



MAY 08 2007

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

L-2007-067
10 CFR 50.54(f)

Re: Florida Power and Light Company
St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251

FPL Energy Seabrook, LLC
Seabrook Station
Docket No. 50-443

FPL Energy Duane Arnold, LLC
Duane Arnold Energy Center
Docket No. 50-331

**Response to NRC Generic Letter 2007-01
Inaccessible or Underground Power Cable Failures that
Disable Accident Mitigation Systems or Cause Plant Transients**

On February 7, 2007, the Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients" (ADAMS Accession No. ML00703606650). The GL discusses moisture-induced degradation or failure of safety-related cables that are routed through underground conduits, concrete duct banks, cable trenches, cable troughs, underground vaults, or are directly buried. The GL requests that certain information regarding cable failures and cable inspection, testing and monitoring programs be submitted to the NRC within 90 days of the date of the GL.

Florida Power & Light Company (FPL), the licensee for the St. Lucie Nuclear Plant, Units 1 and 2, and the Turkey Point Nuclear Plant, Units 3 and 4, FPL Energy Seabrook, LLC (FPL Energy Seabrook), the licensee for Seabrook Station, and FPL Energy Duane Arnold, LLC, the licensee for Duane Arnold Energy Center, hereby submit the 90-day response requested by GL 2007-01.

Attachment 1 provides the FPL St. Lucie Nuclear Plant response. Attachment 2 provides the FPL Turkey Point Nuclear Plant response. Attachment 3 provides the FPL Energy Seabrook Station response. Attachment 4 provides the FPL Energy Duane Arnold Energy Center response.

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The guidance provided in Enclosure 2 to NRC letter dated April 13, 2007 (ADAMS Accession No. ML070940311), to the Nuclear Energy Institute was used by FPL, FPL Energy Seabrook, and FPL Energy Duane Arnold in preparing the response to the GL.

The attached information is provided pursuant to the requirements of Section 182a of the Atomic Energy Act of 1954, as amended and 10 CFR 50.54(f).


There are no new commitments within this letter, or within the Attachments.

Please contact Rajiv S. Kundalkar at (561) 694-4848 if you have any additional questions regarding these responses.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on the 8~~th~~ day of May 2007

Sincerely yours,

for 
for J. A. Stall

Senior Vice President, Nuclear and
Chief Nuclear Officer

Attachments: (4)

cc: Regional Administrator, Region I
Regional Administrator, Region II
Regional Administrator, Region III
USNFC Project Manager, St. Lucie and Turkey Point
USNFC Project Manager, Seabrook Station
USNFC Project Manager, Duane Arnold Energy Center
Senior Resident Inspector, USNRC, St. Lucie
Senior Resident Inspector, USNRC, Turkey Point
Senior Resident Inspector, USNRC, Seabrook Station
Senior Resident Inspector, USNRC, Duane Arnold Energy Center

ATTACHMENT 1
ST. LUCIE NUCLEAR PLANT UNITS 1 AND 2
RESPONSE TO GENERIC LETTER 2007-01

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ST. LUCIE NUCLEAR PLANT UNITS 1 AND 2
RESPONSE TO GENERIC LETTER 2007-01
INACCESSIBLE OR UNDERGROUND POWER CABLE FAILURES
THAT DISABLE ACCIDENT MITIGATION SYSTEMS
OR CAUSE PLANT TRANSIENTS

NRC Request 1: Provide a history of inaccessible or underground power cable failures for all cables that are within the scope of 10 CFR 50.65 (the Maintenance Rule) and for all voltage levels. Indicate the type manufacturer, date of failure, type of service, voltage class, years of service, and the root cause for the failure.

FPL Response:

At St. Lucie, there have been no in-scope 10 CFR 50.65 inaccessible or underground power cable failures. This determination was rendered through reviews of condition reporting databases, the work control database, and the Cable and Raceway Schedule. However, there was one Unit 1 AC power cable that testing, performed during the spring 2007 refueling outage, identified as degraded.

The degraded cable, 480 volt power cable 10309A-SB, is a Unit 1 containment penetration feed-through cable. The cable was identified with a low megger reading on the C-Phase conductor located between the containment annulus and the outer containment concrete wall. The cable will be replaced, during the current outage, to prevent potential future failure. The cause of the cable's low megger reading is under investigation. See Attachment 1, Table 1, for the requested cable information.

