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The Northeast Utilities System

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Docket No. 50-443

NYN-01030

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Seabrook Station
Reply to Inspection Report 2000-11

North Atlantic Energy Service Corporation (North Atlantic) provides in the enclosure our alternative perspective on Inspection Report 2000-11. This letter is submitted in response to your letter of March 2, 2001 as discussed between your Mr. W. Ruland and our Mr. J. Peschel and J. Sobotka on March 12, 2001, March 16, 2001, March 19, 2001 and March 29, 2001. As discussed between Mr. Ruland and Mr. Peschel on March 12, 2001, North Atlantic does not desire a regulatory conference.

As the Inspection Report cover letter notes, North Atlantic has a view of the event significance that differs from the Special Inspection Team's view. The enclosure provides North Atlantic's assessment of specific assumptions and conclusions and the overall conclusion of the Inspection Report. North Atlantic recognizes that the Regulatory Oversight process contains some uncertainties and has evaluated the Inspection Report to provide insight and perspective based upon our analysis of the data and events. Our conclusion is that emergency diesel generator 1B was operable throughout cycle 7 and until the initiation of the failure during the refueling outage on October 29, 2000.

A combination of monthly surveillance runs, oil sample analysis and lubricating oil strainer differential pressure data throughout the operating cycle provide ample assurance that the diesel generator was operable during the cycle. The diesel generator failed following multiple fast starts conducted during the refueling outage and lubricating oil strainer differential pressure data provides uncontroverted evidence regarding the point of failure initiation on October 29, 2000. Our risk evaluation determined that this event was of low significance corresponding to the color Green.

IE01

North Atlantic has taken prompt aggressive corrective action to address the emergency diesel generator failures.

Should you have any questions regarding this matter, please contact Mr. James M. Peschel, Manager-Regulatory Programs, at (603) 773-7194.

Very truly yours,

NORTH ATLANTIC ENERGY SERVICE CORP.

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Executive Vice President and
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NYN-01030

REPLY TO INSPECTION REPORT 2000-11

Quinlan, W.J.	e-mail
Letter Distribution	e-mail
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ENCLOSURE 1 TO NYN-01030

NORTH ATLANTIC'S ALTERNATIVE PERSPECTIVES TO ISSUES DESCRIBED IN NRC INSPECTION REPORT 2000-11

NRC Inspection Report 2000-11 documented the results of the NRC's Special Inspection regarding the failure of the emergency diesel generator DG-1B at Seabrook Station on November 1, 2000. This report identified a preliminary finding of white significance associated with this failure. The report also acknowledged that North Atlantic disagrees with the Special Inspection Team's determination of significance of this event and requested North Atlantic's position on significance and the bases for this position. The following provides the requested information.

Contrary to the conclusions provided in the Inspection Report, North Atlantic has evidence to demonstrate that DG-1B was in fact operable during the seventh operating cycle and that it would have successfully performed its safety function. Limited aspects of this evidence were considered by the Special Inspection Team in its review of North Atlantic's position. North Atlantic shared with the Special Inspection Team its perspectives on diesel generator operability and risk associated with this event during the Special Inspection and provided copies of Engineering Evaluations 010001 and 01003 to the Special Inspection Team. Additional perspectives regarding each of these issues are provided below.

DG-1B Operability During Cycle 7/Ability to Meet 24-Hour Mission Time

North Atlantic documented its determination of operability of DG-1B in Engineering Evaluation (EE) 010001 (see Attachment A). This evaluation also concluded that DG-1B would have successfully functioned for at least 96 hours if it had been called upon to perform its safety function during the operating cycle. Inspection Report 2000-11 indicates that while it is possible that DG-1B may have functioned for its 24-hour mission time, there exists no certainty that this was in fact the case. The Inspection Report further describes what the Special Inspection Team believes to be considerable uncertainty in the run time estimates. However, the Special Inspection Team did not quantify the uncertainties, rank them in order of significance or influence, or eliminate those that were not applicable. Inspection Report 2000-11 identified seven factors of uncertainty that were considered non-conservative since they would be expected to increase the estimated plant risk. North Atlantic's alternative perspectives to these non-conservative factors are addressed below.

Inspection Report 2000-11 Non-Conservative Factors

1. DG-1B Out of Service during Shutdown

Special Inspection Team Position: The risk determination does not quantify or consider the risk associated with having the emergency diesel generator out-of-service while the plant was in a shutdown (below Mode 2) condition.

North Atlantic Position: This statement is incorrect. Engineering Evaluation 01003 describes the significance determination for the November 1, 2000 DG-1B failure (refer to Attachment B). This evaluation explicitly addresses the risk associated with the failure of DG-1B during the outage and concluded that the event risk was insignificant in that it was equivalent to a significance determination of Green.

In conclusion, this component of uncertainty is not applicable.

2. Failure was Random and Independent

Special Inspection Team Position: The licensee's event evaluation team determined that the failure mechanism was random and independent. The risk assessment did not include a random DG failure during the past operating cycle.

North Atlantic Position: The North Atlantic PRA model is designed to calculate the risk impacts due to random failure of the modeled components. Random diesel failures are modeled in terms of both demand failures (i.e., start failures) and operating failures (i.e., run failures). North Atlantic used the November 1, 2000 failure to update the diesel failure frequencies in the PRA model.

The discussion on random failure in the event evaluation report means that without detailed knowledge of the physical condition of the engine, it is not easy to predict, in advance, the failure in any one piston or cylinder. However, this does not mean that once the failure has occurred that it is not possible to accurately determine the circumstances around the failure and determine how long the engine would have been capable of operating for in a design basis event.

In conclusion, the ability to use the failure information to determine how long the engine would have been capable of operating for eliminates this component of uncertainty.

3. Potential for a Common-Mode Failure

Special Inspection Team Position: The potential for a common-mode failure of the DG-1A was not reflected in the assessment. The licensee's event evaluation team identified several causal factors (i.e., method of testing and maintaining the emergency diesel generators in a standby condition) that were common to both emergency diesel generators.

North Atlantic Position: North Atlantic also believes that it is important to consider the potential common mode effects. As a result, common cause potential was evaluated and described in EE-01003. As described in EE-010001, the DG failure mechanism was a combination of a latent condition (i.e., component wear as a result of testing, etc.) and a transient condition (e.g., fast starts). Without either sufficient wear as an initial condition, or the thermal transient that triggers the latent condition, no failure is likely to occur. Inspection of the DG-1A revealed less wear than that observed with DG-1B. This is most likely due to the fewer start cycles and run time experienced by DG-1A versus DG-1B. The reduced wear on the DG-1A renders it unlikely that a common mode failure would occur during the window of the DG-1B failure. In conclusion, this component of uncertainty has minimal influence given the empirical examination evidence of the DG-1A.

4. Insufficient Surveillance and Lubricating Oil Test Data

Special Inspection Team Position: NAESCO's surveillance and lubricating oil test data were insufficient to demonstrate that the emergency diesel generator would have functioned for the required PRA 24-hour mission time during the last operating cycle. The monthly surveillance test runs were typically about 3 to 4 hours in length, which is far less than the 24-hour run time. In fact, the emergency diesel generator operating parameters were essentially normal during the initial portion of the October 29, 2000, 24- hour run. However, the operators were required to secure the diesel generator later in the test due to elevated lubricating oil strainer differential pressure readings.

North Atlantic Position: Implicit with this component of uncertainty, the Special Inspection Team appears to be making the argument that the DG failure would only have manifested itself during the longer (i.e., 24-hour) runs and not the shorter monthly surveillance runs. However, the Special Inspection Team has not provided a factual basis for this belief. As described in EE-010001 and above, the failure was the result of the combination of the latent condition of the diesel generator and a thermal transient. The shorter monthly surveillances experience essentially the same thermal transients experienced during the 24-hour runs in that they both involve fast starts and rapid loading of the DGs. It is recognized that the 24-hour TS runs are somewhat more stressful on the diesel generators than the monthly surveillances since the engines are loaded to 110% in the first two hours of operation. However, this loading, as the loading experienced during the monthly surveillances, is significantly greater than the loads that would be experienced during a design basis event. Notwithstanding, for both the monthly and 24-hour TS surveillances, after the DG's have reached equilibrium temperature the thermal transient is over and the engine operates in a steady state equilibrium condition. As a result, there is far less potential for differential thermal growth of the piston skirt or engine components, and therefore, no apparent failure initiation mechanism.

Inspection Report 2000-11 notes that the DG-1B operating parameters were essentially normal during the initial portion of the October 29, 2000, 24-hour run. This normal operation was due to the fact that the failure was first initiated on that date as evidenced by the first occasion in the operating cycle of an increase in lubricating oil strainer differential pressure beyond the normal band of 2 to 4 psid (refer to EE-010001). In other words, the engine start on October 29 was the thermal transient that initiated the failure process. Lubricating oil strainer differential pressure started increasing as this run progressed as material from the failing piston and cylinder began being deposited on the strainer.

As noted in EE-010001, the DG-1B Technical Specification surveillance tests conducted during the operating cycle and the lubricating oil samples analyzed during the operating cycle verified that the engine was functioning normally. These surveillance tests provide assurance that the engine was operable.

In conclusion, this component of uncertainty is not applicable.

5. Lubricating Oil Samples

Special Inspection Team Position: Lubricating oil analysis samples taken after the October 29, 2000, run indicated a significant wear particle concentration. The previous lube oil results were obtained on July 26, 2000, for the DG-1B, which was prior to the postulated diesel generator failure.

North Atlantic Position: As described in EE-010001 and above, the DG-1B lubricating oil strainer differential pressure remained in the normal band (approximately 2 to 4 psid) during the entire operating cycle and through the start of the refueling outage (which began on October 21, 2000), up to the 24-hour run on October 29, 2000. This provides evidence that the failure had not been initiated until after the October 29, 2000 run. In conclusion, this component of uncertainty is not applicable.

6. Estimation of Run Time on October 29, 2000

Special Inspection Team Position: NAESCO calculated that the DG-1B would have operated for close to 16 hours during the October 29, 2000 surveillance while the NRC inspectors calculated that DG-1B would have operated for 15.5 hours during this surveillance test. This minor difference affected the postulated failure date for DG-1B. The difference was attributed to NAESCO's calculation, which used an assumed value for the initial strainer d/p, whereas the NRC inspector's calculation relied solely on data recorded during the 24-hour surveillance test. NAESCO's approach introduced a non-conservative bias into their final diesel generator run time determination.

North Atlantic Position: Notwithstanding the differences in the calculations described above, the magnitude of the difference between North Atlantic's and the Special Inspection Team's run time estimate is insignificant at best. In fact, both calculations validate one another and demonstrate that this component of uncertainty is of minimal significance.

7. DG-1B Recovery

Special Inspection Team Position: The final diesel generator failure event was determined to be unrecoverable, whereas NAESCO's Plant Risk Assessment (PRA) model assumed that diesel generator failures are recoverable within a specified period of time.

North Atlantic Position: While the Special Inspection Team is incorrect regarding North Atlantic's PRA model assuming all diesel generator failures are recoverable (refer to EE-01003), they are correct that the final DG-1B failure was non-recoverable. However, the Special Inspection Team's risk evaluation is not based on the final failure of the engine, which occurred on November 1, 2000, but rather on the October 29, 2000 run when the engine first started to fail and the strainers exhibited increased differential pressure. The October 29, 2000 run which was terminated due to increasing lubricating oil strainer differential pressure was recoverable. Recovery was accomplished by changing the strainers. DG-1B was run after the October 29, 2000 shutdown four times for a total loaded run time of 24 hours 23 minutes before the crankcase overpressurization event on November 1, 2000. Hence, the engine demonstrated that it would have run for more than its mission time following recovery after the onset of the failure on October 29, 2000.

It is recognized that after the strainers were replaced following the October 29, 2000 run, the strainers and lubricating oil were replaced on October 30, 2000. However, the latter strainer and oil replacement is inconsequential to the ability to run for 24-hours following recovery. Specifically, the engine ran loaded for a total of 19 hours 34 minutes after October 29, 2000 before the strainer differential pressure reached 7 psid on October 30, 2000, when the engine was shutdown to replace the strainers. The observed strainer loading rate was significantly less than that seen during the October 29, 2000 run. Even if one conservatively assumes the Special Inspection Team's calculated strainer loading rate from the October 29, 2000 run, it is unlikely that the low lubricating oil pressure trip setpoint would have been reached prior to exceeding the 24-hour mission time. Hence, DG-1B demonstrated that it would have run in excess of the 24-hour mission time following recovery from the shutdown on October 29, 2000. In conclusion, this component of uncertainty is not applicable.

Inspection Report 2000-11 Conservative Factors

Inspection Report 2000-11 also identified two factors of uncertainty that were considered conservative since they would be expected to decrease the estimated plant risk. North Atlantic's perspectives on these conservative factors are discussed below.

1. Correction for Engine Start Cycles

Special Inspection Team Position: The risk assessment did not correct the assumed diesel generator failure date for the number of start cycles placed on the unit after the unit entered Mode 2. The diesel generator wear would also be expected to be a function of the number of start cycles experienced. The diesel generator was started nine times between the start of the refueling outage (OR07) that started on October 21, 2000, and the diesel generator run on October 29, 2000.

North Atlantic Position: The Special Inspection Team did not attempt to quantify or rank the significance of this uncertainty. Engineering Evaluation 010001 quantified the impact of engine starts on wear by using data from both the engine designer and the former chief engineer for Coltec. Specifically, engine wear associated with each start was determined to be equivalent to that of approximately 8 to 10 hours of full load operation. The engineering evaluation concluded that the nine starts during the outage prior to the shutdown on October 29, 2000 were equivalent to 72 hours of loaded run time. Adding this to the actual/estimated run time provides for a total loaded run time of over 96 hours.

The above determination is consistent with the guidance provided by the NRC Staff in NUREG-1366, "Improvements to Technical Specification Surveillance Requirements." Specifically, NUREG-1366 indicates that fast starts and rapid loading can cause rapid piston and cylinder liner wear.

In conclusion, fast starts of emergency diesel generators are a significant component of uncertainty that warrants quantification.

2. Successful Runs following October 29, 2000

Special Inspection Team Position: The emergency diesel generator was run successfully after the October 29, 2000, shutdown three times (of loaded durations between 1 and 13 hours) for a total of 19 hours and 44 minutes before the test run on November 1, 2000, which culminated in the overpressurization event. The diesel engine lubricating oil was changed and the strainer was cleaned once and replaced once between these runs. This illustrates that the diesel generator had some load capability while the cylinder/piston degradation was in progress.

North Atlantic Position: As clarification to the above, the engine actually ran loaded for a total of 20 hours 52 minutes during this time frame. Additionally, if one does not exclude the last run on November 1, 2000, the engine ran for total 24 hours 23 minutes from the October 29, 2000 shutdown. The Special Inspection Team recognized that this illustrates that the diesel generator had some load capability while the cylinder/piston degradation was in progress. However, the aforementioned load carrying capability should not be minimized since more than 23 hours of the total loaded run time was with loads at or above the values stated in the Technical Specifications, which exceed the loads expected during actual accident conditions.

In conclusion, the fact that the engine was capable of running at load in excess of 24 hours following the October 29, 2000 shutdown is significant in that the engine was sufficiently robust to continue to perform as designed.

Conclusion on Uncertainties

As demonstrated above, of the seven components of uncertainty that were described in Inspection Report 2000-11 as non-conservative, after analysis, two have negligible affect and five were not applicable regarding their affect on DG-1B run time and therefore risk. Of the conservative uncertainties, the successful runs following the engine shutdown on October 29, 2000 demonstrate that the DG-1B was recoverable. The other conservative uncertainty regarding fast starts of emergency diesel generators is a significant component of uncertainty that warrants consideration. When quantified, this component of uncertainty demonstrates that the DG-1B would have been capable of operating at load for at least 96 hours after the plant had been shutdown for the refueling outage. This is significantly in excess of the engine's 24-hour mission time. This component of uncertainty dominates the other uncertainties described in the inspection report. Given that the Special Inspection Team found that the engine would have been capable of operating at load for 23 hours and 51 minutes, the lack of impact of the non-conservative uncertainties, and the significance of the affect engine starts have on the calculated run time, North Atlantic believes that the DG-1B was capable of operation for greater than 24 hours.

Risk Associated with this Event

North Atlantic determined the risk from this event utilizing the NRC's Significance Determination Process. Our evaluation, as provided in Attachment B, shows this event to be of low significance and a classification of Green.

Inspection Report 2000-11 also provided an assessment of the risk associated with the DG-1B failure. The Special Inspection Team determined that the engine would have been capable of operating at load for 23 hours and 51 minutes after the plant had been shutdown for the outage. The difference between this run time and the 24-hour mission was 9 minutes. Fault exposure time was determined to be the number of days from the last monthly DG-1B surveillance where the engine ran at load for at least 9 minutes and the date that the plant shutdown for the refueling outage. Since the last monthly DG-1B surveillance occurred three days prior to the refueling outage, the Special Inspection Team assumed three days of fault exposure time.

According to the new oversight program, the method of determining fault exposure time when there is uncertainty involved is to use one-half the time from the last successful surveillance run (T/2 approach). However, the Special Inspection Team did not consider using the T/2 method from the last successful monthly surveillance that was conducted three days prior to the refueling outage. No basis is provided for why this option was not explored.

North Atlantic believes that if a fault exposure time is to be assumed, it is appropriate to utilize the T/2 method using the last monthly surveillance. As described in the uncertainty analysis above, the root cause of the engine failure is the non-uniform thermal growth of the piston. The Special Inspection Team agreed with this cause in Inspection Report 2000-11. The non-uniform thermal growth is caused by the thermal transient that is established during the initial engine start and load sequence. The shorter monthly surveillances experience essentially the same thermal transients experienced during the 24-hour runs in that they both involve fast starts and rapid loading of the DGs. As a result, the failure experienced by DG-1B would be manifested by either monthly or 24-hour surveillances.

Conclusions on Risk

This event is of low risk significance and is a classification of Green.

ATTACHMENT A TO NYN-01030

EMERGENCY DIESEL GENERATOR B OPERABILITY DURING CYCLE 7

By

Jeffrey Sobotka - Seabrook Station

January 26, 2001

Engineering Evaluation

EE - 010001, Revision 00

Preparer	1/26/01 Date
Independent Reviewer	1/26/01 Date
Engineering Supervisor	1/26/01 Date
Engineering Manager	1/26/01 Date
Director of Engineering	1/26/01 Date

1.0 PURPOSE

This Engineering Evaluation demonstrates that the B Train emergency diesel generator (EDG) was operable and capable of performing its safety function throughout operating cycle 7. It also demonstrates that EDG-B would have functioned during a design basis accident for a period of time greater than the engine's PRA mission time. This evaluation examines degraded conditions that were identified with this engine during the seventh refueling outage.

2.0 BACKGROUND

During two attempts at performing a 24-hour surveillance run on the B-train EDG within the seventh refueling outage (OR-07), the lubricating oil strainer differential pressure increased rapidly forcing premature termination of the surveillance attempts. A third attempt at completion of the 24-hour surveillance run was made on November 1, 2000. During the attempted run, the control room received high crankcase pressure and vibration alarms and operators initiated an emergency shutdown of the engine. While coasting down, the engine experienced a crankcase explosion that filled the room with smoke. Subsequent investigation revealed that the number seven piston and cylinder liner were damaged. EDG-B failed after reactor fuel was offloaded from the core and placed in the spent fuel pool.

The following sections will address the degraded condition identified with EDG-B and address their impact on engine operability.

3.0 DISCUSSION

3.1 Licensing Basis/PRA Considerations

The licensing basis of the plant is that the EDGs, assuming a single failure, are required to run until offsite power is recovered and then the total electrical system is utilized in unison to provide reliable long term AC power to mitigate an accident. The Station's licensing basis assumes no immediate operator action is required to ensure that the long-term supply of AC power is provided. Seabrook Station is a four-hour coping plant in accordance with the analysis and evaluation performed pursuant to 10CFR50.63, "Loss of all alternating current power," and based upon the three offsite lines and the robust switchyard design, offsite power is assumed to be recovered in the four hour period. This assumption is consistent with the Electric Power Research Institute data (NSAC-203) that provides a median loss of offsite power to nuclear plants of one hour for the period from 1980 to 1993.

The Seabrook Station PRA has a loss of offsite power recovery probability of 0.999 at 24 hours. The EDG's have a mission time of 24-hours according to the PRA. The 24-hour mission time is used for sequences initiated by a weather related loss of offsite power. The mission time for all other loss of offsite power events is 6 hours based on actual data. Seabrook Station mission times are based on NSAC-203 (1993) with data specialization for Seabrook Station specific characteristics.

3.2 EDG-B Operability

3.2.1 EDG-B Failure Mechanism

An investigation was conducted immediately following the November 1, 2000 emergency shutdown of EDG-B. An inspection revealed damage to the engine's number seven piston and cylinder. The cylinder liner was scuffed/scored and it revealed heavy bonding of aluminum from the piston skirt. The piston skirt exhibited galling and the cylinder liner exhibited significant bore polishing (i.e., lack of adequate surface finish).

An investigation was conducted to determine the most probable cause of the failure and the most likely failure scenario for EDG-B. The investigation determined that the damage in the number seven cylinder was attributed to non-uniform thermal growth of the piston skirt which resulted in scoring and transfer of aluminum piston skirt material onto the cylinder liner. Scoring and aluminum deposition on the cylinder liner affected the ability of the cylinder liner to retain lubricating oil and impacted the operation of the piston rings particularly in the lower ring travel area. The heat generated by the scuffing and scoring caused the piston skirt to grow further, resulting in increased interference with the liner and eventual failure.

The following are the most important factors that lead to the failure.

Fast Starts

A fast diesel generator start is defined as when the engine starts and accelerates from zero speed to generator rated frequency and voltage in less than ten seconds without pre-lubrication. Fast starting promotes aggressive wear that degrades the long-term service life of the piston and liner. During OR-07, EDG-B was fast started a total of 13 times prior to its failure.

Rapid Loading

Rapid loading is defined as application of 100 percent of rated load within approximately 10 minutes of breaker closing. Rapid loading contributes to additional stress on the engine's power parts by not allowing enough time for the parts to come to thermal equilibrium, thereby reducing clearances between the piston and cylinder liner. Nearly every EDG loading profile since plant startup has been a rapid load in that the load is applied approximately evenly up to 100 percent in a ten-minute period after the breaker is closed.

High Loading

High loading is defined as operation at greater than 100 percent of rated load. High loading contributes to additional engine stress and wear by increasing internal cylinder brake mean effective pressure (BMEP) and temperatures. BMEP is the average pressure in the cylinder over the engine cycle. The wear of the engine piston rings and cylinder liner surfaces is approximately proportional to the square of the BMEP. With 110 percent of rated load, the engine wear rate would be about 121% of the wear rate at rated load. During OR-07, EDG-B was loaded to 110% of rated load on four separate occasions within a relatively short period of time.

Long Duration between Runs

Long duration between runs, particularly when there is no pre-lubrication of the cylinder when the engine is started, allows oil to drain down the cylinder wall. Engine designers and manufacturers indicate that most engine wear occurs within the first few seconds of an engine start when there is only minimal lubricating oil film established between wear surfaces. Since the Seabrook Station EDGs were typically started after about 30 days of being maintained in standby condition, increased wear between the pistons and liners was likely to have occurred.

Cylinder Liner Surface/Carbon Polishing

The design basis for the diesel engine cylinder liner surface finish is to produce a surface that retains a sufficient quantity of oil on the surface to produce an adequate hydrodynamic lubricating film to minimize friction between the piston rings and the liner. An overly smooth surface will allow oil to readily drain off the surface, while a surface that is too rough will promote ring wear.

For a Pielstick 2.3 engine, the specified cylinder liner surface finish for a new liner should range between 80 to 120 micro-inches, rms. The surface finish is established by the manufacturer by a honing process or by etching the liner surface.

Profileometer measurements were taken during inspections of each cylinder liner within EDG-B. These inspections measured the surface finish in micro-inches, rms at the top and bottom of the ring travel at the 0°, 90°, 180° and 270° locations. In addition the inspections recorded any indications of scuffing/scoring and aluminum transfer.

An average profilometer reading was determined for the top ring reversal and bottom ring reversal areas of each cylinder. For all cylinders, the average top reading is lower than the bottom indicating a greater degree of surface finish and less wear on the bottom of each cylinder as compared with the top. This is to be expected due to the effect of hard carbon packing on the top land of the piston. This is the region on the side of the piston above the top piston ring up to the piston crown.

The EDG-B cylinder profilometer readings revealed wear. The average profilometer readings in the top ring reversal area varied between 10 and 47 micro-inches, rms, with seven liners having a finish smoother than 20 micro-inches, rms. Liner finishes smoother than 20 micro-inches, rms are considered well worn.

Temperature difference between standby conditions and operating conditions

Non-uniform heating causes the aluminum piston skirt to expand at a higher rate than the cylinder liner when the engine is rapidly loaded. The piston skirt is aluminum, which has a coefficient of thermal expansion approximately twice that of the cast iron cylinder liner. The cylinder liner was maintained approximately 50°F lower by the keepwarm system than the normal operating temperature. Following engine start, the jacket water temperature initially drops below the keepwarm temperature and then rapidly increases as the engine is loaded. This condition results in a reduced clearance between the piston skirt and the liner during startup and loading. These reduced clearances facilitated contact between the piston skirt and the cylinder liner.

