WOLF CREEK
NUCLEAR OPERATING CORPORATION

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ET 00-0018

U. S. Nuclear Regulatory Commission
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Reference:
1) Letter WM 98-0091, dated July 17, 1998, from O. L. Maynard, WCNOC, to USNRC
2) Letter dated July 18, 1998, from K. M. Thomas, USNRC, to O. L. Maynard, WCNOC
3) Letter WO 99-0001, dated January 12, 1999, from C.C. Warren, WCNOC, to USNRC
4) Letter ET 99-0017, dated May 11, 1999, from R. A. Muench, WCNOC, to USNRC
5) Letter WO 99-0051, dated June 30, 1999, from C. C. Warren, WCNOC, to USNRC
6) Letter dated July 8, 1999, from J. N. Donohew, USNRC, to O. L. Maynard, WCNOC
7) Letter dated September 22, 1999, from J. N. Donohew, USNRC, to O. L. Maynard, WCNOC

Subject: Docket No. 50-482: Application For Amendment To Technical Specification 3.7.9, Ultimate Heat Sink (UHS)

Gentlemen:

This letter transmits an application for amendment to Facility Operating License No. NPF-42 for Wolf Creek Generating Station (WCGS). Environmental conditions during the 1998 and 1999 summer months resulted in an elevated plant inlet water temperature, approaching the 90 °F Technical Specification Surveillance Requirement limit. It is expected that in the future, the plant inlet water temperature will approach and may even exceed the 90 °F limit. This request proposes to modify Technical Specification 3.7.9, Ultimate Heat Sink (UHS), by adding a new ACTION (Condition A). The new ACTION will require verifying that the required cooling capacity is maintained and verifying plant inlet water temperature is less than or equal to 94 °F.

Reference 1 requested a limited duration change to allow continued operation of the plant in the event that plant inlet water temperature exceeds 90 °F. This limited duration change was approved by License Amendment No. 118 (Reference 2) for the 1998 time period. Reference 3 proposed changes to Technical Specification 3.7.9 (Technical Specification 3/4.7.5, pre-License Amendment No. 123) which were subsequently withdrawn as discussed in Reference 7. References 4, 5 and 6 involved a limited duration change for the 1999 time period.

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The proposed change is consistent with the approach proposed by the NRC Staff and discussed with the Technical Specification Task Force (TSTF) in a meeting on March 7, 2000. The TSTF has not endorsed the NRC Staff approach as the industry resolution to this issue. As such, this request is not an endorsement of the NRC Staff's approach for generic resolution. Wolf Creek Nuclear Operating Corporation (WCNOC) considers this request to be a plant specific request.

The probability of the occurrence of environmental conditions causing the plant inlet water temperature to exceed 90 °F is low. With the main cooling lake dam intact, the volume of the lake is sufficient to ensure the design basis temperature of the safety related equipment is not exceeded. A review of the safe shutdown and post-accident capabilities without the main cooling lake dam determined that the calculated cooldown time to reach cold shutdown may be slightly increased and some design basis parameters may be slightly exceeded for a short period of time. However, there is reasonable assurance that cold shutdown can be reached within Technical Specification allowable times and that all safety equipment will perform their safety functions. As such, the health and safety of the public will not be endangered by operation in the proposed manner. Therefore, WCNOC believes it is reasonable to allow continued operation of WCGS with a plant inlet water temperature greater than 90 °F but less than or equal to 94 °F with the requirement to periodically verify that the required cooling capacity is maintained and plant inlet water temperature of the UHS is less than or equal to 94 °F. The proposed changes provide continued assurance that with a plant inlet water temperature > 90 °F, the design temperatures of safety related equipment are maintained within acceptable limits such that a safe shutdown of the plant can be performed.

This requested amendment provides the long-term resolution of the UHS temperature issue discussed in the above References. WCNOC requests approval of this application no later than June 15, 2000, to allow implementation of the proposed change prior to the summer peak loading season. The amendment will be implemented within 30 days of NRC approval.

A Safety Evaluation for the proposed license amendment request is provided in Attachment I and a No Significant Hazards Consideration Determination is provided in Attachment II. Attachment III is the related Environmental Impact Determination. Marked up pages are provided in Attachment IV to indicate the changes to the Technical Specifications. Attachment V provides proposed changes to the Technical Specification Bases for information. Attachment VI provides a summary of the licensing commitments made in this submittal.

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated Kansas State Official. If you should have any questions regarding this submittal, please contact me at (316) 364-4034, or Mr. Tony Harris at (316) 364-4038.

Very truly yours,

Richard A. Muench

RAM/rlr

Attachments:
- I - Safety Evaluation
- II - No Significant Hazards Consideration Determination
- III - Environmental Impact Determination
- IV - Proposed Technical Specification Changes
- V - Proposed Technical Specification Bases Changes
- VI - List of Commitments

cc: V. L. Cooper (KDHE), w/a
J. N. Donohew (NRC), w/a
W. D. Johnson (NRC), w/a
E. W. Merschoff (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Richard A. Muench, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering and Information Services of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the content thereof; that he has executed that same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By R A Muench
Richard A. Muench
Vice President Engineering
and Information Services

SUBSCRIBED and sworn to before me this 31st day of March, 2000.

