1005	265	90	5
81	8	10	2	COOLDOWN	0	100	90	
81	8	10	3	HEATUP	1005	100		
81	8	10	4	TURBROLL	1005	90	420	
81	9	5	1	HOTSBY	1005	265	90	5
81	9	5	2	COOLDOWN	0	100	90	
81	9	5	3	HEATUP	1005	100		
81	9	5	4	TURBROLL	1005	90	420	
81	9	30	1	HOTSBY	1005	265	90	5
81	9	30	2	COOLDOWN	0	100	90	
81	9	30	3	HEATUP	1005	100		
81	9	30	4	TURBROLL	1005	90	420	
81	10	20	1	HOTSBY	1005	265	90	5
81	10	20	2	COOLDOWN	0	100	90	
81	10	20	3	HEATUP	1005	100		
81	10	20	4	TURBROLL	1005	90	420	
81	11	2	1	HOTSBY	1005	265	90	5
81	11	2	2	COOLDOWN	175	25	90	
81	11	2	3	HEATUP	812	65		
81	11	3	1	COOLDOWN	122	45	90	
81	11	3	2	HEATUP	1005	49		
81	11	3	3	TURBROLL	1005	90	420	
81	12	12	1	FHLOSS	1005	265	420	
81	12	18	1	HOTSBY	1005	265	90	5
81	12	18	2	COOLDOWN	0	61	90	
81	12	20	1	HEATUP	1005	50		
81	12	20	2	TURBROLL	1005	90	420	
82	1	13	1	HOTSBY	1005	265	90	5
82	1	13	2	COOLDOWN	90	55	90	

Yr	Mo	Day	Seq.	Transient	Parameters			
82	1	14	1	HEATUP	1005	55		
82	1	14	2	TURBROLL	1005	90	420	
82	1	16	1	HOTSBY	1005	265	90	5
82	1	16	2	COOLDOWN	148	35	90	
82	1	17	1	HEATUP	1005	48		
82	1	17	2	TURBROLL	1005	90	420	
82	1	20	1	HOTSBY	1005	265	90	5
82	1	20	2	COOLDOWN	0	69	90	
82	1	25	1	HEATUP	1005	95		
82	1	28	1	TURBROLL	1005	90	420	
82	2	3	1	HOTSBY	1005	265	90	5
82	2	3	2	COOLDOWN	85	65	90	
82	2	4	1	HEATUP	1005	110		
82	2	4	2	TURBROLL	1005	90	420	
82	2	16	1	HOTSBY	1005	265	90	5
82	2	16	2	COOLDOWN	0	100	90	
82	2	18	1	HEATUP	1005	100		
82	2	18	2	TURBROLL	1005	90	420	
82	3	13	1	HOTSBY	1005	265	90	5
82	3	13	2	COOLDOWN	0	100	90	
82	3	14	1	HEATUP	1005	100		
82	3	14	2	TURBROLL	1005	90	420	
82	4	23	1	HOTSBY	1005	265	90	5
82	4	24	1	COOLDOWN	0	72	90	
82	4	28	1	UNBOLT				
82	5	28	1	REFUEL	3			
82	6	26	1	BOLTUP				
82	9	26	1	HYDROTEST	1005	200		
82	9	29	1	HEATUP	548	50		
82	9	30	1	COOLDOWN	14	11	90	
82	10	2	1	HEATUP	1005	64		
82	10	3	1	TURBROLL	1005	90	420	
82	10	3	2	TURBTRIP	1005	90	420	
82	10	10	1	HOTSBY	1005	265	90	5
82	10	10	2	COOLDOWN	0	50	90	
82	10	16	1	HEATUP	1005	75		
82	10	18	1	TURBROLL	1005	90	420	
82	10	18	2	TURBTRIP	1005	90	420	
82	10	24	1	HOTSBY	1005	265	90	5
82	10	24	2	COOLDOWN	69	90	90	
82	10	24	3	HEATUP	1005	76		
82	10	25	1	TURBROLL	1005	90	420	
82	10	28	1	HOTSBY	1005	265	90	5
82	10	28	2	COOLDOWN	0	45	90	
82	12	4	1	HEATUP	1005	40		
82	12	5	1	TURBROLL	1005	90	420	
82	12	22	1	HOTSBY	1005	265	90	5
