

Telephone: 252/977-2720 Fax: 252/446-1134

## **TELEFAX**

Date:

December 21, 2018

Company:

**NRC Operations Center** 

Fax Number:

301/816-5151

**Verification No.:** 

301/816-5100

Reference:

Report No. 10CFR21-0123, Rev. 1

From:

**Dan Roberts** 

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Dear Sir:

Following this cover is a copy of our report 10CFR21-0123, Rev. 1, for a 10CFR21 reportable notification on EMD fuel and soakback pumps.

A copy of the revised report will be mailed to the NRC Document Control Desk and to our affected nuclear customers.

Should you have questions, please let us know.

Sincerely,

ENGINE SYSTEMS, INC.

Dan Roberts

**Quality Manager** 



Telephone: 252/977-2720 Fax: 252/446-1134

Report No. 10CFR21-0123

Rev. 0: Rev. 1: 11/30/18

12/21/18

# 10CFR21 REPORTING OF DEFECTS AND NON-COMPLIANCE

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| J     |

SYSTEM: Emergency Diesel Generator

CONCLUSION: Reportable in Accordance With 10CFR21

Prepared By: \_\_\_\_\_\_ Date: \_\_\_\_\_\_ Date: \_\_\_\_\_\_\_

**Quality Manager** 

**Quality Performance With Pride** 

Report No.

10CFR21-0123

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| 1 12/21/18 | _ |  |  |  |  |  |  |  |  |
|------------|---|--|--|--|--|--|--|--|--|
|            | 2 | In item (iv), added reference to F4B engine application. In item (vii), revised recommended correction action to include a shaft freeness check and provide guidance for reduced bolt torque for previously installed pumps. |  |  |  |  |  |  |  |
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## Pursuant to 10 CFR 21.21(d)(4), ESI is presenting the required information as follows:

(i) Name and address of the individual or individuals informing the Commission.

Dan Roberts

John Kriesel

Quality Manager Engine Systems Inc. Engineering Manager Engine Systems Inc.

Engine Systems inc. 175 Freight Rd.

175 Freight Rd.

Rocky Mount, NC 27804

Rocky Mount, NC 27804

(ii) Identification of the basic component supplied within the United States which fails to comply or contains a defect.

EMD fuel and soakback pumps of the following part numbers:

| Part Number | Description  |
|-------------|--|
| 8410219     | Fuel Pump, Flanged Connections   |
| 8080284     | Fuel Pump, Threaded Connections  |
| 8417074     | Lube Oil Scavenging and Fuel Pump Assembly (16, 20-645E4, E4B), includes P/N 8410219 |
| 8252842     | Lube Oil Scavenging and Fuel Pump Assembly (16, 20-645E4), includes P/N 8080284      |
| 8417754     | Lube Oil Scavenging and Fuel Pump Assembly (12-645E4, E4B), includes P/N 8410219     |
| 8447715     | Fuel Pump and Motor Assembly, includes P/N 8410219                                   |
| 8455818     | Soakback Pump and Motor Assembly   |
| 8460815     | Lube Oil Soakback and Fuel Pump  |

(iii) Identification of the firm supplying the basic component which fails to comply or contains a defect.

Engine Systems Inc. (ESI)

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect of failure to comply.

ESI was notified by a nuclear customer of two instances where a bolt was found loose or backed out of the cover of an EMD engine driven fuel pump P/N 8410219. Following notification, ESI inspected remaining pumps in inventory and found instances where one or more the pump cover bolts were loose or lightly torqued. See Figure 1 below for a visual depiction of the pump and bolts.

