Jon A. Franke
Site Vice President

PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603
Tel. 570.542.2904 Fax 570.542.1504
jfranke@pplweb.com

MAY 10 2013

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

**SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING CHANGES TO TECHNICAL SPECIFICATION (TS)
SURVEILLANCE REQUIREMENTS (SR) TO INCREASE
DIESEL GENERATOR MINIMUM
STEADY STATE VOLTAGE** **Docket Nos. 50-387**
PLA-6997 **and 50-388**

References: 1) *Letter from PPL (PLA-6825) to USNRC (Document Control Desk), "Susquehanna Steam Electric Station Proposed Amendment No. 310 to License NPF-14 and Proposed Amendment No. 282 to License NPF-22:Change to Technical Specification Surveillance Requirements (SR) 3.8.1.9, 3.8.1.11, 3.8.1.12, and 3.8.1.19 to Increase Diesel Generator Minimum Steady State Voltage," dated September 18, 2012.*

2) *Letter from NRC to PPL, "Susquehanna Steam Electric Station, Units 1 and 2 - Request for Additional Information Regarding Request for Changes to Technical Specification Surveillance Requirements to Increase Diesel Generator Minimum Steady State Voltage (TAC Nos. ME9607and ME9608)," dated February 22, 2013.*

PPL Susquehanna, LLC (PPL) submitted a proposed amendment to the Susquehanna Steam Electric Station (SSES) Unit 1 and Unit 2 Technical Specification (TS) Surveillance Requirements (SR) 3.8.1.9, 3.8.1.11, 3.8.1.12, and 3.8.1.19 in Reference 1. On February 22, 2013, the NRC requested additional information (RAI) via Reference 2. The enclosures to this letter contain PPL's response to the RAI.

There are no new commitments contained in this letter.

Please direct any questions or requests for additional information to Mr. Duane L. Filchner at (610)774-7819.

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

Executed on: 5-10-2013

J. A. Franke

Enclosure 1 - Response to NRC Request for Additional Information
Enclosure 2 – Calculation EC-024-1031, "DG Steady State Output Voltage for Surveillance Test in Isochronous Mode"

Copy:
Mr. W. M. Dean, NRC Region I Administrator
Mr. P. W. Finney, NRC Sr. Resident Inspector
Mr. J. A. Whited, NRC Project Manager
Mr. L. J. Winker, PA DEP/BRP

Enclosure 1 to PLA-6997

Response to NRC Request for Additional Information

Response to NRC Request for Additional Information

NRC QUESTION 1:

Please address the intent of the voltage range in the SRs not being changed by the proposed LAR.

PPL RESPONSE:

The only specific voltage being changed by this proposed License Amendment Request (LAR) is the minimum steady state output voltage of the diesel generator (DG) when operating in the isochronous (emergency) mode. The steady state output voltage when operating in the droop (test) mode is not being changed because when operating in the test configuration the DG output voltage is determined by the electrical power grid to which it is connected.

The specified maximum steady state output voltage of 4400 V is not being changed in the SRs. This value is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages.

The SRs for demonstrating OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide (RG) 1.9 "Application and Testing of Safety – Related Diesel Generators in Nuclear Power Plants." The voltage ranges specified in the SRs are established consistent with RG 1.9.

The new minimum steady state output voltage of 4000 V is the value assumed in the degraded voltage analysis, which represents approximately 96% of the nominal 4160 output voltage. This value allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating.

NRC QUESTION 2:

Describe how the steady state voltage requirements, currently associated with the droop mode SRs, will demonstrate DG operability if the safety busses are below the minimum required 4000 Volts as proposed in the LAR.

The LAR proposes a new voltage range of >= 4000 Volts and <= 4400 Volts for SRs 3.8.1.9, 3.8.1.11, 3.8.1.12, and 3.8.1.19. The current requirements of induction motors and other voltage sensitive equipment vary according to available voltage and frequency.

PPL RESPONSE:

The steady state output voltage of the DG, when operating in the droop mode, is established by the electrical power grid to which it is paralleled. The grid stability and voltage are verified to be greater than 4000 V prior to performing the DG surveillances in the droop mode. This demonstrates the capability of the DG to produce >= 4000 V steady state output voltage and to supply the connected load on the grid.

The DG operability in the isochronous mode is demonstrated by performance of Loss of Coolant Accident / Loss of Offsite Power (LOCA/LOOP) surveillance testing. The acceptance criteria for this surveillance requires that the DG is capable of supplying loads at >= 4000 V when operating in the emergency mode.

NRC QUESTION 3:

Provide excerpts from calculations that validate DG loading when operating at extremes of the proposed voltage range.

PPL RESPONSE:

SSES DG loading calculations, in general, are based on nominal voltages. A formal calculation to validate DG loading when operating at the extremes of the proposed voltage range (4000 V – 4400 V) was not performed since the proposed LAR revises only the steady state lower voltage limit in the conservative direction.

The proposed DG steady state output voltage of 4000V was determined based on Calculation EC-024-1031, Revision 0. (See Enclosure 2 below). The following should be noted as considerations and the results determined for the minimum acceptable DG steady state voltage:

- Upper value of the degraded voltage relay reset voltage (3938.8V), see Section 3.1,
- Worst Case voltage drop from the DG to the 4kV bus (48.3V), see Section 4.4,
- Any unacceptable potential interactions with other bus voltage settings, see Section 4.6,
- Surveillance Steady State DG minimum output voltage determination of 4000 V, see Section 4.5.

