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AUTH.NAME AUTHOR AFFILIATION
FRANZ, J.F. Iowa Electric Light & Power Co.
RECIP.NAME RECIPIENT AFFILIATION
MURLEY, T.E. Office of Nuclear Reactor Regulation, Director (Post 870411)

SUBJECT: Informs of plans to revise fuel oil testing program by replacing accelerated stability test w/particulate test. Revs & justifications listed. Comparison of DAEC fuel oil QA program to Reg Guide 1.137 encl.

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MAY 1992

Iowa Electric Light and Power Company

July 1, 1992
NG-92-2216

JOHN F. FRANZ, JR.
VICE PRESIDENT, NUCLEAR

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station Pl-137
Washington, D.C. 20555

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Diesel Fuel Oil Testing Program
Reference: 1) Letter, L. Root to D. G. Eisenhut,
LDR-80-111, dated April 21, 1980
2) Letter, W. Rothert to Dr. Murley, NG-88-2051,
dated September 13, 1988
3) Letter, J. Franz, Jr. to Dr. Murley,
NG-92-0290, dated January 24, 1992
File: A-100, R-43

Dear Dr. Murley:

In Reference 1, we provided the Staff with a description of our program to ensure the quality of fuel oil for Emergency Diesel Generators at the Duane Arnold Energy Center (DAEC). This program met the intent of Regulatory Guide 1.137 (Rev. 1). In References 2 and 3, we notified the Staff of revisions to that program. These revisions were limited to the aspect of testing to predict the future quality of stored fuel oil. The test we have previously performed to predict the future quality of stored fuel oil is the accelerated stability test described in ASTM-D2274.

Through a recent review of past results of the accelerated stability test, we have determined that the test has not been a reliable predictor of future fuel oil quality. We have plotted the results of quarterly accelerated stability tests for the past five years and found that there was no meaningful trend. In addition, after the test program was modified to allow retests (Reference 2), retests have produced results that were inconsistent with results of the original test.

As Reference 3 indicated, we have investigated alternative tests. We have concluded that the particulate test in ASTM-D2276-89 is more meaningful than the accelerated stability test: the results are reflective of current fuel oil status, and the trended results can be used to reliably predict degradation.

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We plan to revise our fuel oil testing program by replacing the accelerated stability test (Reference 1, 2, and 3) with the particulate test. The revised program will continue quarterly testing of fuel oil and incorporate trigger values for both increased testing frequency and for actions to restore the fuel oil to an acceptable condition. These trigger values will be chosen to assure that action is initiated to restore fuel oil quality before the limit of 10mg of insolubles per liter (U. S. Department of Defense Specification VV-F-800D) is reached.

We have determined that filtration is a reliable means to restore fuel oil to an acceptable condition. We recently utilized a portable filtration rig (Reference 3) and because of the favorable results, plan to continue to employ this technology in the future.

In addition to replacing the accelerated stability test with the particulate test, we have determined that other aspects of our diesel fuel oil testing program should be revised as well. Each of these revisions is a change to our previous commitment. We have compared our testing program to Regulatory Guide 1.137 (Rev. 1) and determined that these revisions are justified. The revisions and justifications are as follows:

- 1) Quarterly tests will no longer be performed for flash point, cloud point, carbon residue, ash content, 90% distillation point, sulfur content, corrosion products, or API gravity.

Regulatory Guide 1.137 states that fuel oil should meet the requirements of ASTM D975-77. We had previously been testing fuel oil on a quarterly basis to verify that it still meets those requirements. Upon review, we have determined that this testing is no longer necessary. A quarterly sample of fuel oil will be tested for particulates, viscosity and water and sediment. We consider these tests to be sufficient to establish fuel oil quality because the characteristics listed above are not likely to change without producing adverse results in one of the tested characteristics.

- 2) The day tank will not be tested for accumulated moisture following diesel operation in excess of one hour.


Regulatory Guide 1.137 states that the day tank should be checked for accumulated moisture after operation of the diesel for more than one hour. The diesel is operated for at least one hour each month as part of routine surveillance. We test the day tank each month for accumulated moisture and remove it if necessary.

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The revised program continues to conform to the DAEC Technical Specifications and ensures that fuel oil stored at the DAEC is of sufficient quality to support emergency diesel generator operability.

Should you have any questions regarding this matter, please contact this office.

Very truly yours,


John F. Franz, Jr.
Vice President, Nuclear

Attachment: Comparison of DAEC Diesel Fuel Oil Quality Assurance Program to Regulatory Guide 1.137

JFF/SCR:so

cc: S. Catron
L. Liu
L. Root
R. McGaughy
C. Shiraki (NRC-NRR)
A. Bert Davis (Region III)
NRC Resident Office
Commitment Control A91417

RG 1.137

DAEC PROGRAM

JUSTIFICATION FOR DEVIATION

ANSI N195,
APP. B

-Check fuel oil quantity and water accumulation after diesel operation for more than one hour

-Accelerated Stability Test (Quarterly)

-Analyze fuel prior to addition

-Remove accumulated moisture quarterly

ASTM
D975-77

-water & sediment

-carbon residue

-ash

-90% distillation

-viscocity

-sulfur

-corrosion

-cetane number

-flash point

-cloud point

-API gravity

-check fuel oil quantity after diesel operation for more than one hour

-Particulate Test (Quarterly)

No deviation

-test for water monthly and remove if necessary

new fuel & monthly test

new fuel

new fuel

new fuel

new fuel & monthly test

new fuel

new fuel

not tested (Ref. 1)

new fuel

new fuel

new fuel

The diesel is operated for at least one hour each month. We test for water every month.

Particulate test is a more reliable test and the results are trendable to provide indication of fuel oil degradation.

We test for water every month. If water is above 0.05%, actions are required to remove it.

This standard applies to new fuel. Our testing of new fuel has not changed.

Our periodic tests are intended to ensure continued acceptability of the fuel oil. The tests are performed on-site and are chosen based on the potential for these characteristics to change. The characteristics we do not test are not likely to change over time.

RG 1.137

DAEC PROGRAM

JUSTIFICATION FOR DEVIATION

**New fuel
(prior to addition)**

Test for:

- API gravity
- water & sediment
- viscosity

**If viscosity or
water and sediment
exceed spec,
diesel should be
considered inoperable**

**Fuel oil not
meeting other specs
should be replaced
(within one week)**

**Moisture accumulated
should be removed
quarterly, or
monthly when
ground water
is above bottom
of tank**

**Tank should be emptied
& cleaned every 10yrs.**

No deviation

No deviation

**If particulate
level exceeds 10mg/l,
filter or replace fuel oil**

**Test for water
monthly and remove
if necessary**

No deviation

**If the results of quarterly particulate test shows
adverse trend, test frequency will be increased; if
results exceed trigger level, oil will be filtered. Filtration
has been shown to be effective at DAEC. If filtration is
not effective, fuel oil will be replaced.**

**Moisture removal initiated based on actual amount
accumulated.**