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PERRY NUCLEAR POWER PLANT

March 21, 1990  
PY-CEI/NRR-1133 L

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

Perry Nuclear Power Plant  
Docket No. 50-440  
Technical Specification Change Request:  
TS 3/4.8.1 Fuel Oil Specification Change

Gentlemen:

The Cleveland Electric Illuminating Company (CEI) hereby requests amendment of Facility Operating License NPF-58 for the Perry Nuclear Power Plant (PNPP) Unit 1. In accordance with the requirements of 10CFR50.91(b)(1), a copy of this request for amendment has been sent to the State of Ohio as indicated below.

The Amendment Request proposes revision of PNPP Technical Specification 3/4.8.1 to support a change in PNPP's fuel oil specification for the Emergency Diesel Generator (EDG) Fuel Oil System to allow use of a grade No. 2-D "straight run" fuel oil, which is less susceptible to degradation during long term storage conditions than is the "catalytic cracked" distillate currently used.

This Amendment Request also proposes revision of PNPP Technical Specification 3/4.8.1 to upgrade the surveillance requirements for sampling and analysis of diesel generator fuel oil to utilize improved methodologies. These specification changes will also serve to preclude recurrence of the EDG fuel oil quality problems which have been experienced at PNPP.

Attachment 1 provides the Summary, Safety Analysis, Significant Hazards and Environmental Impact Considerations. Attachment 2 is a copy of the marked up Technical Specification pages.

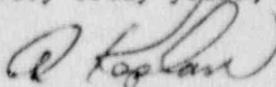
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CEI proposes to implement the above described fuel oil specification change in conjunction with replacement of PNPP's existing EDG fuel oil with a "straight run" grade No. 2-D fuel oil during PNPP's second refueling outage. In order to meet this schedule, CEI requests that the NRC staff approve this TS change prior to the beginning of the second refueling outage, currently scheduled for September 7, 1990.

If you have any questions, please feel free to call.

Very truly yours,



Al Kaplan  
Vice President  
Nuclear Group

AK:njc

Attachment

cc: T. Colburn  
P. Hiland  
USNRC Region III  
J. Harris, State of Ohio

## Summary

This proposed Technical Specification change will provide for implementation of an operating improvement by revising the fuel oil specification for PNPP's Emergency Diesel Generator (EDG) Fuel Oil System and by upgrading PNPP's Technical Specification Surveillance requirements for sampling and analysis of diesel generator fuel oil. This Technical Specification change is proposed in order to prevent recurrence of EDG fuel oil quality problems such as those experienced on January 11, 1989 (LER 89-001), July 21, 1989, and March 10, 1990.

On these occasions fuel oil samples tested in accordance with ASTM-D2274-70, Test Method for Oxidation Stability of Distillate Fuel Oil (Accelerated Method) failed the acceptance criteria specified in TS 4.8.1.1.2.d.4 due to a high concentration of insolubles in the fuel oil following completion of the aging portion of the test. On all three occurrences, the applicable diesel generator was declared inoperable in accordance with TS 3.8.1.1.b. The cause of the fuel oil quality problem has been attributed in part to (1) the unstable nature of the type of fuel currently used in PNPP's EDG Fuel Oil System - a catalytic cracked distillate, and (2) the inadequacy of the ASTM standard currently specified to measure fuel oil impurity, ASTM-D2274-70, the accelerated oxidation stability test. In order to prevent recurrence, CEI proposes improvements to PNPP's EDG Fuel Oil System to permit use of straight-run fuel oil and to upgrade the requirements for sampling and analysis.

### I. Proposed Changes to PNPP's Fuel Oil Specification To Permit Use of Straight-Run Fuel Oil

The diesel fuel oil currently used in PNPP's EDG Fuel Oil System is the product of a catalytic cracked refining process. Cracked products generally are less storage stable than products produced from the straight-run refining process. The stability of the fuel is a measure of its resistance to oxidation and the resulting formation of insoluble particulates during long term fuel storage. Oxidation of fuel oil normally results in the formation of fuel insoluble materials. Insolubles in the fuel oil can coat fuel system surfaces, plug fuel filters and injectors, and lower combustion efficiency. CEI suspects that the unstable nature of the cracked distillate currently used in PNPP's EDG Fuel Oil System is a primary contributor to PNPP's ASTM D2274-70 oxidation stability test failures.

In order to prevent recurrence of the EDG fuel oil quality problems experienced at PNPP, CEI proposes to change the fuel oil specification for PNPP's EDG Fuel Oil System to accommodate the use of "straight run" fuel oil which is less susceptible to degradation during long term storage. The proposed changes address the differences between the refiner's specifications for available straight run fuel oil and PNPP's current specifications, the primary difference being a change in the specified minimum allowable density of EDG fuel oil. The proposed changes to PNPP's Technical Specifications necessary to accommodate the change to "straight run" fuel oil are presented below.

A. Description

The detailed scope of these changes to the Emergency Diesel Generator (EDG) fuel oil Technical Specifications necessary to permit use of straight-run fuel are summarized here and evaluated below.