3.2.2 EDG-B Operability during Operating Cycle 7

EDG-B was fully operable and capable of performing its safety-related function throughout cycle 7. Prior to OR-07, there was no indication of a degrading trend in EDG-B performance as evidenced by: surveillance testing, oil analysis results, engine analyzer data, and lube oil strainer differential pressure. Evidence supporting the conclusion that EDG-B was operable during the operating cycle is described below.

Surveillance Testing during the Operating Cycle

EDG-B successfully completed its Technical Specification (TS) required monthly surveillance testing during cycle 7. TS 4.8.1.1.2 requires each EDG to be demonstrated operable at least once per 31 days by verifying the EDG starts from standby conditions and attains a generator voltage and frequency of 4160+/-1.2 Hz within 10 seconds after the start signal. This TS also requires that the generator to be synchronized and loaded to greater than or equal to 5600kW and less than or equal to 6100kW, and operates with a load greater than or equal to 5600kW and less than or equal to 6100kW for at least 60 minutes. In practice, the EDG's are run for approximately three to four hours at loaded conditions during these surveillances to ensure the engines reach equilibrium temperature. A total of 19 surveillance runs were conducted between June 1999 to October 2000 and equated to approximately 80 hours of total run time. In summary, the surveillance testing conducted demonstrates that EDG-B was operable during the operating cycle.

The monthly TS surveillance tests, which are similar to other facilities TS surveillances, assure the necessary quality of the EDGs are maintained, that facility operation will be within safety limits, and that the TS limiting conditions for operation will be met. These monthly surveillances would have been sufficient to identify engine degradation had the failure mechanism been initiated during the operating cycle. As stated earlier, the failure mechanism was the non-uniform thermal growth of the piston skirt, which resulted in scoring and transfer of aluminum piston skirt material onto the cylinder liner. The thermal transient was initiated by the numerous fast starts conducted during the refueling outage. Since the failure was directly linked to engine starts and rapid loading, the numerous monthly operability surveillances challenged the engine from a thermal transient perspective such that they would have identified any degradation had it been present.

Surveillance Testing/Maintenance Runs during the Refueling Outage OR-07

During the seventh refueling outage (OR-07) that started on October 21, 2000, the EDG-B was run multiple times for both TS required surveillance testing and maintenance activities.

Specifically, the EDG-B was operated 13 times with a total run time of approximately 45 hours before it failed on November 1, 2000. The 13 runs were comprised of seven attempted or completed TS surveillance runs (ESF testing and 24-hour endurance runs) and six maintenance runs. Refer to Table 1 for a detailed description of these runs and Appendix A for details on the loading for these runs as obtained from the Main Plant Computer.

As stated above, the monthly TS surveillance testing established operability of the EDG-B during the operating cycle, with the last surveillance being successfully completed on October 18, 2000, which was approximately three days before the start of the refueling outage. During the outage, three Engineered Safety Features (ESF) tests were conducted including the loss of offsite power test, Safety Injection actuation test, and the loss of offsite power test in conjunction with a Safety Injection actuation. The ESF tests are the design bases tests for the EDGs because they include a simulated loss of offsite power, fast start of the EDGs and loading per the emergency power sequencer in accordance with the loads specified in the Updated Final Safety Analysis Report (UFSAR). These tests provide verification of operability in accordance with the design basis and provide conclusive evidence that EDG-B was operable during the seventh operating cycle.

Also conducted during outages is the 24-hour endurance run, which involves loading the engine to 110% of load (greater than or equal to 6363kW and less than or equal to 6700 kW) for the first two hours with the remaining 22 hours at full load. It is believed that EDG-B started to fail during the first attempted 24-hour run on October 29, 2000 based on increased lubricating oil strainer differential pressure. Subsequent runs further degraded the EDG culminating in failure of the engine. Notwithstanding, through the first run on October 29, 2000 that initiated the failure, and which was voluntarily terminated due to lubricating oil strainer differential pressure, the EDG was successfully started and ran nine times for a total of 19.9 hours during the refueling outage.

Oil Analysis

EDG lubricating oil is routinely analyzed by a laboratory approximately every quarter to determine if there are any adverse trends that can compromise engine operability. During cycle 7, the EDG-B lubricating oil was analyzed on August 1999, November 1999, February 2000, May 2000, and July 2000. Review of the oil analysis results indicates no adverse trends associated with these samples. Specifically, the wear particle counts in these samples ranged from approximately 13.4/ml to 32.1/ml, which is considered normal for this engine. Refer to Table 2 for the oil analysis results.

The first indication of engine degradation was noted in an oil sample taken after the first attempt to complete the 24-hour run on October 29, 2000. The total wear particle count had increased about tenfold above the count in the last sample taken on July 27, 2000, i.e., from 26.1/ml to 219.0/ml. The actual engine run time was approximately 30.2 hours with a total of 12 starts in between taking of those samples. The particle count doubled to a value of 447/ml in a subsequent sample taken on October 30, 2000. The engine ran approximately 20.56 hours with two starts in between taking of the October 29, 2000 and the October 30, 2000 samples. In summary, oil analysis results conclusively demonstrate that engine failure was initiated during the refueling outage.

Lubricating Oil Strainer Differential Pressure

EDG-B lubricating oil strainer differential pressure remained within a normal range of approximately 2 to 4 psid throughout cycle 7. This is depicted on Figure 1. No lubricating oil strainer replacements or cleanings were required during the cycle. Prior to OR-07, the last time the strainers were replaced was in March 1997.

In contrast, rapid increases in lubricating oil strainer differential pressure were noted during the first attempt to complete the 24-hour surveillance run made on October 29, 2000. During the 7 hour 50 minute run, the differential pressure increased from approximately 4 psid to 13 psid. The strainer elements were then replaced with cleaned elements. Similarly, a differential pressure increase was noted during the third attempt to complete the 24-hour surveillance run. During a 22-hour period, the strainer differential pressure increased from 2 psid to 7 psid. The strainer elements were replaced again, the lubricating oil was changed, and the engine failure occurred shortly thereafter during the fourth attempt at the 24-hour run on November 1, 2000. Figure 2 depicts the EDG-B lube oil strainer differential pressure that was recorded each hour during OR-07 through the first attempt at the 24-hour run on October 29, 2000. This further demonstrates that the engine failure was initiated during the refueling outage.

Engine Analyzer Data

Engine signature analysis is periodically performed on the EDG's. This includes the following data by cylinder: average indicated power, peak-firing pressures, exhaust temperature, etc. A review of signature analysis data during the operating cycle did not identify any significant, abnormal operating conditions in cylinder number seven or any other cylinder within EDG-B.

During OR-07, engine signature analysis was conducted at 1045 AM on the first attempt to complete the 24-hour run on October 29, 2000. This analysis was conducted approximately 26.56 hours of engine run time before the crankcase explosion event on November 1, 2000. A review of the engine analysis results (refer to Appendix B) did not identify any significant, abnormal operating conditions in cylinder number seven or any other cylinder within EDG-B. This indicates that the failure was in the very initial stages of development at that time. MPR Associates Inc. reviewed this data and concluded that the indicated power, peak firing pressure, and exhaust temperature balance of the engine were all good at 15%, 93 psi, and 100 degrees F. They noted that while the peak firing pressure spread of 93 psi exceeds the vendor limit of 70 psi, this is a very stringent requirement, with limits of 150 psi more typical for large diesel engines. Cylinder number 7 had lower than lower than average indicated power (IMEP of 233 psi vs 244 psi average) and peak firing pressure (1303 psi vs 1322 psi average) and higher than average cylinder exhaust temperature (900F vs 870F average). However, none of these deviations from average is of concern as all of the cylinder number seven values are within normal ranges and the variation represents normal variation across the cylinders of the engine.

3.2.3 Analysis

Based on the evidence presented above, it is concluded that the EDG-B did not fail until after it was taken out of service for the refueling outage and specifically on October 29, 2000. Therefore, based upon EDG-B successfully performing its surveillance requirements and operating satisfactorily during maintenance runs prior to October 29, 2000, it is concluded that it would have been capable of running for an extended period of time if called upon to do so. Rough estimates can be made to bound the minimum time that EDG-B would have operated for after it was removed from service during the refueling outage. Two models and three sensitivity cases for determining this are presented below.

Model 1

The first model determines the cumulative amount of time that EDG-B ran at load during the refueling outage up to the point that the engine would have tripped on low lubricating oil pressure as a result of strainer clogging due to accumulation of wear products. This is a very simplistic model that is overly conservative, and therefore potentially misleading in that it ignores the influence of the multiple engine starts and thereby the failure mechanism. However, it does provide the minimum bounding estimate. From October 24, 2000 through the first attempted 24-hour run on October 29, 2000, EDG-B was started a total of nine times with a total run time of 19.9 hours. Approximately 15.8 hours of this run time was with the engine loaded (some maintenance runs were conducted with the engine unloaded). During the first attempted 24-hour run on October 29, 2000, EDG-B ran for approximately 7 hours, 27 minutes (7.45 hours), at load before operators shut the engine down due to lubricating oil strainer differential pressure (during the course of the run the differential pressure increased from 4 psid to approximately 13 psid). However, had operators not taken action to shut the engine down, it is estimated based on the rate of strainer loading and the relationship between strainer differential pressure and engine oil pressure, that the engine would have been capable for running at load for another 8.5 hours. This would provide for a total loaded run time during the first 24-hour run October 29, 2000 of 15.966 hours.

The above estimate utilized an Excel program to extrapolate the strainer data collected during that run to roughly estimate when the engine would have tripped on low lubricating oil pressure. To more accurately model the entire run on October 29, 2000, the extrapolation included an estimate of the initial strainer differential pressure from the start of the run along with actual strainer readings taken during the run. This analysis also accounted for the auxiliary lubricating oil positive displacement pump, which starts prior to an engine trip on low lubricating oil pressure, such that the strainer differential pressure can reach 50 psid before the engine trips. Refer to Figure 3 for a depiction of the strainer differential pressure associated with the first 24-hour run on October 29, 2000. While there are some uncertainties associated with the extrapolation, such as accuracy of gauges, lubricating oil pressure trip setpoints, auxiliary oil pump start and relief pressure, etc., it provides a rough estimate of how long the engine would have operated for successfully during that run.

Accounting for the time the engine ran loaded prior to October 29, 2000 (8.36 hours), and the estimate of time the engine would have run on October 29, 2000 prior to a low lubricating oil pressure trip (15.96 hours), the cumulative minimum run time would have been approximately 24.33 hours. This is in excess of the engine's 24-hour mission time. This is a very conservative estimate since the cumulative run time during the refueling outage included multiple starts and stops, which are directly linked to the failure of the engine, whereas performing its safety function would have required only one start and multiple hours of operation at steady-state, thermal equilibrium conditions.

As stated above, the determination of how long the EDG-B would have successfully run on during the first 24-hour run on October 29, 2000 was predicted based on an extrapolation of lubricating oil strainer differential pressure readings taken during the run. For this run, lubricating oil strainer differential pressure was considered the most limiting factor as this would have caused the engine to trip on low lubricating oil pressure long before any other plausible failures would have occurred. Other failure scenarios are not credible due to the robust nature of the engine. Specifically, the engine failure was initiated during the first 24-hour run on October 29, 2000. Following the termination of this run, the engine ran at load for an additional 24.38 hours until the point that it experienced the crankcase explosion. Hence, after the failure was initiated, the engine ran at load for a total of 31.38 hours without a perceptible decline in performance.

Model 2

The second model for estimating the minimum time that EDG-B would have run during OR-07 is more realistic in that it accounts for the wear incurred by fast engine starts and correlates this with normal wear as a result of run time. Fairbanks-Morse provided general operating information developed by SEMT, the Pielstick engine designer, that provides a rough estimate of wear associated with starts. This information acknowledges that wear depends on many parameters and that the following correlation is only a very rough estimate.

Water Temp °C	Lube Oil Temp °C	Pre-lubrication	Equivalent Wear
< 30	< 30	No	30 Hrs.
30 < t < 45	> 45	Yes	15 Hrs.
45 < t < 60	> 45	Yes	15 Hrs.
> 60	> 45	Yes	0.5 Hrs.

During operating cycle 7, EDG-B keep-warm temperatures were approximately 43 degrees C for the water jacket, and 51 degrees C for the lubricating oil. According to the chart above, this provides and equivalent wear of 15 hours per fast start assuming a pre-lubricated condition. A prior chief engineer for Coltec who is currently a contractor for Fairbanks-Morse indicated that the numbers provided in the table may be too high. He provided information based on his recollection of testing that each fast start is equivalent in engine wear to approximately 8 to 10 hours of normal operation at full load.

During the refueling outage, EDG-B was fast started a total of 13 times prior to its failure. Nine of these starts occurred before the initiation of the failure, which was during the first attempt at completing the 24-hour run on October 29, 2000. Multiplying the 9 fast starts by 8 hours results in approximately 72 hours of equivalent normal operation at load. If this value is added to the cumulative loaded run time determined from the first model described above, it results in 96.33 hours of loaded run time, which significantly exceeds the engine's mission time.

Sensitivity Case 1

It is clear that there is some degree of additional wear incurred by fast starts. Even if one questions the specific correlation between fast starts and run time there is no impact on the ability of the engine to run at load for the 24-hour mission time. As a sensitivity case, if the correlation between starts and wear is reduced by a factor of four such that each start correlates to only 2 hours of normal operation at load, this would equate to 18 hours of normal loaded engine operation. When added to the 24.33 hours of cumulative loaded run time described above, this results in a run time of 42.33 hours, which is still significantly in excess of the engine's mission time.

Sensitivity Case 2

Similarly, if one accounts for the only time the engine was loaded to Technical Specification values (which are higher than the maximum accident load) there is no impact. Specifically, the engine ran for approximately 9 hours during the refueling outage at TS load (more than two hours were at 110% load) through the termination of the October 29, 2000 run. Adding the time that the engine would have continued to run for on October 29, 2000 as determined by the second methodology above, results in 17.9 hours. Further adding 2 hours per start results in 35.9 hours, which is longer than the engine's mission time.

Sensitivity Case 3

As a last sensitivity case, the 8 hours of equivalent wear per start is reduced by an order of magnitude, or a factor of ten (i.e., 0.8 hours per start). Note that this is almost a factor of 20 less than the estimates published by the engine's designer. Accounting for the cumulative run time at Technical Specification load values from Sensitivity Case 2, the result is 25.1 hours. These sensitivity cases clearly demonstrate that reasonable engineering judgement dictates that the EDG-B would have been capable of operating at load in excess of its 24-hour mission time.

Consideration of Failure Mechanism

Notwithstanding the minimum bounding estimates described above, a more realistic scenario is that the EDG-B would have run for a significantly longer period of time if it had been called upon to perform during OR-07. The engine failure mechanism involves two distinct components; 1) conditions that create increased wear that make the engine susceptible to failure during thermal transient conditions, and 2) the thermal transient conditions themselves that initiate the failure. The first component that establishes the latent conditions for failure is comprised of the cause elements that lead to cylinder wear and carbon polishing (e.g., fast starts, rapid loading, high loading, residual oil film on the cylinder surface due to duration between runs, and differences in standby and operating temperatures). The second condition involving the thermal transient itself, which initiates the failure, is most significantly influenced by the fast starts, rapid loading, and high loading (i.e., 110% of load per TS testing) of the engine. Without either the latent condition for failure, or the failure initiator, the engine will continue to run reliably.

As stated above, the failure initiator is the numerous maintenance and surveillance runs and run attempts made during OR-07, which resulted in severe thermal cycling of the cylinder liners and pistons. Several of these loaded runs were made within 2 hours of termination of the previous run. At the start of one of these run attempts, the cylinder liner would likely be well below its normal operating temperature, while the piston metal temperature would still be relatively hot. Because of reduced internal clearances, contact between wearing surfaces was far more likely.

In this regard, it is believed that at the conclusion of the operating cycle, EDG-B was capable of at least nine additional fast starts (since the failure was initiated during the first attempt at completing the 24-hour run on October 29, 2000). However, had these fast starts not been performed, and the engine was called upon to perform only one fast start and an extended run at steady state conditions, it is believed that it would have successfully started and run for an extended period of time. Operation at equilibrium temperatures, such as steady state operation at accident loads, which are less than TS loads, does not provide a mechanism to aggravate the latent conditions for failure.

Conclusion

Based on the foregoing, it is concluded that EDG-B was operable during the operating cycle and that it would have been capable of successfully performing its safety function for an undetermined, but extended period of time during the seventh operating cycle. Additionally, while there is inherent uncertainty in predicting how long an engine would have been able to run for, the minimum bounding loaded run time calculations and sensitivity cases described above indicate that as a minimum, the EDG-B would have been capable of running at load for longer than its PRA mission time of 24 hours if it have been called upon to do so during OR-07 after it had been removed from service.

TABLE 1
EDG-B OPERATION DURING OR-07

DATE	START / STOP TIME	TOTAL RUN TIME	LOAD START / STOP TIME	TOTAL LOAD TIME	TIME AT TS LOAD (1)	DESCRIPTION
24 OCT 00	1437 / 1642	2 HR 5 MIN	1549 / 1617	28 MIN	18 MIN	OX1426.21 EVENTS 2 & 3
24 OCT 00	2028 / 2342	3 HR 14 MIN	2028 / 2317	2 HR 49 MIN	0 MIN	OX1426.21 EVENT 4
25 OCT 00	0614 / 0929	3 HR 15 MIN	0614 / 0916	3 HR 2 MIN	0 MIN	OX1426.21 EVENTS 5 & 6
28 OCT 00	1324 / 1358	35 MIN	N/A	N/A	N/A	MAINT RUN
28 OCT 00	1455 / 1455	19 SECONDS	N/A	N/A	N/A	MAINT RUN TRIP ON OS
28 OCT 00	2150 / 2211	21 MIN	N/A	N/A	N/A	MAINT RUN
28 OCT 00	2225 / 2228	3 MIN	N/A	N/A	N/A	MAINT RUN
28/29 OCT 00	2349 / 0219 (2)	2 HR 31 MIN	2355 / 0158	2 HR 3 MIN	1 HR 42 MIN	MAINT / BALANCING RUN
29 OCT 00	0430 / 1220	7 HR 50 MIN	0440 / 1207	7 HR 27 MIN	7 HR 1 MIN	24 HR SURV, STOPPED HIGH STRAINER DP
29/30 OCT 00	1752 / 0031	6 HR 39 MIN	1811 / 0009	5 HR 58 MIN	5 HR 30 MIN	24 HR SURV STOPPED FOR SWITCHYARD
30 OCT 00	0508 / 1903	13 HR 55 MIN	0513 / 1849	13 HR 36 MIN	13 HR 14 MIN	24 HR SURV RESTART
1 NOV 00	1055 / 1241	1 HR 46 MIN	1100 / 1218	1 HR 18 MIN	59 MIN	MAINT RUN
1 NOV 00	1347 / 1726	3 HR 39 MIN	1355 / 1726	3 HR 31 MIN	3 HR 23 MIN	24 HR SURV STOPPED BY EVENT

(1) Time at Technical Specification load is time with electrical load on EDG between 5600 to 6100 kW (TS 4.8.1.1.2).
(2) Clock changed on 29 October 2000 at 0200.

TABLE 2
EDG-B Oil Analysis Results During Cycle 7 and OR-07

Date	3/99	5/99	8/99	11/99	2/00	5/14	7/27	10/29	10/29	10/30	10/31	11/1	11/1
Event	1	OR06, oil changed	1	1	1	1	1	After 1st 24hr run[2]	After 1st 24hr run[3]	During 3rd run[4]	Post 3rd run[5]	Upstream Of Strainer[6]	Down-stream Of Strainer[6]
Fe, ppm	58	---	18	11	11	11	12	22	23	37		4	4
Al ppm	1	---	1	<1	<1	1	<1	<1	<1	<1		<1	<1
Additives	Ok	---	Ok	Ok	Ok	Ok	OK	Ok	Ok	Ok		Ok	Ok
WPC,particles/ml	---	---	---	32	28	13	26	219	252	447		52.4	52.4
Ferrography								Normal. 90% iron corrosion products. 10% Al and copper alloys	Normal. 90% iron corrosion products. 10% Al and copper alloys	Normal. 90% iron corrosion products. 10% Al and copper alloys		copper alloys plus some inorganics (18%), 76% iron products	Copper alloys plus inorganics (23%), 75% iron products

55 gal drum added ~10-24

Maintenance Done
Lube oil change

1. Routine Sample taken from dipstick on engine
2. Filter was found to be improperly positioned thus there was bypass flow for some time period.
3. Sample taken downstream of strainer.
4. Sample taken from crankcase
5. Sample taken after oil was changed following 3rd run.
6. Samples taken upstream/downstream of strainer after 1 hr maintenance run before shutdown event