NOTARY PUBLIC STATE OF KANSAS RHONDA L. RODGERS My Appt. Exp. 5-11-2002

Rhonda L Rodgers
Notary Public

Expiration Date May 11, 2002

ATTACHMENT I

SAFETY EVALUATION

Safety Evaluation

Description of the Proposed Change

Environmental conditions during the 1998 and 1999 summer months resulted in an elevated plant inlet water temperature, approaching the 90 °F Technical Specification limit. It is expected that in the future, the plant inlet water temperature will approach and may even exceed the 90 °F limit. This request for a license amendment proposes to modify Wolf Creek Generating Station (WCGS) Technical Specification 3.7.9, Ultimate Heat Sink (UHS), to add a new ACTION. The new ACTION will require verifying that the required cooling capacity is maintained within 4 hours and once per 12 hours, thereafter, when the plant inlet water temperature of UHS is not within limit. Additionally, the plant inlet water temperature will be verified to be ≤ 94 °F once per 12 hours. The required cooling capacity is maintained by verifying the main cooling lake level is > 1085 ft mean sea level.

Background

The WCGS UHS is the normally submerged Seismic Category I cooling pond. The UHS is formed by providing a volume of cooling water behind a submerged Seismic Category I dam built in one finger of the WCGS cooling lake. The two principal functions of the UHS are the dissipation of residual heat after reactor shutdown and dissipation of residual heat after an accident.

The UHS is the sink for heat removed from the reactor core following all accidents and anticipated operational occurrences in which the unit is cooled down and placed on residual heat removal (RHR) operation. The maximum post accident heat load occurs after a design basis loss of coolant accident (LOCA) when the Emergency Core Cooling System (ECCS) transfers from injection mode of operation to recirculation mode of operation and the RHR System is required to remove the core decay heat.

The performance requirements for the UHS are that a 30 day supply of water be available, and that the design basis temperatures of safety related equipment not be exceeded during an accident. Assuming a LOCA and a failure of the main cooling lake dam, the capacity of the submerged Seismic Category I cooling pond is sufficient to provide cooling for the required period of 30 days with no makeup water under both normal and accident conditions provided plant inlet temperature does not exceed 90 °F. The UHS is assumed to supply cooling water to the Essential Service Water (ESW) System at a rate of 30,000 gpm for the entire 30 day period for this analysis. The UHS has sufficient capacity to supply emergency makeup water to the Spent Fuel Pool System and Component Cooling Water (CCW) System and to serve as the backup water supply for the Auxiliary Feedwater System. The UHS also has sufficient capacity to allow up to 140 gpm of continuous losses throughout the 30 day period due to leakage from the ESW System. The analysis assumes the UHS has lost a volume of 155 acre-feet due to sediment.

The UHS is designed in accordance with Regulatory Guide 1.27, Revision 2, "Ultimate Heat Sink for Nuclear Power Plants," which specifies a 30 day supply of cooling water in the UHS. The UHS satisfies Criterion 3 of 10 CFR 50.36 (c)(2)(ii). The UHS design ensures that the design temperatures of safety related equipment are not exceeded. The design temperature of water supplied to the plant is assumed to be 95 °F.

The operating limits are based on conservative heat transfer analyses for the worst case LOCA. Section 9.2.5 of the Updated Safety Analysis Report (USAR) provides the details of the assumptions used in the analyses, which include worst expected meteorological conditions, conservative uncertainties when calculating decay heat, and postulated failure of the main cooling lake dam.

The UHS is required to be OPERABLE and is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the ESW System to operate for at least 30 days following the design basis LOCA without exceeding the maximum design temperature of the equipment served by the ESW System. To meet the guidance of Regulatory Guide 1.27, the initial plant inlet water temperature should not exceed 90 °F and the minimum water level should not fall below 1070 ft mean sea level during normal unit operation. The water surface elevation of the UHS (the UHS dam crest) is 1070 ft mean sea level.

The UHS design was based upon adverse hydrological and meteorological conditions. The maximum temperature and maximum evaporation periods for recorded weather conditions were considered in sizing of the UHS. Selection of the critical weather periods was based upon a computer analysis (UHSAVG) of meteorological data for a 16 year period that included a severe drought, estimated to have a recurrence interval of 50 years. A weather tape scan of surface weather data for Chanute, Kansas, and of precipitation data for Iola, Kansas, for the period of 1949-1964 was performed. The data included the historic drought years of 1952-1957.

The 16 year weather data was used to evaluate water surface temperatures and evaporation rates for a prescribed rate of heat rejection from the surface of the UHS. The worst evaporation period was obtained by selecting the weather conditions corresponding to the 30 consecutive days for which evaporation loss was maximum. The worst temperature period was obtained by saving the conditions for the 5 consecutive days, 1 day, and 30 consecutive days resulting in highest average water temperature after which these three periods were combined in the indicated order to produce a synthetic 36 day worst-weather period.