82	12	22	2	COOLDOWN	65	27	90	
82	12	23	1	HEATUP	1005	72		
82	12	24	1	TURBROLL	1005	90	420	
83	1	3	1	HOTSBY	1005	265	90	5
83	1	3	2	COOLDOWN	127	24	90	
83	1	4	1	HEATUP	1005	72		
83	1	4	2	TURBROLL	1005	90	420	
83	1	4	3	TURBTRIP	1005	90	420	
83	2	3	1	HOTSBY	1005	265	90	5
83	2	3	2	COOLDOWN	0	60	90	
83	2	14	1	HEATUP	1005	82		
83	2	15	1	TURBROLL	1005	90	420	
83	2	15	2	TURBTRIP	1005	90	420	
83	4	8	1	HOTSBY	1005	265	90	5
83	4	8	2	COOLDOWN	0	80	90	
83	4	24	1	HEATUP	232	42		
83	4	26	1	COOLDOWN	0	29	90	
83	5	8	1	HEATUP	1005	45		
83	5	9	1	TURBROLL	1005	90	420	
83	5	16	1	HOTSBY	1005	265	90	5
83	5	16	2	COOLDOWN	0	75	90	
83	5	18	1	HEATUP	1005	61		
83	5	19	1	TURBROLL	1005	90	420	
83	6	2	1	HOTSBY	1005	265	90	5
83	6	2	2	COOLDOWN	156	29	90	
83	6	4	1	HEATUP	1005	27		
83	6	4	2	TURBROLL	1005	90	420	
83	6	20	1	HOTSBY	1005	265	90	5
83	6	20	2	COOLDOWN	0	45	90	
83	6	25	1	HEATUP	1005	30		

Yr	Mo	Day	Seq.	Transient	Parameters			
83	6	26	1	TURBROLL	1005	90	420	
83	7	30	1	TURBTRIP	1005	90	420	
83	7	30	2	HOTSBY	1005	265	90	5
83	7	30	3	COOLDOWN	0	93	90	
83	8	7	1	HEATUP	1005	19		
83	8	9	1	COOLDOWN	103	30	90	
83	8	11	1	HEATUP	1005	47		
83	8	11	2	TURBROLL	1005	90	420	
83	8	31	1	HOTSBY	1005	265	90	5
83	8	31	2	COOLDOWN	120	70	90	
83	9	2	1	HEATUP	1005	48		
83	9	3	1	TURBROLL	1005	90	420	
83	9	3	2	TURBTRIP	1005	90	420	
83	11	2	1	HOTSBY	1005	265	90	5
83	11	2	2	COOLDOWN	0	55	90	
84	1	4	1	HEATUP	1005	20		
84	1	5	1	TURBROLL	1005	90	420	
84	1	5	2	TURBTRIP	1005	90	420	
84	2	22	1	HOTSBY	1005	265	90	5
84	2	22	2	COOLDOWN	140	15	90	
84	2	23	1	HEATUP	1005	42		
84	2	23	2	TURBROLL	1005	90	420	
84	3	12	1	HOTSBY	1005	265	90	5
84	3	12	2	COOLDOWN	0	48	90	
84	3	22	1	UNBOLT				
84	4	1	1	REFUEL	3			
84	8	27	1	BOLTUP				
84	8	30	1	HYDROTEST	1095	200		
84	10	16	1	HEATUP	1005	20		
84	10	25	1	TURBROLL	1005	90	420	
84	10	25	2	TURBTRIP	1005	90	420	
84	10	26	1	HOTSBY	1005	265	90	0
84	10	27	1	COOLDOWN	130	40	90	
84	10	28	1	HEATUP	920	80		
84	10	29	1	TURBROLL	1005	90	420	
84	10	29	2	TURBTRIP	1005	90	420	
84	10	29	3	HOTSBY	1005	265	90	0
84	10	29	4	COOLDOWN	111	55	90	
84	10	31	1	HEATUP	1005	57		
84	10	31	2	TURBROLL	1005	90	420	
84	10	31	3	HOTSBY	1005	265	90	0
84	10	31	4	COOLDOWN	0	100	90	
84	11	1	1	HEATUP	1005	68		
84	11	2	1	TURBROLL	1005	90	420	
84	11	4	1	HOTSBY	1005	265	90	5
84	11	4	2	COOLDOWN	0	63	90	
84	11	6	1	HEATUP	1005	47		