FIGURE 1
EDG-B Cycle 7 Lubricating Oil Strainer Delta-P

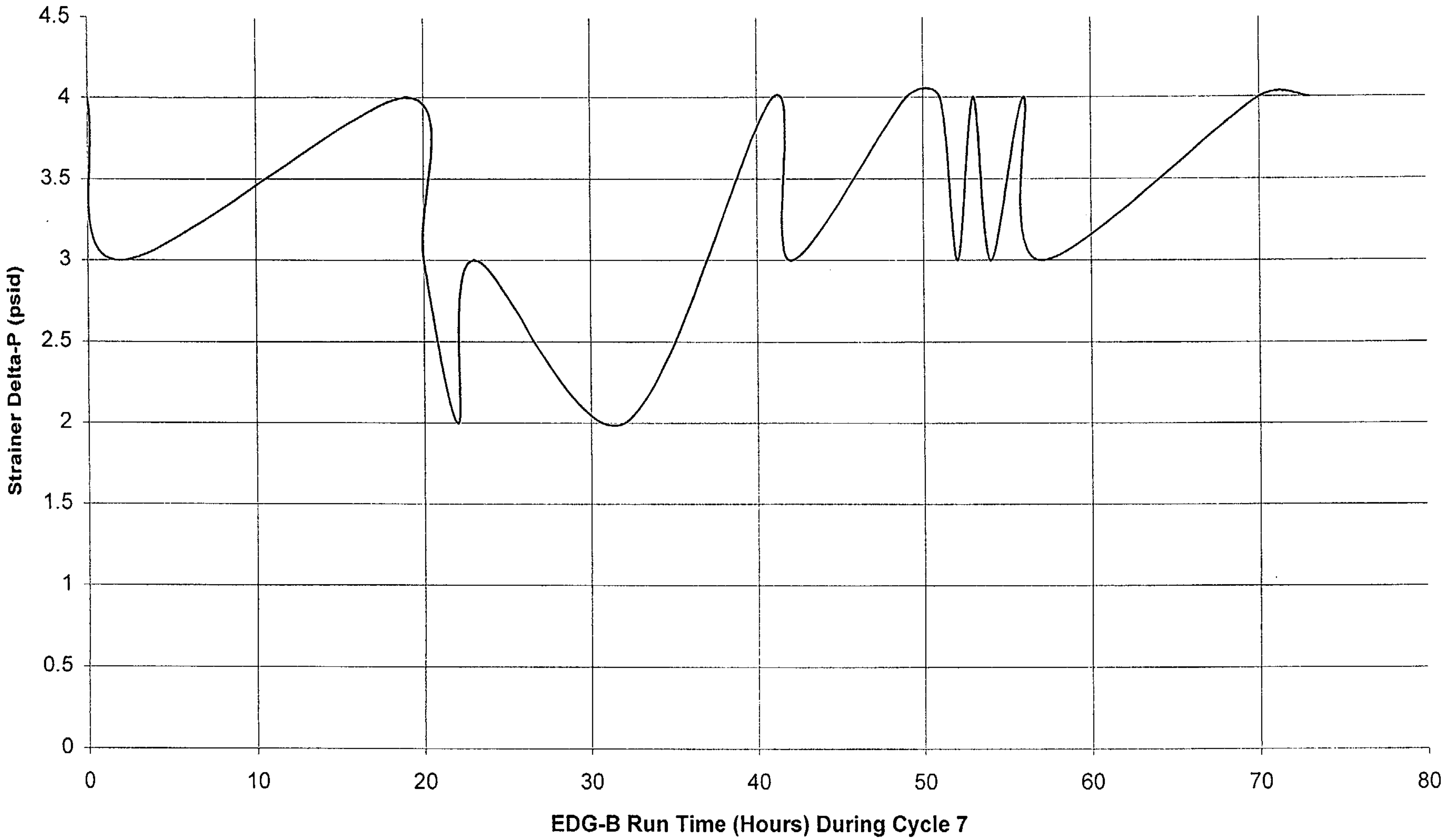


FIGURE 2
OR-07 EDG-B Lubricating Oil Strainer Delta-P

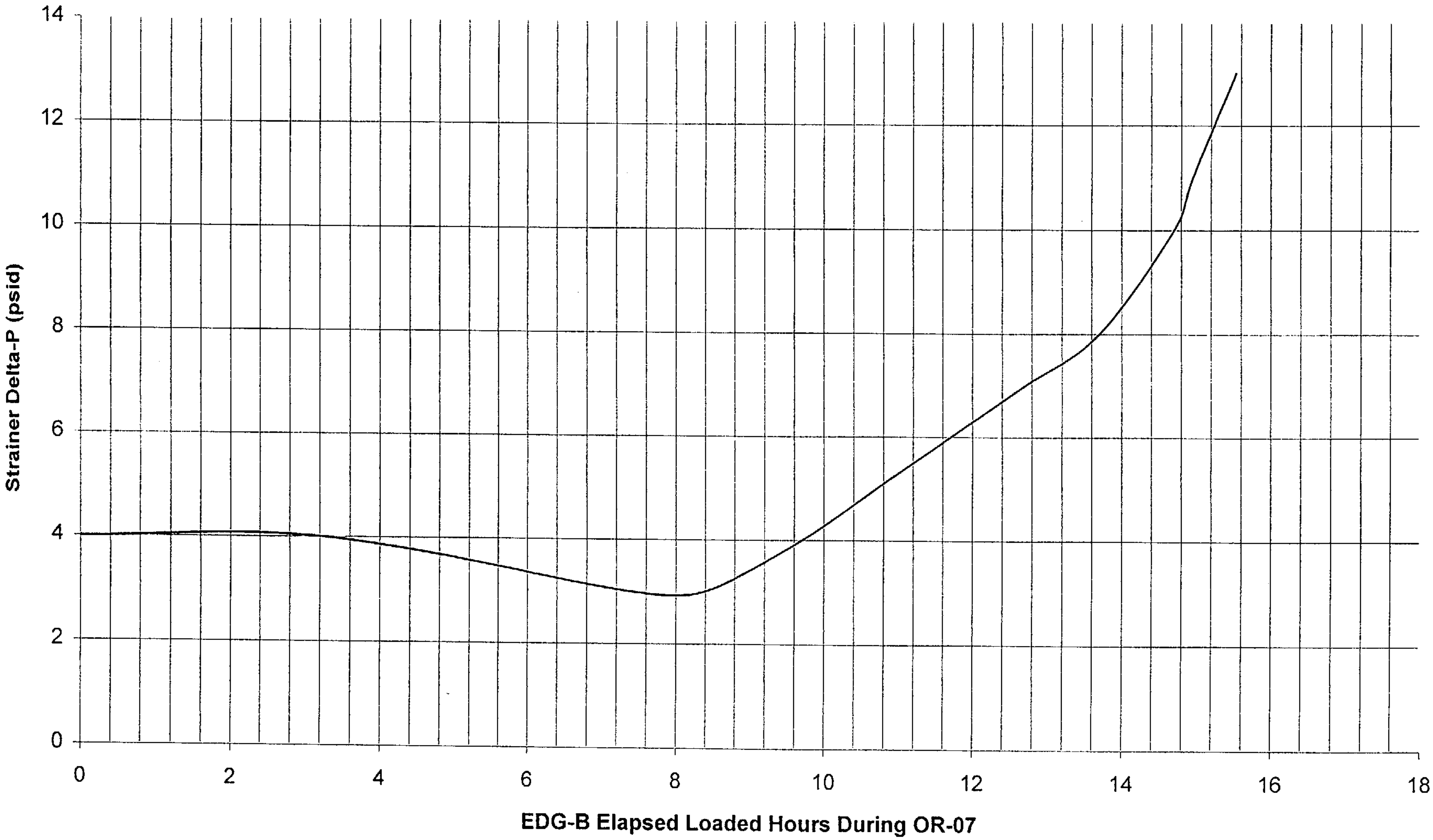
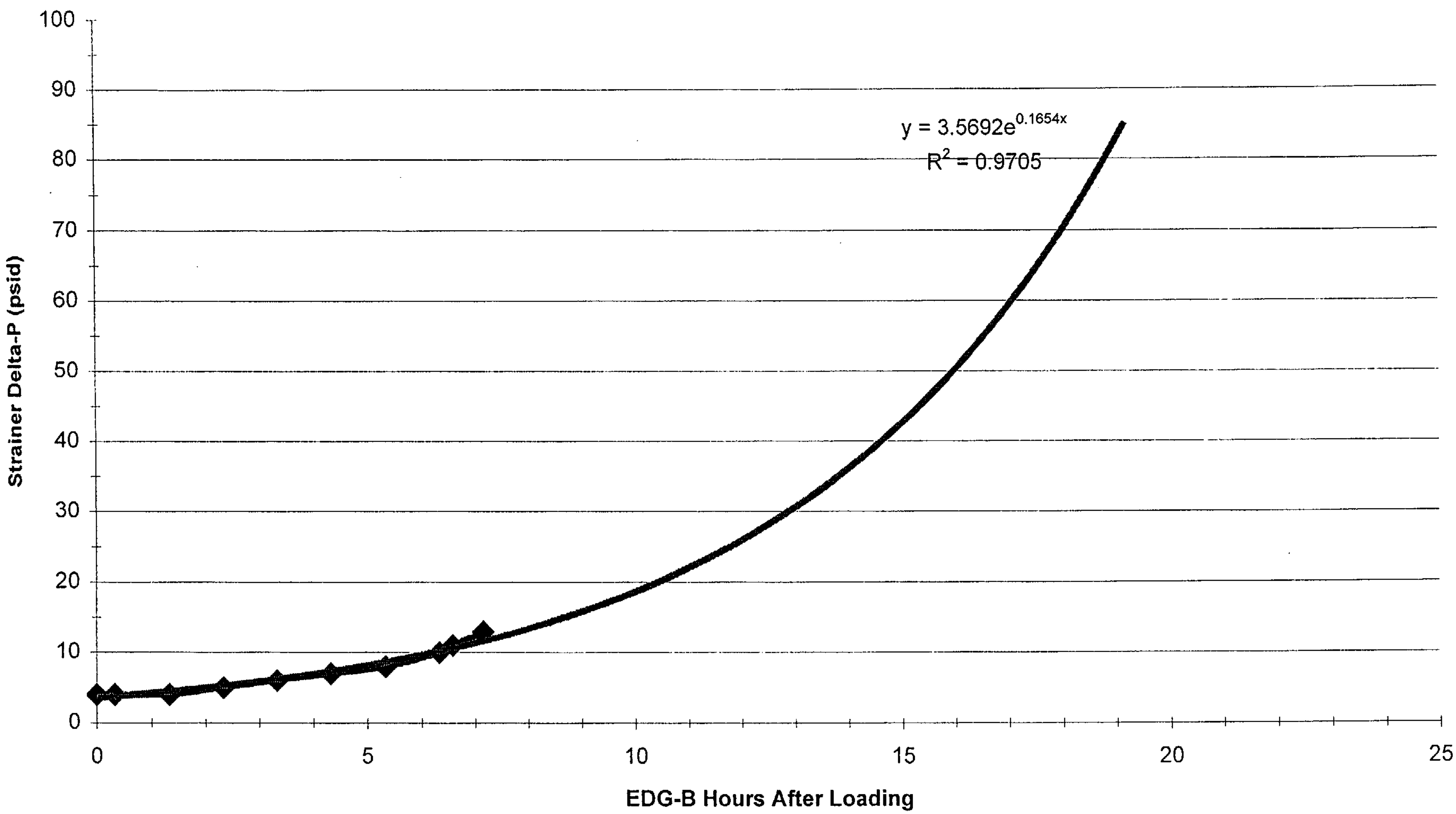


FIGURE 3
10/29/00 EDG-B 24-Hour Run Attempt
Lubricating Oil Strainer Delta-P Extrapolated Exponentially



APPENDIX A

EDG-B LOADING DURING OR-07

21-OCT-2000	00:00:32.52	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	01:00:32.52	A2735	-3.	KW	GOOD	DGB WATTS
21-OCT-2000	02:00:32.62	A2735	-1.	KW	GOOD	DGB WATTS
21-OCT-2000	03:00:32.62	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	04:00:32.62	A2735	2.	KW	GOOD	DGB WATTS
21-OCT-2000	05:00:32.62	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	06:00:32.62	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	07:00:32.62	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	08:00:32.62	A2735	1.	KW	GOOD	DGB WATTS
21-OCT-2000	09:00:32.62	A2735	2.	KW	GOOD	DGB WATTS
21-OCT-2000	10:00:32.62	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	11:00:32.92	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	12:00:32.92	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	13:00:32.92	A2735	-1.	KW	GOOD	DGB WATTS
21-OCT-2000	14:00:32.92	A2735	-1.	KW	GOOD	DGB WATTS
21-OCT-2000	15:00:33.12	A2735	-1.	KW	GOOD	DGB WATTS
21-OCT-2000	16:00:33.12	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	17:00:33.42	A2735	1.	KW	GOOD	DGB WATTS
21-OCT-2000	18:00:33.42	A2735	-3.	KW	GOOD	DGB WATTS
21-OCT-2000	19:00:33.42	A2735	-2.	KW	GOOD	DGB WATTS
21-OCT-2000	20:00:33.42	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	21:00:33.42	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	22:00:33.42	A2735	0.	KW	GOOD	DGB WATTS
21-OCT-2000	23:00:33.42	A2735	-2.	KW	GOOD	DGB WATTS
22-OCT-2000	00:00:33.62	A2735	-2.	KW	GOOD	DGB WATTS
22-OCT-2000	01:00:33.62	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	02:00:33.87	A2735	-4.	KW	GOOD	DGB WATTS
22-OCT-2000	03:00:33.87	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	04:00:33.87	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	05:00:33.87	A2735	-2.	KW	GOOD	DGB WATTS
22-OCT-2000	06:00:33.87	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	07:00:34.27	A2735	-3.	KW	GOOD	DGB WATTS
22-OCT-2000	08:00:34.27	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	09:00:34.27	A2735	1.	KW	GOOD	DGB WATTS
22-OCT-2000	10:00:34.27	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	11:00:34.27	A2735	-3.	KW	GOOD	DGB WATTS
22-OCT-2000	12:00:34.27	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	13:00:34.27	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	14:00:34.27	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	15:00:34.27	A2735	-1.	KW	GOOD	DGB WATTS
22-OCT-2000	16:00:34.27	A2735	1.	KW	GOOD	DGB WATTS
22-OCT-2000	17:00:34.27	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	18:00:34.67	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	19:00:34.77	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	20:00:34.77	A2735	2.	KW	GOOD	DGB WATTS
22-OCT-2000	21:00:34.77	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	22:00:34.87	A2735	0.	KW	GOOD	DGB WATTS
22-OCT-2000	23:00:34.87	A2735	1.	KW	GOOD	DGB WATTS
23-OCT-2000	00:00:34.87	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	01:00:34.87	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	02:00:34.87	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	03:00:34.87	A2735	1.	KW	GOOD	DGB WATTS

EDG-B LOADING DURING OR-07

23-OCT-2000	04:00:34.87	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	05:00:34.87	A2735	1.	KW	GOOD	DGB WATTS
23-OCT-2000	06:00:34.87	A2735	1.	KW	GOOD	DGB WATTS
23-OCT-2000	07:00:34.87	A2735	-3.	KW	GOOD	DGB WATTS
23-OCT-2000	08:00:34.87	A2735	-1.	KW	GOOD	DGB WATTS
23-OCT-2000	09:00:34.87	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	10:00:34.87	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	11:00:36.27	A2735	-1.	KW	GOOD	DGB WATTS
23-OCT-2000	12:00:40.17	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	13:00:40.17	A2735	1.	KW	GOOD	DGB WATTS
23-OCT-2000	14:00:40.17	A2735	1.	KW	GOOD	DGB WATTS
23-OCT-2000	15:00:40.17	A2735	3.	KW	GOOD	DGB WATTS
23-OCT-2000	16:00:41.07	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	17:00:41.07	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	18:00:41.07	A2735	1.	KW	GOOD	DGB WATTS
23-OCT-2000	19:00:41.07	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	20:00:41.07	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	21:00:41.07	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	22:00:41.07	A2735	0.	KW	GOOD	DGB WATTS
23-OCT-2000	23:00:41.07	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	00:00:41.07	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	01:00:41.27	A2735	2.	KW	GOOD	DGB WATTS
24-OCT-2000	02:00:41.27	A2735	-1.	KW	GOOD	DGB WATTS
24-OCT-2000	03:00:41.67	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	04:00:41.67	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	05:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	06:00:41.77	A2735	2.	KW	GOOD	DGB WATTS
24-OCT-2000	07:00:41.77	A2735	-1.	KW	GOOD	DGB WATTS
24-OCT-2000	08:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	09:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	10:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	11:00:41.77	A2735	-1.	KW	GOOD	DGB WATTS
24-OCT-2000	12:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	13:00:41.77	A2735	-1.	KW	GOOD	DGB WATTS
24-OCT-2000	14:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	15:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	15:49:49.47	A2735	263.	KW	GOOD	DGB WATTS
24-OCT-2000	15:49:50.47	A2735	365.	KW	GOOD	DGB WATTS
24-OCT-2000	15:49:53.47	A2735	477.	KW	GOOD	DGB WATTS
24-OCT-2000	15:49:54.47	A2735	604.	KW	GOOD	DGB WATTS
24-OCT-2000	15:50:04.47	A2735	473.	KW	GOOD	DGB WATTS
24-OCT-2000	15:50:06.47	A2735	345.	KW	GOOD	DGB WATTS
24-OCT-2000	15:50:13.47	A2735	491.	KW	GOOD	DGB WATTS
24-OCT-2000	15:51:12.47	A2735	614.	KW	GOOD	DGB WATTS
24-OCT-2000	15:51:41.47	A2735	737.	KW	GOOD	DGB WATTS
24-OCT-2000	15:51:43.47	A2735	891.	KW	GOOD	DGB WATTS
24-OCT-2000	15:51:45.47	A2735	999.	KW	GOOD	DGB WATTS
24-OCT-2000	15:52:04.47	A2735	894.	KW	GOOD	DGB WATTS
24-OCT-2000	15:52:11.47	A2735	1118.	KW	GOOD	DGB WATTS
24-OCT-2000	15:52:14.47	A2735	1237.	KW	GOOD	DGB WATTS
24-OCT-2000	15:52:42.47	A2735	1480.	KW	GOOD	DGB WATTS
24-OCT-2000	15:52:46.47	A2735	1641.	KW	GOOD	DGB WATTS

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24-OCT-2000	15:53:08.47	A2735	1746.	KW	GOOD	DGB WATTS
24-OCT-2000	15:53:09.47	A2735	1850.	KW	GOOD	DGB WATTS
24-OCT-2000	15:53:41.47	A2735	2042.	KW	GOOD	DGB WATTS
24-OCT-2000	15:53:43.47	A2735	2163.	KW	GOOD	DGB WATTS
24-OCT-2000	15:54:16.47	A2735	2382.	KW	GOOD	DGB WATTS
24-OCT-2000	15:54:21.47	A2735	2532.	KW	GOOD	DGB WATTS
24-OCT-2000	15:54:53.47	A2735	2763.	KW	GOOD	DGB WATTS
24-OCT-2000	15:55:15.47	A2735	2908.	KW	GOOD	DGB WATTS
24-OCT-2000	15:55:16.47	A2735	3043.	KW	GOOD	DGB WATTS
24-OCT-2000	15:55:43.47	A2735	3211.	KW	GOOD	DGB WATTS
24-OCT-2000	15:55:45.47	A2735	3340.	KW	GOOD	DGB WATTS
24-OCT-2000	15:56:09.47	A2735	3501.	KW	GOOD	DGB WATTS
24-OCT-2000	15:56:11.47	A2735	3613.	KW	GOOD	DGB WATTS
24-OCT-2000	15:56:14.47	A2735	3724.	KW	GOOD	DGB WATTS
24-OCT-2000	15:56:30.47	A2735	3866.	KW	GOOD	DGB WATTS
24-OCT-2000	15:56:33.47	A2735	3983.	KW	GOOD	DGB WATTS
24-OCT-2000	15:56:58.47	A2735	4102.	KW	GOOD	DGB WATTS
24-OCT-2000	15:57:01.47	A2735	4219.	KW	GOOD	DGB WATTS
24-OCT-2000	15:57:40.47	A2735	4437.	KW	GOOD	DGB WATTS
24-OCT-2000	15:57:43.47	A2735	4538.	KW	GOOD	DGB WATTS
24-OCT-2000	15:58:14.47	A2735	4750.	KW	GOOD	DGB WATTS
24-OCT-2000	15:58:18.47	A2735	4879.	KW	GOOD	DGB WATTS
24-OCT-2000	15:58:42.47	A2735	5056.	KW	GOOD	DGB WATTS
24-OCT-2000	15:58:46.47	A2735	5215.	KW	GOOD	DGB WATTS
24-OCT-2000	15:59:06.47	A2735	5376.	KW	GOOD	DGB WATTS
24-OCT-2000	15:59:26.47	A2735	5497.	KW	GOOD	DGB WATTS
24-OCT-2000	15:59:29.47	A2735	5644.	KW	GOOD	DGB WATTS
24-OCT-2000	15:59:49.47	A2735	5784.	KW	GOOD	DGB WATTS
24-OCT-2000	15:59:51.47	A2735	5885.	KW	GOOD	DGB WATTS
24-OCT-2000	16:00:27.47	A2735	5985.	KW	GOOD	DGB WATTS
24-OCT-2000	16:00:41.77	A2735	5982.	KW	GOOD	DGB WATTS
24-OCT-2000	16:03:39.47	A2735	6085.	KW	GOOD	DGB WATTS
24-OCT-2000	16:10:26.47	A2735	5984.	KW	GOOD	DGB WATTS
24-OCT-2000	16:13:02.47	A2735	6141.	KW	GOOD	DGB WATTS
24-OCT-2000	16:17:46.47	A2735	5587.	KW	GOOD	DGB WATTS
24-OCT-2000	16:17:47.47	A2735	2242.	KW	GOOD	DGB WATTS
24-OCT-2000	16:17:48.47	A2735	919.	KW	GOOD	DGB WATTS
24-OCT-2000	16:17:49.47	A2735	387.	KW	GOOD	DGB WATTS
24-OCT-2000	16:17:50.47	A2735	172.	KW	GOOD	DGB WATTS
24-OCT-2000	16:17:52.47	A2735	44.	KW	GOOD	DGB WATTS
24-OCT-2000	17:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	18:00:41.77	A2735	0.	KW	GOOD	DGB WATTS
24-OCT-2000	19:00:41.77	A2735	2.	KW	GOOD	DGB WATTS
24-OCT-2000	20:00:42.02	A2735	-1.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:43.72	A2735	703.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:44.72	A2735	598.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:46.72	A2735	485.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:47.72	A2735	686.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:48.72	A2735	940.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:52.72	A2735	1087.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:54.72	A2735	968.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:57.72	A2735	1125.	KW	GOOD	DGB WATTS

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24-OCT-2000	20:28:58.72	A2735	1430.	KW	GOOD	DGB WATTS
24-OCT-2000	20:28:59.72	A2735	1543.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:02.72	A2735	1697.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:03.72	A2735	1811.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:05.72	A2735	1929.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:07.72	A2735	1815.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:12.72	A2735	2139.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:13.72	A2735	2783.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:14.72	A2735	2503.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:15.72	A2735	2373.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:18.72	A2735	2548.	KW	GOOD	DGB WATTS
24-OCT-2000	20:29:22.72	A2735	2816.	KW	GOOD	DGB WATTS
24-OCT-2000	20:30:31.72	A2735	3017.	KW	GOOD	DGB WATTS
24-OCT-2000	20:30:52.72	A2735	2914.	KW	GOOD	DGB WATTS
24-OCT-2000	20:46:07.92	A2735	3245.	KW	GOOD	DGB WATTS
24-OCT-2000	20:46:08.92	A2735	3523.	KW	GOOD	DGB WATTS
24-OCT-2000	20:46:09.92	A2735	3227.	KW	GOOD	DGB WATTS
24-OCT-2000	20:46:11.92	A2735	3099.	KW	GOOD	DGB WATTS
24-OCT-2000	20:55:52.92	A2735	2968.	KW	GOOD	DGB WATTS
24-OCT-2000	21:00:42.22	A2735	2939.	KW	GOOD	DGB WATTS
24-OCT-2000	22:00:42.22	A2735	2937.	KW	GOOD	DGB WATTS
24-OCT-2000	23:00:42.22	A2735	3052.	KW	GOOD	DGB WATTS
24-OCT-2000	23:00:47.92	A2735	3080.	KW	GOOD	DGB WATTS
24-OCT-2000	23:00:48.92	A2735	3355.	KW	GOOD	DGB WATTS
24-OCT-2000	23:00:49.92	A2735	3566.	KW	GOOD	DGB WATTS
24-OCT-2000	23:00:51.92	A2735	3668.	KW	GOOD	DGB WATTS
24-OCT-2000	23:00:56.92	A2735	3521.	KW	GOOD	DGB WATTS
24-OCT-2000	23:01:03.92	A2735	3412.	KW	GOOD	DGB WATTS
24-OCT-2000	23:05:21.92	A2735	3540.	KW	GOOD	DGB WATTS
24-OCT-2000	23:07:48.92	A2735	3436.	KW	GOOD	DGB WATTS
24-OCT-2000	23:08:57.92	A2735	3319.	KW	GOOD	DGB WATTS
24-OCT-2000	23:09:00.92	A2735	3148.	KW	GOOD	DGB WATTS
24-OCT-2000	23:09:53.92	A2735	3030.	KW	GOOD	DGB WATTS
24-OCT-2000	23:09:54.92	A2735	2846.	KW	GOOD	DGB WATTS
24-OCT-2000	23:09:57.92	A2735	2507.	KW	GOOD	DGB WATTS
24-OCT-2000	23:10:31.92	A2735	2612.	KW	GOOD	DGB WATTS
24-OCT-2000	23:10:58.92	A2735	2304.	KW	GOOD	DGB WATTS
24-OCT-2000	23:10:59.92	A2735	2149.	KW	GOOD	DGB WATTS
24-OCT-2000	23:11:00.92	A2735	2005.	KW	GOOD	DGB WATTS
24-OCT-2000	23:13:09.92	A2735	1902.	KW	GOOD	DGB WATTS
24-OCT-2000	23:13:44.92	A2735	1692.	KW	GOOD	DGB WATTS
24-OCT-2000	23:13:46.92	A2735	1531.	KW	GOOD	DGB WATTS
24-OCT-2000	23:13:48.92	A2735	1343.	KW	GOOD	DGB WATTS
24-OCT-2000	23:14:48.92	A2735	1071.	KW	GOOD	DGB WATTS
24-OCT-2000	23:14:51.92	A2735	857.	KW	GOOD	DGB WATTS
24-OCT-2000	23:14:56.92	A2735	701.	KW	GOOD	DGB WATTS
24-OCT-2000	23:15:07.92	A2735	826.	KW	GOOD	DGB WATTS
24-OCT-2000	23:16:06.92	A2735	647.	KW	GOOD	DGB WATTS
24-OCT-2000	23:16:09.92	A2735	457.	KW	GOOD	DGB WATTS
24-OCT-2000	23:16:13.92	A2735	308.	KW	GOOD	DGB WATTS
24-OCT-2000	23:17:10.92	A2735	152.	KW	GOOD	DGB WATTS
24-OCT-2000	23:17:19.92	A2735	31.	KW	GOOD	DGB WATTS

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25-OCT-2000	00:00:42.22	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	01:00:42.22	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	02:00:42.22	A2735	1.	KW	GOOD	DGB WATTS
25-OCT-2000	03:00:42.22	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	04:00:42.22	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	05:00:42.22	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	06:00:42.22	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:02.92	A2735	658.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:05.92	A2735	521.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:07.92	A2735	1424.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:09.92	A2735	1318.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:12.92	A2735	1519.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:13.92	A2735	1270.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:15.92	A2735	1139.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:22.92	A2735	1577.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:23.92	A2735	1761.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:24.92	A2735	1873.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:26.92	A2735	1769.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:32.92	A2735	2447.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:33.92	A2735	2597.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:34.92	A2735	2357.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:37.92	A2735	2247.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:42.92	A2735	3124.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:43.92	A2735	3331.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:44.92	A2735	3103.	KW	GOOD	DGB WATTS
25-OCT-2000	06:14:45.92	A2735	2984.	KW	GOOD	DGB WATTS
25-OCT-2000	06:15:49.92	A2735	3187.	KW	GOOD	DGB WATTS
25-OCT-2000	06:24:28.92	A2735	3082.	KW	GOOD	DGB WATTS
25-OCT-2000	07:00:42.52	A2735	3068.	KW	GOOD	DGB WATTS
25-OCT-2000	08:00:42.52	A2735	3081.	KW	GOOD	DGB WATTS
25-OCT-2000	08:04:59.32	A2735	3356.	KW	GOOD	DGB WATTS
25-OCT-2000	08:05:00.32	A2735	3472.	KW	GOOD	DGB WATTS
25-OCT-2000	08:08:18.32	A2735	3585.	KW	GOOD	DGB WATTS
25-OCT-2000	08:08:19.32	A2735	3410.	KW	GOOD	DGB WATTS
25-OCT-2000	08:08:20.32	A2735	3217.	KW	GOOD	DGB WATTS
25-OCT-2000	08:08:36.32	A2735	3110.	KW	GOOD	DGB WATTS
25-OCT-2000	08:29:32.32	A2735	2616.	KW	GOOD	DGB WATTS
25-OCT-2000	08:29:33.32	A2735	2438.	KW	GOOD	DGB WATTS
25-OCT-2000	08:29:36.32	A2735	2326.	KW	GOOD	DGB WATTS
25-OCT-2000	08:46:26.32	A2735	2537.	KW	GOOD	DGB WATTS
25-OCT-2000	08:46:27.32	A2735	2978.	KW	GOOD	DGB WATTS
25-OCT-2000	08:46:28.32	A2735	2768.	KW	GOOD	DGB WATTS
25-OCT-2000	08:46:31.32	A2735	2661.	KW	GOOD	DGB WATTS
25-OCT-2000	08:47:14.32	A2735	3165.	KW	GOOD	DGB WATTS
25-OCT-2000	08:47:15.32	A2735	3576.	KW	GOOD	DGB WATTS
25-OCT-2000	08:47:16.32	A2735	3276.	KW	GOOD	DGB WATTS
25-OCT-2000	08:47:18.32	A2735	3150.	KW	GOOD	DGB WATTS
25-OCT-2000	08:55:34.32	A2735	3040.	KW	GOOD	DGB WATTS
25-OCT-2000	09:00:42.62	A2735	3052.	KW	GOOD	DGB WATTS
25-OCT-2000	09:03:52.32	A2735	3293.	KW	GOOD	DGB WATTS
25-OCT-2000	09:03:53.32	A2735	3542.	KW	GOOD	DGB WATTS
25-OCT-2000	09:03:56.32	A2735	3645.	KW	GOOD	DGB WATTS