The maximum evaporative and temperature periods were determined to have the following dates:

Maximum Evaporation Period

Worst 30 days: June 24, 1954 to July 23, 1954

Maximum Temperature Period

Worst 5 days: June 30, 1949 to July 5, 1949
Worst 1 day: July 2, 1949 (Noon) to July 3, 1949 (Noon)
Worst 30 days: July 16, 1951 to August 15, 1951

For the above listed weather periods, UHS drawdown and plant inlet temperatures were evaluated as a function of time using a computer model (LAKET-5) which predicts the transient response of the heat sink to external conditions.

Heat rejection rates were taken as those corresponding to a LOCA or normal shutdown with an assumed total flow of 30,000 gpm. In addition, it was assumed that all of the water in the UHS was at 90 °F at the start of this analysis.

Following the loss of the main cooling lake dam, the highest plant inlet water temperature during the maximum temperature period is predicted to be 95 °F. The predicted plant inlet temperature was usually well below 95 °F. The predicted plant inlet average temperature over the entire period was slightly below 90 °F, and 95% of the time, below 94 °F.

The maximum drawdown under worst evaporative conditions, including water loss due to lake seepage, was found to be approximately 1.65 feet from the initial elevation of 1070 feet. This corresponds to a decrease in UHS volume of about 39% of the volume existing at the start of the accident. At this point in the event, the UHS water level reaches 1068.35 feet, and the UHS has already provided the required 390,000 gallons of emergency makeup water and 140 gpm of ESW System losses throughout the 30 days. As such, the plant can achieve safe shutdown in the event of postulated LOCA using only the UHS.

Evaluation

The WCGS Technical Specification 3/4.7.5 (pre-License Amendment No. 123) action statement change requested by WCNOC in July of 1998 and subsequently approved by the NRC in License Amendment No. 118 of the WCGS Technical Specifications was prompted when, on July 14, 1998, the WCGS cooling lake slightly exceeded 89 °F. This temperature was higher than previously expected. An evaluation conducted by an outside contractor concluded that the combination of moderately high dry bulb temperatures, high humidity (dew point temperatures), unusually persistent and strong solar radiation due to only occasional cloud cover, and unusually low wind speed over the several days leading up to July 14, 1998, was the cause of the elevated lake temperature. The combined effects of these factors was to severely limit the lake's cooling capacity, primarily through unusually high heat input to the lake from solar radiation and suppression of normal evaporative cooling. The outside contractor also concluded that these weather conditions were slightly more effective at suppressing normal heat dissipation by the lake than the design basis weather period (July-August 1951) discussed in the USAR as the basis for predicting 87.7 °F as the peak lake temperature.

This was an unprecedented condition that was not predictable, as the environmental conditions being experienced were more severe than previously experienced and analyzed. The prediction at the time for continuing harsh meteorological conditions raised the concern that the plant inlet water temperature may exceed 90 °F, forcing a unit shutdown under the WCGS Technical Specification 3.7.9 (post-License Amendment No. 123) ACTIONS, during a period of peak electrical demand. The action statement approved in Amendment No. 118 of the WCGS Technical Specifications was a temporary measure granted by the NRC with the provision that a permanent solution to this issue be provided at a later date.

In January 1999, WCNOC proposed a permanent change to the Technical Specification; however, the NRC concluded that the proposed change was generic in nature and requested WCNOC propose a limited duration amendment similar to that approved in Amendment No. 118. Amendment No. 125 was issued in July, 1999, approving a second limited duration action statement. A plant inlet water temperature of 88.4 °F on July 29, 1999 was the maximum temperature observed in 1999.

This proposed license amendment is the permanent solution WCNOC is proposing to replace the temporary measures described above. The proposed change differs from Amendment No. 118 and 125 in that it will allow continued operation with a plant inlet water temperature above 90 °F indefinitely provided a verification that required cooling capacity is maintained. This

verification is required to be performed within 4 hours and once per 12 hours thereafter (Required Action A.1) and plant inlet water temperature does not exceed 94 °F (Required Action A.2). This change is considered acceptable based on the following.

1) The capacity of the UHS and the entire volume of the lake is sufficient to provide cooling for the required period of 30 days with no makeup water under both normal and accident conditions provided the main cooling lake dam remains intact. The main cooling lake dam is designed such that its slopes are stable under all reservoir operating conditions including an earthquake force equivalent to the site Operational Basis Earthquake. A surveillance program has been maintained to monitor and observe the behavior of the main cooling lake dam and associated water control structures. The dam monitoring program ensures that a sudden catastrophic failure of the main cooling lake dam is highly unlikely, and therefore would be available for safe shutdown following a LOCA.

   The normal main cooling lake elevation is 1087 ft mean sea level. Surveillance Procedure, STS CR-001, "Shift Log for MODES 1, 2, & 3," provides for checking the UHS to be > 1075 feet mean sea level every 8 hours. The 1075 feet mean sea level is based on the minimum operating level for the service water pumps as discussed in the Updated Safety Analysis Report (USAR) section 9.2.1.1.2.3. Typically, when lake level approaches the 1086 ft mean sea level, actions are taken to raise the lake level.