Enclosure 2 to PLA-6997

Calculation EC-024-1031
DG Steady State Output Voltage for Surveillance Test in Isochronous Mode

For Information Only

NUCLEAR ENGINEERING CALCULATION COVER SHEET NEPM-QA-0221-1	1. Page 1 of 14 Total Pages 14

➢2. TYPE: CALC ➢3. NUMBER: EC-024-1031 ➢4. REVISION: 0

*➢5. UNIT: 0 *➢6. QUALITY CLASS: Q

➢7. DESCRIPTION: DG Steady State Output Voltage for Surveillance Test in Isochronous Mode

8. SUPERSEDED BY: N/A

9. Alternate Number: N/A 10. Cycle: N/A

11. Computer Code/Model used: N/A 12. Discipline: E

➢ 13. Are any results of this calculation described in the Licensing Documents?
☒ Yes, *Refer to NDAP-QA-0730 and NDAP-QA-0731* ☐ No

➢ 14. Is this calculation changing any method of evaluation described in the FSAR and using the results to support or change the FSAR? (Refer to PPL Resource Manual for definition of FSAR)
☐ Yes, *50.59 screen or evaluation required.* ☒ No

➢ 15. Is this calculation Prepared by an External Organization?
☐ Yes ☒ No
EG771 Qualifications may not be required for individuals from external organizations (see Section 7.4.3).

➢16. Prepared by[1]:	J. Rothe *Print Name(EG771 Qualification Required)*	J. Rothe *Signature*	11/11/10 Date
➢17. Reviewed by[1]:	M. Desai *Print Name(EG771 Qualification Required)*	M. Desai *Signature*	11/12/10 Date
➢18. Verified by:	M. Desai *Print Name (EG771 & QADR Qualification Required)*	M. Desai *Signature*	11/12/10 Date
➢19. Approved by:	P. Brady *Print Name (Qualified per NEPM-QA-0241 and comply with Section 7.8 of NEPM-QA-0221)*	P. Brady *Signature*	11/12/10 Date
➢20. Accepted by:	N/A *Print Name(EG771 Qualification Required and comply with Section 7.9 of NEPM-QA-0221)*	*Signature*	Date

[1]For Fire Protection related calculations see Section 7.4.3.n for additional qualification requirements.
ADD A NEW COVER PAGE FOR EACH REVISION

* Verified Fields
➢ REQUIRED FIELDS

1. Purpose

The purpose of this calculation is to determine a minimum DG steady state output voltage value for use in DG surveillances in the isochronous mode.

Acceptance criteria
The DG steady state output voltages used in the applicable surveillances should be above minimum required steady state equipment voltages and be above the upper value of the degraded grid relay reset voltage.

2. Conclusions

A value of 4000 VAC steady state AC volts meets the acceptance criteria and is acceptable for use in the DG surveillance procedures.

3. Inputs

3.1 Upper value of degraded grid relay reset voltage 3938.8 volts per EC-004-1031.
3.2 DG A-D continuous rating 4000 KW at 0.8pf per FSAR.
3.3 DG-E continuous rating 5000 KW at 0.8pf per FSAR.
3.4 Cable impedances from PPL ETAP library etaplib5.lib at 90 degrees C. The library values are from EC-004-1034 with temperature correction to 90 degrees C.
3.5 Unit 1 and Unit 2 Technical Specification Bases 3.8.1 indicate that the existing steady state surveillance value of 3793 volts meets minimum required steady state equipment voltages. Specifically, both the Unit 1 and Unit 2 Technical Specification Bases state,

> "Where the SRs discussed herein specify voltage and frequency tolerances, the following summary is applicable. The minimum steady state output voltage of 3793 V is the value assumed in the degraded voltage analysis and is approximately 90% of the nominal 4160 V output voltage. This value allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating."

Accordingly, the more limiting of the acceptance criteria is to be above the upper value of the degraded grid relay reset voltage which is greater than 3793 V.

3.6 For the purposes of this calculation, due to the conservatisms of this calculation and the balanced nature of a large percentage of the DG loads, it is reasonable to consider the DG to have balanced loads.

4. Method

4.1 Method Overview

The method used is to determine the worst case voltage drop from the Diesel Generator to an associated 4 KV switchgear bus. This worst case voltage drop is then added to the upper value of degraded grid relay reset voltage (Input 3.1). This method is used because the degraded grid voltage is at the 4KV bus and the surveillance voltage value is based on the DG output voltage. A voltage value equal to or above this summed value is selected. This establishes a steady state DG voltage that would not result in actuation of the degraded grid relay scheme. The selected value is then evaluated to ensure that it is compatible with other setting values to which it might be related. Determining the worst case voltage drop requires determining the worst case cable impedance between the Diesel Generator and the 4KV bus and determining the maximum steady state current. This allows calculation of the associated voltage drop and of the required DG voltage to meet the acceptance criteria.

4.2 Worst case cable impedance

Figures 1 through 4 illustrate cable types and lengths for the situation where DG-E is substituted for DG-A through D respectively. Figure 5 provides a typical and more comprehensive illustration showing when DG-E is not substituted and DG-A is aligned to the 4KV bus.

Referring to Figure 5, when DG-E is not substituted, the cable lengths shown from DG-E to 0A510A02 are replaced by DG-A cables AF0G2401F and G (F10's) at 49 ft each and AF0G2401 J and H at 114 ft each (H01's). These cables add up to less impedance compared to using the cables when DG-E is substituted. A review of Table 1 for the analogous cables for DG-B, C, and D shows that in all cases, as expected, the lengths when DG-E is substituted are greater than when DG-E is not substituted, and the corresponding circuit impedance is greater with DG-E substituted.