1. The specified minimum allowable density of EDG fuel oil in degrees API gravity, is changed from 36 degrees API (7.034 lbs./gal.) to 39 degrees API (6.910 lbs./gal.). This change affects Technical Specification 4.8.1.1.2.d.
2. The volume of EDG fuel oil required to be stored in the Fuel Storage System for each diesel generator in order to be considered operable, is increased from 69,430 gallons to 73,700 gallons for Division 1 and 2; and from 34,824 gallons to 36,100 gallons for Division 3. This change affects Technical Specifications 3.8.1.1.b.2 and 3.8.1.2.b.2.

B. Safety Analysis

The primary purpose for density/API gravity testing (item 1) is to assure that new fuel received is the proper grade, i.e., No. 2-D, and not gasoline or residual fuel. The recommendation to test the property of fuel density/API gravity is contained in Regulatory Guide 1.137, Revision 1, Section C.2.b. However, the guide does not specify limits of acceptability for this property. Reg. Guide 1.137 states that ANSI N195-1976, "Fuel Oil Systems for Standby Diesel Generators" should be used as a basis for a fuel oil program. This standard also does not specify acceptance criteria for fuel density/API Gravity. Reg. Guide 1.137 also notes that fuel oil should meet the requirements of Federal Fuel Oil Specification VV-F-800b (April 12, 1975), ASTM-D975 "Standard Specification for Diesel Fuel Oils or the requirements of the diesel-generator manufacturer if they are more restrictive. ASTM D975 which prescribes the required properties of diesel fuels at the time of delivery does not require testing of API gravity and therefore does not specify acceptance criteria for API gravity. However, the Federal Fuel Oil Specification does contain a minimum density limit, and this proposed change is encompassed within that limit. Although the current published limit for PNPP's Division 1 and 2 diesels, as found in PNPP's Delaval Engine Instruction Manual, is 38 degrees API gravity, the manufacturer's representative (Enterprise Engine) has reviewed the proposed change to 39 degrees API and has found it acceptable for use with their engines. Consequently, PNPP's Delaval Engine Instruction Manual will be revised to reflect this change. This change does not represent a deviation from the manufacturer's recommendations for fuel oil for the Division 3 diesel generator.

As stated above, API gravity testing is a method to determine that new fuel received is the proper grade. The only other impact that the change to reduce the minimum allowable density of fuel oil could have is that it can be hypothesized to limit an EDG from generating at 110% of rated power. This is because lower density fuels with similar heat rates (BTU/lb) will produce less heat per unit volume (BTU/gal), and because

the engine fuel injection pumps have some limit on the maximum volume of fuel which can be delivered to the cylinders. Considering a case where a fuel of significantly lower density is utilized, the fuel pumps' maximum volume delivered might not contain sufficient BTU's to power the engine at rated speed with 110% rated load. However, the magnitude of this proposed change is sufficiently small that this effect has been demonstrated to be negligible. A sample of straight run fuel oil tested at Perry exhibited a mass heat of combustion (BTU/lb) comparable to previous test results for the currently specified higher density fuel. As a result, the change in BTU/gallon can be considered to be directly proportional to the difference in density (1.8%). This change will not limit the EDG's from attaining 110% rated load as it is so small it would be undetectable. Hence, this change does not significantly impact the margin of excess capacity of the fuel injection pumps on the EDG's.

The result of operating with a lower density fuel oil is reduced fuel economy, correlating to the above discussion with respect to less heat per unit volume. However, engineering calculations were reperformed to account for this anticipated loss of fuel economy, such that an adequate fuel inventory (item 2) is maintained in the storage system to mitigate a design basis event with a seven day duration for all EDG's, in accordance with the requirements of Regulatory Guide 1.137, Revision 1, and ANSI N195-1976.

The changes to the volume of fuel oil required to be stored in the Fuel Storage System for each EDG are conservative with respect to the existing Technical Specification limits. The revised volumes have accounted for the change in fuel oil consumption rate due to the above described change in fuel density. For Division 1 and 2, these revised volume limits were also increased to address increases in Division 1 and 2 electrical loads and to more accurately reflect the unuseable tankage in the fuel oil storage tanks. The Division 1 and 2 EDG calculated fuel oil consumption was determined using the time-dependent calculation of diesel loads, with an additional conservatism introduced through the use of a 15% margin rather than the minimum 10% margin provided for this methodology in ANSI N195-1976. This margin was increased from 10% to 15% to permit minor changes in Divisional electrical loads to further remove risk of future impact to the margin of safety included in the Technical Specification limit. For Division 3, the revised volume limits were determined by use of the more conservative alternative calculation method provided in ANSI N195-1976 by assuming that the diesel operates continuously for seven days at its rated capacity.

Based on the above discussion of the changes being evaluated, it is evident that the previously evaluated performance capabilities of the EDG's and their associated Fuel Oil Systems have not been compromised, and will likely be improved. These changes therefore do not adversely affect the reliability of the Emergency Diesel-Generators to respond to mitigate transients/accidents.