84	11	6	2	TURBROLL	1005	90	420	
84	11	6	3	TURBTRIP	1005	90	420	
84	11	10	1	HOTSBY	1005	265	90	5
84	11	10	2	COOLDOWN	60	35	90	
84	11	11	1	HEATUP	1005	37		
84	11	12	1	TURBROLL	1005	90	420	
84	11	16	1	HOTSBY	1005	265	90	5
84	11	16	2	COOLDOWN	0	30	90	
84	11	22	1	HEATUP	1005	89		
84	11	22	2	TURBROLL	1005	90	420	
84	11	27	1	HOTSBY	1005	265	90	5
84	11	27	2	COOLDOWN	0	10	90	
84	12	7	1	HEATUP	370	28		
84	12	8	1	COOLDOWN	0	84	90	
84	12	17	1	HEATUP	1005	35		
84	12	18	1	TURBROLL	1005	90	420	
85	1	3	1	HOTSBY	1005	265	90	5
85	1	3	2	COOLDOWN	69	88	90	
85	1	4	1	HEATUP	1005	74		
85	1	4	2	TURBROLL	1005	90	420	
85	2	16	1	HOTSBY	1005	265	90	5
85	2	16	2	COOLDOWN	0	100	90	
85	2	16	3	HEATUP	1005	100		
85	2	16	4	TURBROLL	1005	90	420	
85	3	9	1	HOTSBY	1005	265	90	5
85	3	9	2	COOLDOWN	0	55	90	
85	3	16	1	HEATUP	1005	81		
85	3	16	2	COOLDOWN	0	80	90	
85	3	20	1	HEATUP	1005	88		
85	3	20	2	TURBROLL	1005	90	420	

Yr	Mo	Day	Seq.	Transient	Parameters			
85	4	1	1	HOTSBY	1005	265	90	5
85	4	1	2	COOLDOWN	0	32	90	
85	4	8	1	HEATUP	1008	68		
85	4	9	1	TURBROLL	1008	90	420	
85	9	4	1	HOTSBY	1005	265	90	5
85	9	4	2	COOLDOWN	196	30	90	
85	9	5	1	HEATUP	1005	6		
85	9	5	2	TURBROLL	1005	90	420	
85	9	26	1	HOTSBY	1005	265	90	5
85	9	26	2	COOLDOWN	0	50	90	
85	10	8	1	HEATUP	1005	47		
85	10	11	1	TURBROLL	1005	90	420	
85	10	15	1	HOTSBY	1005	265	90	5
85	10	15	2	COOLDOWN	0	15	90	
85	10	17	1	HEATUP	1005	10		
85	10	18	1	TURBROLL	1005	90	420	
85	11	22	1	HOTSBY	1005	265	90	5
85	11	22	2	COOLDOWN	0	17	90	
85	11	23	1	HEATUP	1005	55		
85	11	23	2	TURBROLL	1005	90	420	
85	11	29	1	HOTSBY	1005	265	90	5
85	11	29	2	COOLDOWN	0	55	90	
85	12	6	1	UNBOLT				
86	2	12	1	REFUEL	3			
86	4	[illegible]	1	BOLTUP				
86	4	[illegible]	1	HYDROTEST	1025	200		
86	6	1	1	HEATUP	1005	42		
86	6	15	1	TURBROLL	1005	90	420	
86	6	18	1	HOTSBY	1005	265	90	5
86	6	18	2	COOLDOWN	0	50	90	
86	6	25	1	HEATUP	1005	40		
86	6	26	1	TURBROLL	1005	90	420	
86	7	11	1	HOTSBY	1005	265	90	5
86	7	11	2	COOLDOWN	0	100	90	
86	7	14	1	HEATUP	1005	48		
86	7	14	2	TURBROLL	1005	90	420	
86	8	23	1	HOTSBY	1005	265	90	5
86	8	23	2	COOLDOWN	76	41	90	
86	8	25	1	HEATUP	1005	80		
86	8	25	2	TURBROLL	1005	90	420	
86	10	3	1	HOTSBY	1005	265	90	5
86	10	3	2	COOLDOWN	0	60	90	
86	10	5	1	HEATUP	1005	48		
86	10	5	2	TURBROLL	1005	90	420	
86	10	18	1	HOTSBY	1005	265	90	5
86	10	18	2	COOLDOWN	0	50	90	