Also, in all cases the cable length to the 4KV buses for Unit 2 is greater than that to the 4KV buses for Unit 1. Total lengths are based upon 4KV buses for Unit 2 and it is conservatively assumed that all current from each DG is supplied to its 4KV bus for Unit 2. This provides the worst case voltage drop for each case.

The worst case cable lengths are for DG-E substituted for A, and DG-E substituted for D.

The worst case impedance can be determined as follows:

From ETAP library etaplib5.lib at 90 degrees C

Material	Cable Code	R/1000 ft	X/1000 ft
Cu	H01	0.022	0.089
Al	F10	0.025	0.0341

DG-E for A		Length*R/2000 (Note 1)	Length*X/2000 (Note 1)
Length H01	780	0.00858	0.03471
Length F10	615	0.007688	0.010486
Total R and X		0.016268	0.045196
Total Z (SQRT(R^2+X^2))	0.048035	Angle 70.18 degrees	

DG-E for D		Length*R/2000 (Note 1)	Length*X/2000 (Note 1)
Length H01	810	0.00891	0.036045
Length F10	552	0.0069	0.009412

Total R and X		0.01581	0.045457
Total Z ($SQRT(R^2+X^2)$)	0.048128	Angle 70.82 degrees	

Note 1: Note that all conductors are doubled up, cutting the effective resistance in half. This is why the devisor is 2000 and not 1000. Where the paralleled cable lengths are different, the longer length is conservatively used.

To determine which case represents the worst voltage drop will require determining the voltage drop for each case.

4.3 Maximum steady state current

It is appropriate to base the maximum steady state current on the DG-A through D rating rather than the higher rating of DG-E. This is because steady state loads must stay within the capability of the lower machine rating.

The highest DG load shown in the FSAR diesel loading tables is in FSAR table 8.3-3 which shows a maximum steady state diesel load of 3976.85 KW (DG-A). This is close to the 4000 KW machine nominal rating. For purposes of determining the maximum steady state current, a steady state loading of 4000 KW will be used. Using a power factor of 0.8 from the FSAR yields a KVA of 4000/0.8 = 5000 KVA.

Amps =KVA*1000/ (4160*SQRT 3) =

5000*1000/ (4160*SQRT 3) =694.75 amps. Round to 695 amps

Maximum steady state current = 695 amps

4.4 Voltage Drop

Since the machine rating of 5000 KVA and 4000 KW uses a 0.8 power factor, the voltage drop calculation will also use that power factor. Per input 3.6, the calculation is based on balanced loads.

The following formula is the approximate formula for line to neutral voltage drop:

Vdrop line to neutral = $I(R \cos\theta + X \sin\theta)$ Reference: Industrial Power Systems Handbook page 234.

The error introduced by using the approximate formula is minor, and is enveloped by the rounding of values in the subsequent section, "Determination of surveillance voltage."

Vdrop DG-E substituted for DG-A:

Vdrop line to neutral = 695*((0.016268*0.8) + (0.045196*0.6)) = 27.89 volts

Vdrop= line to line = (SQRT(3))* Vdrop line to neutral = 48.3 volts

Vdrop DG-E substituted for DG-D:

Vdrop line to neutral = 695*((0.01581*0.8) + (0.045457*0.6)) = 27.74 volts

Vdrop= line to line = (SQRT(3))* Vdrop line to neutral = 48.1 volts

DG-E substituted for A is the worst case voltage drop of 48.3 volts

4.5 Determination of surveillance voltage

The principle used was that the DG steady state output voltages used in the applicable surveillances should be above minimum required equipment voltages (part of the existing Tech Spec bases) and be above the upper end of the degraded grid relay reset value.

The diesel surveillance measures DG output voltage. The degraded grid relays monitor voltage at the 4KV bus. Therefore, the value chosen as the minimum acceptable DG steady state voltage needs to consider:

(1) The upper end of the degraded grid relay reset value (3938.8 volts) (Input 3.1)
(2) The voltage drop from the DG to the 4 KV bus (48.3 volts) (Calculated in 4.4)
(3) Any unacceptable potential interactions with other settings. (None on basis of the principle for the surveillance test that voltages be above degraded grid reset value.)

Rounding voltages yield the following:

3940 volts + 50 volts = 3990 volts.

Per discussion with System Engineers R. Bogar and L. Casella, this is rounded to 4000 volts.

4.6 Potential Interaction with other settings

Other settings provided by relay and test, S. Brylinsky:

PDP-4	DG VR Emergency Setpoints	4050 – 4350

Reference: Procedure MT-RC-063

This setting indicated that the DG voltage regulator will control voltage to a minimum value of 4050 volts which is above the proposed surveillance voltage. As such, these settings would not prevent the surveillance from being successful.

27-1&2	Permissive to Close Diesel Breaker	3945 – 4106

Reference : Calculation EC-SOPC-0607 Rev. 0 applies. The associated RSCN's 82-663, -664, -665, and – 666 specify 115 V for relay pick-up. MT-RC-026, Rev. 6 specifies a tolerance of +/- 2% which is 2.3 volts. The values shown above are the corresponding DG voltage levels. (The potential transformer is 102 V to 4200V. For ex. (115+2.3)*4200/120 = 4106)

For the DG breaker supplying the 4KV bus to auto- close, this setting should never be above the DG output voltage when breaker auto-closure is otherwise indicated. However, that situation could potentially occur with the existing setpoint range. CR 1315904 identifies this potential and will require a setpoint change. Resolution of that issue is outside the scope of this calculation and is tracked by the CR.

5.0 Results

The result is that a steady state surveillance value of 4000 Volts for DG output will meet the acceptance criteria of this calculation.