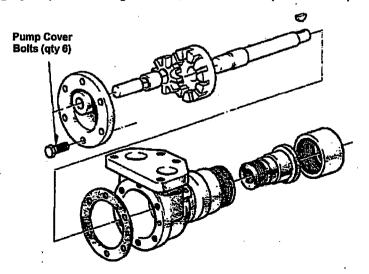


Figure 1: Exploded View of Pump P/N 8410219

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EMD fuel pump, P/N 8410219, is commonly used on all 12, 16, and 20-cylinder EMD model 645E4, E4B, and F4B engines. The pump is either mechanically driven from the engine (via the scavenging lube oil pump) or motor driven (as in the case of a backup/redundant fuel pump). The pump transfers fuel oil from the day tank to the fuel injectors to support fuel combustion. Without the supply of fuel oil, the diesel engine is unable to produce power which adversely affects the safety-

(v) The date on which the information of such defect or failure to comply was obtained.

related operation of the emergency diesel generator set.

October 24, 2018

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

The extent of condition includes pump P/N 8410219 as well as the part numbers listed in Table 1 in Appendix A. Note that P/N 8080284 is otherwise identical to P/N 8410219 except that the ports are threaded as opposed to flanged. The scavenging pump assemblies listed are upper level assemblies that contain either P/N 8410219 or 8080284. The fuel pump and motor assembly utilizes P/N 8410219. The soakback pump assemblies listed use a pump made by the same manufacturer with similar construction and therefore are included in the extent of condition.

Based on ESI's investigation the issue may extend as far back as 2014. Therefore, any of the pumps supplied from 2014 through 2018 are considered suspect.

(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

#### For all affected customers:

ESI recommends inspecting the bolt tightness for all pumps. The recommended bolt torque is 108 to 120 in-lbs (12 to 13 Nm). After verifying bolt torque, a shaft freeness check is recommended. The pump shaft should be capable of being rotated by hand in either direction. Due to the small shaft size, this check is commonly performed with a small crescent wrench or with the coupling half installed on the shaft. Inability to rotate by hand indicates loss of end clearance and the pump should be returned to ESI for rework or replacement.

Note: For installed pumps where it is not possible to check shaft freeness, ESI recommends using a reduced bolt torque of 60 to 70 in-lbs (7 to 8 Nm). This is sufficient to ensure the bolts are snug while safeguarding against loss of end clearance that would otherwise go undetected.

This activity should be performed at the earliest opportunity; however, it is more important for the inspection to be performed on newly installed pumps. It is expected that for pumps supplied with low bolt torque, if a problem were to develop it would be in the form of a fuel leak soon after installation. For pumps that have been successfully installed for several months or years with no detectable leakage, it is less likely that bolt(s) are loose and therefore the urgency of this inspection is reduced.

#### For ESI:

The dedication procedures for these pumps have been revised or are being revised to add a step to verify proper bolt torque. This will be completed prior to any future shipments. In addition, ESI is in correspondence with the pump manufacturer to implement corrective actions to prevent reoccurrence.

(viii) Any advice related to the potential defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

Verification of bolt tightness is non-invasive and may be performed with the pump installed (and operating). The bolts are external to the pump and the cover is stationary; there is no impact to pump operation or functionality while performing this inspection.