   The computed minimum drawdown elevation assuming the design weather conditions is 1085 ft mean sea level. Verifying main cooling lake level greater than 1085 ft mean sea level ensures the required cooling capacity is maintained. The 4 hour Completion Time is based on the low probability of an accident occurring during the four hour period, and being a reasonable time frame to verify main cooling lake level.

2) Maintaining plant inlet water temperature ≤ 94 °F with the main cooling lake dam intact will ensure the temperature does not exceed the design temperatures of the safety related equipment (i.e., 95 °F).

3) The probability of the occurrence of environmental conditions causing the plant inlet water temperature to exceed 90 °F is low. This is demonstrated by the fact that the lake temperature recorded over the past 15 years has never exceeded 90 °F, including the 1998 conditions, and the fact that the combination of environmental conditions resulting in the July 1998 peak temperatures, similar to those seen in 1951, would indicate an event occurrence on the order of once in 47 years. (The lake temperature analysis assuming 1951 environmental conditions predicted a maximum temperature less than 90 °F, as well.) With the main cooling lake dam intact, the volume of the lake is sufficient to ensure the design basis temperature of the safety related equipment is not exceeded.

In addition, the requirement to verify that both RHR trains are available is not included in the proposed license amendment. This requirement is not included since only one RHR train is required to perform the required safety function of core cooling and achieve safe shutdown in the event of postulated LOCA. The requirements of Technical Specification 3.5.2, ECCS - Operating, are adequate to ensure the RHR System can perform its safety function during an accident and support placing the plant in a safe condition. With plant inlet water temperature between 90 and 95 °F, the calculated RHR cooldown time is increased. However, the additional RHR cooldown time is not excessive and does not adversely affect the mitigation of any accident or transient. Also, plant operators may initiate a power reduction as permitted by electrical grid

conditions to decrease the RHR cooldown time. The Table below shows the expected time to reach cold shutdown conditions based on a power reduction of 5% for each degree ESW temperature exceeds 90 °F (maximum reduction of 80%).

The calculated cooldown times (hours after reactor shutdown) assuming one RHR train is OPERABLE, are:

ESW Temperature °F	Power Level % (MW_t)			
	95% (3386.8)	90% (3209)	85% (3030)	80% (2852)
91	**30.0**	26.8	23.8	21.2
92	32.9	**29.3**	26.2	23.2
93	36.5	32.5	**28.9**	25.7
94	41.1	36.7	32.5	**28.8**

Various plant operating conditions were reviewed assuming an initial plant inlet water temperature of > 90 °F and ≤ 94 °F. The results of these reviews are discussed below.

Normal plant operation

Short term operation with an inlet water temperature of up to 94 °F is not expected to negatively affect normal plant operation, with the possible exception of turbine back pressure. A slight load reduction may be necessary to maintain acceptable turbine back pressure. Existing plant guidance will be employed if turbine back pressure becomes too high.

Continued plant operation during long term weather conditions causing the plant inlet water temperature to exceed 90 °F is not expected. The probability of environmental conditions significantly worse than those experienced in the summer of 1998 is low. Further, a review of data from the extreme meteorological conditions experienced in 1998 shows that a maximum lake water temperature is experienced only for a short duration. Daily peak lake temperatures during this time period were on the order of 2-3 °F lower than the overall peak lake water temperature.

Shutdown with the main cooling lake dam intact

During normal or emergency plant cooldown operation, the cooling lake serves as a reservoir to supply water to the ESW System. The ESW System, in conjunction with the CCW System and the RHR System, removes decay heat and sensible heat from the core and cools the plant from entry into the decay heat removal mode of RHR operation to cold shutdown during plant cooldown. The time required for this evolution is a function of the number of pumps, CCW heat exchangers, and RHR System trains that are operating. The RHR System may be placed in operation approximately four hours after reactor shutdown is initiated, when the RCS temperature is approximately 350 °F and pressure is below 360 psig.

Plant cooldown using the RHR System is calculated using a computer code. The computer code limits the cooldown rate to a maximum of 50 °F per hour, and to a rate which limits the CCW System outlet temperature from the CCW heat exchanger to a maximum of 120 °F. The reactor coolant flow through the RHR System heat exchangers is throttled during the early stages of cooldown to maintain a 120 °F limit. The 120 °F CCW temperature limit is dictated by cooling water temperature requirements of the reactor coolant pumps, which continue to run during the early part of the cooldown.

For a normal plant design cooldown, assuming both RHR trains are in service and a 90 °F ESW temperature, the plant can be cooled down to cold shutdown conditions (200 °F) within approximately 8 hours after reactor shutdown. However, for the single RHR train operation, the calculated cooldown time increases to about 32 hours. As stated above, the time to reach cold shutdown conditions is increased with plant inlet temperature between 90 and 94 °F. However, the time to reach cold shutdown conditions during normal operation is not assumed in any safety analysis. In addition, Technical Specifications provide adequate controls to ensure decay heat removal capability is available during normal plant shutdown.