6.0 References

6.1 CR 1302829, DG ISOCHONOUS SURVEILLANCE LOW VOLTAGE ACCEPTANCE CRITERIA IS NOT TECHNICALLY SUPPORTABLE

6.2 CRA 1312458, CR 1302829 PROCEDURES REQUIRING EXPEDITIOUS REVISION AND REQUIRED VOLTAGE VALUE

6.3 AR-EWR 1315923, CREATE A FORMAL CALCULATION FOR THE 4000 V CRITERION ESTABLISHED VIA CRA 1312458

6.4 CR 1315904, THE POTENTIAL EXISTS FOR THE SETPOINT FOR THE EDG BREAKER CLOSURE VOLTAGE PERMISSIVE RELAYS TO BE SET AT A HIGHER VALUE THAN THE UPPER VALUE ALLOWED FOR THE AUTO VOLTAGE REGULATOR (AVR) WHEN AN EDG IS FUNCTIONING IN EMERGENCY MODE.

6.5 EC-004-1031, Rev. 4, PLANT AC LOADFLOW ANALYSIS

6.6 CRIMP

6.7 ETAP library etaplib5.lib

6.8 EC-004-1034, Rev. 1, POWER CABLE DATA FOR ETAP

6.9 Industrial Power Systems Handbook, Donald Beeman, McGraw-Hill, 1955

6.10 FSAR text 8.3.1.4, Rev. 68 in NIMS

6.11 FSAR table 8.3-3 Table Rev 56 in NIMS

6.12 Schematic drawing E-23, Sheet 6, Rev. 28

6.13 Schematic drawing E-23, Sheet 6B, Rev. 2

6.14 Schematic drawing E-23, Sheet 6C, Rev. 7

6.15 Schematic drawing E-23, Sheet 6D, Rev. 2

6.16 Schematic drawing E-23, Sheet 6E, Rev. 10

6.17 Schematic drawing E-23, Sheet 6F, Rev. 2

6.18 Schematic drawing E-23, Sheet 6G, Rev. 9

6.19 Schematic drawing E-23, Sheet 6H, Rev. 2

6.20 Schematic drawing E-23, Sheet 10, Rev. 10

6.21 Schematic drawing E-23, Sheet 13, Rev. 9

6.22 Procedure MT-RC-026, Rev. 6, CS (POT. & BRUM.) RELAY CALIBRATION PROCEDURE

6.23 RSCN's 82-663 through 666

6.24 EC-SOPC-0607, Rev. 0, RELAY SETTING CALCULATION FOR DIESEL GENERATOR A&B&C&D&E VOLTAGE PERMISSIVE FOR LOADING SUPERSEDES 1-20204-13 REV 1