12:04:22 p.m. 12-21-2018

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Appendix A

List of Affected Customers 1 of 2

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| Prof.   Prof   |                         |             |   |                       |                               | · ugo              |              |                    |      | •  |
|--|-------------------------|-------------|---|-----------------------|-------------------------------|--------------------|--------------|--------------------|------|--|
| FIGRICA POWER & LIGHT-ST LICICE C2313321,00049 000596922 1 7 01/27/44 901408 1.1 1777/0831 1777/0832 1777/ | A STATE OF THE STATE OF | Description | Customer                                    | Customer PO           | Commence of the second second | 13.4.7.4.7.4.4.104 | FAMOUS COURT | 1 174 12 / L D 3-1 | Line |  |
| TEDNESSEE VALLEY AUTHORITY - BROWNEY FERRY   73,965   44,9220   4   09/21/4   002220   20,1   271,065   127,065      |                         |             | FLORIDA POWER & LIGHT - ST LUCIE            | <b>02313521/00043</b> | 0000368522.1                  | 7                  | 03/27/14     | 3012408            | 1.1  | 12710535<br>12710539<br>12710553<br>12710544<br>12710548 |
| TRANSPER VALLEY AUTHORITY - BIOWNYS FERRY   7,1965   8410219   4   |                         |             | TENNESSEE VALLEY AUTHORITY - BROWN'S FERRY  | 713665                | 841021 <del>9</del>           | 4                  | 08/21/14     | 8002290            | 20.1 | 12710671<br>12710666<br>12710551                         |
| NULLINA   NULL   |                         |             | TENNESSEE VALLEY ALITHORITY - BROWN'S FERRY | <b>713665</b>         | 8410219                       | 4                  | 08/21/14     | 8002290            | 34.1 | 12710665<br>12710669                                     |
| BATERIOY OFFEATIONS INC SURES BOND   10415737   10021121008   1.   0470175   1002177   1.   10717075   1.      |                         |             |   | 10428304              | 1281504299                    | 1                  | 01/28/15     | 3013513            | 1.1  | 12710573   |
| PRICE PARTY POINT REACH LIC   \$2215120,00000  |                         |             |   | 00544836              | D001679179 1                  | 1                  | 04/08/15     | 3013781            | 1.1  | 12710664   |
| PULIF PUMP, PLANGED CONNECTIONS, DELOY HORSTWINEST   00344098   0035165345   2   007415   301652   3.1   4097790128  |                         |             | ENTERGY OPERATIONS INC RIVER BEND           | 10439523              | 0032132608                    | 1.                 | 04/08/15     | 3013974            | 1.1  | 12710675   |
| ### PAID NOT PRINCE OF PAINT RESCO.  **PUEL PLANF, PLANGED CONNECTIONS, DELLON - PAINT RESCO.**   315.774774625   305825   1 02/29/16   3018073   1.1 4897750012   **NUCLEAR POWER PLANT RESCO.**   315.774774625   305825   1 02/29/16   3018073   1.1 4897750122   **NUCLEAR POWER PLANT RESCO.**   315.774774625   305825   1 02/29/16   3018073   1.1 4897750122   **DELON - LEAGLE CONNECTIONS, DELLON - PRESENT OFFER TOWN OFFER PLANT RESCO.**   315.774774725   305825   1 02/29/16   3018072   1.1 4897760122   **SAVANNAH RIVER REMEDIATION LIC SARAGESIJA SA15219   2 12/06/16   3018072   31 152710073   **SURTEN OFFER TOWN OFFER PLANT RESCO.**   30180611   3018072   31 152710073   3018072   31 152710073   **DURIEDY MORTHWEST CONSESSATION OF PLANT RESCO.**   30180611   3019071   30190770   1.1 4897800101   30190770   30 |                         |             | NEXTERA ENERGY POINT BEACH LLC              | 02313520/00080        | 0006559075 1                  | 1                  | 04/30/15     | 3014099            | 1.1  | 8497750094   |
| ### PRICON - DRIEDEN 793-16-12066 000045813.1 1 0.272916 301697 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 409773007 1.1 40973100 1.1 409773007 1.1 40977 |                         |             | ENERGY NORTHWEST                            | 00344B0B              | 0058165345                    | 2                  | 09/24/15     | 3014525            | 3.1  |  |