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25-OCT-2000	09:04:07.32	A2735	3536.	KW	GOOD	DGB WATTS
25-OCT-2000	09:04:16.32	A2735	3435.	KW	GOOD	DGB WATTS
25-OCT-2000	09:08:44.32	A2735	3334.	KW	GOOD	DGB WATTS
25-OCT-2000	09:09:44.32	A2735	3196.	KW	GOOD	DGB WATTS
25-OCT-2000	09:11:17.32	A2735	3019.	KW	GOOD	DGB WATTS
25-OCT-2000	09:11:19.32	A2735	2891.	KW	GOOD	DGB WATTS
25-OCT-2000	09:11:51.32	A2735	2737.	KW	GOOD	DGB WATTS
25-OCT-2000	09:11:53.32	A2735	2606.	KW	GOOD	DGB WATTS
25-OCT-2000	09:12:16.32	A2735	2399.	KW	GOOD	DGB WATTS
25-OCT-2000	09:12:19.32	A2735	2223.	KW	GOOD	DGB WATTS
25-OCT-2000	09:12:49.32	A2735	2060.	KW	GOOD	DGB WATTS
25-OCT-2000	09:12:51.32	A2735	1939.	KW	GOOD	DGB WATTS
25-OCT-2000	09:13:21.32	A2735	1794.	KW	GOOD	DGB WATTS
25-OCT-2000	09:13:22.32	A2735	1670.	KW	GOOD	DGB WATTS
25-OCT-2000	09:13:25.32	A2735	1542.	KW	GOOD	DGB WATTS
25-OCT-2000	09:13:44.32	A2735	1439.	KW	GOOD	DGB WATTS
25-OCT-2000	09:13:46.32	A2735	1314.	KW	GOOD	DGB WATTS
25-OCT-2000	09:14:16.32	A2735	1202.	KW	GOOD	DGB WATTS
25-OCT-2000	09:14:18.32	A2735	1069.	KW	GOOD	DGB WATTS
25-OCT-2000	09:14:43.32	A2735	886.	KW	GOOD	DGB WATTS
25-OCT-2000	09:14:46.32	A2735	767.	KW	GOOD	DGB WATTS
25-OCT-2000	09:15:12.32	A2735	523.	KW	GOOD	DGB WATTS
25-OCT-2000	09:15:20.32	A2735	409.	KW	GOOD	DGB WATTS
25-OCT-2000	09:15:47.32	A2735	276.	KW	GOOD	DGB WATTS
25-OCT-2000	09:15:57.32	A2735	160.	KW	GOOD	DGB WATTS
25-OCT-2000	09:16:02.32	A2735	34.	KW	GOOD	DGB WATTS
25-OCT-2000	10:00:42.62	A2735	-2.	KW	GOOD	DGB WATTS
25-OCT-2000	11:00:42.62	A2735	-1.	KW	GOOD	DGB WATTS
25-OCT-2000	12:00:42.62	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	13:00:42.62	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	14:00:42.62	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	15:00:42.62	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	16:00:42.72	A2735	-3.	KW	GOOD	DGB WATTS
25-OCT-2000	17:00:42.72	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	18:00:42.72	A2735	-1.	KW	GOOD	DGB WATTS
25-OCT-2000	19:00:42.72	A2735	1.	KW	GOOD	DGB WATTS
25-OCT-2000	20:00:42.72	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	21:00:42.92	A2735	1.	KW	GOOD	DGB WATTS
25-OCT-2000	22:00:42.92	A2735	0.	KW	GOOD	DGB WATTS
25-OCT-2000	23:00:42.92	A2735	-1.	KW	GOOD	DGB WATTS
26-OCT-2000	00:00:42.92	A2735	-1.	KW	GOOD	DGB WATTS
26-OCT-2000	01:00:42.92	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	02:00:42.92	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	03:00:42.92	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	04:00:42.92	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	05:00:42.92	A2735	-3.	KW	GOOD	DGB WATTS
26-OCT-2000	06:00:42.92	A2735	-3.	KW	GOOD	DGB WATTS
26-OCT-2000	07:00:42.92	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	08:00:42.92	A2735	-3.	KW	GOOD	DGB WATTS
26-OCT-2000	09:00:44.02	A2735	2.	KW	GOOD	DGB WATTS
26-OCT-2000	10:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	11:00:44.02	A2735	0.	KW	GOOD	DGB WATTS

26-OCT-2000	12:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	13:00:44.02	A2735	1.	KW	GOOD	DGB WATTS
26-OCT-2000	14:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	15:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	16:00:44.02	A2735	-3.	KW	GOOD	DGB WATTS
26-OCT-2000	17:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	18:00:44.02	A2735	1.	KW	GOOD	DGB WATTS
26-OCT-2000	19:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	20:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	21:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	22:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
26-OCT-2000	23:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	00:00:44.02	A2735	-1.	KW	GOOD	DGB WATTS
27-OCT-2000	01:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	02:00:44.02	A2735	2.	KW	GOOD	DGB WATTS
27-OCT-2000	03:00:44.02	A2735	-1.	KW	GOOD	DGB WATTS
27-OCT-2000	04:00:44.02	A2735	-2.	KW	GOOD	DGB WATTS
27-OCT-2000	05:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	06:00:44.02	A2735	-1.	KW	GOOD	DGB WATTS
27-OCT-2000	07:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	08:00:44.02	A2735	-1.	KW	GOOD	DGB WATTS
27-OCT-2000	09:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	10:00:44.02	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	11:00:44.27	A2735	-2.	KW	GOOD	DGB WATTS
27-OCT-2000	12:00:44.27	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	13:00:44.27	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	14:00:44.37	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	15:00:44.37	A2735	-1.	KW	GOOD	DGB WATTS
27-OCT-2000	16:00:44.37	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	17:00:44.37	A2735	-1.	KW	GOOD	DGB WATTS
27-OCT-2000	18:00:44.37	A2735	-1.	KW	GOOD	DGB WATTS
27-OCT-2000	19:00:44.37	A2735	1.	KW	GOOD	DGB WATTS
27-OCT-2000	20:00:44.37	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	21:00:44.37	A2735	-2.	KW	GOOD	DGB WATTS
27-OCT-2000	22:00:44.37	A2735	0.	KW	GOOD	DGB WATTS
27-OCT-2000	23:00:44.37	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	00:00:44.37	A2735	-1.	KW	GOOD	DGB WATTS
28-OCT-2000	01:00:44.37	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	02:00:44.47	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	03:00:44.47	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	04:00:44.67	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	05:00:44.67	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	06:00:44.67	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	07:00:44.67	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	08:00:44.67	A2735	-2.	KW	GOOD	DGB WATTS
28-OCT-2000	09:00:44.67	A2735	1.	KW	GOOD	DGB WATTS
28-OCT-2000	10:00:44.67	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	11:00:44.67	A2735	-1.	KW	GOOD	DGB WATTS
28-OCT-2000	12:00:44.67	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	13:00:44.87	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	14:00:44.87	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	15:00:48.17	A2735	0.	KW	GOOD	DGB WATTS

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28-OCT-2000	16:00:48.17	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	17:00:48.17	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	18:00:48.17	A2735	-1.	KW	GOOD	DGB WATTS
28-OCT-2000	19:00:48.17	A2735	1.	KW	GOOD	DGB WATTS
28-OCT-2000	20:00:48.17	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	21:00:48.17	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	22:00:48.37	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	23:00:48.37	A2735	0.	KW	GOOD	DGB WATTS
28-OCT-2000	23:54:49.07	A2735	248.	KW	GOOD	DGB WATTS
28-OCT-2000	23:54:58.07	A2735	432.	KW	GOOD	DGB WATTS
28-OCT-2000	23:55:27.07	A2735	544.	KW	GOOD	DGB WATTS
28-OCT-2000	23:55:37.07	A2735	443.	KW	GOOD	DGB WATTS
28-OCT-2000	23:55:39.07	A2735	546.	KW	GOOD	DGB WATTS
28-OCT-2000	23:56:21.07	A2735	665.	KW	GOOD	DGB WATTS
28-OCT-2000	23:56:29.07	A2735	806.	KW	GOOD	DGB WATTS
28-OCT-2000	23:56:32.07	A2735	951.	KW	GOOD	DGB WATTS
28-OCT-2000	23:56:36.07	A2735	1086.	KW	GOOD	DGB WATTS
28-OCT-2000	23:56:40.07	A2735	1224.	KW	GOOD	DGB WATTS
28-OCT-2000	23:57:18.07	A2735	1331.	KW	GOOD	DGB WATTS
28-OCT-2000	23:57:25.07	A2735	1538.	KW	GOOD	DGB WATTS
28-OCT-2000	23:57:27.07	A2735	1732.	KW	GOOD	DGB WATTS
28-OCT-2000	23:57:31.07	A2735	1834.	KW	GOOD	DGB WATTS
28-OCT-2000	23:58:18.07	A2735	1986.	KW	GOOD	DGB WATTS
28-OCT-2000	23:58:20.07	A2735	2208.	KW	GOOD	DGB WATTS
28-OCT-2000	23:58:22.07	A2735	2310.	KW	GOOD	DGB WATTS
28-OCT-2000	23:58:24.07	A2735	2424.	KW	GOOD	DGB WATTS
28-OCT-2000	23:58:25.07	A2735	2529.	KW	GOOD	DGB WATTS
28-OCT-2000	23:59:16.07	A2735	2630.	KW	GOOD	DGB WATTS
28-OCT-2000	23:59:18.07	A2735	2760.	KW	GOOD	DGB WATTS
28-OCT-2000	23:59:20.07	A2735	2879.	KW	GOOD	DGB WATTS
28-OCT-2000	23:59:22.07	A2735	2981.	KW	GOOD	DGB WATTS
28-OCT-2000	23:59:56.07	A2735	3083.	KW	GOOD	DGB WATTS
29-OCT-2000	00:00:21.07	A2735	3242.	KW	GOOD	DGB WATTS
29-OCT-2000	00:00:23.07	A2735	3388.	KW	GOOD	DGB WATTS
29-OCT-2000	00:00:25.07	A2735	3502.	KW	GOOD	DGB WATTS
29-OCT-2000	00:00:26.07	A2735	3628.	KW	GOOD	DGB WATTS
29-OCT-2000	00:00:35.07	A2735	3731.	KW	GOOD	DGB WATTS
29-OCT-2000	00:00:48.37	A2735	3782.	KW	GOOD	DGB WATTS
29-OCT-2000	00:01:25.07	A2735	3877.	KW	GOOD	DGB WATTS
29-OCT-2000	00:01:27.07	A2735	3994.	KW	GOOD	DGB WATTS
29-OCT-2000	00:01:29.07	A2735	4095.	KW	GOOD	DGB WATTS
29-OCT-2000	00:01:30.07	A2735	4242.	KW	GOOD	DGB WATTS
29-OCT-2000	00:01:31.07	A2735	4360.	KW	GOOD	DGB WATTS
29-OCT-2000	00:02:32.07	A2735	4615.	KW	GOOD	DGB WATTS
29-OCT-2000	00:02:37.07	A2735	4848.	KW	GOOD	DGB WATTS
29-OCT-2000	00:03:27.07	A2735	4736.	KW	GOOD	DGB WATTS
29-OCT-2000	00:03:47.07	A2735	4897.	KW	GOOD	DGB WATTS
29-OCT-2000	00:04:19.07	A2735	5051.	KW	GOOD	DGB WATTS
29-OCT-2000	00:04:24.07	A2735	5209.	KW	GOOD	DGB WATTS
29-OCT-2000	00:04:30.07	A2735	5410.	KW	GOOD	DGB WATTS
29-OCT-2000	00:06:00.07	A2735	5764.	KW	GOOD	DGB WATTS
29-OCT-2000	00:06:08.07	A2735	5867.	KW	GOOD	DGB WATTS

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29-OCT-2000	00:06:16.07	A2735	5972.	KW	GOOD	DGB WATTS
29-OCT-2000	00:12:40.07	A2735	6131.	KW	GOOD	DGB WATTS
29-OCT-2000	00:13:58.07	A2735	6238.	KW	GOOD	DGB WATTS
29-OCT-2000	00:14:43.07	A2735	6103.	KW	GOOD	DGB WATTS
29-OCT-2000	00:19:00.07	A2735	6001.	KW	GOOD	DGB WATTS
29-OCT-2000	00:22:00.07	A2735	6129.	KW	GOOD	DGB WATTS
29-OCT-2000	00:23:10.07	A2735	6027.	KW	GOOD	DGB WATTS
29-OCT-2000	00:25:14.07	A2735	6129.	KW	GOOD	DGB WATTS
29-OCT-2000	00:42:52.07	A2735	6028.	KW	GOOD	DGB WATTS
29-OCT-2000	01:00:48.37	A2735	6042.	KW	GOOD	DGB WATTS
29-OCT-2000	01:45:24.07	A2735	6151.	KW	GOOD	DGB WATTS
29-OCT-2000	01:45:26.07	A2735	6303.	KW	GOOD	DGB WATTS
29-OCT-2000	01:45:28.07	A2735	6198.	KW	GOOD	DGB WATTS
29-OCT-2000	01:45:29.07	A2735	6079.	KW	GOOD	DGB WATTS
29-OCT-2000	01:45:41.07	A2735	6181.	KW	GOOD	DGB WATTS
29-OCT-2000	01:47:53.07	A2735	6029.	KW	GOOD	DGB WATTS
29-OCT-2000	01:47:54.07	A2735	5605.	KW	GOOD	DGB WATTS
29-OCT-2000	01:48:10.07	A2735	5491.	KW	GOOD	DGB WATTS
29-OCT-2000	01:48:50.07	A2735	5390.	KW	GOOD	DGB WATTS
29-OCT-2000	01:48:51.07	A2735	5210.	KW	GOOD	DGB WATTS
29-OCT-2000	01:48:57.07	A2735	5007.	KW	GOOD	DGB WATTS
29-OCT-2000	01:48:58.07	A2735	4818.	KW	GOOD	DGB WATTS
29-OCT-2000	01:49:45.07	A2735	4685.	KW	GOOD	DGB WATTS
29-OCT-2000	01:49:49.07	A2735	4573.	KW	GOOD	DGB WATTS
29-OCT-2000	01:49:51.07	A2735	4440.	KW	GOOD	DGB WATTS
29-OCT-2000	01:49:57.07	A2735	4303.	KW	GOOD	DGB WATTS
29-OCT-2000	01:50:50.07	A2735	4067.	KW	GOOD	DGB WATTS
29-OCT-2000	01:50:54.07	A2735	3917.	KW	GOOD	DGB WATTS
29-OCT-2000	01:50:57.07	A2735	3792.	KW	GOOD	DGB WATTS
29-OCT-2000	01:52:34.07	A2735	3677.	KW	GOOD	DGB WATTS
29-OCT-2000	01:52:36.07	A2735	3549.	KW	GOOD	DGB WATTS
29-OCT-2000	01:52:37.07	A2735	3444.	KW	GOOD	DGB WATTS
29-OCT-2000	01:52:40.07	A2735	3283.	KW	GOOD	DGB WATTS
29-OCT-2000	01:52:43.07	A2735	3104.	KW	GOOD	DGB WATTS
29-OCT-2000	01:52:51.07	A2735	3209.	KW	GOOD	DGB WATTS
29-OCT-2000	01:53:11.07	A2735	3045.	KW	GOOD	DGB WATTS
29-OCT-2000	01:53:13.07	A2735	2891.	KW	GOOD	DGB WATTS
29-OCT-2000	01:53:16.07	A2735	2721.	KW	GOOD	DGB WATTS
29-OCT-2000	01:53:20.07	A2735	2620.	KW	GOOD	DGB WATTS
29-OCT-2000	01:53:26.07	A2735	2468.	KW	GOOD	DGB WATTS
29-OCT-2000	01:53:35.07	A2735	2569.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:04.07	A2735	2410.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:07.07	A2735	2252.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:10.07	A2735	2093.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:14.07	A2735	1965.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:27.07	A2735	2083.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:34.07	A2735	1923.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:51.07	A2735	1822.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:55.07	A2735	1666.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:57.07	A2735	1565.	KW	GOOD	DGB WATTS
29-OCT-2000	01:54:59.07	A2735	1446.	KW	GOOD	DGB WATTS
29-OCT-2000	01:55:04.07	A2735	1330.	KW	GOOD	DGB WATTS

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29-OCT-2000	01:55:49.07	A2735	1192.	KW	GOOD	DGB WATTS
29-OCT-2000	01:55:52.07	A2735	1068.	KW	GOOD	DGB WATTS
29-OCT-2000	01:55:53.07	A2735	957.	KW	GOOD	DGB WATTS
29-OCT-2000	01:55:58.07	A2735	831.	KW	GOOD	DGB WATTS
29-OCT-2000	01:56:58.07	A2735	672.	KW	GOOD	DGB WATTS
29-OCT-2000	01:57:13.07	A2735	553.	KW	GOOD	DGB WATTS
29-OCT-2000	01:57:19.07	A2735	416.	KW	GOOD	DGB WATTS
29-OCT-2000	01:57:32.07	A2735	287.	KW	GOOD	DGB WATTS
29-OCT-2000	01:57:48.07	A2735	184.	KW	GOOD	DGB WATTS
29-OCT-2000	01:57:59.07	A2735	44.	KW	GOOD	DGB WATTS
29-OCT-2000	01:00:48.37	A2735	0.	KW	GOOD	DGB WATTS
29-OCT-2000	02:00:48.37	A2735	2.	KW	GOOD	DGB WATTS
29-OCT-2000	03:00:48.37	A2735	0.	KW	GOOD	DGB WATTS
29-OCT-2000	04:00:48.37	A2735	0.	KW	GOOD	DGB WATTS
29-OCT-2000	04:40:25.07	A2735	334.	KW	GOOD	DGB WATTS
29-OCT-2000	04:40:27.07	A2735	472.	KW	GOOD	DGB WATTS
29-OCT-2000	04:40:31.07	A2735	595.	KW	GOOD	DGB WATTS
29-OCT-2000	04:40:33.07	A2735	918.	KW	GOOD	DGB WATTS
29-OCT-2000	04:40:57.07	A2735	780.	KW	GOOD	DGB WATTS
29-OCT-2000	04:40:58.07	A2735	659.	KW	GOOD	DGB WATTS
29-OCT-2000	04:41:33.07	A2735	795.	KW	GOOD	DGB WATTS
29-OCT-2000	04:41:34.07	A2735	927.	KW	GOOD	DGB WATTS
29-OCT-2000	04:41:36.07	A2735	1042.	KW	GOOD	DGB WATTS
29-OCT-2000	04:41:38.07	A2735	1226.	KW	GOOD	DGB WATTS
29-OCT-2000	04:42:32.07	A2735	1352.	KW	GOOD	DGB WATTS
29-OCT-2000	04:42:34.07	A2735	1559.	KW	GOOD	DGB WATTS
29-OCT-2000	04:42:36.07	A2735	1694.	KW	GOOD	DGB WATTS
29-OCT-2000	04:42:48.07	A2735	1802.	KW	GOOD	DGB WATTS
29-OCT-2000	04:42:55.07	A2735	1904.	KW	GOOD	DGB WATTS
29-OCT-2000	04:43:18.07	A2735	2072.	KW	GOOD	DGB WATTS
29-OCT-2000	04:43:20.07	A2735	2217.	KW	GOOD	DGB WATTS
29-OCT-2000	04:43:21.07	A2735	2353.	KW	GOOD	DGB WATTS
29-OCT-2000	04:43:23.07	A2735	2488.	KW	GOOD	DGB WATTS
29-OCT-2000	04:44:08.07	A2735	2610.	KW	GOOD	DGB WATTS
29-OCT-2000	04:44:11.07	A2735	2712.	KW	GOOD	DGB WATTS
29-OCT-2000	04:44:13.07	A2735	2832.	KW	GOOD	DGB WATTS
29-OCT-2000	04:44:22.07	A2735	2978.	KW	GOOD	DGB WATTS
29-OCT-2000	04:44:24.07	A2735	3097.	KW	GOOD	DGB WATTS
29-OCT-2000	04:45:05.07	A2735	3251.	KW	GOOD	DGB WATTS
29-OCT-2000	04:45:08.07	A2735	3553.	KW	GOOD	DGB WATTS
29-OCT-2000	04:45:12.07	A2735	3720.	KW	GOOD	DGB WATTS
29-OCT-2000	04:46:13.07	A2735	3904.	KW	GOOD	DGB WATTS
29-OCT-2000	04:46:15.07	A2735	4033.	KW	GOOD	DGB WATTS
29-OCT-2000	04:46:17.07	A2735	4221.	KW	GOOD	DGB WATTS
29-OCT-2000	04:47:10.07	A2735	4410.	KW	GOOD	DGB WATTS
29-OCT-2000	04:47:13.07	A2735	4576.	KW	GOOD	DGB WATTS
29-OCT-2000	04:47:14.07	A2735	4737.	KW	GOOD	DGB WATTS
29-OCT-2000	04:48:27.07	A2735	4879.	KW	GOOD	DGB WATTS
29-OCT-2000	04:48:30.07	A2735	5027.	KW	GOOD	DGB WATTS
29-OCT-2000	04:48:32.07	A2735	5209.	KW	GOOD	DGB WATTS
29-OCT-2000	04:48:35.07	A2735	5329.	KW	GOOD	DGB WATTS
29-OCT-2000	04:50:45.07	A2735	5470.	KW	GOOD	DGB WATTS