6.25 MT-RC-063, Rev. 1, STANDBY DIESEL GENERATOR AUTO VOLTAGE REGULATOR POWER DRIVEN POTENTIOMETER ADJUSTMENT PROCEDURE

6.26 Unit 1 Technical Specification Bases 3.8.1, Rev. 6

6.27 Unit 1 Technical Specification Bases 3.8.1, Rev. 8

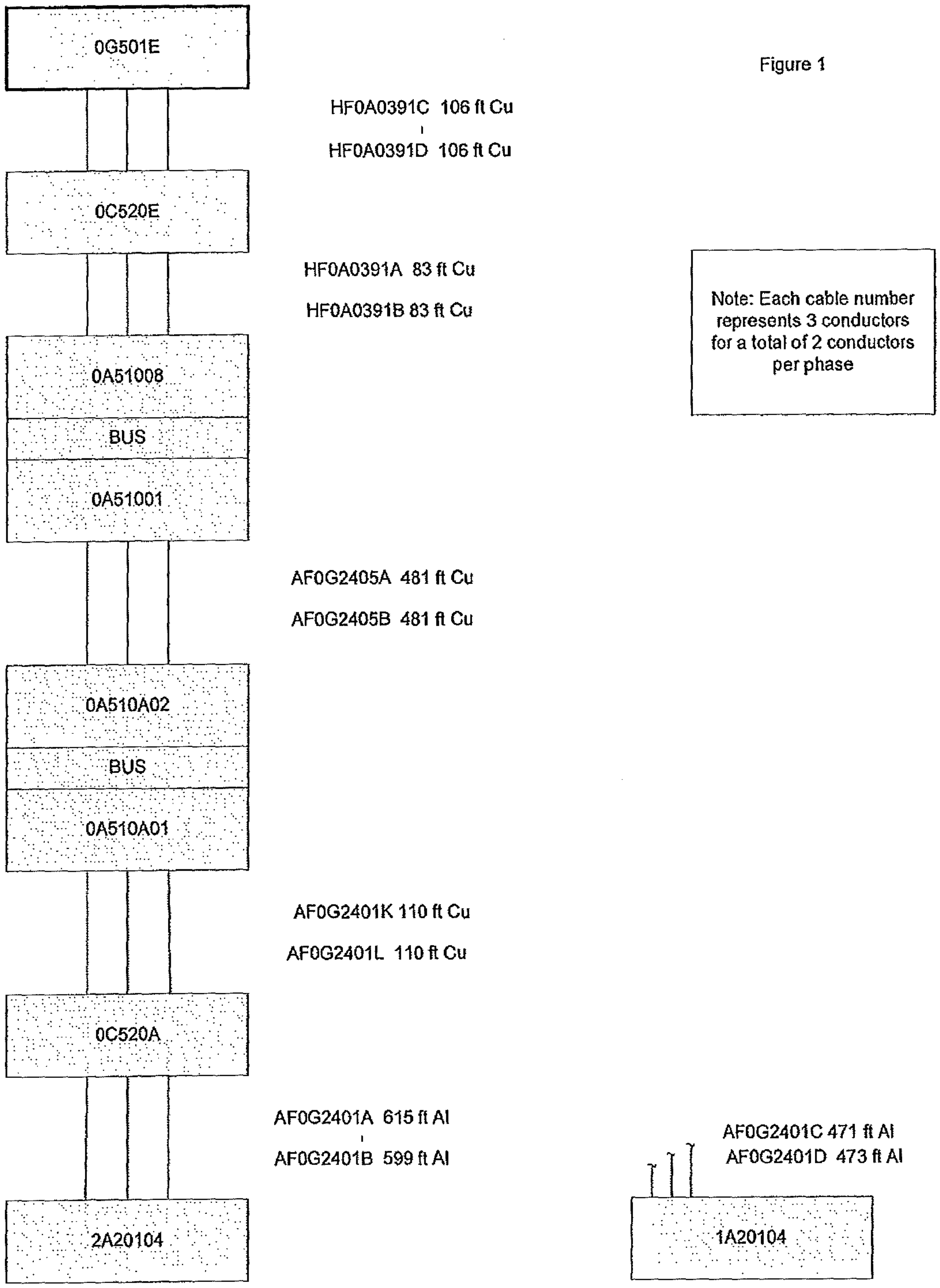