| ### PUBLICATION PRINCES   NUMBER PLANT KRISCO   31517477/4625   258325   1 03/03/16 301407   1 1 8877920222   ### PUBLICAN PRINCES   CONCOLUSION   CONCOLUSI |                         |             | EXELON - DRESDEN                            | 703; Rel. 12685       | 00000436111                   | 1                  | 02/25/16     | 3015071            | 1.1  |  |
| ### PUEL PLANP, PLANGED CONNECTIONS, ENGINEER PLANT   09572185   0000045611   4   05/05/16   301530   1.1   32173073   8591700277   8591700277   1.1   32173073   8591700277   1.1   32173073   8591700277   1.1   32173073   8591700277   1.1   32173073   8591700277   1.1   32173073   1.1   3217307 |                         |             | NUCLEAR FOWER PLANT KRSKO+                  | 3151747/14625         | 105825                        | 1                  | 02/29/16     | 3014817            | 1.1  | 8497920112   |
| DECION - LASALLE  DECION - LASALLE  DECION - LASALLE  DECION - LASALLE  SARADGEL44  B410219  2 12/05/16  SARADGEL45  B410219  2 12/05/16  SARADGEL46  B410219  2 12/05/16  SARADGEL48  B1007 CORRESPONDEN  TENNESSE VALLEY AUTHORITY - BROWN'S FERRY  DELON - DREEDEN  DOSSEUSS-S 1 1 03/05/18  DELON - DREEDEN  DOSSEUSS-S 1 0 03/05/18  DELON - DREEDEN  DURE EMERGY CARCUMAS LIC - COUNEE NUCLEAR  DURE EMERGY CARCUMAS LIC - COUNEE NUCLEAR  DURS EMERGY CARCUMAS LIC - COUNEE NUCLEAR  DOSSEUSS-S 1 0 03/05/18  SARADGEL48  DELON - CLINTON POWER PLANT  TOS; Rel 12989  DOCODESCI11 3 03/05/18  DOSSEUSS-S 1 0 03/05/18  SARADGEL48  DELON - CLINTON POWER PLANT  TOS; Rel 12989  DOCODESCI11 3 03/05/18  SARADGEL49  DELON - CLINTON POWER PLANT  TOS; Rel 12989  DOCODESCI11 3 03/05/18  SARADGEL49  DELON - CLINTON POWER PLANT  TOS; Rel 12989  DOCODESCI11 3 03/05/18  SARADGEL49  DELON - CLINTON POWER PLANT  TOS; Rel 12989  DOCODESCI11 3 03/05/18  DOSSEUSS-S 2 1 1 1815/05/01/18  SARADGEL49  DELON - CLINTON POWER PLANT  TOS; Rel 12989  DOCODESCI11 3 05/05/18  SARADGEL49  DELON - CLINTON POWER PLANT  TOS; Rel 12989  DOCODESCI11 3 05/05/18  DOSSEUSS-S 2 1 1 1 15/05/05/18  DOSSEUSS-S 2 1  |                         |             | NUCLEAR POWER PLANT KRSKO+                  | 3151747/14625         | 205825                        | 1                  | 03/03/16     | 3014817            | 1.1  | 8497920124   |
| ### SHAPPEN SH | 8410219                 |             | EXELON - LASALLE                            | 00572185              | 00000436111                   | 4                  | 05/06/16     | 3015350            | 1.1  | 12710734<br>8591700274                                   |
| NUCLEAR UNCLEAR UNCLEAR UNCLEAR CONTRIBUTES  |                         |             | SAVANNAH RIVER REMEDIATION LLC              | 5RRA069144            | 8410219                       | 2                  | 12/06/16     | 3015928            | 39.1 |  |
| ENERGY NORTHWEST 00351174 0058165345 1 03/06/12 3017807 1.1 01597500001  TENNESSEE VALLEY AUTHORITY - BROWN'S FERRY 3418640 CVTHAIN 1 03/16/12 3018069 1.1 01597500001  DELLON - DRESDEN 00546095 0000035111 2 06/16/12 3018069 1.1 01597500202  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3018069 1.1 01594501014  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501014  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501014  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501014  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501014  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501014  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501014  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501024  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501024  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501024  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501024  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501024  ENERGY NORTHWEST 00351174 0058165345 4 06/20/13 3017807 1.1 01594501024  ENERGY NORTHWEST 00351174 0058165345 0 0000147511 3 08/20/14 3017806 1.1 01594501024  ENERGY NORTHWEST 00351174 00581675 0 000014961 1 3 06/20/14 3017800 1.1 125725608  ENERGY NORTHWEST 00351174 00581675 0 