The scope of the changes described in Section I above have no effect on the EDG Control System. These changes have no impact on the seismic or environmental qualification of equipment. This change creates no cross-ties between safety-related divisional power supplies or interconnections between Divisional Diesel Generators. Therefore, this change maintains the independence and redundancy of the onsite safety related power supply.

II. Proposed Changes to PNPP Technical Specification Surveillance Requirements for Sampling and Testing of EDG Fuel Oil

This Amendment also proposes changes to the surveillance requirements for Emergency Diesel Generator fuel oil in the PNPP Technical Specifications as provided in Attachment 2. The proposed changes involve replacing the fuel oil tests currently required by PNPP's Technical Specification with tests which are more effective in detecting unsatisfactory fuel oil, and more conducive to on-site performance. The proposed changes are similar to those recently approved by the NRC staff on other plant docket.

A. Description

The following is a summary of the specific changes proposed:

- (a) Replace ASTM D2274-70 (accelerated oxidation stability test), which was performed every 92 days and on addition of new fuel, with ASTM D2276-88 (particulate contamination test), performed every 31 days to detect actual particulate contamination.
- (b) Replace the Water and Sediment test (by centrifuge) with the more sensitive Clear and Bright test (ASTM D4176-86) for detection of water and sediment and for possible contamination of new fuel prior to addition of the fuel to the storage tanks.
- (c) Add the requirement to perform the Flash Point test for new fuel prior to adding new fuel to the storage tanks to detect possible contamination of the fuel.
- (d) Add the following optional methods to verify fuel gravity in addition to the existing API gravity method: (1) by testing for absolute specific gravity and (2) by testing for either above method (API gravity or Specific Gravity) and comparing results with the supplier's certification. The viscosity test would be required only if gravity was determined without reference to a supplier's certification.
- (e) Revise the time limit for obtaining ASTM D975 test results for the "other properties" (other than water and sediment, flash point, and kinematic viscosity) from 14 days to 31 days.
- (f) Remove the requirement to perform ASTM D975 testing every 92 days for fuel already in storage.

- (g) Replace the Saybolt universal viscosity test with a kinematic viscosity test in accordance with ASTM D975.
- (h) Update the Technical Specifications to specify use of current ASTM standards - specifically, ASTM D4057-88 instead of the withdrawn standard ASTM D270-75 and ASTM D975-89 instead of ASTM D975-77.
- (i) Allow up to 7 days to correct out-of-specification conditions for fuel oil in the storage tanks not meeting the applicable ASTM D975-89 test requirements of TS 4.8.1.1.2.d.2 and TS 4.8.1.1.2.e prior to declaring the EDGs inoperable (reference Reg. Guide 1.137-79 paragraph C.2.a).
- (j) Make an editorial change to renumber several sections due to the addition of the new particulate test requirement.

B. Safety Analysis

The proposed amendment to PNPP's Technical Specifications is intended to establish surveillance requirements which are more effective than the current surveillances in ensuring fuel oil quality. The proposed surveillance requirements are based on the following considerations: (1) Receipts of new fuel oil should be tested prior to addition to the storage tanks to detect contamination which could occur after leaving the refinery. While fuel oil leaving the refinery is generally good quality and must meet ASTM standards, as a verification of the transport process controls, the proposed Technical Specifications would require verifying ASTM D975 is met for new fuel. And, to ensure that all likely sources of contamination are detected, specific tests are proposed. (2) Fuel in storage should be tested periodically to detect degradation. Only those parameters which can change during storage need to be tested. (3) periodic testing for particulates formed in storage should concentrate on actual particulate contamination existing at the time of testing.

- (a) The current TS 4.8.1.1.2.d.4 requirement to test for "impurity level" in accordance with ASTM D2274-70 (accelerated oxidation stability test) every 92 days is replaced by the TS 4.8.1.1.2.e requirement to test for actual total particulate contamination in accordance with ASTM D2276-88 every 31 days.

TS 4.8.1.1.2.d.4 currently requires that "impurity level" be "tested in accordance with ASTM D2274-70." The purpose of testing stored fuel oil for "impurity level" is to limit the amount of particulate (solid) matter in the fuel oil that will be pumped to the diesel generators which could impair diesel generator operation or result in diesel generator unavailability. Industry experience has shown that the ASTM D2274-70 accelerated oxidation stability test does not describe an accurate method for determining existing fuel oil impurity level. ASTM D2274-70 provides a rough prediction of the tendency of fuel oil to oxidize and form particulates during long term storage; it does not indicate actual particulate contamination.

Secondly, ASTM D975-89, Appendix X3 states that "correlation [of ASTM D2274-70 test results] with actual storage stability may vary significantly, depending upon field conditions and fuel composition" and that "correlation [of ASTM D2274 test results] with fuel stability are tenuous." This is because the severely oxidating conditions of the test may not be representative of the environment for fuel in relatively quiescent storage.