Figure 1

Cu is cable code H01. Total H01 length is 780 ft for any one conductor path

Al is cable code F10. Total F10 length is 615 ft for any one conductor path

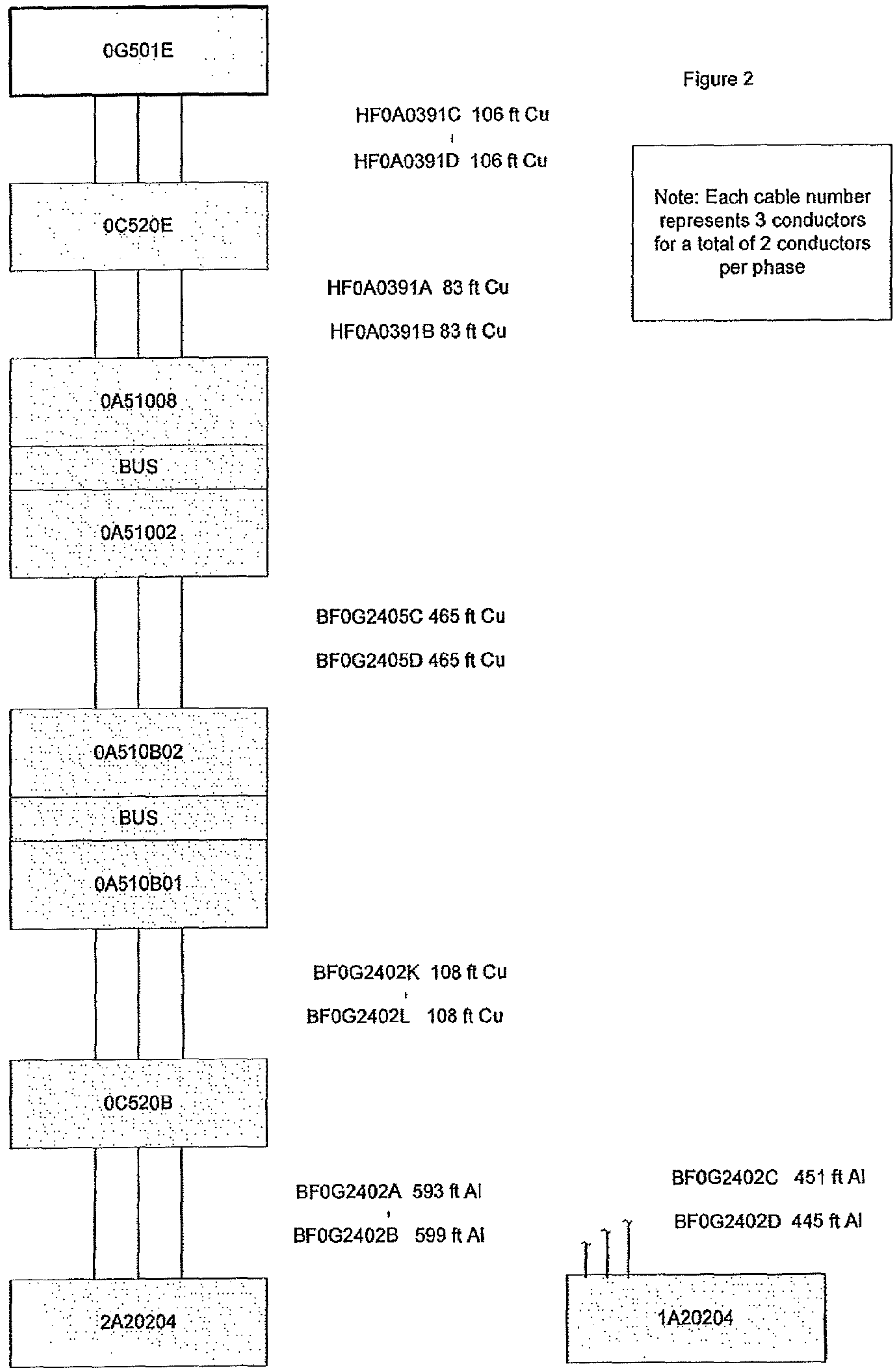
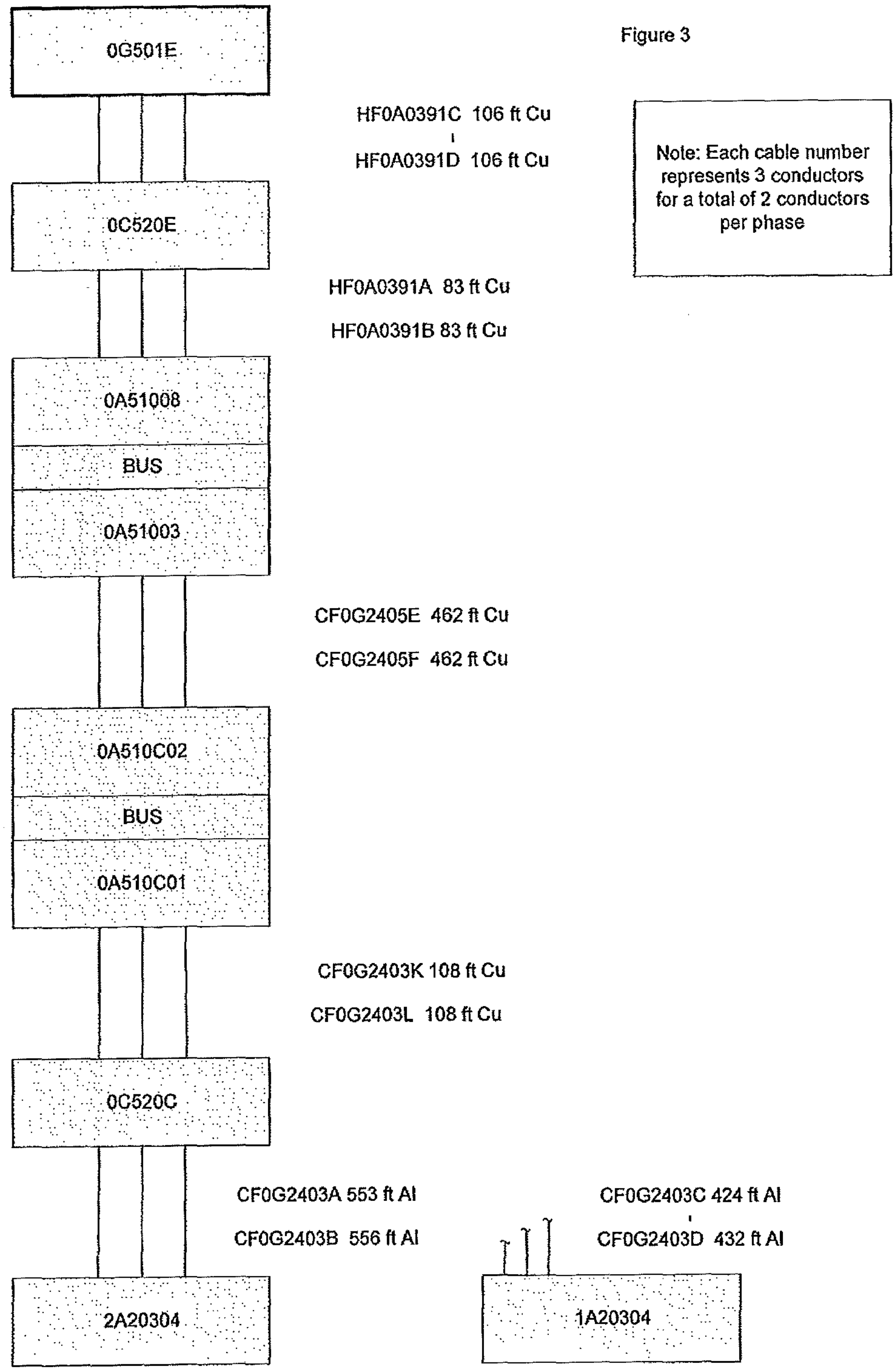