000014961 3 10/20/16 3015655 2.1 8896750113  ENERGY NORTHWEST 00351174 00581677 0 000014961 1 3 10/20/16 3015655 2.1 8896750113  ENERGY NORTHWEST 00351174 00581677 0 000015419 1 3 10/20/16 3015655 2.1 8896750113  ENERGY NORTHWEST 00351175 0 000015419 1 3 10/20/16 3015655 2.1 8896750113  ENERGY NORTHWEST 00351175 0 000015419 1 3 10/20/16 3015676 1.1 82584650261  ENERGY NORTHWEST 00351175 0 000015419 1 3 10/20/16 3015676 1.1 82584650261  ENERGY NORTHWEST 00351175 0 000015419 1 3 10/20/16 3015676 1.1 82584650261  ENERGY NORTHWEST 00351175 0 000015419 1 3 10/20/16 3015676 1.1 82584650261  ENERGY NORTHWEST 00351175 0 000015419 1 2 10/20/16 3015676 |                         |             |   | 10529624              | 1281504299                    | 2                  | 01/08/18     | 3017555            | 2.1  |  |
| ### PARCH - PRESEN   00546995   00000496111   2   06/18/18   3018069   1.1   8197850294  |                         |             |   | 00351174              | 0058165345                    | 1                  | 03/09/18     | 3017807            | 1.1  |  |
| ENERGY NORTHWEST   0.0351174   0.058165345   4   0.6/20/18   3018050   1.1   8134960193  |                         |             | TENNESSEE VALLEY AUTHORITY - BROWN'S FERRY  | 3418640               | CVT548N                       | 1                  |              |                    |      |  |
| ENERGY NORTHWEST 00351174 0058165345 4 06/20/18 3017807 1.1 8134950193 813495 |                         |             | EXELON - DRESDEN                            | 00546095              | 00000435111                   | 2                  | 06/18/18     | 3018069            | 1.1  |  |
| DUKE ENERGY CARQUINAS LIC - OCONEE NUCLEAR   03066435   0000157557   1 08/01/19 3018132   1.1 8196760103   |                         |             | ENERGY NORTHWEST                            | 00351174              | 0058165345                    | 4                  | 06/20/18     | 3017807            | 1.1  | 6194890101<br>6194960189<br>6194960193                   |
| ENTERGY OPERATIONS INC - GRAND GULF NUCLEAR  10553808 1281504299 1 08/30/18 3018608 1.1 8194960191  EXELON - LASALLE 703; Rel. 12989 0000043611 1 3 08/30/18 3018649 1.1 8195760104 8195760104 8195760105 8195690125  EXELON - CLINTON POWER PLANT 703; Rel. 12988 0000043611 1 3 09/20/18 3018650 1.1 8195690125 8195860125 9FGS ENRIQUE MARIA HIERRO SL - ALMARAZ N2D18/018 8410219 2 10/18/18 3018630 1.1 81956760100 81956760111 8080284 1 06/03/16 3015292 7.1 8591070015 0DMINION VIRGINIA FOWER - SURRY POWER STATION 8591960081 859196081 85 |                         |             | EXELON - NINE MILE POINT                    | 00643368              | 0001679179 1                  | 1                  | 06/21/18     | 3018002            | 1.1  | B194950194   |
| NUCLEAR   10553808   1281504299   1   08/30/18   3018608   1.1   8194501016  |                         |             | DUKE ENERGY CAROLINAS LLC - OCONEE NUCLEAR  | 03066435              | 0000157557                    | 1                  | 08/01/18     | 3018132            | 1.1  | 8196760103   |
| EXELON - LASALLE 703; Rel. 12989 0000043611 3 08/30/18 3018639 1.1 8195/60106 8195690224 8195690224 8195690224 8195690224 8195690224 8195690224 8195690224 8195690224 8195690224 8195690224 8195690225 819569025 81956902 |                         |             |   | 10553808              | 1281504299                    | 1                  | 08/30/18     | 3018608            | 1.1  | B19496019D   |
| EXELON - CLINTON POWER PLANT   703; Rel. 12988   0000043611   3   09/20/18   3018650   1.1   8195800229   8193840555   8193840555   8193840555   8193840555   81958701105   8195760105      |                         |             | EXELON - LASALLE                            | 703; Rel. 12989       | 00000436111                   | 3                  | 08/30/1B     | 3018649            | 1.1  | 8196760106   |
| FUEL PUMP, THREADED CONNECTIONS, ENGINE DRIVEN   EXELON - PRIZED   |                         |             | EXELON - CLINTON POWER PLANT                | 703; Rel. 12988       | 00000436111                   | 3                  | 09/20/18     | 3018650            | 1.1  | 8195690229<br>8193840555                                 |