In addition, the 2 mg/100ml acceptance criterion provided in TS 4.8.1.1.2.d.4 for the ASTM D2274-70 oxidation stability test was selected as an alarm point and may be somewhat of an arbitrary number because there is no evidence that impurities of this level are in fact detrimental to diesel generator operation. This is especially true at the time of test performance, since the purpose of the test is to look at future likelihood that the fuel may degrade and form particulates. As stated in ASTM D975-89, Appendix X3, "performance criteria for accelerated stability tests that assume satisfactory long-term storage of fuels have not been established." Also, the precision and reproducibility of this method is relatively poor.

Finally, the ASTM D2274-70 test method involves a significant cost and a significant administrative burden. The test takes a considerable amount of time (up to 24 hours) to perform and is considered a significant fire hazard to personnel. (The test involves bubbling pure oxygen for sixteen hours through a filtered fuel oil sample heated to 203 degrees F, a temperature significantly greater than the flash point).

For the above reasons, CEI considers it more pertinent to measure and monitor the actual particulate contamination of fuel oil than to depend on trying to predict the stability of fuel in storage. Therefore, in lieu of the accelerated oxidation stability test, a test for actual particulate contamination, ASTM D2276-88, is proposed. This test would be performed every 31 days for fuel in storage (more frequently than the current test frequency of 92 days for the accelerated oxidation stability test).

The more frequent testing for actual particulates in the stored fuel oil will provide more accurate data on actual fuel condition and more reliable data on the tendency for formation of particulates under site storage conditions. Since formation of particulates during storage at ambient temperature is a relatively slow process, the 31 day test frequency will ensure early detection of particulate contamination. The proposed test method for determining actual particulate contamination (ASTM D2276-88) and the proposed test frequency (at least every 31 days) more closely monitors the actual condition of the fuel oil that will be pumped to the emergency Diesel Generators in terms of particulate (solid) matter that could impair diesel generator operation or result in diesel generator unavailability. The proposed test would therefore be more conservative in establishing the adequacy of stored fuel oil than

the present requirements. In addition, ASTM D2276-88 is a relatively simple test which can be performed much more quickly on site. This test need not be a Technical Specification requirement for performance on new fuel receipts because the proposed Clear and Bright test (ASTM D4176-86) described in item (b) below detects particulates in new fuel prior to addition of the new fuel to the storage tanks.

- (b) The TS 4.8.1.1.2.d.1 requirement to test for Water and Sediment by centrifuge in accordance with ASTM D1796 every 92 days and from new fuel is replaced by the TS 4.8.1.1.2.d.1.d requirement to test for no visible free water or particulate contamination in accordance with ASTM D4176-86 (Clear and Bright test) from new fuel prior to addition of new fuel to the storage tank. The Clear and Bright test is more sensitive for detecting water and sediment in fuel oil than the Water and Sediment test by centrifuge which is currently used. According to ASTM D4176-86, an experienced tester can visually detect as little as 40 ppm of free water in fuel by use of the clear and bright test. On the other hand, the lower limit of water detectable by centrifuge is 250 ppm, this limit being imposed by the smallest readable division on the centrifuge tube. Not only is the clear and bright test more restrictive, it is a simpler and faster test to perform than the Water and Sediment test by centrifuge. As noted above, periodic checks for particulates (sediment) will be performed every 31 days, and the requirement to remove any accumulated water from the day tanks every 31 days and from the storage tanks every 92 days remains in place, to ensure these properties are maintained during long-term storage of the fuel. This "clear and bright" test can also detect contamination of the diesel fuel with residual fuel oil (black) which may have been introduced at some point in the transportation process, even though carriers do not typically cross-utilize transport tanks between residual oil and distillate fuel.
- (c) Currently, the test for Flash Point is contained within the present TS 4.8.1.1.2.d.5 requirement. The proposal changes the testing for Flash Point to require performance of the test on new fuel receipts prior to addition of new fuel to the storage tanks (proposed TS 4.8.1.1.2.d.1.c). This is consistent with the purpose of testing for Flash Point, which is to provide an additional indication that new fuel is within specification limits, and not contaminated by other petroleum products which may have been introduced during the transportation process. Flash Point is essential in detecting even small percentages of gasoline or JP-4 which will put grade 2-D diesel fuel off-specification. Testing for Flash Point prior to adding new fuel to the storage tank would reduce the possibility of adding "bad fuel" to the fuel oil already in storage. Current TS 4.8.1.1.2.d.5 would allow Flash Point to be determined after addition of the new fuel oil to the storage tank. By requiring the test to be performed prior to addition of new fuel to the storage tanks, the change represents a more conservative approach to maintaining fuel oil quality and diesel generator reliability.