LOCA with the main cooling lake dam intact

The effect of full power plant operation on plant inlet water temperature during worst case predicted summer environmental conditions is approximately 0.5 °F. The peak heat rejection rate by the plant post-LOCA would be approximately 5% of the continuous heat rejection rate of the plant during normal operation. Therefore, the effect of post-LOCA heat loads on plant inlet water temperature would be less than 0.1 °F.

The current UHS analysis assumes that there has been a main cooling lake dam failure and uses assumed worst case environmental conditions. The results indicate that with an initial UHS temperature of 90 °F, peak plant intake water temperature is expected to be 95 °F or less. Current plant Design Basis Accident analyses were performed assuming a continuous plant intake water temperature of 95 °F. The UHS analysis results also indicate that the environmental conditions have a much greater effect on peak plant intake water temperature than the heat rejected from the plant. The current UHS analysis is recognized as bounding the LOCA condition with the main cooling lake dam intact because the volume of the UHS (submerged Seismic Category I cooling pond) is significantly smaller than the volume of the WCGS main cooling lake (approximately 1%).

The probability that environmental conditions significantly worse than those causing entry into the Technical Specification ACTIONS is low. The probability of these conditions occurring simultaneously with a LOCA is even lower.

Safe shutdown or post-accident capability without the main cooling lake dam

Safe shutdown or post-accident capability without the main cooling lake dam is ensured when the plant is operated within Technical Specification limits (e.g., less than or equal to 90 °F). Safe shutdown and post-accident capability are also ensured with the main cooling lake dam intact and lake temperature less than or equal to 94 °F. Parameter studies performed at 92 °F show that the maximum predicted plant inlet water temperature could increase for a few hours to a maximum of 96 °F on the third and sixth days after the start of the event when decay heat loads are significantly reduced. The lake temperature is predominately driven by the affect of the environment and only slightly affected by the plant heat loads. Lake temperature exhibits a diurnal sine wave pattern which reflects heat gained by the lake during the daytime hours, and net heat loss from the lake during nighttime hours. Therefore, the predicted plant inlet water temperature, over the entire analysis period would average slightly less than 90 °F, and 95% of the time, would be below 94 °F, which is the same as when the initial lake temperature

was 90 °F. With lake temperatures approaching 94 °F, the maximum plant inlet water temperature is estimated by conservatively projecting the results of previous studies, to reach a maximum inlet temperature approaching 97 °F for a few hours. This peak temperature is also expected to occur three and six days after the start of the event. For this case also, the average predicted plant inlet water temperature is expected to average about 90 °F, and 95 % of the time, would be below 94 °F. In all cases, the required makeup capacities are available to maintain plant shutdown for 30 days as makeup and evaporation capabilities remains essentially the same.

Safe shutdown and post-accident (other than LOCA) capability has been reviewed for critical plant components that would be required to function following the loss of the main cooling lake dam.

As a result of short duration peak lake temperatures approaching 97 °F, the maximum Component Cooling Water (CCW) heat exchangers outlet temperature would slightly exceed 120 °F. The components served by the CCW System would not be adversely impacted by a short duration slightly higher CCW heat exchanger outlet temperature. However, the elevated lake water temperature may extend the calculated cooldown times (hours after shutdown), assuming one RHR train is OPERABLE. The average plant inlet water temperature is expected to be about 91.6 °F during the first 36 hours following a plant shutdown, assuming an initial inlet temperature of 94 °F. Based on previous calculations assuming a constant plant inlet water temperature of 90 °F, the cooldown time for single train operation was calculated to be 32 hours. Therefore, there is reasonable assurance that the plant can be cooled down to cold shutdown conditions within 36 hours as required by Technical Specifications.

With a peak plant inlet temperature of 96 °F, the Emergency Diesel Generator (EDG) heat exchanger design outlet temperatures would not be exceeded as determined by Engineering calculation. With plant inlet water temperature approaching 97 °F, the heat removal capability of the intercooler heat exchanger (assuming maximum fouling and tubes plugged) will be temporarily reduced to a level slightly below its design value. This would result in a short duration rise of approximately 1 °F in the intercooler heat exchanger. However, since the maximum inlet temperature should not occur until three days post loss of a main cooling lake dam event, the EDG loading would be considerably reduced from its maximum design value. The outlet of this heat exchanger is the inlet to the jacket water and lube oil heat exchangers in series. At all postulated lake temperatures, the intercooler heat exchanger cold water outlet temperature will remain below the design value. Therefore, the downstream jacket water and lube oil heat exchangers will also remain within their design values. Based upon the above, it can be concluded that even under the worst temporary scenario, the EDG would be able to perform its intended safety function.