Figure 2

Cu is cable code H01. Total H01 length is 762 ft for any one conductor path

Al is cable code F10. Total F10 length is 599 ft for any one conductor path

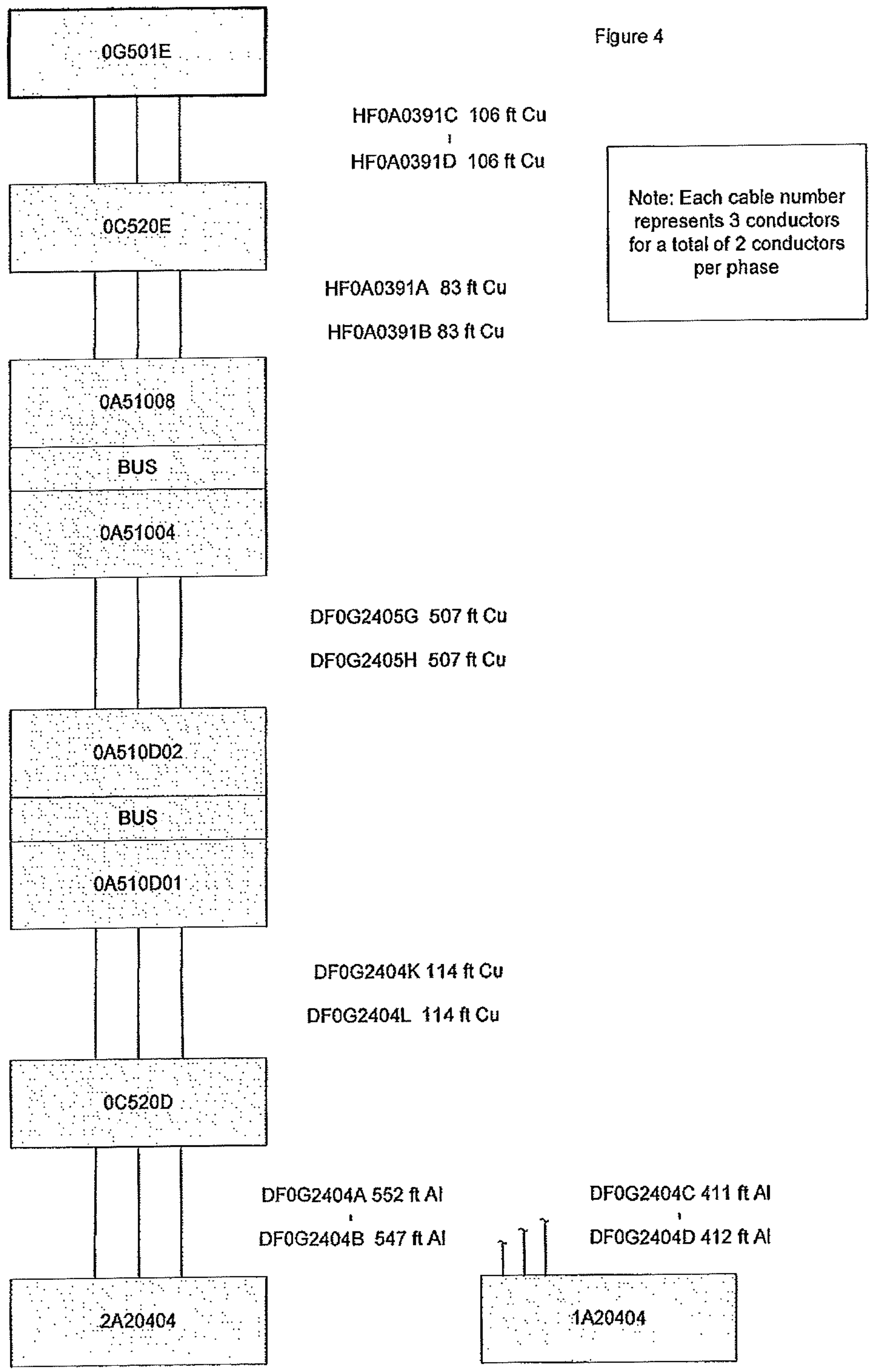
Figure 3



Cu is cable code H01. Total H01 length is 759 ft for any one conductor path

Al is cable code F10. Total F10 length is 556 ft for any one conductor path

Figure 4



Cu is cable code H01. Total H01 length is 810 ft for any one conductor path

Al is cable code F10. Total F10 length is 552 ft for any one conductor path

Figure 5

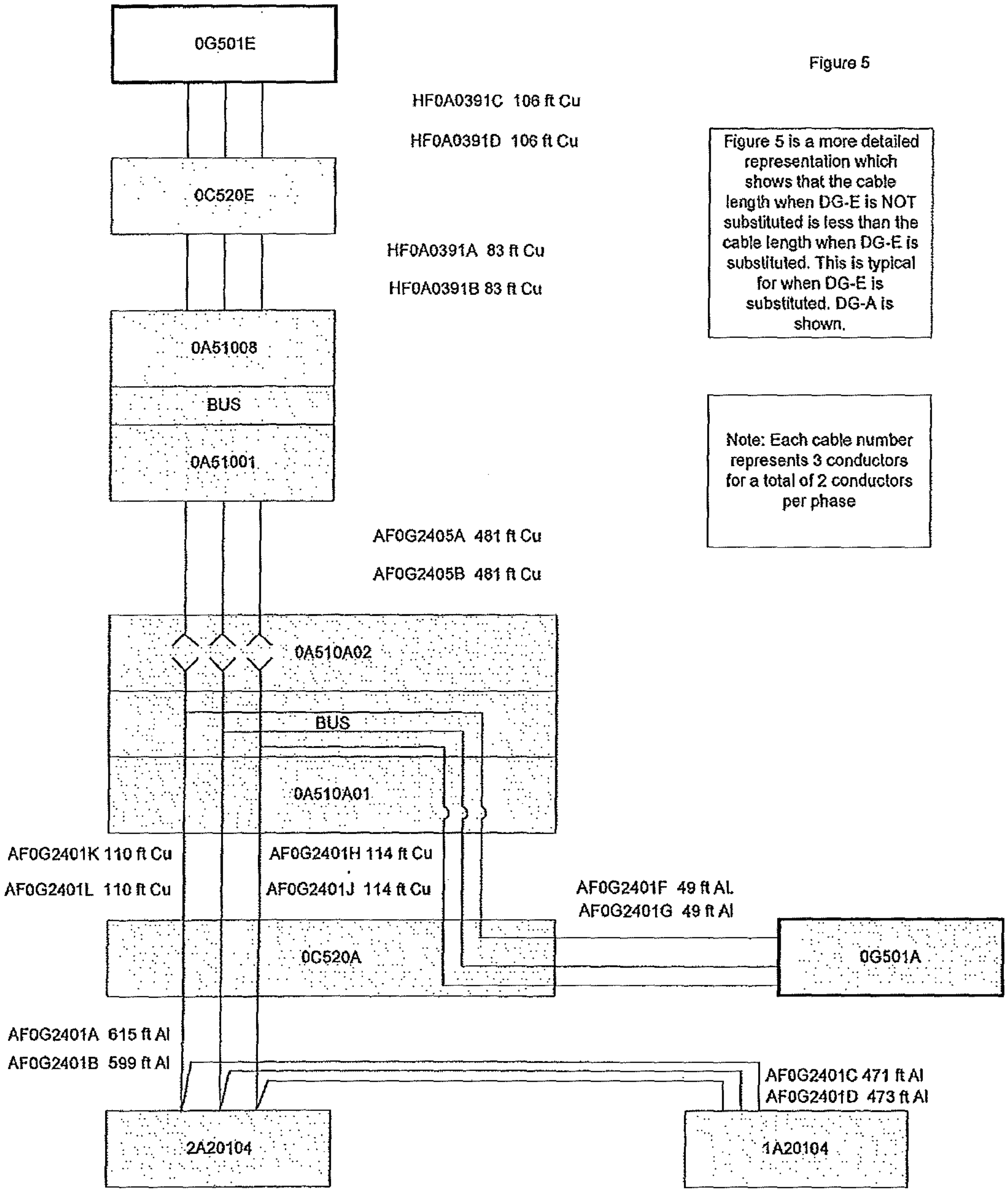


Figure 5 is a more detailed representation which shows that the cable length when DG-E is NOT substituted is less than the cable length when DG-E is substituted. This is typical for when DG-E is substituted. DG-A is shown.

Note: Each cable number represents 3 conductors for a total of 2 conductors per phase

Cu is cable code H01.

Al is cable code F10.

Table 1

SELECT TRAK2000_CABL.ID, TRAK2000_CABL.FROMEQ, TRAK2000_CABL.TOEQ, TRAK2000_CABL.CODE, TRAK2000_CABL.ILEN, TRAK2000_CABL.DLEN
FROM TRAK2000_CABL
WHERE (((TRAK2000_CABL.ID) Like "?F0G240[1-4]?" Or (TRAK2000_CABL.ID) Like "?F0G2405[A-H]")) OR (((TRAK2000_CABL.ID) Like "HF0A0391[A-D]"))
ORDER BY TRAK2000_CABL.ID;

ID	FROMEQ	TOEQ	CODE	ILEN	DLEN
AF0G2401A	0C520A	2A20104	F10	615	615
AF0G2401B	0C520A	2A20104	F10	599	599
AF0G2401C	0C520A	1A20104	F10	471	471
AF0G2401D	0C520A	1A20104	F10	473	473
AF0G2401E	0C520A	0G501A	F04	49	49
AF0G2401F	0C520A	0G501A	F10	49	49
AF0G2401G	0C520A	0G501A	F10	49	49
AF0G2401H	0A510A01	0C520A	H01	114	114
AF0G2401J	0A510A01	0C520A	H01	114	114
AF0G2401K	0A510A01	0C520A	H01	110	110
AF0G2401L	0A510A01	0C520A	H01	110	110
AF0G2405A	0A510A02	0A51001	H01	481	481