- (d) The change to TS 4.8.1.1.2.d to specify optional methods of verifying proper gravity of new fuel oil prior to addition to the storage tank is consistent with the requirements of Regulatory Guide 1.137, Revision 1, which requires testing of new fuel for either Specific or API Gravity prior to addition to the storage tank. The purpose of testing for Specific or API gravity is to detect contamination of the fuel oil in transport, and more broadly, to ensure that a truckload of the wrong product hasn't arrived by mistake. Testing for specific gravity at 60/60 F in accordance with ASTM D1298 is the generally accepted method of testing for specific gravity of fuel oil for the purpose of verifying proper fuel oil grade and detecting contamination. The option of verifying new fuel Specific or API gravity by testing and comparing with the supplier's certification is justified since, if the supplier provides density certification on each transport load shipped, any contamination of fuel oil during transportation (for example, by gasoline, jet fuel, etc.) would be indicated by a difference in the tested density value as compared to the supplier's certification. Other tests will also detect this type of contamination. For example, incorrect flash point will be detected by testing as described in item (c) above. Any contamination which will alter the fuel oil appearance will be detected by the Clear and Bright test discussed in item (b) above. With tests for flash point and appearance as additional indicators, a verification of fuel oil Specific or API gravity by testing and comparing to the supplier's certification will provide the necessary assurance that the new fuel is within specification limits. Since comparative gravity, as proposed, can detect contamination by a variety of petroleum products including "Jet A type" jetfuel and since the other types of contamination are also detected by tests other than viscosity, testing for viscosity is not required if gravity is determined using this alternate method (i.e., by testing and comparing with the supplier's certification).
- (e) At present TS 4.8.1.1.2.d requires new fuel to be tested for conformance to the limits of the "other" fuel oil properties listed in Table 1 of ASTM D975, (the "other properties" in addition to those checked prior to addition of the fuel to the tank) and the test results are to be available within 14 days following fuel oil delivery. Under PNPP's proposed surveillance program, the fuel oil properties which, if not in conformance with specification requirements, could result in detrimental and immediate impact on diesel generator operation (water and sediment, flash point, viscosity/gravity), are checked for conformance to applicable ASTM limits immediately prior to acceptance of the new fuel. The remaining fuel oil properties are those which might impact diesel generator performance only on a long term basis. Because of the effective screening done before unloading of the fuel to verify that proper fuel is being received, the proposal to extend the time for obtaining test results for the remaining fuel oil properties from 14 days to 31 days would not adversely affect diesel generator reliability.

- (f) The proposed changes to TS 4.8.1.1.2.d include deleting the requirement for testing of fuel oil in storage in accordance with ASTM D975 on a 92 day basis. The rationale for the deletion is that the majority of fuel oil properties tested by ASTM D975 (flash point, cetane number, viscosity, cloud point, etc.) do not change during storage. If these properties are within specification when the fuel oil is placed in storage, they will remain within specification unless non-specification petroleum products are added to the storage tanks. The addition of non-specification petroleum products is precluded by CEI's proposed fuel surveillance program for new fuel as detailed above. Over prolonged periods of time stored fuel oil can oxidize and form particulates which, in significant concentrations, could impair diesel generator performance. Particulate concentrations and bacteria concentrations are the only characteristics that will change in stored fuel. Particulate concentrations will be monitored every 31 days as detailed in item (a) above. Bacteria growth is currently prevented and will continue to be prevented by periodic removal of water from the storage tanks every 92 days (reference TS 4.8.1.1.2.b. and c). Considering that the fuel oil properties will not change in storage and that fuel oil conditions which could affect diesel generator operation will be closely monitored, further testing of stored fuel in accordance with ASTM D975 every 92 days will not provide any additional data nor improve diesel generator reliability.
- (g) The replacement of the Saybolt Universal Viscosity test method currently specified in TS 4.8.1.1.2.d.2 with the Kinematic Viscosity test method in TS 4.8.1.1.2.d.1.b is proposed in order to maintain consistency with the test method for viscosity specified in ASTM D975-89 Table 1. This change in test method does not affect the reliability of the fuel oil or the operation of the diesel generators because the Kinematic Viscosity test method is the specified method for determination of viscosity in ASTM D975. The change in acceptance criteria for viscosity from units Saybolt (32.6 to 40.1 SUS) to units Kinematic (1.9 to 4.1 centistokes) is a change in form only as the proposed kinematic units are equivalent to the current Saybolt units, both of which are provided in ASTM D975-77. Note that while ASTM D975-77 provides acceptance criteria for viscosity in both units Kinematic and Units Saybolt, the acceptance criteria in units Saybolt has been deleted in ASTM D975-89. PNPP's existing acceptance criteria, whether expressed in units Saybolt or in units Kinematic, is more conservative than that specified by the manufacturers of PNPP's Division 1, 2 and 3 emergency diesel generators.
- (h) TS 4.8.1.1.2.d has been revised to specify use of the following updated ASTM standards:
- (1) Fuel Oil Sampling Standard ASTM D270-75 is replaced with updated standard ASTM D4057-88. ASTM D4057-88 covers procedures for obtaining representative samples of stocks or shipments of uniform petroleum products consistent with its predecessor standard ASTM D270-75 (ASTM D270 has been withdrawn). Therefore, the proposed update of the fuel oil sampling standards will not affect diesel generator reliability.