NRC Request 2: Describe inspection, testing and monitoring programs to detect the degradation of inaccessible or underground power cables that support emergency diesel generators (EDGs), offsite power, essential service water (ESW), service water, component cooling water and other systems that are within the scope of 10 CFR 50.65 (the Maintenance Rule).

FPL Response:

St. Lucie has a manhole inspection program for safety related manholes to ensure that they are clean, dry, that the sump pump is working (if applicable) and to repair any degradation to the cables or manhole. The objective of this program is to provide assurance that the systems designed to minimize the amount of time the cable is exposed to a wet environment are operational. The current inspection cycle is every 2 years and the program is a License Renewal commitment for both Units at the site. The program is controlled under the Preventative Maintenance Program Activity 99-Manhole Inspect. Manholes are sealed to prevent most moisture intrusion, and drain to manholes with sumps.

St. Lucie does not have a formal program for testing and monitoring for degradation of inaccessible or underground power cables. However, periodic cable testing is done as part of the normal plant maintenance program. Cables are tested as part of the normal preventative maintenance program for motors from the smallest Limitorque motor operated valve to the

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largest 6.9-kV AC motor. At a minimum, at least one phase of the power cable to ground is meggered from the power source (local starter, MCC, load center, switchgear, etc...). For some larger motors, testing beyond the normal megger test continues so the polarization index may be calculated and/or all three phases of the cable may be meggered to ground and between phases. Power distribution cables feeding distribution equipment (load centers, MCC, etc.) are tested during the periodic scheduled maintenance of the subject distribution equipment by megger test phase to ground.

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Cable information:

TABLE 1

Cable	Date of Failure or Testing	Type of Service	Manufacturer	Cable Type	Shield	Voltage Class	Years of Service	Energized/ De-energized	Maintenance Rule	Under ground	Cause of Failure	Reference Document
St. Lucie #1 10309A-SB (Containment penetration feed-through cable)	4/26/07 Testing- Comment #1 below	480V feeder to containment fan cooler motor (HVS-1C)	Conax	1/C #250 KCMil	N/A	480V	Installed in 1985, approx 22 years	Continuously energized under normal plant operation	Yes	No	No Failure Low Meg-Ohm reading *See Comment #1 below	Condition Report No. 07-12838

*Comments:

- The cable did not fail. A low Meg-Ohm reading on C Phase was identified during post-maintenance testing for the motor. Containment fan cooler HVS-1C was in operation prior to the start of refueling outage on 4/1/07. All 6 cables (two 250 KCMIL per phase) in the containment annulus feed-through will be replaced to prevent a potential future failure. The cause of the cable's low Meg-Ohm reading is currently under investigation. This annulus cable section is approximately 4 feet in length.

ATTACHMENT 2
TURKEY POINT NUCLEAR PLANT UNITS 3 AND 4
RESPONSE TO GENERIC LETTER 2007-01

TURKEY POINT NUCLEAR PLANT UNITS 3 AND 4
RESPONSE TO GENERIC LETTER 2007-01
INACCESSIBLE OR UNDERGROUND POWER CABLE FAILURES
THAT DISABLE ACCIDENT MITIGATION SYSTEMS
OR CAUSE PLANT TRANSIENTS

NRC Request 1: Provide a history of inaccessible or underground power cable failures for all cables that are within the scope of 10 CFR 50.65 (the Maintenance Rule) and for all voltage levels. Indicate the type manufacturer, date of failure, type of service, voltage class, years of service, and the root cause for the failure.

FPL Response:

At Turkey Point, a records search indicates that within the scope of 10 CFR 50.65, there has been one AC power cable failure, one AC power cable that testing identified as degraded, and no DC power cable failures at Turkey Point. This determination was rendered through reviews of the condition report databases, Circuit and Raceway Schedule, and survey/interviews with plant personnel.

The cable failure involved 480 volt cable 4B0909/4B09-4FA1/1. This is a feeder cable to a Traveling Screen Motor. The feeder cable was intermittently tripping the breaker. The cable was found to be damaged about five feet from the motor where the flex conduit connected to the embedded conduit which was in a deteriorated state of condition. The apparent cause of the cable damage was the physical interface with the deteriorated conduit section. The screen wash system and the associated power source are not nuclear safety related and are not considered risk significant. However, the screen wash system is included in the Maintenance Rule Program due to its potential impact on the intake cooling water system and, therefore, is included in the results. See Attachment 2, Table 1, for the requested cable information.