29-OCT-2000	04:50:46.07	A2735	5640.	KW	GOOD	DGB WATTS
29-OCT-2000	04:50:47.07	A2735	5748.	KW	GOOD	DGB WATTS
29-OCT-2000	04:50:49.07	A2735	5960.	KW	GOOD	DGB WATTS
29-OCT-2000	04:50:50.07	A2735	6240.	KW	GOOD	DGB WATTS
29-OCT-2000	04:52:46.07	A2735	6103.	KW	GOOD	DGB WATTS
29-OCT-2000	05:00:48.37	A2735	6168.	KW	GOOD	DGB WATTS
29-OCT-2000	05:08:39.07	A2735	5999.	KW	GOOD	DGB WATTS
29-OCT-2000	05:18:47.07	A2735	6103.	KW	GOOD	DGB WATTS
29-OCT-2000	05:21:50.07	A2735	5991.	KW	GOOD	DGB WATTS
29-OCT-2000	05:25:21.07	A2735	6095.	KW	GOOD	DGB WATTS
29-OCT-2000	05:28:17.07	A2735	5994.	KW	GOOD	DGB WATTS
29-OCT-2000	05:54:40.07	A2735	6137.	KW	GOOD	DGB WATTS
29-OCT-2000	05:54:49.07	A2735	6275.	KW	GOOD	DGB WATTS
29-OCT-2000	05:54:56.07	A2735	6378.	KW	GOOD	DGB WATTS
29-OCT-2000	05:55:45.07	A2735	6525.	KW	GOOD	DGB WATTS
29-OCT-2000	06:00:48.37	A2735	6572.	KW	GOOD	DGB WATTS
29-OCT-2000	06:04:01.07	A2735	6632.	KW	GOOD	DGB WATTS
29-OCT-2000	06:16:31.07	A2735	6524.	KW	GOOD	DGB WATTS
29-OCT-2000	06:21:03.07	A2735	6624.	KW	GOOD	DGB WATTS
29-OCT-2000	06:40:54.07	A2735	6511.	KW	GOOD	DGB WATTS
29-OCT-2000	07:00:09.07	A2735	6676.	KW	GOOD	DGB WATTS
29-OCT-2000	07:00:11.07	A2735	6796.	KW	GOOD	DGB WATTS
29-OCT-2000	07:00:21.07	A2735	6681.	KW	GOOD	DGB WATTS
29-OCT-2000	07:00:48.37	A2735	6616.	KW	GOOD	DGB WATTS
29-OCT-2000	07:03:17.07	A2735	6579.	KW	GOOD	DGB WATTS
29-OCT-2000	07:10:47.07	A2735	6475.	KW	GOOD	DGB WATTS
29-OCT-2000	07:22:03.07	A2735	6371.	KW	GOOD	DGB WATTS
29-OCT-2000	07:24:15.27	A2735	6479.	KW	GOOD	DGB WATTS
29-OCT-2000	07:26:20.27	A2735	6367.	KW	GOOD	DGB WATTS
29-OCT-2000	07:28:57.27	A2735	6469.	KW	GOOD	DGB WATTS
29-OCT-2000	07:41:38.27	A2735	6367.	KW	GOOD	DGB WATTS
29-OCT-2000	07:44:12.27	A2735	6476.	KW	GOOD	DGB WATTS
29-OCT-2000	07:48:41.27	A2735	6375.	KW	GOOD	DGB WATTS
29-OCT-2000	07:49:30.27	A2735	6505.	KW	GOOD	DGB WATTS
29-OCT-2000	07:52:15.27	A2735	6607.	KW	GOOD	DGB WATTS
29-OCT-2000	07:53:02.27	A2735	6503.	KW	GOOD	DGB WATTS
29-OCT-2000	08:00:48.57	A2735	6509.	KW	GOOD	DGB WATTS
29-OCT-2000	08:03:21.27	A2735	6399.	KW	GOOD	DGB WATTS
29-OCT-2000	08:05:14.27	A2735	6500.	KW	GOOD	DGB WATTS
29-OCT-2000	08:07:39.27	A2735	6617.	KW	GOOD	DGB WATTS
29-OCT-2000	08:07:46.27	A2735	6489.	KW	GOOD	DGB WATTS
29-OCT-2000	08:07:50.27	A2735	6354.	KW	GOOD	DGB WATTS
29-OCT-2000	08:08:56.47	A2735	6218.	KW	GOOD	DGB WATTS
29-OCT-2000	08:08:59.47	A2735	6117.	KW	GOOD	DGB WATTS
29-OCT-2000	08:09:03.47	A2735	5982.	KW	GOOD	DGB WATTS
29-OCT-2000	08:16:30.47	A2735	5880.	KW	GOOD	DGB WATTS
29-OCT-2000	08:31:39.47	A2735	5982.	KW	GOOD	DGB WATTS
29-OCT-2000	08:33:30.47	A2735	5873.	KW	GOOD	DGB WATTS
29-OCT-2000	09:00:48.77	A2735	5928.	KW	GOOD	DGB WATTS
29-OCT-2000	09:15:02.47	A2735	5767.	KW	GOOD	DGB WATTS
29-OCT-2000	09:16:21.47	A2735	5872.	KW	GOOD	DGB WATTS
29-OCT-2000	09:22:12.47	A2735	5771.	KW	GOOD	DGB WATTS

29-OCT-2000	09:28:05.47	A2735	5871.	KW	GOOD	DGB WATTS
29-OCT-2000	09:31:45.47	A2735	5763.	KW	GOOD	DGB WATTS
29-OCT-2000	09:51:25.47	A2735	5865.	KW	GOOD	DGB WATTS
29-OCT-2000	10:00:31.47	A2735	5758.	KW	GOOD	DGB WATTS
29-OCT-2000	10:00:48.77	A2735	5790.	KW	GOOD	DGB WATTS
29-OCT-2000	10:14:25.47	A2735	5653.	KW	GOOD	DGB WATTS
29-OCT-2000	10:18:13.47	A2735	5755.	KW	GOOD	DGB WATTS
29-OCT-2000	10:24:24.47	A2735	5886.	KW	GOOD	DGB WATTS
29-OCT-2000	10:29:17.47	A2735	5990.	KW	GOOD	DGB WATTS
29-OCT-2000	10:38:07.47	A2735	5880.	KW	GOOD	DGB WATTS
29-OCT-2000	10:39:47.47	A2735	5991.	KW	GOOD	DGB WATTS
29-OCT-2000	10:51:03.47	A2735	5889.	KW	GOOD	DGB WATTS
29-OCT-2000	10:52:27.47	A2735	5992.	KW	GOOD	DGB WATTS
29-OCT-2000	11:00:48.77	A2735	5989.	KW	GOOD	DGB WATTS
29-OCT-2000	11:06:42.47	A2735	5877.	KW	GOOD	DGB WATTS
29-OCT-2000	11:11:39.47	A2735	5978.	KW	GOOD	DGB WATTS
29-OCT-2000	11:13:46.47	A2735	5870.	KW	GOOD	DGB WATTS
29-OCT-2000	11:30:34.47	A2735	5979.	KW	GOOD	DGB WATTS
29-OCT-2000	11:46:55.47	A2735	5878.	KW	GOOD	DGB WATTS
29-OCT-2000	11:51:44.47	A2735	5750.	KW	GOOD	DGB WATTS
29-OCT-2000	11:52:07.47	A2735	5631.	KW	GOOD	DGB WATTS
29-OCT-2000	11:52:09.47	A2735	5486.	KW	GOOD	DGB WATTS
29-OCT-2000	11:52:50.47	A2735	5268.	KW	GOOD	DGB WATTS
29-OCT-2000	11:52:54.47	A2735	5130.	KW	GOOD	DGB WATTS
29-OCT-2000	11:53:35.47	A2735	4986.	KW	GOOD	DGB WATTS
29-OCT-2000	11:54:11.47	A2735	4834.	KW	GOOD	DGB WATTS
29-OCT-2000	11:54:14.47	A2735	4628.	KW	GOOD	DGB WATTS
29-OCT-2000	11:54:16.47	A2735	4509.	KW	GOOD	DGB WATTS
29-OCT-2000	11:55:01.47	A2735	4397.	KW	GOOD	DGB WATTS
29-OCT-2000	11:55:04.47	A2735	4286.	KW	GOOD	DGB WATTS
29-OCT-2000	11:55:15.47	A2735	4155.	KW	GOOD	DGB WATTS
29-OCT-2000	11:55:38.47	A2735	4029.	KW	GOOD	DGB WATTS
29-OCT-2000	11:56:11.47	A2735	3877.	KW	GOOD	DGB WATTS
29-OCT-2000	11:56:15.47	A2735	3761.	KW	GOOD	DGB WATTS
29-OCT-2000	11:56:44.47	A2735	3654.	KW	GOOD	DGB WATTS
29-OCT-2000	11:56:47.47	A2735	3518.	KW	GOOD	DGB WATTS
29-OCT-2000	11:56:51.47	A2735	3400.	KW	GOOD	DGB WATTS
29-OCT-2000	11:57:27.47	A2735	3290.	KW	GOOD	DGB WATTS
29-OCT-2000	11:57:29.47	A2735	3184.	KW	GOOD	DGB WATTS
29-OCT-2000	11:57:35.47	A2735	3082.	KW	GOOD	DGB WATTS
29-OCT-2000	11:58:20.47	A2735	2918.	KW	GOOD	DGB WATTS
29-OCT-2000	11:58:25.47	A2735	2807.	KW	GOOD	DGB WATTS
29-OCT-2000	11:59:10.47	A2735	2697.	KW	GOOD	DGB WATTS
29-OCT-2000	11:59:14.47	A2735	2588.	KW	GOOD	DGB WATTS
29-OCT-2000	12:00:07.47	A2735	2431.	KW	GOOD	DGB WATTS
29-OCT-2000	12:00:11.47	A2735	2326.	KW	GOOD	DGB WATTS
29-OCT-2000	12:00:48.77	A2735	2289.	KW	GOOD	DGB WATTS
29-OCT-2000	12:01:04.47	A2735	2182.	KW	GOOD	DGB WATTS
29-OCT-2000	12:01:08.47	A2735	2037.	KW	GOOD	DGB WATTS
29-OCT-2000	12:01:28.47	A2735	1919.	KW	GOOD	DGB WATTS
29-OCT-2000	12:02:13.47	A2735	1800.	KW	GOOD	DGB WATTS
29-OCT-2000	12:02:17.47	A2735	1693.	KW	GOOD	DGB WATTS

29-OCT-2000	12:02:18.47	A2735	1588.	KW	GOOD	DGB WATTS
29-OCT-2000	12:03:24.47	A2735	1480.	KW	GOOD	DGB WATTS
29-OCT-2000	12:03:27.47	A2735	1344.	KW	GOOD	DGB WATTS
29-OCT-2000	12:04:03.47	A2735	1223.	KW	GOOD	DGB WATTS
29-OCT-2000	12:04:05.47	A2735	1120.	KW	GOOD	DGB WATTS
29-OCT-2000	12:04:07.47	A2735	1017.	KW	GOOD	DGB WATTS
29-OCT-2000	12:05:00.47	A2735	916.	KW	GOOD	DGB WATTS
29-OCT-2000	12:05:02.47	A2735	788.	KW	GOOD	DGB WATTS
29-OCT-2000	12:05:47.47	A2735	665.	KW	GOOD	DGB WATTS
29-OCT-2000	12:05:52.47	A2735	505.	KW	GOOD	DGB WATTS
29-OCT-2000	12:05:59.47	A2735	378.	KW	GOOD	DGB WATTS
29-OCT-2000	12:06:34.47	A2735	233.	KW	GOOD	DGB WATTS
29-OCT-2000	12:06:49.47	A2735	78.	KW	GOOD	DGB WATTS
29-OCT-2000	13:00:48.77	A2735	-1.	KW	GOOD	DGB WATTS
29-OCT-2000	14:00:49.47	A2735	-1.	KW	GOOD	DGB WATTS
29-OCT-2000	15:00:49.47	A2735	-1.	KW	GOOD	DGB WATTS
29-OCT-2000	16:00:49.57	A2735	2.	KW	GOOD	DGB WATTS
29-OCT-2000	17:00:49.57	A2735	0.	KW	GOOD	DGB WATTS
29-OCT-2000	18:00:49.57	A2735	-1.	KW	GOOD	DGB WATTS
29-OCT-2000	18:11:27.27	A2735	278.	KW	GOOD	DGB WATTS
29-OCT-2000	18:12:41.27	A2735	452.	KW	GOOD	DGB WATTS
29-OCT-2000	18:12:44.27	A2735	614.	KW	GOOD	DGB WATTS
29-OCT-2000	18:13:06.27	A2735	786.	KW	GOOD	DGB WATTS
29-OCT-2000	18:13:09.27	A2735	938.	KW	GOOD	DGB WATTS
29-OCT-2000	18:13:35.27	A2735	1047.	KW	GOOD	DGB WATTS
29-OCT-2000	18:13:37.27	A2735	1204.	KW	GOOD	DGB WATTS
29-OCT-2000	18:13:42.27	A2735	1360.	KW	GOOD	DGB WATTS
29-OCT-2000	18:14:13.27	A2735	1475.	KW	GOOD	DGB WATTS
29-OCT-2000	18:14:41.27	A2735	1620.	KW	GOOD	DGB WATTS
29-OCT-2000	18:14:44.27	A2735	1786.	KW	GOOD	DGB WATTS
29-OCT-2000	18:15:09.27	A2735	1888.	KW	GOOD	DGB WATTS
29-OCT-2000	18:15:12.27	A2735	2045.	KW	GOOD	DGB WATTS
29-OCT-2000	18:15:15.27	A2735	2194.	KW	GOOD	DGB WATTS
29-OCT-2000	18:15:37.27	A2735	2356.	KW	GOOD	DGB WATTS
29-OCT-2000	18:15:40.27	A2735	2517.	KW	GOOD	DGB WATTS
29-OCT-2000	18:16:12.27	A2735	2685.	KW	GOOD	DGB WATTS
29-OCT-2000	18:16:15.27	A2735	2815.	KW	GOOD	DGB WATTS
29-OCT-2000	18:16:43.27	A2735	2938.	KW	GOOD	DGB WATTS
29-OCT-2000	18:16:46.27	A2735	3074.	KW	GOOD	DGB WATTS
29-OCT-2000	18:19:54.27	A2735	3175.	KW	GOOD	DGB WATTS
29-OCT-2000	18:24:04.27	A2735	3285.	KW	GOOD	DGB WATTS
29-OCT-2000	18:24:07.27	A2735	3399.	KW	GOOD	DGB WATTS
29-OCT-2000	18:24:48.27	A2735	3553.	KW	GOOD	DGB WATTS
29-OCT-2000	18:24:50.27	A2735	3683.	KW	GOOD	DGB WATTS
29-OCT-2000	18:25:35.27	A2735	3786.	KW	GOOD	DGB WATTS
29-OCT-2000	18:25:37.27	A2735	3907.	KW	GOOD	DGB WATTS
29-OCT-2000	18:25:40.27	A2735	4019.	KW	GOOD	DGB WATTS
29-OCT-2000	18:26:44.27	A2735	4139.	KW	GOOD	DGB WATTS
29-OCT-2000	18:26:46.27	A2735	4244.	KW	GOOD	DGB WATTS
29-OCT-2000	18:27:37.27	A2735	4390.	KW	GOOD	DGB WATTS
29-OCT-2000	18:27:41.27	A2735	4558.	KW	GOOD	DGB WATTS
29-OCT-2000	18:28:17.27	A2735	4666.	KW	GOOD	DGB WATTS

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29-OCT-2000	18:28:18.27	A2735	4806.	KW	GOOD	DGB WATTS
29-OCT-2000	18:28:21.27	A2735	4941.	KW	GOOD	DGB WATTS
29-OCT-2000	18:28:52.27	A2735	5076.	KW	GOOD	DGB WATTS
29-OCT-2000	18:29:32.27	A2735	5233.	KW	GOOD	DGB WATTS
29-OCT-2000	18:29:34.27	A2735	5352.	KW	GOOD	DGB WATTS
29-OCT-2000	18:30:25.27	A2735	5511.	KW	GOOD	DGB WATTS
29-OCT-2000	18:30:28.27	A2735	5678.	KW	GOOD	DGB WATTS
29-OCT-2000	18:30:31.27	A2735	5783.	KW	GOOD	DGB WATTS
29-OCT-2000	18:31:00.27	A2735	5938.	KW	GOOD	DGB WATTS
29-OCT-2000	18:34:19.27	A2735	6057.	KW	GOOD	DGB WATTS
29-OCT-2000	18:39:40.27	A2735	5955.	KW	GOOD	DGB WATTS
29-OCT-2000	18:43:48.27	A2735	6057.	KW	GOOD	DGB WATTS
29-OCT-2000	18:47:47.27	A2735	5954.	KW	GOOD	DGB WATTS
29-OCT-2000	18:59:37.27	A2735	5851.	KW	GOOD	DGB WATTS
29-OCT-2000	19:00:49.57	A2735	5863.	KW	GOOD	DGB WATTS
29-OCT-2000	19:02:21.27	A2735	5953.	KW	GOOD	DGB WATTS
29-OCT-2000	19:04:03.27	A2735	5852.	KW	GOOD	DGB WATTS
29-OCT-2000	19:07:06.27	A2735	5962.	KW	GOOD	DGB WATTS
29-OCT-2000	19:10:00.27	A2735	5861.	KW	GOOD	DGB WATTS
29-OCT-2000	19:14:22.27	A2735	5964.	KW	GOOD	DGB WATTS
29-OCT-2000	19:17:58.27	A2735	5863.	KW	GOOD	DGB WATTS
29-OCT-2000	19:33:11.27	A2735	6094.	KW	GOOD	DGB WATTS
29-OCT-2000	19:33:21.27	A2735	6254.	KW	GOOD	DGB WATTS
29-OCT-2000	19:33:26.27	A2735	6374.	KW	GOOD	DGB WATTS
29-OCT-2000	19:33:50.27	A2735	6502.	KW	GOOD	DGB WATTS
29-OCT-2000	19:42:06.27	A2735	6605.	KW	GOOD	DGB WATTS
29-OCT-2000	19:45:01.27	A2735	6496.	KW	GOOD	DGB WATTS
29-OCT-2000	19:55:51.27	A2735	6598.	KW	GOOD	DGB WATTS
29-OCT-2000	20:00:44.27	A2735	6707.	KW	GOOD	DGB WATTS
29-OCT-2000	20:00:49.57	A2735	6714.	KW	GOOD	DGB WATTS
29-OCT-2000	20:03:45.27	A2735	6570.	KW	GOOD	DGB WATTS
29-OCT-2000	20:07:01.27	A2735	6465.	KW	GOOD	DGB WATTS
29-OCT-2000	20:12:15.27	A2735	6570.	KW	GOOD	DGB WATTS
29-OCT-2000	20:14:30.27	A2735	6462.	KW	GOOD	DGB WATTS
29-OCT-2000	20:17:58.27	A2735	6563.	KW	GOOD	DGB WATTS
29-OCT-2000	20:25:26.27	A2735	6463.	KW	GOOD	DGB WATTS
29-OCT-2000	20:30:00.27	A2735	6574.	KW	GOOD	DGB WATTS
29-OCT-2000	20:36:14.27	A2735	6469.	KW	GOOD	DGB WATTS
29-OCT-2000	20:57:19.27	A2735	6579.	KW	GOOD	DGB WATTS
29-OCT-2000	20:58:18.27	A2735	6680.	KW	GOOD	DGB WATTS
29-OCT-2000	21:00:22.27	A2735	6575.	KW	GOOD	DGB WATTS
29-OCT-2000	21:00:49.57	A2735	6596.	KW	GOOD	DGB WATTS
29-OCT-2000	21:02:14.27	A2735	6469.	KW	GOOD	DGB WATTS
29-OCT-2000	21:05:23.27	A2735	6570.	KW	GOOD	DGB WATTS
29-OCT-2000	21:14:42.27	A2735	6469.	KW	GOOD	DGB WATTS
29-OCT-2000	21:22:23.27	A2735	6581.	KW	GOOD	DGB WATTS
29-OCT-2000	21:25:09.27	A2735	6479.	KW	GOOD	DGB WATTS
29-OCT-2000	21:26:41.27	A2735	6590.	KW	GOOD	DGB WATTS
29-OCT-2000	21:32:57.27	A2735	6487.	KW	GOOD	DGB WATTS
29-OCT-2000	21:37:53.27	A2735	6277.	KW	GOOD	DGB WATTS
29-OCT-2000	21:37:54.27	A2735	6155.	KW	GOOD	DGB WATTS
29-OCT-2000	21:38:01.27	A2735	6027.	KW	GOOD	DGB WATTS

29-OCT-2000	21:42:34.27	A2735	5924.	KW	GOOD	DGB WATTS
29-OCT-2000	21:51:19.27	A2735	5822.	KW	GOOD	DGB WATTS
29-OCT-2000	21:52:35.27	A2735	5930.	KW	GOOD	DGB WATTS
29-OCT-2000	21:55:45.27	A2735	5828.	KW	GOOD	DGB WATTS
29-OCT-2000	21:57:30.27	A2735	5929.	KW	GOOD	DGB WATTS
29-OCT-2000	21:58:56.27	A2735	6033.	KW	GOOD	DGB WATTS
29-OCT-2000	22:00:14.27	A2735	5921.	KW	GOOD	DGB WATTS
29-OCT-2000	22:00:49.57	A2735	5943.	KW	GOOD	DGB WATTS
29-OCT-2000	22:04:26.27	A2735	6029.	KW	GOOD	DGB WATTS
29-OCT-2000	22:11:56.27	A2735	5924.	KW	GOOD	DGB WATTS
29-OCT-2000	22:31:48.27	A2735	6026.	KW	GOOD	DGB WATTS
29-OCT-2000	22:35:30.27	A2735	5914.	KW	GOOD	DGB WATTS
29-OCT-2000	22:38:20.27	A2735	6022.	KW	GOOD	DGB WATTS
29-OCT-2000	22:41:30.27	A2735	5908.	KW	GOOD	DGB WATTS
29-OCT-2000	22:56:46.27	A2735	6012.	KW	GOOD	DGB WATTS
29-OCT-2000	23:00:49.57	A2735	6104.	KW	GOOD	DGB WATTS
29-OCT-2000	23:00:50.27	A2735	6117.	KW	GOOD	DGB WATTS
29-OCT-2000	23:08:07.27	A2735	6008.	KW	GOOD	DGB WATTS
29-OCT-2000	23:24:39.27	A2735	6118.	KW	GOOD	DGB WATTS
29-OCT-2000	23:25:44.27	A2735	5984.	KW	GOOD	DGB WATTS
29-OCT-2000	23:35:21.27	A2735	5879.	KW	GOOD	DGB WATTS
29-OCT-2000	23:41:50.27	A2735	5982.	KW	GOOD	DGB WATTS
29-OCT-2000	23:46:26.27	A2735	5875.	KW	GOOD	DGB WATTS
29-OCT-2000	23:50:00.27	A2735	5980.	KW	GOOD	DGB WATTS
29-OCT-2000	23:59:08.27	A2735	5823.	KW	GOOD	DGB WATTS
29-OCT-2000	23:59:12.27	A2735	5699.	KW	GOOD	DGB WATTS
29-OCT-2000	23:59:13.27	A2735	5566.	KW	GOOD	DGB WATTS
29-OCT-2000	23:59:34.27	A2735	5462.	KW	GOOD	DGB WATTS
30-OCT-2000	00:00:04.27	A2735	5601.	KW	GOOD	DGB WATTS
30-OCT-2000	00:00:12.27	A2735	5725.	KW	GOOD	DGB WATTS
30-OCT-2000	00:00:22.27	A2735	5552.	KW	GOOD	DGB WATTS
30-OCT-2000	00:00:41.27	A2735	5448.	KW	GOOD	DGB WATTS
30-OCT-2000	00:00:49.57	A2735	5441.	KW	GOOD	DGB WATTS
30-OCT-2000	00:00:56.27	A2735	5303.	KW	GOOD	DGB WATTS
30-OCT-2000	00:01:00.27	A2735	5168.	KW	GOOD	DGB WATTS
30-OCT-2000	00:01:02.27	A2735	5046.	KW	GOOD	DGB WATTS
30-OCT-2000	00:01:05.27	A2735	4943.	KW	GOOD	DGB WATTS
30-OCT-2000	00:01:22.27	A2735	4820.	KW	GOOD	DGB WATTS
30-OCT-2000	00:01:25.27	A2735	4694.	KW	GOOD	DGB WATTS
30-OCT-2000	00:01:29.27	A2735	4456.	KW	GOOD	DGB WATTS
30-OCT-2000	00:01:33.27	A2735	4353.	KW	GOOD	DGB WATTS
30-OCT-2000	00:02:10.27	A2735	4251.	KW	GOOD	DGB WATTS
30-OCT-2000	00:02:13.27	A2735	4125.	KW	GOOD	DGB WATTS
30-OCT-2000	00:02:15.27	A2735	4017.	KW	GOOD	DGB WATTS
30-OCT-2000	00:02:17.27	A2735	3777.	KW	GOOD	DGB WATTS
30-OCT-2000	00:03:01.27	A2735	3667.	KW	GOOD	DGB WATTS
30-OCT-2000	00:03:38.27	A2735	3553.	KW	GOOD	DGB WATTS
30-OCT-2000	00:03:39.27	A2735	3445.	KW	GOOD	DGB WATTS
30-OCT-2000	00:03:41.27	A2735	3343.	KW	GOOD	DGB WATTS
30-OCT-2000	00:03:44.27	A2735	3189.	KW	GOOD	DGB WATTS
30-OCT-2000	00:04:11.27	A2735	3047.	KW	GOOD	DGB WATTS
30-OCT-2000	00:04:22.27	A2735	2874.	KW	GOOD	DGB WATTS