In addition, the affect of increased plant inlet water temperatures for short durations, was reviewed for control room habitability and for the equipment that is important for safe shutdown. This equipment is located in rooms that are cooled by room coolers. The increased plant inlet water temperature for a limited duration would marginally reduce the room cooler and control room air conditioning units cooling capacity and cause a temporary small rise in these room temperatures. However, the control room will remain habitable and equipment relied on for safe shutdown, will not malfunction as a result of possible limited duration increased plant inlet water temperatures.

In summary, the calculated cooldown time to reach cold shutdown may be slightly increased and some design basis parameters may be slightly exceeded for a short period of time. However, there is reasonable assurance that cold shutdown can be reached within Technical Specification allowable times and that all safety equipment will perform their safety functions. As such, the health and safety of the public will not be endangered by operation in the proposed manner. Therefore, WCNOC believes it is reasonable to allow continued operation of WCGS with a plant inlet water temperature greater than 90 °F but less than or equal to 94 °F with the requirement to periodically verify that the required cooling capacity is maintained and plant inlet water temperature of the UHS is less than or equal to 94 °F.

Main Cooling Lake Dam Monitoring

A seismic event is a possible initiating event for causing failure of the main cooling lake dam. The main cooling lake dam is designed such that its slopes are stable under all reservoir operation conditions including an earthquake force equivalent to the site Operational Bases Earthquake. The frequency of the seismic initiator on an annual basis is nearly equal to a large break LOCA. The main cooling lake dam and saddle dams are under the jurisdiction of the state of Kansas, Department of Agriculture, Division of Water Resources, and complies with the provisions of the state of Kansas statutes KSA 82a-301 through 305.

WCGS has a surveillance program in place to monitor and observe the behavior of the main cooling lake dam and associated water control structures. The program meets the recommendations of Regulatory Guide 1.127, Revision 1, "Inspection of Water-Control Structures Associated with Nuclear Power Plants." It includes quarterly visual inspections for seepage and annual visual inspections of the embankments for undue vertical or horizontal settlement, slope stability, slope protection, condition of the service spillway, change in seepage conditions and measurement/evaluation of piezometric water levels and inclinometer readings.

Annual surveys of the settlement and slope monitors were performed and an engineering report was prepared from startup through 1994. After this date, the monument surveys and engineering report frequency was increased to every 5 years. These reductions in frequency are consistent with Regulatory Guide 1.127, Position 4b, which allows extended inspections if the results of previous inspections warrant this extension. Any change in the dam's structural, hydraulic and foundation conditions can be detected promptly and corrected. The dam monitoring program ensures that a sudden catastrophic failure of the main cooling lake dam is highly unlikely, and therefore would be available following a LOCA. The eighth periodic inspection, performed in 1999, of all applicable structures including the main cooling lake dam, saddle dams, and spillways revealed no signs of defects that, in the inspectors opinion, would affect the immediate function or operation of the facility. However, several items were noted including the need to repair rip rap along the splash zone of the main cooling lake dam, continued quarterly monitoring of wet areas behind the dam, further evaluation of one piezometer, and additional monument surveys. These items have been independently evaluated by the Engineer of Record. The independent evaluation concluded that the stability and integrity of the main cooling lake dam are not compromised by the reported data. This data and observations do not constitute a critical state for the main cooling lake dam.

Conclusion

The proposed changes to Technical Specification 3.7.9 will allow continued operation of the plant when environmental conditions result in an elevated plant inlet water temperature of the UHS. The proposed changes provide continued assurance that with a plant inlet water temperature > 90 °F, the design temperatures of safety related equipment are maintained within acceptable limits such that a safe shutdown of the plant can be performed. With the main cooling lake dam intact, and the lake temperature at 94 °F or less, the LOCA analyses are preserved. That is because the LOCA analyses are based on 95 °F lake temperature, and heatup to the entire lake volume following a LOCA is minimal. Therefore, it is concluded that this proposed change is of low risk significance.

ATTACHMENT II

NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

No Significant Hazards Consideration Determination

Proposed Change

This request for a license amendment proposes to modify Wolf Creek Generating Station (WCGS) Technical Specification 3.7.9, Ultimate Heat Sink (UHS), to add a new ACTION. The new ACTION will require verifying that the required cooling capacity is maintained within 4 hours and once per 12 hours, thereafter, when the plant inlet water temperature of UHS is not within limit. Additionally, the plant inlet water temperature will be verified to be ≤ 94 °F once per 12 hours. The required cooling capacity is maintained by verifying the main cooling lake level > 1085 ft mean sea level. Environmental conditions during the 1998 and 1999 summer months resulted in an elevated plant inlet water temperature, approaching the 90 °F Technical Specification limit. It is expected that in the future, the plant inlet water temperature will approach and may even exceed the 90 °F limit.

The following sections discuss the proposed change under the three standards of 10 CFR 50.92.