(2) The 1977 edition of ASTM D975, "Standard Specification for Fuel Oils", is replaced with the 1989 edition. The primary advantage of the 1989 edition is the incorporation of alternative test methods for determination of sulfur content of new fuel oil. Present ASTM D975-77 requirements are such that testing new fuel oil for sulfur content may only be performed in accordance with ASTM D129. The 1989 edition of ASTM D975 allows use of alternate test methods D1552, D2622, and D4294 in addition to D129. This change will allow use of the most up-to-date test methods for determination of sulfur content in fuel oil (which are also capable of being performed on site). These additional methods have also been approved for use in Federal Specification VV-F-800D (July 29, 1988). CEI believes that the test results obtained by use of the above fuel oil specifications will be equivalent to results obtained by use of ASTM D129. CEI is particularly interested in obtaining approval for use of ASTM D4294, an X-ray fluorescence method which has a lower minimum sensitivity and exceeds the requirements of D129, General Bomb Method.

Note: PNPP USAR Table 1.8-1 and paragraph 9.5.4.4.d will be updated to reference ASTM D975-89 and to note an exception to conformance with Reg. Guide 1.137 since that Reg. Guide references the 1977 edition of ASTM D975.

- (i) TS 3.8.1.1 has been revised by adding Action Statement (j) to clarify the Action requirements when the fuel oil contained in the storage tank does not meet the properties specified in proposed surveillance requirements 4.8.1.1.2.d.2 or 4.8.1.1.2.e. These surveillance requirements verify the quality of new fuel oil added to the storage tanks (4.8.1.1.2.d.2) and the quality of fuel oil in the storage tanks on a periodic basis (4.8.1.1.2.e). In accordance with Regulatory Guide 1.137 Revision 1, Regulatory Position C.2.a, the fuel oil may be replaced in a short period of time (about a week) when the fuel oil does not meet the specification requirements. The intent of the surveillance requirements is to ensure the fuel oil satisfies the quality specifications. Therefore, Action Statement (j) has been added to allow up to 7 days to correct the out-of-specification condition whether this involves replacing the fuel oil or another suitable method.
- (j) Present PNPP Technical Specification Surveillance Requirements 4.8.1.1.2.e, f, and g have been renumbered to reflect the addition of proposed surveillance requirement 4.8.1.1.2.e. This change is editorial in nature and has no effect on the reliability of PNPP's emergency diesel generators or PNPP's Electrical Power Systems.

#### No Significant Hazards Consideration

The Nuclear Regulatory Commission (NRC) has promulgated standards in 10CFR50.92(c) for determining whether a proposed amendment to facility operating license involves no significant hazards consideration. A proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or
- (2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (3) Involve a significant reduction in a margin of safety.

CEI has reviewed the proposed amendment with respect to these standards and has determined that the proposed changes do not involve a significant hazard because:

- (1) The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes to PNPP's Technical Specifications are limited to the Emergency Diesel Generator Fuel Oil System. The accidents evaluated in Chapter 15 of the USAR involve equipment and systems which are physically isolated from the EDG building and equipment such that the probability of occurrence of an accident evaluated previously is not affected by changes or failures of the EDG's and their associated Fuel Oil Systems. Furthermore, the safety function of the EDG's is to mitigate Chapter 15 accidents/transients which have been initiated by other causes and not to prevent the occurrence of any initiating event. Although station blackout is not currently discussed in the USAR, the changes described do not affect the reliability or redundancy of the onsite power supply, and therefore do not contribute to the probability of occurrence of a station blackout. Hence, these changes will not affect the probability of occurrence of an accident evaluated previously in the USAR.

This change maintains the reliability of the Emergency Diesel Generators. As discussed below for each of these changes, this amendment will have no adverse effect on the overall reliability of the onsite power supply. The response of the Emergency Diesel Generators and the onsite power supply to plant accident conditions evaluated previously is not affected by this change since function, performance, and redundancy have not been compromised. The accidents would be mitigated as evaluated previously and the consequences would be unchanged. Categorically, the response of the Emergency Diesel Generators and the onsite power supply to equipment malfunctions is not affected by this change, and the resultant consequences would be unchanged, also.