| FLORIDA POWER & LIGHT - TURKEY POINT   0.2318321/00043   0.001700687 1   |                         |             | PGS ENRIQUE MARIA HIERRO 5L - ALMARAZ       | N2018/018             | 8410219                       | 2                  | 10/15/18     | EBOBLOE            | 1.1  |  |
| SOB0284   FUEL PUMP, THREADED CONNECTIONS, ENGINE DRIVEN   EXELDN - FITZPATRICK   TO3; Rel. 12927   DU06211221   2 03/27/18 3013767   1.1 82588902512   2258608 1.1 12523608 1.1 12523608 1.1 12523608 1.2 12523608   |                         |             | FLORIDA POWER & LIGHT - TURKEY POINT        | 02318321/00043        | 00017006871                   | 1                  | 02/28/14     | 3012203            | 1.1  |  |
| 8080284 FUEL PUMP, THREADED CONNECTIONS, ENGINE DRIVEN  FUEL PUMP, THREADED CONNECTIONS, ENGINE POWER - SURRY POWER 4500298167 0500510 1 07/07/16 3015625 2.1 8396760113  EXELON - DRESDEN  TO3; Rel. 12731 0000019419 1 3 10/31/16 3016024 1.1 8394860265 8392800023  EXELON - FITZPATRICK 703; Rel. 12927 0000511221 2 03/27/18 3017678 1.1 8290730210 8394860261  EXELON - NINE MILE POINT 703; Rel. 12937 0001579038 1 1 04/03/18 3017674 1.1 8288890252  ENTERGY OPERATIONS INC - ARKANSAS 10550517 000558-718 2 08/30/18 3018470 1.1 8194920089  |                         |             | OMAHA PUBLIC POWER DISTRICT                 | 00204966              | 00000243791                   | 3                  | 08/15/14     | 3012980            | 1.1  | 1252360B   |
| FUEL PUMP, THREADED CONNECTIONS, ENGINE DRIVEN   4500238167   05006510   1 07/07/16   3015625   2.1 8396760113   3016024   1.1 8396760112   83948601265      |                         |             | FIRST ENERGY CORP - BEAVER VALLEY           | 45458123              | 8523787                       | 2                  | 01/19/15     | 3013189            | 1.1  |  |
| STATION   STAT   | 8080284                 |             | PGS ENRIQUE MARIA HIERRO SL - NUCLENDR      | N2016/011             | 8080284                       | 1                  | 06/03/16     | 3015292            | 7.1  | 8591700267   |
| EXELON - DRESDEN 703; Rel. 12731 0000019419 1 3 10/31/16 3016024 1.1 8396760112  EXELON - FITZPATRICK 703; Rel. 12927 00105211221 2 03/27/18 3017678 1.1 829070210  EXELON - NINE MILE POINT 703; Rel. 12937 0001579058 1 1 04/09/18 3017764 1.1 8288890252  ENTERGY OPERATIONS INC - ARKANSAS 10550517 000558-718 2 08/39/18 3018470 1.1 8194920089   |                         |             |   | 4500298167            | 06006510                      | 1                  | 07/07/16     | 3015625            | 2.1  | 8396760113   |
| EXELON - FITZPATRICX 703; Rel. 12927 DIU05211221 2 03/27/18 3017678 1.1 8290730210 EXELON - NINE MILE POINT 709; Rel. 12937 0001579058 1 1 04/03/18 3017764 1.1 8288890252 ENTERGY OPERATIONS INC - ARKANSAS 10550517 000558-718 2 08/30/18 3018470 1.1 8194920089   |                         |             | EXELON - DRESDEN                            | 703; Rel. 12731       | 0000019419 1                  | 3                  | 10/31/16     | 3016024            | 1.1  | 8394860265   |
| EXELON - NINE MILE POINT 703; Rel. 12997 . 0001579058 1 1 04/09/18 3017764 1.1 8288890252  ENTERGY OPERATIONS INC - ARKANSAS 10550517 000558-718 2 08/30/18 3018470 1.1 8194920089   |                         |             | EXELON - FITZPATRICK                        | 703; Rel. 12927       | DOJ05211221                   | 2                  | 03/27/18     | 3017678            | 1.1  | 8290730210   |
|  |                         |             | EXELON - NINE MILE POINT                    | 709; Rel. 12997       | 0001579058 1                  | 1                  | 04/03/18     | 3017764            | 1.1  | <del></del>  |
|  |                         |             | ENTERGY OPERATIONS INC-ARKANSAS             | 10550517              | 000558-718                    | 2                  | 08/30/18     | 3019470            | 2.1  | 8194920089<br>8194920068                                 |