86	10	30	1	HEATUP	1005	57		
86	11	1	1	TURBROLL	1005	90	420	
87	1	5	1	HOTSBY	1005	265	90	5
87	1	5	2	COOLDOWN	0	52	90	
87	1	12	1	HEATUP	1005	41		
87	1	13	1	TURBROLL	1005	90	420	
87	1	17	1	TURBTRIP	1005	90	420	
87	1	17	2	TURBTRIP	1005	90	420	
87	1	17	3	HOTSBY	1005	265	90	5
87	1	17	4	COOLDOWN	130	52	90	
87	1	18	1	HEATUP	1005	70		
87	1	19	1	TURBROLL	1005	90	420	
87	1	19	2	TURBTRIP	1005	90	420	
87	1	19	3	TURBTRIP	1005	90	420	
87	1	19	4	TURBTRIP	1005	90	420	
87	2	6	1	HOTSBY	1005	265	90	5
87	2	6	2	COOLDOWN	0	40	90	
87	2	9	1	HEATUP	1005	187		
87	2	10	1	TURBROLL	1005	90	420	
87	2	10	2	TURBTRIP	1005	90	420	
87	3	11	1	HOTSBY	1005	265	90	5
87	3	11	2	COOLDOWN	50.2	28	90	
87	3	13	1	HEATUP	1005	40		
87	3	13	2	TURBROLL	1005	90	420	
87	4	6	1	HOTSBY	1005	265	90	5
87	4	6	2	COOLDOWN	0	30	90	
87	4	9	1	HEATUP	1005	55		
87	4	10	1	TURBROLL	1005	90	420	
87	5	22	1	TURBTRIP	1005	90	420	
87	5	26	1	TURBTRIP	1005	90	420	
87	7	3	1	FHLOSS	1005	265	420	

Yr	Mo	Day	Seq.	Transient	Parameters			
88	1	2	1	HOTSBY	1005	265	90	5
83	1	2	2	COOLDOWN	0	20	90	
88	1	15	1	UNBOLT				
88	2	15	1	REFUEL	3			
88	3	15	1	BOLTUP				
88	3	20	1	HYDROTEST	1093	207		
88	4	20	1	HEATUP	1007	45		
88	4	24	1	TURBROLL	1007	90	420	
88	4	24	2	TURBTRIP	1007	90	420	
88	4	24	3	HOTSBY	1007	265	90	0
88	4	25	1	COOLDOWN	0	65	90	
88	4	27	1	HEATUP	1005	92		
88	4	28	1	TURBROLL	1005	90	420	
88	4	28	2	TURBTRIP	1005	90	420	
88	4	28	3	TURBTRIP	1005	90	420	
88	4	28	4	TURBTRIP	1005	90	420	
88	4	28	5	TURBTRIP	1005	90	420	
88	4	28	6	TURBTRIP	1005	90	420	
88	4	29	1	TURBTRIP	1005	90	420	
88	5	2	1	HOTSBY	1005	265	90	5
88	5	2	2	COOLDOWN	150	25	90	
88	5	4	1	HEATUP	1005	20		
88	5	4	2	TURBROLL	1005	90	420	
88	5	7	1	HOTSBY	1005	265	90	5
88	5	7	2	COOLDOWN	0	50	90	
88	5	14	1	HEATUP	1005	35		
88	5	14	2	TURBROLL	1005	90	420	
88	5	15	1	HOTSBY	1005	265	90	0
88	5	15	2	COOLDOWN	0	12	90	
88	5	16	1	HEATUP	1005	60		
88	5	17	1	TURBROLL	1005	90	420	
88	5	17	2	TURBTRIP	1005	90	420	
88	7	23	1	HOTSBY	1005	265	90	5
88	7	23	2	COOLDOWN	0	25	90	
88	7	30	1	HEATUP	1005	25		
88	7	31	1	TURBROLL	1005	90	420	
88	11	16	1	TURBTRIP	1005	90	420	
88	11	16	2	HOTSBY	1005	265	90	5
88	11	16	3	COOLDOWN	0	65	90	
88	11	17	1	HEATUP	1005	47		
88	11	19	1	TURBROLL	1005	90	420	
89	6	17	1	HOTSBY	1005	265	90	5
89	6	17	2	COOLDOWN	0	115	90	
89	6	27	1	HEATUP	1005	60		
89	6	28	1	TURBROLL	1005	90	420	