The degraded cable involved 4160 volt power cable 4AA03/4AA03-4P1A/1. This is the feeder cable from the safety related 4160 volt switchgear to the steam generator feedwater pump motor. The cable was identified with a low, but acceptable, megger reading on one of the three conductors making up the C Phase, in 1994. The cable was replaced during the next refueling outage to prevent potential future failure. The portion of the cable routed underground was not removed for inspection / testing. The cause of the cable's low megger condition is not known. See Attachment 2, Table 1, for the requested cable information.

NRC Request 2: Describe inspection, testing and monitoring programs to detect the degradation of inaccessible or underground power cables that support emergency diesel generators (EDGs), offsite power, essential service water (ESW), service water, component cooling water and other systems that are within the scope of 10 CFR 50.65 (the Maintenance Rule).

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FPL Response:

Turkey Point has a manhole inspection program that ensures manhole sump pumps/drains are working. The objective of this program is to provide assurance that systems, that are designed to minimize the amount of time cable is exposed to a wet environment, are operational. The current inspection cycle is every 2 years for manholes where water was found during an inspection. The manholes without any water are inspected once every three years. Certain designated manholes are inspected under a hurricane preparedness program prior to each hurricane season. In addition, covers of Appendix R manholes containing redundant safe shutdown cables are sealed to prevent the spread of flammable or combustible liquids into the manholes. The seals are inspected every three years.

Turkey Point does not have a formal program for testing and monitoring for degradation of inaccessible or underground power cables. However, periodic cable testing is done as part of the normal plant preventive maintenance program. Cables are tested as part of the normal preventative maintenance program for motors from the smallest Limitorque Motor Operated Valve to the largest 4-kV AC motor. At a minimum, at least one phase of the power cable to ground is meggered from the power source (local starter, MCC, load center, switchgear, etc...). For some larger motors, testing beyond the normal megger test continues so the polarization index may be calculated and/or all three phases of the cable may be meggered to ground and between the phases.

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Cable Information:

TABLE 1

Cable	Date of Failure or Testing	Type of Service	Manu- facturer	Cable Type	Shield	Voltage Class	Years of Service	Energized/ De-energized	Maintenance Rule	Under ground	Cause of Failure	Reference Document
4AA03/4A A03- 4P1A/1	1994 *See Comment #1 below	4.16kV feeder to SGFWP Motor	General Cable	1/C # 750 Lead Sheath, Butyl Rubber Insulation	Lead Sheath	5kV	Original plant cable - 1973, 21 Years	Continuously energized	Yes	Yes	No Failure Low megger *See Comment #1 below	Condition Report No. 94-1224
4B0909/4 B09- 4FA1/1	2/1997	480V feeder to Traveling Screen Motor	N/A	2-1/C #12 THW	N/A	600V	Original plant cable - 1973, 24 Years	Energized for long periods of time - Considered continuously energized	Yes **See Comment #3 below	Yes	Physical interface with damaged conduit *See Comment #2 below	Spec Clarification #E-012-097- 005

*Comments:

- 1 The cable did not fail. Low megger readings on one of the three conductors of C Phase was identified and the cable was replaced the next refueling outage to prevent potential future failure. The cause of the cable's low megger reading was not determined. The portion of the cable routed underground was not removed for inspection / testing.
- 2 The cable was damaged about five feet from the motor where the flex conduit connected to the embedded conduit which was in a deteriorated state of condition. The apparent cause of the cable damage was the physical interface with the deteriorated conduit section.
3. The screen wash system and the associated power source are not nuclear safety related and are not considered risk significant. However, the screen wash system is included in the Maintenance Rule Program due to its potential impact on the Intake Cooling Water System.

ATTACHMENT 3
SEABROOK STATION
RESPONSE TO GENERIC LETTER 2007-01

**SEABROOK STATION
 RESPONSE TO GENERIC LETTER 2007-01
 INACCESSIBLE OR UNDERGROUND POWER CABLE FAILURES
 THAT DISABLE ACCIDENT MITIGATION SYSTEMS
 OR CAUSE PLANT TRANSIENTS**

NRC Request 1: Provide a history of inaccessible or underground power cable failures for all cables that are within the scope of 10 CFR 50.65 (the Maintenance Rule) and for all voltage levels. Indicate the type manufacturer, date of failure, type of service, voltage class, years of service, and the root cause for the failure.