In order to preclude the diesel generator fuel oil quality problems experienced at PNPP on January 11, 1989 (LER 89-001), July 21, 1989 and March 10, 1990, these Technical Specification changes are required to accommodate the use of "straight run" fuel oil which is less susceptible to degradation during long term storage. These changes address the differences between the refiner's specification for straight run fuel oil and the site's current specifications. These changes do not negatively affect those properties of fuel oil which significantly influence EDG performance. Consequently, EDG

reliability is not affected by these changes. The effect of any change in BTU/gallon of fuel oil delivered to PNPP's EDGs as a result of the proposed change in minimum allowable density has been calculated and demonstrated to be negligible and will not limit the EDGs from attaining 110% rated load. Any reduction in fuel economy as a consequence of operating with a lower density fuel oil has been compensated for by a conservative increase in the minimum fuel oil inventory required to be maintained in the fuel storage system to mitigate a design basis event with a seven day duration for all EDGs in accordance with the requirements of Regulatory Guide 1.137, Revision 1, and ANSI N195-1976. This change of fuel oil refining process will have no deleterious effects on the EDGs and will result in a significant improvement in the stability/reliability of the EDG fuel oil. Hence, the change in PNPP's fuel oil specification will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes to PNPP's Technical Specification Surveillance requirements for sampling and testing of EDG fuel oil will not involve a significant increase in the probability or consequences of an accident previously evaluated in that the proposed changes involve replacing fuel oil tests currently specified with tests which are either more effective or equally effective in detecting unsatisfactory fuel oil. The proposed change involves replacing the requirement for testing stored fuel oil in accordance with ASTM D2274-70 (accelerated oxidation stability test) every 92 days with a requirement to test for actual particulate concentrations in accordance with ASTM D2276-88 every 31 days. The proposed test, ASTM D2276-88, addresses the actual condition of the fuel oil that will be pumped to the diesel generators in terms of particulate (solid) matter which could impair diesel generator operation or result in diesel generator unavailability. The current surveillance requirement, ASTM D2274-70, is oriented to predicting the tendency of fuel oil to oxidize and form particulates during long term storage. ASTM D2274-70 is not an appropriate test for determining actual particulate contamination of fuel in storage. In addition, ASTM D2274-70 test results may not accurately correlate with actual fuel condition because test results tend to vary depending on factors such as storage conditions and fuel composition. Also, the proposed ASTM D2276-88 tests would be performed every 31 days as opposed to every 92 days for ASTM D2274-70. The more frequent testing for actual particulates in the stored fuel oil would provide better data on fuel condition at the time of test as well as the tendency for formation of particulate under site storage conditions. The proposed tests would therefore be more conservative in establishing adequacy of stored fuel than the present requirements.

The change to replace the Water and Sediment test by centrifuge on new fuel oil per the test method specified in ASTM D975-77 (ASTM D1796) with the Clear and Bright test per ASTM D4176-86 is a conservative change in that the Clear and Bright test is more sensitive in determining the presence of water and sediment in fuel oil than the Water and Sediment test by centrifuge.

Requiring performance of the Flash Point test for new fuel oil prior to adding new fuel to the storage tank to detect possible contamination of the new fuel is a conservative change. The Flash Point test provides an additional indication that new fuel oil is within specification limits. Requiring performance of the Flash Point test prior to acceptance of new fuel oil will reduce the possibility of adding "bad fuel" to the fuel oil already in storage.

Adding optional methods of verifying fuel gravity by (1) testing for Specific Gravity, and (2) by testing for either API Gravity or Specific Gravity and comparing results with the supplier's certification will not affect the reliability of the emergency diesel generators. The Specific Gravity test method is a method specifically approved by Regulatory Guide 1.137 Revision 1, and is therefore acceptable for use in determining fuel oil gravity. Testing new fuel oil prior to addition to the storage tank by either the API Gravity or Specific Gravity methods and comparing with the supplier's certification is justified in that any contamination of fuel oil during transportation would be indicated by changes in appearance, flashpoint or gravity/viscosity. Any contamination which would alter the fuel oil appearance will be detected by the Clear and Bright test discussed above. Incorrect flash point will also be detected prior to addition of new fuel to the storage tank as described above. With tests for appearance and flash point as additional indicators, a verification of fuel oil Specific or API gravity by testing and comparing to the supplier's certification will provide the necessary assurance that the new fuel is within specification limits. Since comparative gravity, as proposed, can detect contamination by a variety of petroleum products including "Jet A type" jetfuel, and since the other types of contamination are also detected by tests other than viscosity, testing for viscosity is not required if gravity is determined using this alternate method (i.e., by testing and comparing with the supplier's certification). Therefore, the proposed new fuel oil surveillance program will not adversely affect the operation of the EDGs.

Under PNPP's proposed fuel oil surveillance program, the fuel oil properties which, if not within specification, would have the most detrimental and immediate impact on diesel generator operation (water and sediment, flash point, viscosity/gravity) are checked for conformance to applicable ASTM limits immediately prior to accepting the new fuel. The remaining fuel oil properties (the "other properties" of proposed TS 4.8.1.1.2.d.2) are those which might impact diesel generator performance only on a long term basis. Therefore, the proposal to extend the time limit for obtaining test results for these remaining fuel oil properties from 14 days to 31 days would not adversely affect diesel generator reliability.