Standard I - Involves a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated

The proposed change does not involve any physical alteration of plant systems, structures or components. The proposed change provides an allowance for the plant to continue operation with plant inlet water temperature in excess of the current Technical Specification limit of 90 °F with the verification that required cooling capacity being maintained and temperature ≤ 94 °F. The 94 °F limit is less than the design limit of 95 °F for associated plant components. The plant inlet water temperature is not assumed to be an initiating condition of any accident analysis evaluated in the Updated Safety Analysis Report (USAR). Therefore, the allowance for the water temperature to be in excess of the current limit does not involve an increase in the probability of an accident previously evaluated in the USAR. The UHS supports OPERABILITY of safety related systems used to mitigate the consequences of an accident. Plant operation for brief periods with plant inlet water temperature greater than 90 °F up to 94 °F will not adversely affect the OPERABILITY of these safety related systems and will not adversely impact the ability of these systems to perform their safety related functions. Therefore, the proposed change does not involve a significant increase in the consequences of an accident previously evaluated in the USAR.

Standard II - Create the Possibility of a New or Different Kind of Accident from any Previously Evaluated

The proposed change does not involve any physical alteration of plant systems, structures or components. The temperature of the plant inlet water being greater than 90 °F but less than or equal to 94 °F (with the main cooling lake dam intact) does not introduce new failure mechanisms for systems, structures or components not already considered in the USAR. The 94 °F limit is less than the design limit of 95 °F for associated plant components. Therefore, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

Standard III - Involve a Significant Reduction in the Margin of Safety

The proposed change will allow an increase in plant inlet water temperature above the current Technical Specification limit of 90 °F for the UHS, provided UHS temperature is maintained below 95 °F and that the required cooling

capacity is verified maintained within 4 hours and once per 12 hours, thereafter. Additionally, the plant inlet water temperature will be verified to be ≤ 94 °F once per 12 hours. The proposed change does not alter any safety limits, limiting safety system settings, or limiting conditions for operation, and the proposed changes provide continued assurance that with a plant inlet temperature > 90 °F, the design temperature of safety related equipment are maintained within acceptable limits such that a safe shutdown of the plant can be performed. In addition, avoiding a plant transient during environmental conditions that could challenge the stability of the Electrical Power System offsets any perceptible reduction in the margin of safety as a result of the proposed change. Thus, the proposed change does not involve a significant reduction in any margin of safety.

Based on the above discussions, it has been determined that the requested Technical Specification amendment does not involve a significant increase in the probability or consequences of an accident or other adverse conditions over previous evaluations; or create the possibility of a new or different kind of accident or condition over previous evaluations; or involve a significant reduction in a margin of safety. Therefore, the requested license amendment does not involve a significant hazards consideration.

ATTACHMENT III

ENVIRONMENTAL IMPACT DETERMINATION

Environmental Impact Determination

10 CFR 51.22(b) specifies the criteria for categorical exclusions from the requirement for a specific environmental assessment per 10 CFR 51.21. This amendment request meets the criteria specified in 10 CFR 51.22(c)(9) as specified below:

(i) the amendment involves no significant hazards consideration

As demonstrated in Attachment II, the proposed changes do not involve any significant hazards considerations.

(ii) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite

The proposed change does not involve a change to the facility or operating procedures that would cause an increase in the amounts of effluents or create new types of effluents. While the predicted increase in cooling lake temperature is higher than previously experienced, this increase is due to environmental effects of nature, not from plant operation. Plant operation with plant inlet water temperature greater than 90 °F but less than or equal to 94 °F will not cause a significant change in the types of or a significant increase in the amounts of any effluents that may be released offsite. In addition, WCNOC review of potential environmental impacts concluded that the higher lake temperatures will not significantly increase thermal impacts to the lake's biota (i.e., benthic organisms, phytoplankton, zooplankton, and fish) greater than previously evaluated by the NRC in the Final Environmental Statement (NUREG-0878).

(iii) there is no significant increase in individual or cumulative occupational radiation exposure

This change has no relation to occupational radiation exposure, either individual or cumulative.

Based on the above, it is concluded that there will be no impact on the environment resulting from this change and the change meets the criteria specified in 10 CFR 51.22 for a categorical exclusion from the requirements of 10 CFR 51.21 relative to requiring a specific environmental assessment by the Commission.

ATTACHMENT IV

PROPOSED TECHNICAL SPECIFICATION CHANGES

3.7 PLANT SYSTEMS

3.7.9 Ultimate Heat Sink (UHS)

LCO 3.7.9 The UHS shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
INSERT 3.7-20			
~~A. UHS inoperable.~~	A.1	Be in MODE 3.	6 hours
	AND		
B	A.2	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Verify water level of UHS is ≥ 1070 ft mean sea level.	24 hours
SR 3.7.9.2	Verify plant inlet water temperature of UHS is ≤ 90°F.	24 hours

B. Required Action and associated Completion Time not met.
OR
UHS inoperable for reasons other than Condition A.

INSERT 3.7-20

A. Plant inlet water temperature of UHS not within limit.	A.1	Verify required cooling capacity maintained.	4 hours AND Once per 12 hours thereafter
	AND		
	A.2	Verify plant inlet water temperature of UHS is ≤ 94 °F.	Once per 12 hours

ATTACHMENT V

PROPOSED TECHNICAL SPECIFICATION BASES CHANGES

FOR INFORMATION ONLY

B 3.7 PLANT SYSTEMS

B 3.7.9 Ultimate Heat Sink (UHS)

BASES

BACKGROUND

The UHS provides a heat sink for processing and operating heat from safety related components during and following a transient or accident or a plant cooldown using only safety grade equipment. This is done by utilizing the Essential Service Water (ESW) System and the Component Cooling Water (CCW) System.