FPL Energy Seabrook Response:

There have been no in-scope 10 CFR 50.65 inaccessible or underground power cable failures at Seabrook Station. This determination was rendered through reviews of the condition report database, work control database, and from interviews with cognizant design and plant engineering personnel.

NRC Request 2: Describe inspection, testing and monitoring programs to detect the degradation of inaccessible or underground power cables that support emergency diesel generators (EDGs), offsite power, essential service water (ESW), service water, component cooling water and other systems that are within the scope of 10 CFR 50.65 (the Maintenance Rule).

FPL Energy Seabrook Response:

As described in Seabrook Station Engineering Evaluation 94-41, "Submerged Electrical Cables and Supports," underground and inaccessible cable-monitoring program consists of three tests of representative power cables and a periodic manhole inspection for cable support condition and integrity. See Table 1 below for identification of cable loads, the test description and test frequency.

Table 1

Seabrook Station Cable Monitoring PMs		
Equipment ID	Frequency	Description of Task
1-CBA-UH-129-E 290-0000-000 (480 VAC motor control center MCC-141 to disconnect switch for Control Building Unit Heater at J5J)	96 Weeks	Perform a Time-Domain Reflectometry (TDR) test to each phase of cable CY6-J5J.
1-SY-CP-636-E290-0000-000 (120/240 VAC Distribution panel E64 to termination yard lighting panel E60)	96 Weeks	Perform a TDR test to each phase of cable E60-E64
1-ED-MCC-131-I:290-0000-000 (480 VAC terminal box WS1 to Switchyard Power Receptacle JJ3)	96 Weeks	Perform a TDR test to each phase of cable JJ3-WS1
1-BM-MM-INSP-VH-IE-000	10% of safety related manholes every 5 years	Perform 5 year inspection of supports in safety related electrical manway enclosures.

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Although not part of the formal monitoring program, some inaccessible or underground power cables are tested as part of preventive maintenance on connected equipment. For example, underground power cables between the 4.16-kV and 13.8-kV busses and connected motors in Service Water and Circulating Water Systems are periodically insulation-resistance tested when motors are tested.

ATTACHMENT 4
DUANE ARNOLD ENERGY CENTER
RESPONSE TO GENERIC LETTER 2007-01

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DUANE ARNOLD ENERGY CENTER
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THAT DISABLE ACCIDENT MITIGATION SYSTEMS
OR CAUSE PLANT TRANSIENTS

NRC Request 1: Provide a history of inaccessible or underground power cable failures for all cables that are within the scope of 10 CFR 50.65 (the Maintenance Rule) and for all voltage levels. Indicate the type manufacturer, date of failure, type of service, voltage class, years of service, and the root cause for the failure.

FPL Energy Duane Arnold Response:

There have been no in-scope 10 CFR 50.65 inaccessible or underground power cable failures at Duane Arnold Energy Center. This determination was rendered through reviews of condition reporting databases, work control database, and the Cable and Raceway database.

It should be noted that power cables have been damaged during construction and maintenance activities, mainly during digging operations. In those cases, the damage was either identified immediately or during post maintenance testing. Since cables damaged during construction and maintenance activities were not placed in service, they were not considered failures for the purpose of this response to Generic Letter 2007-01.

NRC Request 2: Describe inspection, testing and monitoring programs to detect the degradation of inaccessible or underground power cables that support emergency diesel generators (EDGs), offsite power, essential service water (ESW), service water, component cooling water and other systems that are within the scope of 10 CFR 50.65 (the Maintenance Rule).

FPL Energy Duane Arnold Response:

Duane Arnold Energy Center inspects, on a quarterly basis, the electrical manholes that have a history of flooding. The electrical manholes that have a history of flooding are those between the main plant and the intake structure which have flooded during very wet springs and when the river floods.

Duane Arnold Energy Center does not have a program for testing and monitoring for degradation of inaccessible or underground power cables. Some inaccessible or underground power cables are tested as part of preventive maintenance on connected equipment. For example, the 5-kV power cables between the main plant and the intake structure have the insulation resistance (megger) tested when the 4.16-kV / 480V transformers at the Intake Structure are tested. Power cables to motors are also tested as part of the periodic insulation test of the connected motor.

FPL Energy Duane Arnold is currently preparing a license renewal application. As part of the License Renewal Project, an Aging Management Program meeting the intent of NUREG 1801 Volume II XI.E:3 (Page XI E-7) will be developed and implemented.