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30-OCT-2000	00:04:26.27	A2735	2710.	KW	GOOD	DGB WATTS
30-OCT-2000	00:05:03.27	A2735	2814.	KW	GOOD	DGB WATTS
30-OCT-2000	00:05:16.27	A2735	2709.	KW	GOOD	DGB WATTS
30-OCT-2000	00:05:20.27	A2735	2598.	KW	GOOD	DGB WATTS
30-OCT-2000	00:05:36.27	A2735	2490.	KW	GOOD	DGB WATTS
30-OCT-2000	00:05:41.27	A2735	2354.	KW	GOOD	DGB WATTS
30-OCT-2000	00:05:44.27	A2735	2222.	KW	GOOD	DGB WATTS
30-OCT-2000	00:05:46.27	A2735	2107.	KW	GOOD	DGB WATTS
30-OCT-2000	00:05:49.27	A2735	1991.	KW	GOOD	DGB WATTS
30-OCT-2000	00:06:14.27	A2735	1869.	KW	GOOD	DGB WATTS
30-OCT-2000	00:06:32.27	A2735	1760.	KW	GOOD	DGB WATTS
30-OCT-2000	00:06:33.27	A2735	1606.	KW	GOOD	DGB WATTS
30-OCT-2000	00:06:36.27	A2735	1475.	KW	GOOD	DGB WATTS
30-OCT-2000	00:06:39.27	A2735	1368.	KW	GOOD	DGB WATTS
30-OCT-2000	00:06:56.27	A2735	1260.	KW	GOOD	DGB WATTS
30-OCT-2000	00:07:16.27	A2735	1151.	KW	GOOD	DGB WATTS
30-OCT-2000	00:07:20.27	A2735	954.	KW	GOOD	DGB WATTS
30-OCT-2000	00:07:21.27	A2735	822.	KW	GOOD	DGB WATTS
30-OCT-2000	00:07:33.27	A2735	689.	KW	GOOD	DGB WATTS
30-OCT-2000	00:07:56.27	A2735	584.	KW	GOOD	DGB WATTS
30-OCT-2000	00:08:00.27	A2735	447.	KW	GOOD	DGB WATTS
30-OCT-2000	00:08:22.27	A2735	288.	KW	GOOD	DGB WATTS
30-OCT-2000	00:09:15.27	A2735	177.	KW	GOOD	DGB WATTS
30-OCT-2000	00:09:29.27	A2735	47.	KW	GOOD	DGB WATTS
30-OCT-2000	01:00:49.57	A2735	0.	KW	GOOD	DGB WATTS
30-OCT-2000	02:00:49.57	A2735	0.	KW	GOOD	DGB WATTS
30-OCT-2000	03:00:49.57	A2735	1.	KW	GOOD	DGB WATTS
30-OCT-2000	04:00:49.57	A2735	0.	KW	GOOD	DGB WATTS
30-OCT-2000	05:00:49.97	A2735	0.	KW	GOOD	DGB WATTS
30-OCT-2000	05:12:53.67	A2735	202.	KW	GOOD	DGB WATTS
30-OCT-2000	05:13:03.67	A2735	478.	KW	GOOD	DGB WATTS
30-OCT-2000	05:13:36.67	A2735	597.	KW	GOOD	DGB WATTS
30-OCT-2000	05:13:45.67	A2735	488.	KW	GOOD	DGB WATTS
30-OCT-2000	05:13:48.67	A2735	667.	KW	GOOD	DGB WATTS
30-OCT-2000	05:14:45.67	A2735	821.	KW	GOOD	DGB WATTS
30-OCT-2000	05:14:46.67	A2735	984.	KW	GOOD	DGB WATTS
30-OCT-2000	05:14:48.67	A2735	1148.	KW	GOOD	DGB WATTS
30-OCT-2000	05:16:01.67	A2735	1278.	KW	GOOD	DGB WATTS
30-OCT-2000	05:16:04.67	A2735	1531.	KW	GOOD	DGB WATTS
30-OCT-2000	05:16:07.67	A2735	1717.	KW	GOOD	DGB WATTS
30-OCT-2000	05:16:09.67	A2735	1843.	KW	GOOD	DGB WATTS
30-OCT-2000	05:16:55.67	A2735	1945.	KW	GOOD	DGB WATTS
30-OCT-2000	05:16:57.67	A2735	2179.	KW	GOOD	DGB WATTS
30-OCT-2000	05:17:00.67	A2735	2324.	KW	GOOD	DGB WATTS
30-OCT-2000	05:17:01.67	A2735	2473.	KW	GOOD	DGB WATTS
30-OCT-2000	05:17:03.67	A2735	2576.	KW	GOOD	DGB WATTS
30-OCT-2000	05:17:41.67	A2735	2835.	KW	GOOD	DGB WATTS
30-OCT-2000	05:17:44.67	A2735	3000.	KW	GOOD	DGB WATTS
30-OCT-2000	05:18:58.67	A2735	3134.	KW	GOOD	DGB WATTS
30-OCT-2000	05:19:05.67	A2735	3312.	KW	GOOD	DGB WATTS
30-OCT-2000	05:19:06.67	A2735	3442.	KW	GOOD	DGB WATTS
30-OCT-2000	05:19:08.67	A2735	3631.	KW	GOOD	DGB WATTS

EDG-B LOADING DURING OR-07

30-OCT-2000	05:19:49.67	A2735	3733.	KW	GOOD	DGB WATTS
30-OCT-2000	05:19:51.67	A2735	3890.	KW	GOOD	DGB WATTS
30-OCT-2000	05:19:54.67	A2735	4095.	KW	GOOD	DGB WATTS
30-OCT-2000	05:19:58.67	A2735	4223.	KW	GOOD	DGB WATTS
30-OCT-2000	05:20:55.67	A2735	4372.	KW	GOOD	DGB WATTS
30-OCT-2000	05:20:58.67	A2735	4528.	KW	GOOD	DGB WATTS
30-OCT-2000	05:21:00.67	A2735	4638.	KW	GOOD	DGB WATTS
30-OCT-2000	05:21:03.67	A2735	4785.	KW	GOOD	DGB WATTS
30-OCT-2000	05:21:49.67	A2735	4894.	KW	GOOD	DGB WATTS
30-OCT-2000	05:21:56.67	A2735	5048.	KW	GOOD	DGB WATTS
30-OCT-2000	05:21:59.67	A2735	5161.	KW	GOOD	DGB WATTS
30-OCT-2000	05:22:08.67	A2735	5305.	KW	GOOD	DGB WATTS
30-OCT-2000	05:22:11.67	A2735	5422.	KW	GOOD	DGB WATTS
30-OCT-2000	05:23:50.67	A2735	5613.	KW	GOOD	DGB WATTS
30-OCT-2000	05:23:53.67	A2735	5763.	KW	GOOD	DGB WATTS
30-OCT-2000	05:23:54.67	A2735	5865.	KW	GOOD	DGB WATTS
30-OCT-2000	05:25:13.67	A2735	5975.	KW	GOOD	DGB WATTS
30-OCT-2000	05:41:41.67	A2735	5859.	KW	GOOD	DGB WATTS
30-OCT-2000	05:52:10.67	A2735	5975.	KW	GOOD	DGB WATTS
30-OCT-2000	05:54:25.67	A2735	5868.	KW	GOOD	DGB WATTS
30-OCT-2000	06:00:49.97	A2735	5886.	KW	GOOD	DGB WATTS
30-OCT-2000	06:04:43.67	A2735	5766.	KW	GOOD	DGB WATTS
30-OCT-2000	06:06:53.67	A2735	5877.	KW	GOOD	DGB WATTS
30-OCT-2000	06:12:02.67	A2735	5771.	KW	GOOD	DGB WATTS
30-OCT-2000	06:24:41.67	A2735	5877.	KW	GOOD	DGB WATTS
30-OCT-2000	06:24:51.67	A2735	6115.	KW	GOOD	DGB WATTS
30-OCT-2000	06:24:59.67	A2735	6352.	KW	GOOD	DGB WATTS
30-OCT-2000	06:25:13.67	A2735	6458.	KW	GOOD	DGB WATTS
30-OCT-2000	06:28:02.67	A2735	6559.	KW	GOOD	DGB WATTS
30-OCT-2000	06:29:47.67	A2735	6456.	KW	GOOD	DGB WATTS
30-OCT-2000	06:40:01.67	A2735	6577.	KW	GOOD	DGB WATTS
30-OCT-2000	06:42:38.67	A2735	6469.	KW	GOOD	DGB WATTS
30-OCT-2000	06:52:29.67	A2735	6572.	KW	GOOD	DGB WATTS
30-OCT-2000	06:57:22.67	A2735	6472.	KW	GOOD	DGB WATTS
30-OCT-2000	07:00:49.97	A2735	6536.	KW	GOOD	DGB WATTS
30-OCT-2000	07:01:03.67	A2735	6578.	KW	GOOD	DGB WATTS
30-OCT-2000	07:18:58.67	A2735	6465.	KW	GOOD	DGB WATTS
30-OCT-2000	07:23:41.67	A2735	6567.	KW	GOOD	DGB WATTS
30-OCT-2000	07:24:22.67	A2735	6442.	KW	GOOD	DGB WATTS
30-OCT-2000	07:39:59.67	A2735	6339.	KW	GOOD	DGB WATTS
30-OCT-2000	07:42:45.67	A2735	6440.	KW	GOOD	DGB WATTS
30-OCT-2000	07:44:42.67	A2735	6550.	KW	GOOD	DGB WATTS
30-OCT-2000	07:46:49.67	A2735	6437.	KW	GOOD	DGB WATTS
30-OCT-2000	07:50:49.67	A2735	6575.	KW	GOOD	DGB WATTS
30-OCT-2000	08:00:49.97	A2735	6559.	KW	GOOD	DGB WATTS
30-OCT-2000	08:08:12.67	A2735	6680.	KW	GOOD	DGB WATTS
30-OCT-2000	08:10:47.67	A2735	6573.	KW	GOOD	DGB WATTS
30-OCT-2000	08:29:35.67	A2735	6305.	KW	GOOD	DGB WATTS
30-OCT-2000	08:29:40.67	A2735	6186.	KW	GOOD	DGB WATTS
30-OCT-2000	08:29:47.67	A2735	6050.	KW	GOOD	DGB WATTS
30-OCT-2000	08:30:10.67	A2735	5934.	KW	GOOD	DGB WATTS
30-OCT-2000	08:31:53.67	A2735	5833.	KW	GOOD	DGB WATTS

30-OCT-2000	08:51:38.67	A2735	5732.	KW	GOOD	DGB WATTS
30-OCT-2000	08:55:43.67	A2735	5837.	KW	GOOD	DGB WATTS
30-OCT-2000	09:00:49.97	A2735	5826.	KW	GOOD	DGB WATTS
30-OCT-2000	09:49:54.92	A2735	5732.	KW	GOOD	DGB WATTS
30-OCT-2000	09:52:49.92	A2735	5835.	KW	GOOD	DGB WATTS
30-OCT-2000	09:58:15.92	A2735	5732.	KW	GOOD	DGB WATTS
30-OCT-2000	10:00:50.22	A2735	5770.	KW	GOOD	DGB WATTS
30-OCT-2000	10:01:03.92	A2735	5921.	KW	GOOD	DGB WATTS
30-OCT-2000	10:02:51.92	A2735	6033.	KW	GOOD	DGB WATTS
30-OCT-2000	10:04:45.92	A2735	5926.	KW	GOOD	DGB WATTS
30-OCT-2000	11:00:50.22	A2735	5928.	KW	GOOD	DGB WATTS
30-OCT-2000	11:32:21.92	A2735	6033.	KW	GOOD	DGB WATTS
30-OCT-2000	11:35:54.92	A2735	5924.	KW	GOOD	DGB WATTS
30-OCT-2000	11:50:32.92	A2735	5822.	KW	GOOD	DGB WATTS
30-OCT-2000	11:54:48.92	A2735	5929.	KW	GOOD	DGB WATTS
30-OCT-2000	12:00:50.22	A2735	5940.	KW	GOOD	DGB WATTS
30-OCT-2000	12:01:28.92	A2735	6029.	KW	GOOD	DGB WATTS
30-OCT-2000	12:05:36.92	A2735	5926.	KW	GOOD	DGB WATTS
30-OCT-2000	12:32:37.92	A2735	6034.	KW	GOOD	DGB WATTS
30-OCT-2000	12:34:38.92	A2735	5917.	KW	GOOD	DGB WATTS
30-OCT-2000	12:52:26.92	A2735	6021.	KW	GOOD	DGB WATTS
30-OCT-2000	12:54:04.92	A2735	5914.	KW	GOOD	DGB WATTS
30-OCT-2000	13:00:50.22	A2735	5938.	KW	GOOD	DGB WATTS
30-OCT-2000	13:02:42.92	A2735	6016.	KW	GOOD	DGB WATTS
30-OCT-2000	13:04:01.92	A2735	5907.	KW	GOOD	DGB WATTS
30-OCT-2000	13:27:54.92	A2735	5803.	KW	GOOD	DGB WATTS
30-OCT-2000	13:30:21.92	A2735	5908.	KW	GOOD	DGB WATTS
30-OCT-2000	13:43:57.92	A2735	6010.	KW	GOOD	DGB WATTS
30-OCT-2000	13:50:17.92	A2735	5906.	KW	GOOD	DGB WATTS
30-OCT-2000	13:54:19.92	A2735	6010.	KW	GOOD	DGB WATTS
30-OCT-2000	13:58:54.92	A2735	5905.	KW	GOOD	DGB WATTS
30-OCT-2000	14:00:50.22	A2735	5926.	KW	GOOD	DGB WATTS
30-OCT-2000	14:08:37.92	A2735	6006.	KW	GOOD	DGB WATTS
30-OCT-2000	14:17:11.92	A2735	5902.	KW	GOOD	DGB WATTS
30-OCT-2000	14:18:58.92	A2735	6012.	KW	GOOD	DGB WATTS
30-OCT-2000	14:23:15.92	A2735	5900.	KW	GOOD	DGB WATTS
30-OCT-2000	14:30:31.92	A2735	6008.	KW	GOOD	DGB WATTS
30-OCT-2000	14:36:03.92	A2735	5901.	KW	GOOD	DGB WATTS
30-OCT-2000	14:40:28.92	A2735	6005.	KW	GOOD	DGB WATTS
30-OCT-2000	14:42:31.92	A2735	5899.	KW	GOOD	DGB WATTS
30-OCT-2000	14:43:40.92	A2735	6002.	KW	GOOD	DGB WATTS
30-OCT-2000	14:51:36.92	A2735	5896.	KW	GOOD	DGB WATTS
30-OCT-2000	14:54:03.92	A2735	6001.	KW	GOOD	DGB WATTS
30-OCT-2000	14:57:14.92	A2735	5898.	KW	GOOD	DGB WATTS
30-OCT-2000	15:00:50.22	A2735	5893.	KW	GOOD	DGB WATTS
30-OCT-2000	15:02:14.92	A2735	6006.	KW	GOOD	DGB WATTS
30-OCT-2000	15:03:17.92	A2735	5898.	KW	GOOD	DGB WATTS
30-OCT-2000	15:33:37.92	A2735	6006.	KW	GOOD	DGB WATTS
30-OCT-2000	15:35:38.92	A2735	5901.	KW	GOOD	DGB WATTS
30-OCT-2000	15:39:38.92	A2735	6002.	KW	GOOD	DGB WATTS
30-OCT-2000	15:40:58.92	A2735	5889.	KW	GOOD	DGB WATTS
30-OCT-2000	15:44:27.92	A2735	5996.	KW	GOOD	DGB WATTS

30-OCT-2000	15:49:27.92	A2735	5896.	KW	GOOD	DGB WATTS
30-OCT-2000	16:00:00.92	A2735	5781.	KW	GOOD	DGB WATTS
30-OCT-2000	16:00:50.22	A2735	5821.	KW	GOOD	DGB WATTS
30-OCT-2000	16:02:19.92	A2735	5882.	KW	GOOD	DGB WATTS
30-OCT-2000	16:44:32.92	A2735	5779.	KW	GOOD	DGB WATTS
30-OCT-2000	16:49:44.92	A2735	5886.	KW	GOOD	DGB WATTS
30-OCT-2000	17:00:09.92	A2735	5783.	KW	GOOD	DGB WATTS
30-OCT-2000	17:00:50.22	A2735	5776.	KW	GOOD	DGB WATTS
30-OCT-2000	17:03:48.92	A2735	5891.	KW	GOOD	DGB WATTS
30-OCT-2000	17:04:56.92	A2735	5789.	KW	GOOD	DGB WATTS
30-OCT-2000	17:09:12.92	A2735	5890.	KW	GOOD	DGB WATTS
30-OCT-2000	17:12:05.92	A2735	5995.	KW	GOOD	DGB WATTS
30-OCT-2000	17:13:30.92	A2735	5893.	KW	GOOD	DGB WATTS
30-OCT-2000	17:23:13.92	A2735	5996.	KW	GOOD	DGB WATTS
30-OCT-2000	17:24:23.92	A2735	5886.	KW	GOOD	DGB WATTS
30-OCT-2000	17:46:36.92	A2735	5987.	KW	GOOD	DGB WATTS
30-OCT-2000	17:49:34.92	A2735	5880.	KW	GOOD	DGB WATTS
30-OCT-2000	17:58:12.92	A2735	5776.	KW	GOOD	DGB WATTS
30-OCT-2000	18:00:50.22	A2735	5819.	KW	GOOD	DGB WATTS
30-OCT-2000	18:02:59.92	A2735	5881.	KW	GOOD	DGB WATTS
30-OCT-2000	18:10:59.92	A2735	5983.	KW	GOOD	DGB WATTS
30-OCT-2000	18:13:28.92	A2735	5880.	KW	GOOD	DGB WATTS
30-OCT-2000	18:14:27.92	A2735	5777.	KW	GOOD	DGB WATTS
30-OCT-2000	18:15:46.92	A2735	5880.	KW	GOOD	DGB WATTS
30-OCT-2000	18:20:58.92	A2735	5986.	KW	GOOD	DGB WATTS
30-OCT-2000	18:23:04.92	A2735	5882.	KW	GOOD	DGB WATTS
30-OCT-2000	18:28:37.92	A2735	5984.	KW	GOOD	DGB WATTS
30-OCT-2000	18:32:51.92	A2735	5877.	KW	GOOD	DGB WATTS
30-OCT-2000	18:38:49.92	A2735	5723.	KW	GOOD	DGB WATTS
30-OCT-2000	18:38:52.92	A2735	5615.	KW	GOOD	DGB WATTS
30-OCT-2000	18:38:57.92	A2735	5513.	KW	GOOD	DGB WATTS
30-OCT-2000	18:39:03.92	A2735	5410.	KW	GOOD	DGB WATTS
30-OCT-2000	18:39:35.92	A2735	5281.	KW	GOOD	DGB WATTS
30-OCT-2000	18:39:37.92	A2735	5079.	KW	GOOD	DGB WATTS
30-OCT-2000	18:39:42.92	A2735	4971.	KW	GOOD	DGB WATTS
30-OCT-2000	18:40:38.92	A2735	4750.	KW	GOOD	DGB WATTS
30-OCT-2000	18:40:42.92	A2735	4577.	KW	GOOD	DGB WATTS
30-OCT-2000	18:40:46.92	A2735	4431.	KW	GOOD	DGB WATTS
30-OCT-2000	18:40:52.92	A2735	4297.	KW	GOOD	DGB WATTS
30-OCT-2000	18:41:39.92	A2735	4176.	KW	GOOD	DGB WATTS
30-OCT-2000	18:41:40.92	A2735	4034.	KW	GOOD	DGB WATTS
30-OCT-2000	18:41:44.92	A2735	3889.	KW	GOOD	DGB WATTS
30-OCT-2000	18:41:46.92	A2735	3782.	KW	GOOD	DGB WATTS
30-OCT-2000	18:41:49.92	A2735	3681.	KW	GOOD	DGB WATTS
30-OCT-2000	18:42:41.92	A2735	3565.	KW	GOOD	DGB WATTS
30-OCT-2000	18:42:43.92	A2735	3437.	KW	GOOD	DGB WATTS
30-OCT-2000	18:42:45.92	A2735	3255.	KW	GOOD	DGB WATTS
30-OCT-2000	18:42:49.92	A2735	3121.	KW	GOOD	DGB WATTS
30-OCT-2000	18:42:56.92	A2735	3224.	KW	GOOD	DGB WATTS
30-OCT-2000	18:43:36.92	A2735	3100.	KW	GOOD	DGB WATTS
30-OCT-2000	18:43:40.92	A2735	2942.	KW	GOOD	DGB WATTS
30-OCT-2000	18:43:43.92	A2735	2811.	KW	GOOD	DGB WATTS

30-OCT-2000	18:43:47.92	A2735	2659.	KW	GOOD	DGB WATTS
30-OCT-2000	18:43:54.92	A2735	2554.	KW	GOOD	DGB WATTS
30-OCT-2000	18:44:39.92	A2735	2371.	KW	GOOD	DGB WATTS
30-OCT-2000	18:44:41.92	A2735	2264.	KW	GOOD	DGB WATTS
30-OCT-2000	18:44:45.92	A2735	2093.	KW	GOOD	DGB WATTS
30-OCT-2000	18:44:47.92	A2735	1956.	KW	GOOD	DGB WATTS
30-OCT-2000	18:44:56.92	A2735	2065.	KW	GOOD	DGB WATTS
30-OCT-2000	18:45:04.92	A2735	1917.	KW	GOOD	DGB WATTS
30-OCT-2000	18:45:39.92	A2735	1813.	KW	GOOD	DGB WATTS
30-OCT-2000	18:45:41.92	A2735	1678.	KW	GOOD	DGB WATTS
30-OCT-2000	18:45:43.92	A2735	1524.	KW	GOOD	DGB WATTS
30-OCT-2000	18:45:45.92	A2735	1400.	KW	GOOD	DGB WATTS
30-OCT-2000	18:45:53.92	A2735	1501.	KW	GOOD	DGB WATTS
30-OCT-2000	18:45:57.92	A2735	1377.	KW	GOOD	DGB WATTS
30-OCT-2000	18:46:46.92	A2735	1263.	KW	GOOD	DGB WATTS
30-OCT-2000	18:46:49.92	A2735	1130.	KW	GOOD	DGB WATTS
30-OCT-2000	18:46:51.92	A2735	1009.	KW	GOOD	DGB WATTS
30-OCT-2000	18:47:04.92	A2735	906.	KW	GOOD	DGB WATTS
30-OCT-2000	18:47:09.92	A2735	790.	KW	GOOD	DGB WATTS
30-OCT-2000	18:47:16.92	A2735	685.	KW	GOOD	DGB WATTS
30-OCT-2000	18:48:05.92	A2735	577.	KW	GOOD	DGB WATTS
30-OCT-2000	18:48:15.92	A2735	425.	KW	GOOD	DGB WATTS
30-OCT-2000	18:48:24.92	A2735	317.	KW	GOOD	DGB WATTS
30-OCT-2000	18:49:20.92	A2735	159.	KW	GOOD	DGB WATTS
30-OCT-2000	18:49:22.92	A2735	26.	KW	GOOD	DGB WATTS
30-OCT-2000	19:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
30-OCT-2000	20:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
30-OCT-2000	21:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
30-OCT-2000	22:00:50.22	A2735	1.	KW	GOOD	DGB WATTS
30-OCT-2000	23:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	00:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	01:00:50.22	A2735	-1.	KW	GOOD	DGB WATTS
31-OCT-2000	02:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	03:00:50.22	A2735	-1.	KW	GOOD	DGB WATTS
31-OCT-2000	04:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	05:00:50.22	A2735	1.	KW	GOOD	DGB WATTS
31-OCT-2000	06:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	07:00:50.22	A2735	-2.	KW	GOOD	DGB WATTS
31-OCT-2000	08:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	09:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	10:00:50.22	A2735	-2.	KW	GOOD	DGB WATTS
31-OCT-2000	11:00:50.22	A2735	-1.	KW	GOOD	DGB WATTS
31-OCT-2000	12:00:50.22	A2735	-1.	KW	GOOD	DGB WATTS
31-OCT-2000	13:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	14:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	15:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	16:00:50.22	A2735	2.	KW	GOOD	DGB WATTS
31-OCT-2000	17:00:50.22	A2735	-2.	KW	GOOD	DGB WATTS
31-OCT-2000	18:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	19:00:50.22	A2735	-1.	KW	GOOD	DGB WATTS
31-OCT-2000	20:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
31-OCT-2000	21:00:50.22	A2735	0.	KW	GOOD	DGB WATTS