The change to remove the requirement to perform ASTM D975 testing every 92 days for fuel already in storage is based upon the rationale that the majority of fuel oil properties tested by ASTM D975 (flash point, certain number, viscosity, cloud point) do not

change during storage. If these properties are within specification when the fuel oil is placed in storage, they will remain within specification unless other non-specification petroleum products are added to the storage tanks. The addition of non-specification petroleum products is precluded by PNPP's proposed new fuel oil surveillance program detailed above. Over prolonged periods, stored fuel oil can oxidize and form particulates which in significant concentrations, could impair diesel generator performance. Particulate concentrations and bacteria concentrations are the only characteristics that will change in stored fuel oil. Particulate concentrations will be monitored every 31 days in accordance with ASTM D2276-88 as discussed above. Bacteria growth is currently prevented and will continue to be prevented by periodic removal of water from the storage tanks as required by existing Technical Specifications 4.8.1.1.2.c and 4.8.1.1.2.d. Considering that the fuel oil properties will not change in storage, and that fuel oil conditions which could affect diesel generator operation will be closely monitored, further testing of stored fuel oil in accordance with ASTM D975 every 92 days will not provide any additional data nor improve diesel generator reliability.

Replacement of the Saybolt Universal Viscosity test method currently specified with the Kinematic Viscosity test method does not affect the reliability of the fuel oil or the operation of the diesel generator because the Kinematic Viscosity test method is the specified method for determination of viscosity in ASTM D975. The acceptance criteria for viscosity remains the same although expressed in units Kinematic (centistokes) rather than in units Saybolt (SUS) as currently presented.

The change to update PNPP's Technical Specification to allow use of current ASTM standards, specifically, ASTM D4057-88 in lieu of ASTM D270-75 and ASTM D975-89 in lieu of ASTM D975-77 will not affect the quality of the fuel oil or the reliability of the diesel generators in that the replacement standards are substantially equivalent to those replaced. The methods for sampling fuel oil provided in ASTM D4057-88 are equally effective as those provided in ASTM D270-75 (which has been withdrawn by ASTM). There has been no change in properties required to be tested or in acceptance criteria between the 1977 and 1989 editions of ASTM D975. While ASTM D975-89 does provide for alternative methods of testing for sulfur content (ASTM D1552, D2622 and D4294), CEI believes that the results obtained by use of the alternative methods will be equivalent to the method currently specified in D975-77 (ASTM D129).

Proposed surveillance requirements 4.8.1.1.2.d.2 and 4.8.1.1.2.e verify the quality of new fuel oil added to the storage tanks (4.8.1.1.2.d.2) and the quality of fuel oil in the storage tanks on a periodic basis (4.8.1.1.2.e). In accordance with Regulatory Guide 1.137 Revision 1, Regulatory Position C.2.a, the fuel oil may be replaced in a short period of time (about a week) when the fuel oil does not meet the specification requirements. The intent of the

surveillance requirements is to ensure the fuel oil satisfies the quality specifications. Therefore, Action (j) has been added to allow up to 7 days to correct the out-of-specification condition whether this involves replacing the fuel oil or another suitable method.

Based on the above discussion of the changes being evaluated, it is evident that the previously evaluated performance capabilities of the EDGs and their associated Fuel Oil Systems have not been compromised, and will likely be improved. These changes therefore do not adversely affect the reliability of the emergency diesel generators to respond to mitigate transients/accidents.

The scope of the changes described above have no effect on the EDG Control System. These changes have no impact on the seismic or environmental qualification of equipment. This change creates no cross-ties between safety-related divisional power supplies or interconnections between Divisional Diesel Generators. Therefore, this change maintains the independence and redundancy of the onsite safety related power supply. Following approval of the proposed changes to PNPP's Technical Specification the original design requirements of the emergency diesel generator system will continue to be met, and safety related systems which require power supply from the diesel generators will be capable of performing their original design functions. Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

- (2) The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes do not involve a change in the design of any plant system or component nor do they involve a change in the operation of any plant system or component. The proposed changes do not reduce the level of diesel generator operability nor do they function as initiating events of any accident. Based on the above arguments that performance, function, and redundancy of the original design remain unchanged, this change creates no new potential for an event of such significance to be considered a design basis accident. Furthermore, since no new types of equipment have been introduced and the new fuel oil will have no adverse effect on existing equipment, no potential for a different type of malfunction is created by this change.

3. The proposed changes do not involve a significant reduction in a margin of safety.

The margin of safety as defined in the bases to Technical Specification Section 3/4-8 refers to the reliability of the onsite power supply. This proposed amendment to PNPP Technical Specifications does not adversely affect the reliability of the

onsite power supply. Nor does the proposed change affect any of the plant setpoints or margins to the accident analysis limits. The changes in the fuel oil sampling and testing requirements do not affect the capability of the diesels to perform their function. The purpose of the change is to increase the reliability of PNPP's emergency diesel generators. Hence, this change does not reduce the margin of safety of the Technical Specifications' bases.

#### **Environmental Consideration**

The Cleveland Electric Illuminating Company has reviewed the proposed Technical Specification change against the criteria of 10 CFR 51.22 for environmental considerations. As shown above, the proposed change does not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, CEI concludes that the proposed Technical Specification change meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

NJC/CODED/3164