89	9	8	1	HOTSBY	1005	265	90	5
89	9	8	2	COOLDOWN	0	95	90	
89	9	13	1	UNBOLT				
89	9	26	1	REFUEL	3			
90	2	1	1	BOLTUP				
90	2	13	1	HYDROTEST	1088	200		
90	3	11	1	HEATUP	1005	100		
90	3	12	1	TURBROLL	1005	90	420	
90	5	20	1	HOTSBY	1005	265	90	5
90	5	20	2	COOLDOWN	0	86	90	
90	6	10	1	HEATUP	1005	61		
90	6	12	1	TURBROLL	1005	90	420	
90	8	16	1	TURBTRIP	1005	90	420	
90	8	16	2	HOTSBY	1005	265	90	5
90	8	16	3	COOLDOWN	12	100	90	
90	8	17	1	HEATUP	1005	90		
90	8	18	1	TURBROLL	1005	90	420	
90	8	19	1	HOTSBY	1005	265	90	0
90	8	19	2	COOLDOWN	0	91	90	
90	8	29	1	HEATUP	1006	65		
90	9	3	1	TURBROLL	1006	90	420	
90	9	27	1	HOTSBY	1005	265	90	5
90	9	27	2	COOLDOWN	58	46	90	
90	9	30	1	HEATUP	1005	55		
90	10	1	1	TURBROLL	1005	90	420	
90	10	12	1	TURBTRIP	1005	90	420	
90	10	12	2	HOTSBY	1005	265	90	5
90	10	12	3	COOLDOWN	35	55	90	
90	10	17	1	HEATUP	1005	66		
90	10	19	1	TURBROLL	1005	90	420	
91	1	25	1	HOTSBY	1005	265	90	5
91	1	25	2	COOLDOWN	17	77	90	

Yr	Mo	Day	Seq.	Transient	Parameters			
91	1	30	1	HEATUP	1005	60		
91	1	31	1	TURBROLL	1005	90	420	
91	3	29	1	HOTSBY	1005	265	90	5
91	3	29	2	COOLDOWN	0	100	90	
91	5	6	1	HEATUP	1005	90		
91	5	8	1	TURBROLL	1005	90	420	
91	6	8	1	TTBYPASS	1005	90	420	
91	9	12	1	HOTSBY	1005	265	90	5
91	9	12	2	COOLDOWN	0	85	90	
91	9	17	1	UNBOLT				
91	10	31	1	REFUEL	3			
91	11	23	1	BOLTUP				
91	11	24	1	HYDROTEST	1094	191.2		
91	12	6	1	HEATUP	1006	73		
91	12	22	1	TURBROLL	1005	90	420	
91	12	22	2	HOTSBY	1005	265	90	0
91	12	22	3	COOLDOWN	0	65	90	
92	1	1	1	HEATUP	1005	48		
92	1	5	1	TURBROLL	1005	90	420	
92	1	6	1	TURBTRIP	1005	90	420	
92	1	7	1	TURBTRIP	1005	90	420	
92	1	10	1	HOTSBY	1005	265	90	5
92	1	11	1	COOLDOWN	90	50	90	
92	1	11	2	HEATUP	1005	40		
92	1	12	1	TURBROLL	1005	90	420	
92	2	2	1	HOTSBY	1005	265	90	5
92	2	2	2	COOLDOWN	153	30	90	
92	2	4	1	HEATUP	782	15		
92	2	6	1	COOLDOWN	166	60	90	
92	2	13	1	HEATUP	1005	50		
92	2	14	1	TURBROLL	1005	90	420	
92	4	21	1	HOTSBY	1005	265	90	5
92	4	21	2	COOLDOWN	0	25	90	

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2
NRC DOCKET NO. 50-324
OPERATING LICENSE NO. DPR-62
NUREG-0619 INSPECTIONS OF FEEDWATER NOZZLES
SUBMITTAL OF FATIGUE USAGE INFORMATION

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager-Regulatory Affairs at the Brunswick Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage*
1. None	N/A