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31-OCT-2000	22:00:50.22	A2735	-1.	KW	GOOD	DGB WATTS
31-OCT-2000	23:00:50.22	A2735	-2.	KW	GOOD	DGB WATTS
1-NOV-2000	00:00:50.22	A2735	-1.	KW	GOOD	DGB WATTS
1-NOV-2000	01:00:50.22	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	02:00:50.22	A2735	-1.	KW	GOOD	DGB WATTS
1-NOV-2000	03:00:50.82	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	04:00:50.82	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	05:00:50.82	A2735	-2.	KW	GOOD	DGB WATTS
1-NOV-2000	06:00:50.82	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	07:00:50.82	A2735	1.	KW	GOOD	DGB WATTS
1-NOV-2000	08:00:50.82	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	09:00:50.82	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	10:00:50.82	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	11:00:39.52	A2735	157.	KW	GOOD	DGB WATTS
1-NOV-2000	11:00:40.52	A2735	306.	KW	GOOD	DGB WATTS
1-NOV-2000	11:00:50.82	A2735	367.	KW	GOOD	DGB WATTS
1-NOV-2000	11:00:57.52	A2735	472.	KW	GOOD	DGB WATTS
1-NOV-2000	11:01:25.52	A2735	709.	KW	GOOD	DGB WATTS
1-NOV-2000	11:01:33.52	A2735	576.	KW	GOOD	DGB WATTS
1-NOV-2000	11:02:19.52	A2735	704.	KW	GOOD	DGB WATTS
1-NOV-2000	11:02:37.52	A2735	806.	KW	GOOD	DGB WATTS
1-NOV-2000	11:02:46.52	A2735	918.	KW	GOOD	DGB WATTS
1-NOV-2000	11:02:52.52	A2735	1032.	KW	GOOD	DGB WATTS
1-NOV-2000	11:03:11.52	A2735	1147.	KW	GOOD	DGB WATTS
1-NOV-2000	11:03:19.52	A2735	1254.	KW	GOOD	DGB WATTS
1-NOV-2000	11:03:30.52	A2735	1371.	KW	GOOD	DGB WATTS
1-NOV-2000	11:03:38.52	A2735	1497.	KW	GOOD	DGB WATTS
1-NOV-2000	11:03:49.52	A2735	1614.	KW	GOOD	DGB WATTS
1-NOV-2000	11:04:05.52	A2735	1719.	KW	GOOD	DGB WATTS
1-NOV-2000	11:04:15.52	A2735	1835.	KW	GOOD	DGB WATTS
1-NOV-2000	11:04:29.52	A2735	1944.	KW	GOOD	DGB WATTS
1-NOV-2000	11:04:41.52	A2735	2080.	KW	GOOD	DGB WATTS
1-NOV-2000	11:04:49.52	A2735	2187.	KW	GOOD	DGB WATTS
1-NOV-2000	11:04:56.52	A2735	2288.	KW	GOOD	DGB WATTS
1-NOV-2000	11:05:05.52	A2735	2397.	KW	GOOD	DGB WATTS
1-NOV-2000	11:05:15.52	A2735	2516.	KW	GOOD	DGB WATTS
1-NOV-2000	11:05:31.52	A2735	2626.	KW	GOOD	DGB WATTS
1-NOV-2000	11:05:34.52	A2735	2727.	KW	GOOD	DGB WATTS
1-NOV-2000	11:05:58.52	A2735	2885.	KW	GOOD	DGB WATTS
1-NOV-2000	11:06:06.52	A2735	2995.	KW	GOOD	DGB WATTS
1-NOV-2000	11:06:18.52	A2735	3104.	KW	GOOD	DGB WATTS
1-NOV-2000	11:06:31.52	A2735	3219.	KW	GOOD	DGB WATTS
1-NOV-2000	11:06:42.52	A2735	3354.	KW	GOOD	DGB WATTS
1-NOV-2000	11:06:47.52	A2735	3455.	KW	GOOD	DGB WATTS
1-NOV-2000	11:06:57.52	A2735	3578.	KW	GOOD	DGB WATTS
1-NOV-2000	11:07:04.52	A2735	3705.	KW	GOOD	DGB WATTS
1-NOV-2000	11:07:21.52	A2735	3819.	KW	GOOD	DGB WATTS
1-NOV-2000	11:07:27.52	A2735	3943.	KW	GOOD	DGB WATTS
1-NOV-2000	11:07:38.52	A2735	4045.	KW	GOOD	DGB WATTS
1-NOV-2000	11:07:42.52	A2735	4146.	KW	GOOD	DGB WATTS
1-NOV-2000	11:07:53.52	A2735	4286.	KW	GOOD	DGB WATTS
1-NOV-2000	11:08:08.52	A2735	4405.	KW	GOOD	DGB WATTS

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1-NOV-2000	11:08:14.52	A2735	4519.	KW	GOOD	DGB WATTS
1-NOV-2000	11:08:22.52	A2735	4626.	KW	GOOD	DGB WATTS
1-NOV-2000	11:08:36.52	A2735	4727.	KW	GOOD	DGB WATTS
1-NOV-2000	11:08:42.52	A2735	4845.	KW	GOOD	DGB WATTS
1-NOV-2000	11:08:57.52	A2735	4974.	KW	GOOD	DGB WATTS
1-NOV-2000	11:09:02.52	A2735	5077.	KW	GOOD	DGB WATTS
1-NOV-2000	11:09:13.52	A2735	5189.	KW	GOOD	DGB WATTS
1-NOV-2000	11:09:24.52	A2735	5306.	KW	GOOD	DGB WATTS
1-NOV-2000	11:09:31.52	A2735	5429.	KW	GOOD	DGB WATTS
1-NOV-2000	11:09:46.52	A2735	5567.	KW	GOOD	DGB WATTS
1-NOV-2000	11:09:54.52	A2735	5688.	KW	GOOD	DGB WATTS
1-NOV-2000	11:10:05.52	A2735	5805.	KW	GOOD	DGB WATTS
1-NOV-2000	11:10:13.52	A2735	5949.	KW	GOOD	DGB WATTS
1-NOV-2000	11:13:39.52	A2735	6050.	KW	GOOD	DGB WATTS
1-NOV-2000	11:22:54.52	A2735	5940.	KW	GOOD	DGB WATTS
1-NOV-2000	11:32:30.52	A2735	6042.	KW	GOOD	DGB WATTS
1-NOV-2000	11:35:21.52	A2735	5940.	KW	GOOD	DGB WATTS
1-NOV-2000	11:54:30.52	A2735	6047.	KW	GOOD	DGB WATTS
1-NOV-2000	12:00:50.82	A2735	6031.	KW	GOOD	DGB WATTS
1-NOV-2000	12:05:43.52	A2735	5946.	KW	GOOD	DGB WATTS
1-NOV-2000	12:08:06.52	A2735	6061.	KW	GOOD	DGB WATTS
1-NOV-2000	12:08:19.52	A2735	5945.	KW	GOOD	DGB WATTS
1-NOV-2000	12:08:27.52	A2735	5844.	KW	GOOD	DGB WATTS
1-NOV-2000	12:08:35.52	A2735	5704.	KW	GOOD	DGB WATTS
1-NOV-2000	12:08:42.52	A2735	5594.	KW	GOOD	DGB WATTS
1-NOV-2000	12:08:55.52	A2735	5485.	KW	GOOD	DGB WATTS
1-NOV-2000	12:09:07.52	A2735	5384.	KW	GOOD	DGB WATTS
1-NOV-2000	12:09:16.52	A2735	5272.	KW	GOOD	DGB WATTS
1-NOV-2000	12:09:24.52	A2735	5168.	KW	GOOD	DGB WATTS
1-NOV-2000	12:09:37.52	A2735	5049.	KW	GOOD	DGB WATTS
1-NOV-2000	12:09:47.52	A2735	4937.	KW	GOOD	DGB WATTS
1-NOV-2000	12:10:07.52	A2735	4821.	KW	GOOD	DGB WATTS
1-NOV-2000	12:10:15.52	A2735	4720.	KW	GOOD	DGB WATTS
1-NOV-2000	12:10:20.52	A2735	4606.	KW	GOOD	DGB WATTS
1-NOV-2000	12:10:39.52	A2735	4458.	KW	GOOD	DGB WATTS
1-NOV-2000	12:10:51.52	A2735	4354.	KW	GOOD	DGB WATTS
1-NOV-2000	12:11:05.52	A2735	4220.	KW	GOOD	DGB WATTS
1-NOV-2000	12:11:15.52	A2735	4087.	KW	GOOD	DGB WATTS
1-NOV-2000	12:11:26.52	A2735	3986.	KW	GOOD	DGB WATTS
1-NOV-2000	12:11:30.52	A2735	3869.	KW	GOOD	DGB WATTS
1-NOV-2000	12:11:46.52	A2735	3764.	KW	GOOD	DGB WATTS
1-NOV-2000	12:11:56.52	A2735	3655.	KW	GOOD	DGB WATTS
1-NOV-2000	12:12:09.52	A2735	3550.	KW	GOOD	DGB WATTS
1-NOV-2000	12:12:14.52	A2735	3435.	KW	GOOD	DGB WATTS
1-NOV-2000	12:12:34.52	A2735	3334.	KW	GOOD	DGB WATTS
1-NOV-2000	12:12:44.52	A2735	3221.	KW	GOOD	DGB WATTS
1-NOV-2000	12:12:56.52	A2735	3082.	KW	GOOD	DGB WATTS
1-NOV-2000	12:13:14.52	A2735	2953.	KW	GOOD	DGB WATTS
1-NOV-2000	12:13:24.52	A2735	2846.	KW	GOOD	DGB WATTS
1-NOV-2000	12:13:34.52	A2735	2730.	KW	GOOD	DGB WATTS
1-NOV-2000	12:13:44.52	A2735	2622.	KW	GOOD	DGB WATTS
1-NOV-2000	12:13:57.52	A2735	2484.	KW	GOOD	DGB WATTS

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1-NOV-2000	12:14:17.52	A2735	2368.	KW	GOOD	DGB WATTS
1-NOV-2000	12:14:25.52	A2735	2235.	KW	GOOD	DGB WATTS
1-NOV-2000	12:14:42.52	A2735	2128.	KW	GOOD	DGB WATTS
1-NOV-2000	12:14:53.52	A2735	1966.	KW	GOOD	DGB WATTS
1-NOV-2000	12:15:09.52	A2735	1848.	KW	GOOD	DGB WATTS
1-NOV-2000	12:15:19.52	A2735	1710.	KW	GOOD	DGB WATTS
1-NOV-2000	12:15:28.52	A2735	1596.	KW	GOOD	DGB WATTS
1-NOV-2000	12:15:43.52	A2735	1481.	KW	GOOD	DGB WATTS
1-NOV-2000	12:15:58.52	A2735	1370.	KW	GOOD	DGB WATTS
1-NOV-2000	12:16:11.52	A2735	1220.	KW	GOOD	DGB WATTS
1-NOV-2000	12:16:25.52	A2735	1110.	KW	GOOD	DGB WATTS
1-NOV-2000	12:16:37.52	A2735	971.	KW	GOOD	DGB WATTS
1-NOV-2000	12:16:50.52	A2735	865.	KW	GOOD	DGB WATTS
1-NOV-2000	12:16:57.52	A2735	726.	KW	GOOD	DGB WATTS
1-NOV-2000	12:17:20.52	A2735	604.	KW	GOOD	DGB WATTS
1-NOV-2000	12:17:36.52	A2735	489.	KW	GOOD	DGB WATTS
1-NOV-2000	12:18:02.52	A2735	360.	KW	GOOD	DGB WATTS
1-NOV-2000	12:18:15.52	A2735	246.	KW	GOOD	DGB WATTS
1-NOV-2000	12:18:34.52	A2735	140.	KW	GOOD	DGB WATTS
1-NOV-2000	12:18:42.52	A2735	29.	KW	GOOD	DGB WATTS
1-NOV-2000	13:00:50.82	A2735	2.	KW	GOOD	DGB WATTS
1-NOV-2000	13:55:57.52	A2735	218.	KW	GOOD	DGB WATTS
1-NOV-2000	13:55:58.52	A2735	327.	KW	GOOD	DGB WATTS
1-NOV-2000	13:55:59.52	A2735	491.	KW	GOOD	DGB WATTS
1-NOV-2000	13:57:05.52	A2735	611.	KW	GOOD	DGB WATTS
1-NOV-2000	13:57:09.52	A2735	733.	KW	GOOD	DGB WATTS
1-NOV-2000	13:57:27.52	A2735	887.	KW	GOOD	DGB WATTS
1-NOV-2000	13:57:39.52	A2735	1015.	KW	GOOD	DGB WATTS
1-NOV-2000	13:57:52.52	A2735	1138.	KW	GOOD	DGB WATTS
1-NOV-2000	13:58:04.52	A2735	1260.	KW	GOOD	DGB WATTS
1-NOV-2000	13:58:14.52	A2735	1362.	KW	GOOD	DGB WATTS
1-NOV-2000	13:58:18.52	A2735	1475.	KW	GOOD	DGB WATTS
1-NOV-2000	13:58:22.52	A2735	1628.	KW	GOOD	DGB WATTS
1-NOV-2000	13:58:32.52	A2735	1757.	KW	GOOD	DGB WATTS
1-NOV-2000	13:58:48.52	A2735	1867.	KW	GOOD	DGB WATTS
1-NOV-2000	13:58:55.52	A2735	1990.	KW	GOOD	DGB WATTS
1-NOV-2000	13:59:05.52	A2735	2114.	KW	GOOD	DGB WATTS
1-NOV-2000	13:59:14.52	A2735	2223.	KW	GOOD	DGB WATTS
1-NOV-2000	13:59:24.52	A2735	2342.	KW	GOOD	DGB WATTS
1-NOV-2000	13:59:28.52	A2735	2443.	KW	GOOD	DGB WATTS
1-NOV-2000	13:59:32.52	A2735	2555.	KW	GOOD	DGB WATTS
1-NOV-2000	13:59:41.52	A2735	2660.	KW	GOOD	DGB WATTS
1-NOV-2000	13:59:48.52	A2735	2811.	KW	GOOD	DGB WATTS
1-NOV-2000	13:59:57.52	A2735	2932.	KW	GOOD	DGB WATTS
1-NOV-2000	14:00:09.52	A2735	3089.	KW	GOOD	DGB WATTS
1-NOV-2000	14:00:15.52	A2735	3191.	KW	GOOD	DGB WATTS
1-NOV-2000	14:00:23.52	A2735	3304.	KW	GOOD	DGB WATTS
1-NOV-2000	14:00:36.52	A2735	3451.	KW	GOOD	DGB WATTS
1-NOV-2000	14:00:49.52	A2735	3563.	KW	GOOD	DGB WATTS
1-NOV-2000	14:00:50.82	A2735	3633.	KW	GOOD	DGB WATTS
1-NOV-2000	14:00:59.52	A2735	3672.	KW	GOOD	DGB WATTS
1-NOV-2000	14:01:04.52	A2735	3792.	KW	GOOD	DGB WATTS

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1-NOV-2000	14:01:09.52	A2735	3931.	KW	GOOD	DGB WATTS
1-NOV-2000	14:01:19.52	A2735	4034.	KW	GOOD	DGB WATTS
1-NOV-2000	14:01:30.52	A2735	4148.	KW	GOOD	DGB WATTS
1-NOV-2000	14:01:35.52	A2735	4251.	KW	GOOD	DGB WATTS
1-NOV-2000	14:01:48.52	A2735	4360.	KW	GOOD	DGB WATTS
1-NOV-2000	14:01:57.52	A2735	4493.	KW	GOOD	DGB WATTS
1-NOV-2000	14:02:06.52	A2735	4599.	KW	GOOD	DGB WATTS
1-NOV-2000	14:02:15.52	A2735	4734.	KW	GOOD	DGB WATTS
1-NOV-2000	14:02:26.52	A2735	4859.	KW	GOOD	DGB WATTS
1-NOV-2000	14:02:36.52	A2735	4974.	KW	GOOD	DGB WATTS
1-NOV-2000	14:02:47.52	A2735	5104.	KW	GOOD	DGB WATTS
1-NOV-2000	14:02:52.52	A2735	5207.	KW	GOOD	DGB WATTS
1-NOV-2000	14:03:00.52	A2735	5338.	KW	GOOD	DGB WATTS
1-NOV-2000	14:03:12.52	A2735	5461.	KW	GOOD	DGB WATTS
1-NOV-2000	14:03:17.52	A2735	5567.	KW	GOOD	DGB WATTS
1-NOV-2000	14:03:29.52	A2735	5702.	KW	GOOD	DGB WATTS
1-NOV-2000	14:03:34.52	A2735	5805.	KW	GOOD	DGB WATTS
1-NOV-2000	14:03:39.52	A2735	5908.	KW	GOOD	DGB WATTS
1-NOV-2000	14:03:53.52	A2735	6015.	KW	GOOD	DGB WATTS
1-NOV-2000	14:08:01.52	A2735	6120.	KW	GOOD	DGB WATTS
1-NOV-2000	14:11:01.52	A2735	6015.	KW	GOOD	DGB WATTS
1-NOV-2000	14:13:02.52	A2735	6120.	KW	GOOD	DGB WATTS
1-NOV-2000	14:30:14.52	A2735	6015.	KW	GOOD	DGB WATTS
1-NOV-2000	14:56:24.52	A2735	5907.	KW	GOOD	DGB WATTS
1-NOV-2000	15:00:23.52	A2735	6008.	KW	GOOD	DGB WATTS
1-NOV-2000	15:00:50.82	A2735	6080.	KW	GOOD	DGB WATTS
1-NOV-2000	15:15:05.52	A2735	6117.	KW	GOOD	DGB WATTS
1-NOV-2000	15:15:54.52	A2735	6237.	KW	GOOD	DGB WATTS
1-NOV-2000	15:15:58.52	A2735	6351.	KW	GOOD	DGB WATTS
1-NOV-2000	15:16:00.52	A2735	6475.	KW	GOOD	DGB WATTS
1-NOV-2000	15:16:17.52	A2735	6615.	KW	GOOD	DGB WATTS
1-NOV-2000	15:54:39.52	A2735	6725.	KW	GOOD	DGB WATTS
1-NOV-2000	15:56:12.52	A2735	6622.	KW	GOOD	DGB WATTS
1-NOV-2000	15:58:02.52	A2735	6521.	KW	GOOD	DGB WATTS
1-NOV-2000	16:00:50.82	A2735	6534.	KW	GOOD	DGB WATTS
1-NOV-2000	16:06:20.52	A2735	6625.	KW	GOOD	DGB WATTS
1-NOV-2000	16:23:35.52	A2735	6524.	KW	GOOD	DGB WATTS
1-NOV-2000	16:26:53.52	A2735	6625.	KW	GOOD	DGB WATTS
1-NOV-2000	16:46:07.52	A2735	6523.	KW	GOOD	DGB WATTS
1-NOV-2000	16:56:23.52	A2735	6421.	KW	GOOD	DGB WATTS
1-NOV-2000	16:57:05.52	A2735	6567.	KW	GOOD	DGB WATTS
1-NOV-2000	17:00:50.82	A2735	6596.	KW	GOOD	DGB WATTS
1-NOV-2000	17:07:48.52	A2735	6671.	KW	GOOD	DGB WATTS
1-NOV-2000	17:12:19.52	A2735	6567.	KW	GOOD	DGB WATTS
1-NOV-2000	17:17:52.52	A2735	6455.	KW	GOOD	DGB WATTS
1-NOV-2000	17:17:57.52	A2735	6343.	KW	GOOD	DGB WATTS
1-NOV-2000	17:18:06.52	A2735	6238.	KW	GOOD	DGB WATTS
1-NOV-2000	17:18:10.52	A2735	6121.	KW	GOOD	DGB WATTS
1-NOV-2000	17:18:14.52	A2735	5989.	KW	GOOD	DGB WATTS
1-NOV-2000	17:24:20.52	A2735	6091.	KW	GOOD	DGB WATTS
1-NOV-2000	17:26:05.52	A2735	5547.	KW	GOOD	DGB WATTS
1-NOV-2000	17:26:06.52	A2735	2220.	KW	GOOD	DGB WATTS

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1-NOV-2000	17:26:07.52	A2735	905.	KW	GOOD	DGB WATTS
1-NOV-2000	17:26:08.52	A2735	382.	KW	GOOD	DGB WATTS
1-NOV-2000	17:26:09.52	A2735	168.	KW	GOOD	DGB WATTS
1-NOV-2000	17:26:11.52	A2735	42.	KW	GOOD	DGB WATTS
1-NOV-2000	18:00:50.82	A2735	2.	KW	GOOD	DGB WATTS
1-NOV-2000	19:00:50.82	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	20:00:50.82	A2735	-1.	KW	GOOD	DGB WATTS
1-NOV-2000	21:00:50.82	A2735	0.	KW	GOOD	DGB WATTS
1-NOV-2000	22:00:50.82	A2735	2.	KW	GOOD	DGB WATTS
1-NOV-2000	23:00:50.82	A2735	0.	KW	GOOD	DGB WATTS

APPENDIX B

Engine Combustion Report
Seabrook
Engine

nit Name:	DGB	Model:	PC 2.3	Date:	10/29/00 10:45:00 AM
.ocation:	South Engine	Unit Mfr:	Coltec	Serial No.:	

Stroke: 4	Marker Correction Angle: 0.0 deg.	Engine runs counter clockwise and is Vee - Regular		Periods Collected (PT):	11
Left Bank Air Pressure, psi	20.0	Left Bank Air Temperature, F	120	Engine Load , kW	5850.0
Right Bank Air Pressure, psi	20.0	Right Bank Air Temperature, F	85	Reactive Load, V	3150.0
Left Bank Turbo Group 1 [1,2,:	1080	Left Bank Turbo Group 2 [3,4,5	1060	Jackt water temp, F	170
Right Turbo Group 1 [9,10,15,1	1070	Right Turbo Group 2 [11,12,13,	1070	Engine oil temp in, F	160
Engine Oil Pressure, psi	79.0	Engine oil temp out, F	135		

Cyl	Speed (rpm)	Rack Pos.	MEP (psi)	IHP (ihp)	Comp. Ref 20 BTDC (psig)	Comb. Start (deg ATDC)	Max Rise Rate (psi/deg)	Peak Firing Pressures AVE (psig)	DEV (psi)	MAX (psig)	MIN (psig)	DELTA (psi)	PFP Angle ATDC	Exp. Ref 75 ATDC (psig)	Exp. Term 150 ATDC (psig)	Exhaust Temp.
1	514	52	256	586	620	-2	40.5	1314	11	1345	1293	-8	12	305	118	850 F
2	514	50	245	562	HI 675	1	30.1	1287	10	1334	1262	-35	13	305	119	860 F
3	515	52	254	582	606	-0	29.3	1302	10	1331	1282	-20	14	310	117	870 F
4	515	51	230	527	620	-1	34.6	1299	12	1337	1271	-23	12	290	113	860 F
5	514	52	221	506	651	-2	34.2	1285	13	1311	1255	-37	12	285	LO 108	840 F
6	514	50	254	581	LO 588	-2	34.4	1292	12	1322	1262	-30	12	312	113	900 F
7	514	50	233	533	652	-3	31.8	1303	12	1328	1267	-19	12	290	112	900 F
8	514	50	227	520	635	-4	36.9	1314	15	1362	1283	-8	10	LO 283	113	900 F
9	514	49	257	589	625	-1	41.1	1370	11	1403	1341	48	12	HI 315	119	840 F
10	514	48	245	561	656	-1	31.4	1332	10	1374	1308	11	12	314	118	840 F
11	515	50	252	578	611	-2	30.4	1321	9	1347	1297	-1	12	314	119	880 F
12	514	51	257	588	673	-2	34.1	1342	12	1403	1312	20	12	310	HI 126	880 F
13	514	52	245	561	649	-1	29.9	1310	10	1338	1286	-12	11	310	119	LO 820 F
14	515	51	256	587	623	-3	38.4	1368	11	1396	1332	46	11	314	124	880 F
15	514	49	232	531	666	-2	31.8	1333	12	1368	1297	12	11	298	120	880 F
16	515	49	232	532	HI 675	-4	41.2	1378	10	1409	1360	56	10	291	118	HI 920 F
Eng:	514		244	8924	639	-1	34	1322	11			24	12	303	117	870.0 F
Sprd:	0%		15%	15%	14%	5 deg	35%	7%	52%				4 deg	11%	16%	100.0 F

Notes:
1. The peak firing pressure (PFP) is the highest pressure in the cylinder during the cycle.
2. PFP statistics are based on up to 50 cycles.
3. PFP Angle data is derived from: a) Up to 50 cycles for EPD data; or b) Up to 10 cycles for PT3 data.
4. Marker Type: Once Per Turn (OPT) and Trap Type: 9240.
5. Pressure trace units are psig. You may require to change the column title.
6. For cylinders with no PT Data, IHP is assigned the average Engine IHP.

Observations and Recommendations	Machine Condition Notes

Analyst Signature: 11/18/00 10:39:14 AM

<u>ATTACHMENT B TO NYN-01030</u>

Significance Determination for 11/1/2000 Failure of Emergency Diesel Generator "B"

Larry Rau – Seabrook Station

February 12, 2001

Engineering Evaluation

EE – 01003

Larry Rau Preparer	2/13/2001 Date
Kenneth L. [illegible] Independent Reviewer	2/13/2001 Date
Larry Rau Engineering Supervisor	2/13/2001 Date
J M [illegible] Engineering Manager	2/13/2001 Date
[illegible] Vargas Director of Engineering	2/13/2001 Date

1.0 PURPOSE

This evaluation documents the Significance Determination evaluation performed for the 11/01/2000 failure of the "B" emergency diesel generator. Significance Determination was performed using the Phase 2 and Phase 3 NRC process (Reference 1) for both power operation and shutdown risk.

2.0 BACKGROUND

The Significance Determination Process (SDP) plays a key role in the Nuclear Regulatory Commission's new Reactor Oversight Process (ROP). The SDP is used to determine risk significance after an inspector has concluded that there may be a "finding" related to licensee performance in one of the cornerstone areas.

The Reactor Safety Cornerstones use a 3 Phase process for SDP. Phase 1 may be described as characterization and initial screening of the finding. Phase 2 is an initial determination of significance using site specific worksheets. Phase 3 is a detailed evaluation of significance using a full probabilistic assessment. The Resident Inspector normally performs Phase 1 and 2, while Phase 3 relies on substantial interaction between the NRC Regional SRA and the licensee's PRA staff.

Instructions and considerations for performance of Phase 1 and Phase 2 evaluations are provided in Reference 1. The NRC does not currently have any publicly available guidance for conduct of a Phase 3 evaluation.

References:

1. NRC Inspection Manual IMC 0609 Significance Determination Process
2. "Seabrook Station Site Specific Worksheets for Use in the Nuclear Regulatory Commission's Significance Determination Process", R.M. Pulsifer to T.C.Feigenbaum, 3/27/2000.
3. Seabrook Station Probabilistic Safety Study 1999 Peer Review Update, SB99PR.
4. Seabrook Station Spent Fuel Pool Probabilistic Safety Study, March 2000.
5. Engineering Evaluation 01001, Emergency Diesel Generator B Operability During Cycle 7.