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Appendix A

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List of Affected Customers 2 of 2

Page:

| Part<br>Number | Description   | Customer   | Customer PO  | Customer Part<br>Number | Qty<br>Shipped | C of C<br>Date | ESI<br>Order        | Une  | Pump Serial<br>Number(s)               |
|----------------|---|--|--------------|-------------------------|----------------|----------------|---------------------|------|--|
| 8417074        | Lube Oil Scavenging and Fuel<br>Fump assembly (16,20-645E4,E48)<br>With P/N 8410219 Fuel Pump | BMPC-KAPL  | 7017027      | B417074                 | 1              | 01/28/14       | 3012288             | 73.1 | 12548134                               |
|                |   | TENNESSEE VALLEY AUTHORITY - WATTS BAR           | 2605647      | CAW481V                 | 1              | 04/05/17       | 3016354             | 1.1  | 12547923                               |
| 8252842        | LUBE OIL SCAVENGING & FUEL PUMP<br>ASSEMBLY (15,20-645E4)<br>WITH P/N 8080284 FUEL PUMP       | OMAHA PLIBLIC POWER DISTRICT                     | 00200846     | 0000139165 1            | 1              | 10/20/14       | 3012561             | 2.1  | 12523773                               |
| B417754        | LUBE DIL SCAVENGING AND FUEL<br>PUMP ASSEMBLY (12-645E4, E4B)<br>WITH P/N B410219 FUEL PUMP   | DUKE ENERGY CAROLINAS LLC - OCONEE<br>NUCLEAR    | 03035494     | 0000330781 1            | 1              | 05/01/17       | 3016921             | 1.1  | 8492750228                             |
| 8447715        | FUEL PUMP AND MOTOR ASSEMBLY  | EXELON - CLINTON POWER PLANT                     | 00572667     | 0000032240              | 2              | 02/23/18       | 2015959             | Li   | 8295750088<br>8295750089               |
| 8455818        | SOAKBACK PUMP & MOTOR ASSEMBLY  | DOMINION VIRGINIA POWER - SURRY POWER<br>STATION | 4500386340   | 42026328                | 1              | 10/31/17       | 3017171             | 1.1  | 8387770061                             |
| 5.05020        |   | DOMINION VIRGINIA POWER – SURRY POWER<br>STATION | 4500394508 . | 42026328                | 2              | 02/06/1B       | 301730 <del>6</del> | 1.1  | 8489910003<br>8487970346               |
| 8460815        | LUBE OIL SOAKBACK AND FUEL PUMP   | ENERGY NORTHWEST                                 | 00345051     | 0058166535              | 3              | 01/12/16       | 3014666             | 3.1  | 8587900264<br>8497860219<br>8493900161 |
|                |   | ENERGY NORTHWEST                                 | 00351743     | 0058166535              | 2              | 05/25/18       | 3018195             | 1.1  | 8198820094<br>8198820096               |

**Table 1: List of Affected Customers**