The UHS is the normally submerged seismic Category I cooling pond. The UHS is formed by providing a volume of cooling water behind a Seismic Category I dam built in one finger of the main cooling lake. The two principal functions of the UHS are the dissipation of residual heat after reactor shutdown, and dissipation of residual heat after an accident.

The design temperature of water supplied to the plant is assumed to be 95 °F.

The basic performance requirements are that a 30 day supply of water be available, and that the design basis temperatures of safety related equipment not be exceeded.

Additional information on the design and operation of the system, along with a list of components served, can be found in Reference 1.

APPLICABLE SAFETY ANALYSES

The UHS is the sink for heat removed from the reactor core following all accidents and anticipated operational occurrences in which the unit is cooled down and placed on residual heat removal (RHR) operation. Its maximum post accident heat load occurs after a design basis loss of coolant accident (LOCA) when the unit switches from injection to recirculation and the containment cooling systems and RHR are required to remove the core decay heat.

The operating limits are based on conservative heat transfer analyses for the worst case LOCA. Reference 1 provides the details of the assumptions used in the analysis, which include worst expected meteorological conditions, conservative uncertainties when calculating decay heat, and worst case single active failure (e.g., single failure of a manmade structure). The UHS is designed in accordance with Regulatory Guide 1.27 (Ref. 2), which requires a 30 day supply of cooling water in the UHS.

The UHS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

If the Required Actions are not completed within the associated Completion Time, or the UHS is inoperable for reasons other than Condition A,

BASES

LCO

The UHS is required to be OPERABLE and is considered OPERABLE if it contains a sufficient volume of water at or below the maximum temperature that would allow the ESW System to operate for at least 30 days following the design basis LOCA without exceeding the maximum design temperature of the equipment served by the ESW System. To meet this condition, the UHS temperature should not exceed 90°F and the level should not fall below 1070 ft mean sea level during normal unit operation.

APPLICABILITY

In MODES 1, 2, 3, and 4, the UHS is required to support the OPERABILITY of the equipment serviced by the UHS and required to be OPERABLE in these MODES.

In MODE 5 or 6, the OPERABILITY requirements of the UHS are determined by the systems it supports.

ACTIONS

INSERT B 3.7.9-2

B

~~A~~1 and ~~A~~2

~~If the UHS is inoperable, because either inlet water temperature > 90°F or water level is below 1070 ft MSL,~~ the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

This SR verifies that adequate long term (30 day) cooling can be maintained. The 24 hour Frequency is based on operating experience related to trending of the parameter variations during the applicable MODES. This SR verifies that the UHS water level is ≥ 1070 ft mean sea level (USGS datum).

SR 3.7.9.2

This SR verifies that the ESW System is available to cool the CCW System to at least its maximum design temperature with the maximum accident or normal design heat loads for 30 days following a Design Basis Accident. The 24 hour Frequency is based on operating experience

INSERT B 3.7.9-2

A.1 and A.2

If the inlet water temperature of the UHS exceeds 90 °F, the unit cannot provide a 30 day supply of cooling water in the event of a worst case LOCA concurrent with the failure of the main cooling lake dam as specified by Regulatory Guide 1.27. As such, action is taken to verify that the required cooling capacity is maintained. The required cooling capacity is maintained with the main cooling lake dam intact. Verification that the main cooling lake dam is intact is based on verification that the lake level is > 1085 ft mean sea level. With the main cooling lake dam intact, the volume of the lake is sufficient to ensure the design basis temperature of the safety related equipment is not exceeded. During the time period the inlet water temperature of the UHS is > 90 °F, temperature is verified to be ≤ 94 °F once per 12 hours. This verification ensures the plant inlet temperature remains below the maximum water temperature allowed for the safety related components to perform their safety function.

The Completion Time of Required Action A.1 is based on engineering judgment and the fact that degradation of the main cooling lake dam's structural, hydraulic, and foundation conditions is slow and significant degradation would be promptly detected and corrected prior to catastrophic failure of the main cooling lake dam.

The Completion Time of Required Action A.2 is based on engineering judgment and considered acceptable since temperature monitoring capability is available to the operators in the control room to quickly detect an increase in plant inlet water temperature.

LIST OF COMMITMENTS

The following table identifies those actions committed to by Wolf Creek Nuclear Operating Corporation (WCNOC) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be commitments. Please direct questions regarding these commitments to Mr. Tony Harris, Manager Regulatory Affairs at Wolf Creek Generating Station, (316) 364-4038.

COMMITMENT	Due Date/Event
The amendment will be implemented within 30 days of NRC approval.	Within 30 days of NRC approval