3.0 DISCUSSION

3.1 Phase 2 Full Power Significance Determination

Even though NAESCO has concluded that the "B" EDG was operable throughout Cycle 7 (Reference 5), the Resident Inspector has stated that he believes that the "B" EDG was not operable after the final surveillance run of the cycle.

The full power Phase 2 significance determination was performed using the above conservative assumption. During the final run, the diesel generator breaker was opened at 0523 10/18/00. The reactor was tripped at the end of the cycle on 0352 10/21/00. The interval between the end of the surveillance run and the opening of the reactor trip breakers is less than three days.

Since the finding concerns the emergency diesel generators, Attachment A, Table 4 is used to determine that the Loss of Offsite Power initiator should be evaluated. Using an exposure time of <3 days, and the Loss of Offsite Power initiator (Attachment A, Table 1) gives a likelihood rating of D. Sequences 4 - 8 of Attachment A, Table 5, involve EDG capability, so these sequences are used to determine the remaining mitigation capability. Based on the plant configuration at the time of the last "B" EDG surveillance test, and consulting Attachment A, Table 3 for remaining mitigation capability gives the following results:

- Sequence 4: EAC= 1 train, = 2 ("A" EDG), HPR=Operator action= 2. Total = 4
- Sequence 5: EAC=2 (same as above), EIHP=1 multi train system = 3. Total = 5
- Sequence 6: EAC=2 (same as above), REC5=Operator action=2. Total = 4
- Sequence 7: EAC=2 (same as above), TDEFW=1 train (diverse) [note not ASD]=2, FB=operator action=2. Total = 6
- Sequence 8: EAC=2 (same as above), TDEFW=2 (same as above), REC2=Operator action under high stress=1. Total = 5

Entering Attachment A, Table 2 with a likelihood rating of D and the above results gives a color of GREEN. Note that even if the assumption is an exposure time of 3 to 30 days, this gives a likelihood rating of C and a resulting color of "GREEN bordered on White". The rules of engagement for the table require a Phase 3 evaluation if there are 3 or more hits in a "Green bordered by white" cell. However, since there are only 2 "hits" in the Green bordered by White, the result would also be GREEN.

3.2 Phase 2 Shutdown

The SDP for Shutdown Operations is considerably simpler than for Power Operations.

From the outage log:

- Mode 5 10/22/00 0240
- DG A ECCS Testing 10/22/00 1230
- DG B ECCS Testing 10/24/00 1047

Thus, the first DG runs were after entry into Mode 5. The case of DG operability for Modes 2 - 4 at the beginning of OR07 should be the same as during the previous operating cycle (i.e., the DG-B was fully operable).

Review of the Shutdown SDP (Reference 1, Appendix G) indicates that the appropriate section for the configuration at the time of the EDG failure is "PWR Refueling Operation RCS Level >23' OR PWR Cold Shutdown or Refueling Operation with time to boil > 2 hours" (Appendix G, page T-12). Section III deals with Power Availability Guidelines, and verifies that the Technical Specifications for AC and DC power are being met. Since the Technical Specifications were being met at the time of the EDG failure, the SDP would not proceed to Phase 2 analysis (i.e. the significance determination would be GREEN).

In addition, the most restrictive Phase 2 shutdown SDP requires "3 sources of AC power including: 1 offsite and 1 onsite source." Since we had at least the "A" EDG, two offsite lines, and at least two of the RATs and UATs during this period, there is no issue with regard to Phase 2.

3.3 Phase 3 Significance Determination (Online and Shutdown)

The Phase 3 evaluation addresses the risk implications of the failure to run of the Train "B" emergency diesel generator (EDG) during OR07 as well as some sensitivity cases for unavailability during power operation. Based on the fact that the failure occurred during the outage and the evidence that both EDGs were operable throughout Cycle 7 (Reference 5), the risk significance is based on an evaluation of *outage risk*. Since the failure of EDG "B" occurred during fuel offload, in one of the lowest risk windows in the outage, this event is risk insignificant (i.e., equivalent to a significance determination of GREEN).

The additional operating history of both diesels during cycle 7 and OR07 allow an updated estimate of the EDG failure rate. The resultant change in the calculated at-power risk should not be considered an increase in risk from Seabrook Station. This change is more correctly viewed as a change in our state of knowledge of Seabrook Station risk resulting from a better assessment of the true EDG failure rate.

The following paragraphs describe the actions taken to assess the results of the revised failure rate, as well as the risk implications of the failure to run of the "B" emergency diesel generator during OR07. The probabilistic evaluation considers three perspectives: the impact on average risk, the impact on risk during the previous cycle 7, and the impact on outage risk.

Five changes to the PRA were incorporated in order to reflect this failure:

- Change in the average EDG failure rate, based on this failure as well as the success data from cycle 7.
- Change in the EDG recovery potential, based on the consequences of this failure.
- Change to the common cause factor between the two EDGs.
- Change to the unavailability of the EDGs during cycle 7.
- Change to the outage risk due to the EDG failure.

These changes were evaluated using the official RISKMAN model (SB99PR) as well as the Spent Fuel Pool PRA. The results are presented below.

EDG Failure Rate

The EDG failure rate in the RISKMAN model is divided into three terms - fail to start, fail to run for the first hour, and failure to run after the first hour. The two RUN terms help to account for the difference in data from the short runs for monthly tests vs. the 24 hr run at refueling. The failure that occurred during OR07 was in the term "failure to run after the first hour." As a result, the data for both EDGs is as follows through OR07:

Failure Mode	Failures	Success
Fail to start (S)	0	534
Fail to run for the first hour (R1)	2	461 hr
Fail to run after the first hour (R2)	2	1567 hr

Note the recent failure doubles the number of failures for the third term, from one to two failures.

RISKMAN was used to perform a Baysian update of generic failure rates with this plant specific data:

Failure Mode	Generic Failure Rate	Current Failure Rate	New Failure Rate
Fail to start (S)	2.14E-2	4.26E-3	3.99E-3
Fail to run for the first hour (R1)	1.69E-2	6.50E-3	6.04E-3
Fail to run after the first hour (R2)	2.50E-3/hr	1.32E-3/hr	1.57E-3/hr

Thus, with additional cycle 7 data, the first two terms (S and R1) decreased while the third (R2) increased due to the additional failure as well as additional success data. The large increase in R2 (19%) is due the one additional failure in light of the high reliability in the past, with only one previous failure. If the EDGs had been less reliable in the past, one additional failure would have made much less difference to the failure rate.

Two different EDG success criteria are used in the RISKMAN model: for LOSPSY (switchyard related events), the mission time is 6 hr; for LOSPW (weather related events), the mission time is 24hr. The changes in failure terms have different impacts:

Success Criteria	Equation	Current Failure Rate	New Failure Rates
EDG (6hr)	= S + R1 + R2 (5hr)	1.74E-2	1.79E-2
EDG (24hr)	= S + R1 + R2 (23hr)	4.11E-2	4.61E-2

Thus, for the 6-hr mission time, the increase in EDG failure probability is about 3% while for the 24hr mission time it is 12%.

Note: the "current" EDG failure rate data is documented in Section 6.1.1 and Tables 6.1-1 and 2 of Reference 3.

EDG Recovery Probability

The PRA model currently contains a generic EDG recovery probability curve. With four actual failures at Seabrook Station, we can construct a simple plant-specific recovery curve. The four EDG failures with estimated recovery times:

Failure Date	Est. Recovery Time	Non-Recovery at 4hr	Non-Recovery at 12hr
9-11-91	24hr	1.0	1.0
12-16-92	1 hr	0.0	0.0
9-20-96	1 hr	0.0	0.0
11-1-00	> 24 hr	1.0	1.0

Yielding the recovery failure probabilities:

EDG Recovery Failure	Current	New
EDGR (4hr)	0.43	0.50
EDGR (12hr)	0.32	0.50

The 4hr and 12 hr times are used based on battery lifetimes. This impacts only the LOSPSY since the LOSPW is assumed to last for more than 12 hrs.

Note: the current EDG recovery model is documented in Section 3.18D of Reference 3.

Common Cause Potential

The current PRA model includes a beta factor of 0.031 for fail to start and 0.040 for fail to run. Thus, the current model includes some common cause failure potential. In order to be considered a common cause failure (CCF), the most recent failure mode would have to result in both EDGs failing at the same time. Just the presence of the same wear mechanism is not sufficient to consider it a CCF. It would not be appropriate to increase either beta factor since the inspection of the "A" EDG shows that the "A" EDG was not on the verge of failing from the same cause that "B" EDG failed from. The "A" EDG would have run successfully in its next 24hr run. The inspection of the "A" EDG showed some of the same wear indications but not to the point of imminent failure; thus, common cause failure would be unlikely. In addition, the EDGs do have somewhat different total start and run times (this is estimated from surveillance and maintenance start/runs):

EDG	# Starts	# Run Hours
"A"	353	1160 hr
"B"	391	1265 hr

Since this wear mechanism is start/load related (Reference 5), one might expect that it would initially be encountered in the "B" EDG.

Note: the current CCF model is documented in Section 6.3 and Table 6-3 of the Reference 3.

Unavailability During Cycle 7

If one or both of the EDGs were non-functional (i.e., unable to perform its mission from a PRA standpoint) sometime during Cycle 7, then the actual "risk" during Cycle 7 would have been higher than assumed based on unavailability from average maintenance and random failures. The word risk is in quotes since, strictly speaking, risk relates solely to future or unknown events. Since we know that the core did not melt during Cycle 7, the risk is zero. However we can consider risk in a historical sense by assuming we are back in Cycle 7 with no knowledge of the future beyond what we now know about the condition of the EDGs. This section addresses the potential unavailability of each EDG during Cycle 7 in this context.

As discussed previously, the risk model includes two mission times for EDGs, 6 hr and 24 hr. We examined the data for EDG runs during Cycle 7 and OR07 for evidence that each EDG would be able to run for these mission times. Each EDG was run successfully for at least 4 hours at its monthly surveillance, for a total of at least 72 hr per EDG during Cycle 7. EDG "A" successfully ran a number of hours during Cycle 7 before its 24-hour run. This evidence gives good assurance that the EDG "A" would have run for 6 hr and for 24 hr if a real demand had occurred during the cycle.

Similarly, EDG "B" ran loaded for more than 37 hours during OR07, prior to the run where the failure occurred. The failure mode that occurred appears to be related to the number of fast starts/loads (i.e., a wear out failure mode based on the stress from the start and initial load). The "B" EDG was started at least 10 times during OR07 before the failure. Thus, during Cycle 7, the "B" EDG had at least 10 fewer starts than when it failed. This evidence also give good assurance that the EDG "B" would have run for 6 hr and for 24 hr if a real demand had occurred during the cycle.

We have previously stated that we believe there was no unavailability of the "B" EDG during Cycle 7. However one could perform a sensitivity case using a bounding assumption for the typical fault exposure time determination (i.e. ½ duration from last successful surveillance to end of cycle). We believe that the observed failure would not be confined to runs of 24-hour duration (see Insights and Observations section following). The quantification (based on Reference 3) is as follows:

Duration = ½ * (2 days, 22 hr, 29 minutes) = 35.24 hrs

Delta CDF = CDF base * (RAW-1) * Duration/8760

= 4.6e-5 * (6.04-1) * 35.24/8760 = 9.33e-7

Outage Risk Assessment

A quantitative estimate of fuel damage risk for the configuration of interest is bounded by a case with all the fuel in the spent fuel pool and no permanent diesels available.

This is an evaluation of the change in CDF risk given the following bounding assumptions:

- The fuel has been offloaded to the spent fuel pool.
- Both emergency diesels are out of service and not quickly restorable.
- One emergency AC bus is out of service.
- This configuration occurs for one month.

We can start by evaluating the condition of both EDGs out of service with the core offloaded. From the Seabrook Spent Fuel Pool PRA (Reference 4), the base case (average annual) risk is:

Loss of Flow	5.2E-10
Loss of Cooling	3.6E-8
Loss of Level	5.3E-7
TOTAL	5.7E-7

With the fuel offloaded, the base case conditional CDF is:

Loss of Flow	2.1E-8
Loss of Cooling	1.2E-6
Loss of Level	7.4E-7
TOTAL	1.9E-6

This is computed by changing the OFFLOAD variable from 0.02 to 1.0 i.e., assuming the SFP is in the OFFLOAD condition. (Note this is significantly higher than the average baseline CDF of 5.7E-7/yr, which indicates that OFFLOAD configuration has a higher average risk, as one would expect).

If we assume the plant is in this configuration for one month per year, with average equipment unavailability, the CDF = 1.9E-6/12 = 1.6E-7/yr.

With the fuel offloaded, one emergency bus and both EDGs out of service, the conditional CDF is:

Loss of Flow	9.1E-7
Loss of Cooling	1.2E-6
Loss of Level	7.4E-7
TOTAL	2.9E-6

Again, assuming this configuration is present for one month per year, the CDF = 2.4E-7.

Thus, the increase due to bus and EDG outages is (2.4E-7 - 1.6E-7) = 8e-8/yr.

The change in outage risk due to the EDG failure is insignificant due to the plant configuration, with all the fuel in the spent fuel pool.

Insights and Observations

These paragraphs discuss insights obtained from these significance determinations as well as answering various questions from internal and external reviewers.

- Why does one failure have such an impact on the average risk?

The change in CDF from this one failure is due to two factors: (a) the importance of station blackout to the overall risk and (b) the high reliability of the EDGs such that one additional failure significantly alters the estimate of EDG failure over 24 hours. For example, if the data through Cycle 6 was 4 failures in failure mode R2 (rather than 1), an additional failure through Cycle 7 would make only a 7% difference in failure rate (from 2.63E-3/hr to 2.82E-3/hr). This is in contrast to the 19% change from the actual data.

- What is the Risk Significance of this event?

Based on the fact that the failure occurred during the outage and the evidence that the EDGs were operable throughout Cycle 7, the risk significance is on outage risk. Since the failure of EDG "B" occurred during fuel offload, in one of the lowest risk windows in the outage, this event is risk insignificant. The failure also allowed a new estimate of the EDG failure rate, but this is not a change to the risk but a better assessment of the true EDG failure rate. In other words, even though the diesels are risk significant equipment, this failure was not risk significant.

- Do the EDGs have different failure rates?

There are two arguments for considering the EDG data together rather than dividing it between "A" and "B". First, these machines are essentially identical in their design, operation, and start/run data. Combining the reliability data produces a more statistically valid failure rate. Second, each machine has had 2 failures over 7 cycles. While the failure times are different ("A" failures occurred during the first hour, "B" failures occurred after the first hour), this data does support the assertion that there is not a "bad" EDG that would justify separating out data.

- Could this failure only be discovered during 24 hour run?

The various EDG reports do not conclude that the recent EDG failures would only be experienced during a 24 hour run (i.e. long demand). Based on the failure analysis conducted by the Event Team, it is logical to conclude that the cylinder damage would have manifested at any time after some level of cylinder wall damage was experienced. Based on this assumption, one could then argue that the correct fault exposure time is one half of the duration from the last surveillance on 10/18 to the start of the outage. The NRC staff concluded that they did not think going back to the last 24 hour run was appropriate. At any rate, the event clearly demonstrates that the failure occurred well before 24 hours.

4.0 SAFETY SIGNIFICANCE

There is no safety significance since the diesel generator failure occurred while the core was offloaded to the spent fuel pool. This is substantiated by the risk quantification described above.

5.0 CONCLUSION

Using the NRC Significance Determination Methodology, the Phase 2 Full Power results are GREEN and the Phase 1 shutdown results would not proceed to Phase 2 (i.e. GREEN). Performing a Phase 3 sensitivity case using a bounding estimate of Cycle 7 EDG "B" unavailability yields a delta risk of 9.3e-7, also GREEN.

The "B" EDG failure was not risk significant. There is ample evidence presented to conclude that the "B" EDG was capable of performing its PRA mission at any time during cycle 7. As the bounding case from section 3 above demonstrates, a change in risk can be shown to be proportional to an increase beyond the baseline unavailability. In addition, the bounding case for shutdown also results in an insignificant increase in the Spent Fuel Pool risk estimate.

Timing and circumstance cannot be ignored when determining the risk significance of an event. Therefore arguments of "what might have been" are invalid for this purpose. In fact, the NRC guidance for the Significance Determination Process specifically forbids consideration of hypothetical configurations or circumstances (Reference 1, pg A1-4), and requires the determination to be performed based on the facts related to the finding.

Attachment A

SDP Tables (Reference 2)
(marked up for 11/1/00 EDG Event)

Table 1 - Estimated Likelihood for Initiating Event Occurrence During Degraded Period

Row	Approx. Freq.	Example Event Type	Estimated Likelihood Rating		
I	>1 per 1 - 10 yr	Reactor Trip Loss of Power Conv. Sys. (loss of condenser, closure of MSIVs, loss of feedwater)	A	B	C
II	1 per 10 - 10^2 yr	Loss of Offsite Power Small LOCA (BWR) (Stuck open SRV only) MSLB (outside cntmt)	B	C	D
III	1 per 10^2 - 10^3 yr	SGTR Stuck open PORV (PWR) Small LOCA (PWR) (RCP seal failures and stuck open SVs only) MFLB MSLB (inside PWR cntmt)	C	D	E
IV	1 per 10^3 - 10^4 yr	Small LOCA (breaks) Med LOCA (breaks) ATWS-PWR (elect only)	D	E	F
V	1 per 10^4 - 10^5 yr	Large LOCA (breaks) ATWS-BWR	E	F	G
VI	<1 per 10^5 yr	ATWS-PWR (mech only) ISLOCA Vessel Rupture	F	G	H
			> 30 days	30-3days	<3 days
			Exposure Time for Degraded Condition		

Table 2 - Risk Significance Estimation Matrix

Initiating Event Likelihood	Remaining Mitigation Capability Rating (with Examples)						
	6	5	4	3	2	1	0
	3 diverse trains OR 2 multi-train systems OR 1 train + 1 multi-train system + recovery of failed train	1 train + 1 multi-train system OR 2 diverse trains + recovery of failed train	2 diverse trains OR 1 multi-train system + recovery of failed train	1 train + recovery of failed train OR 1 multi-train system OR Operator action + recovery of failed train	1 train OR Operator action OR Operator action under high stress + recovery of failed train	Recovery of failed train OR Operator action under high stress	none
A	Green	White	Yellow	Red	Red	Red	Red
B	Green	Green	White	Yellow	Red	Red	Red
C	Green	Green	Green	White	Yellow	Red	Red
D	Green	Green	Green	Green	White	Yellow	Red
E	Green	Green	Green	Green	Green	White	Yellow
F	Green	Green	Green	Green	Green	Green	White
G	Green	Green	Green	Green	Green	Green	Green
H	Green	Green	Green	Green	Green	Green	Green

Table 3 - Remaining Capability Rating Values

Type of Remaining Capability	Remaining Capability Rating
Operator Action Under High Stress Definition: Operator action assumed to have about a 1E-1 probability of failing when credited as "remaining mitigation capability".	1
Recovery of Failed Train Definition: Operator action to recover failed equipment that is capable of being recovered after an initiating event occurs that requires the equipment (e.g., equipment was unavailable due to a switch misalignment). Action may take place either in the control room or outside the control room and is assumed to have about a 1E-1 probability of failing when credited as "remaining mitigation capability".	1
1 Automatic Steam-Driven (ASD) Train Definition: A collection of associated equipment that includes a single turbine-driven component to provide 100% of a specified safety function. The probability of such a train being unavailable due to failure, test, or maintenance is assumed to be about 1E-1 when credited as "remaining mitigation capability".	1
Operator Action Definition: Operator action that can occur with sufficient time to have about a 1E-2 probability of failing when credited as "remaining mitigation capability".	2
1 Train (diverse as compared to other trains) Definition: A collection of associated equipment (e.g., pumps, valves, breakers, etc.) that together can provide 100% of a specified safety function and for which the probability of being unavailable due to failure, test, or maintenance is assumed to be about 1E-2 when credited as "remaining mitigation capability". Two or more trains are diverse if they are not considered to be susceptible to common cause failure modes.	2
1 Multi-Train System Definition: A system comprised of two or more trains (as defined above) that are considered susceptible to common cause failure modes. Such a system is assumed to have about a 1E-3 probability of being unavailable, regardless of how many trains comprise the system, when credited as "remaining mitigation capability".	3
2 (diverse) Trains [adding example] (2 diverse trains are assumed to have a combined 1E-4 probability of being unavailable)	4 (= 2 + 2)
1 Train + Recovery of Failed Train [adding example] (1 train plus recovery of failed train is assumed to have a combined 1E-3 probability of being unavailable or failed)	3 (=2 + 1)

Table 4 – Seabrook Specific Dependency Matrix (applicable portion)

Affected Systems[1]	Major Components	Support Systems	Initiating Events
AC Power System	Offsite power:[2] Switchyard	Non-Class 1E DC	Transients with Main Feedwater Available (Reactor Trip), Transients with Loss of Main Feedwater, SLOCA, SORV, MLOCA , LLOCA, LOOP, SGTR, ATWS, MSLBOC, RCP seal LOCA
	Vital 4.16 kV AC Power:[2] Two load groups, each with a Class 1E bus	Offsite power, Vital 125 VDC, Switchgear ventilation, Emergency power sequencer[3]	Transients with Main Feedwater Available (Reactor Trip), Transients with Loss of Main Feedwater, SLOCA, SORV, MLOCA , LLOCA, LOOP, SGTR, ATWS, MSLBOC, RCP seal LOCA
	120 VAC vital instrument power	Vital 4.16 kV AC Power, Vital 125 VDC	Transients with Main Feedwater Available (Reactor Trip), Transients with Loss of Main Feedwater, SLOCA, SORV, MLOCA , LLOCA, LOOP, SGTR, ATWS, MSLBOC, RCP seal LOCA
	Two diesel generators (one per load group)	Vital 125 VDC, SW, Diesel generator building ventilation, Fuel oil transfer pump	LOOP

Table 5 - SDP Worksheet for Seabrook Station — LOOP (Table 2.7, Ref 2)

Estimated Frequency (Table 1 Row) *1 per 10-1e-2/yr* Exposure Time *<3D* Table 1 Result (circle): A B C D E F G H

Safety Functions Needed:	Full Creditable Mitigation Capability for Each Safety Function:
Emergency AC Power (EAC)	1 / 2 Emergency Diesel Generators (1 train)(1)
Turbine-driven EFW pump (TDEFW)	1 / 1 TDP pump of EFW (1 train)(2)
Secondary Heat Removal (EFW)	1 / 2 MDEFW trains (1 multi-train system) or 1 / 1 TDEFW train (1 ASD train)(2)
Recovery of AC Power in < 2 hrs (REC2)	SBO procedures implemented (operator action under high stress)
Recovery of AC Power in < 5 hrs (REC5)	SBO procedures implemented (operator action)(3)
Early Inventory, High Pressure Injection (EIHP)	1 / 2 charging pumps or 1 / 2 SI pumps (1 multi-train system)(4)
Primary Heat Removal, Feed/Bleed (FB)	2 / 2 PORVs and block valves open for Feed/Bleed (operator action)
High Pressure Recirculation (HPR)	(1 / 2 charging pumps or 1 / 2 SI pumps) with 1 / 2 RHR pumps and with operator action for switchover (operator action)

Circle Affected Functions	Recovery of Failed Train	Remaining Mitigation Capability Rating for Each Affected Sequence	Sequence Color
1 LOOP - EFW - HPR (3)		*N/A*	
2 LOOP - EFW - FB (4)		*N/A*	
3 LOOP - EFW - EIHP (5)		*N/A*	
4 LOOP - EAC - HPR (7, 11) (AC recovered)		*2 + 2*	*G*
5 LOOP - EAC - EIHP (8, 13) (AC recovered)		*2 + 3*	*G*

6 LOOP - EAC - REC5 (9)		$2 + 2$	*G*
7 LOOP - EAC - TDEFW - FB (12) (AC recovered)		$2 + 2 + 2$	*G*
8 LOOP - EAC - TDEFW - REC2 (14)		$2 + 2 + 1$	*G*
Identify any operator recovery actions that are credited to directly restore the degraded equipment or initiating event: If operator actions are required to credit placing mitigation equipment in service or for recovery actions, such credit should be given only if the following criteria are met: 1) sufficient time is available to implement these actions, 2) environmental conditions allow access where needed, 3) procedures exist, 4) training is conducted on the existing procedures under conditions similar to the scenario assumed, and 5) any equipment needed to complete these actions is available and ready for use.			

Notes:

1) *Split fraction DGAB, Total loss of two diesel generators, is 7.5E-3.*
2) *The value assessed by the IPE (page E-97) for the failure of the TDP of EFW is 4.8E-2. For the SDP calculation, a value of 1E-1 can be used.*
3) *In an SBO situation, an RCP seal LOCA may occur, with subsequent core damage at about 5 hours.*
4) *Since the charging pumps and the SI pumps depend on the same support systems, the mitigating capability is 1 multi-train system.*