AF0G2405B	0A510A02	0A51001	H01	481	481
BF0G2402A	0C520B	2A20204	F10	593	593
BF0G2402B	0C520B	2A20204	F10	599	599
BF0G2402C	0C520B	1A20204	F10	451	451
BF0G2402D	0C520B	1A20204	F10	445	445
BF0G2402E	0C520B	0G501B	F04	49	49
BF0G2402F	0C520B	0G501B	F10	49	49
BF0G2402G	0C520B	0G501B	F10	49	49
BF0G2402H	0A510B01	0C520B	H01	113	113
BF0G2402J	0A510B01	0C520B	H01	113	113
BF0G2402K	0A510B01	0C520B	H01	108	108
BF0G2402L	0A510B01	0C520B	H01	108	108
BF0G2405C	0A510B02	0A51002	H01	465	465
BF0G2405D	0A510B02	0A51002	H01	465	465
CF0G2403A	0C520C	2A20304	F10	553	553
CF0G2403B	0C520C	2A20304	F10	556	556
CF0G2403C	0C520C	1A20304	F10	424	424
CF0G2403D	0C520C	1A20304	F10	432	432
CF0G2403E	0C520C	0G501C	F04	35	35

ID	FROMEQ	TOEQ	CODE	ILEN	DLEN
CF0G2403F	0C520C	0G501C	F10	35	35
CF0G2403G	0C520C	0G501C	F10	35	35
CF0G2403H	0A510C01	0C520C	H01	112	112
CF0G2403J	0A510C01	0C520C	H01	112	112
CF0G2403K	0A510C01	0C520C	H01	108	108
CF0G2403L	0A510C01	0C520C	H01	108	108
CF0G2405E	0A510C02	0A51003	H01	462	462
CF0G2405F	0A510C02	0A51003	H01	462	462
DF0G2404A	0C520D	2A20404	F10	552	552
DF0G2404B	0C520D	2A20404	F10	547	547
DF0G2404C	0C520D	1A20404	F10	411	411
DF0G2404D	0C520D	1A20404	F10	412	412
DF0G2404E	0C520D	0G501D	F04	34	34
DF0G2404F	0C520D	0G501D	F10	34	34
DF0G2404G	0C520D	0G501D	F10	34	34
DF0G2404H	0A510D01	0C520D	H01	116	116
DF0G2404J	0A510D01	0C520D	H01	116	116
DF0G2404K	0A510D01	0C520D	H01	114	114
DF0G2404L	0A510D01	0C520D	H01	114	114
DF0G2405G	0A510D02	0A51004	H01	507	507
DF0G2405H	0A510D02	0A51004	H01	507	507
HF0A0391A	0A51008	0C520E-HV	H01		83
HF0A0391B	0A51008	0C520E-HV	H01		83
HF0A0391C	0C520E-HV	0G501E	H01		106
HF0A0391D	0C520E-HV	0G501E	H01		106

Use design length (DLEN) if installed length (ILEN) is blank.