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| **0A** | **08/11/2018** | **EMISSÃO INICIAL** | **KAM/LBR** | **MVMO** | **LMSA** |
| Nº | Data | Natureza da Revisão | Elaborado | Verificado | Aprovado |

MARTE Engenharia

Sterlite São Francisco Energia S.A.

# Sterlite São Francisco Transmissão de Energia S.A.

## PROJETO BÁSICO – LOTE 7 – LEILÃO Nº02/2018 - ANEEL

| ELAB. | VERIF. | APROV. | RESP. TÉCNICO | CREA | DATA |
|---|---|---|---|---|---|
| LBR/KAM | MVMO | LMSA | CSF | 2000119859 | 08/11/2018 |

TÍTULO

# REDE EQUIVALENTE PARA ESTUDOS DE TRANSITÓRIOS ELETROMAGNÉTICOS

| Nº DOCUMENTO | FOLHA | REVISÃO |
|---|---|---|
| **SF01818-ES-GN-G-RE-0009** | **1 de 151** | **0A** |

# ÍNDICE

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# 1. OBJETIVO

O presente relatório tem por objetivo apresentar a rede representada nas simulações de efeitos transitórios correspondentes ao Lote 7 do Leilão 02/2018 da ANEEL [1][2]. As Linhas de Transmissão que compõem o Lote 7 são:

- LT 500 kV Porto Sergipe – Olindina C1, com 180 km;
- LT 500 kV Olindina – Sapeaçu C1, com 207 km;
- LT 230 kV Morro do Chapéu II – Irecê, C2 e C3, com 67 km;

Abaixo segue um mapa da região em que os empreendimentos do lote 7 serão construídos e que será representada na rede equivalente.

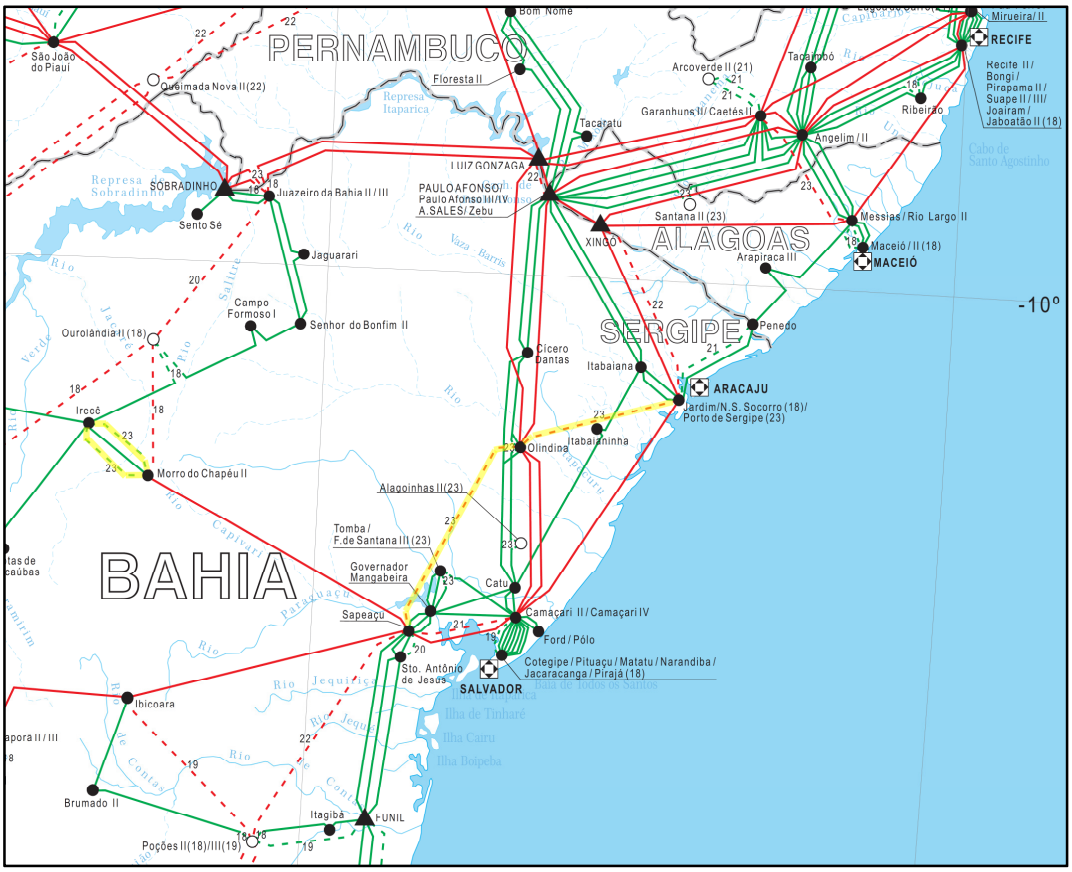


**Figura 1.1 - Região dos empreendimentos do Lote em Estudo**

Abaixo segue um diagrama da região em que os empreendimentos do lote 7 serão construídos e que será representada na rede equivalente, os diagramas da rede retida completa estão no ANEXO III– DIAGRAMA DO SISTEMA EQUIVALENTE REPRESENTADO NO ATP.

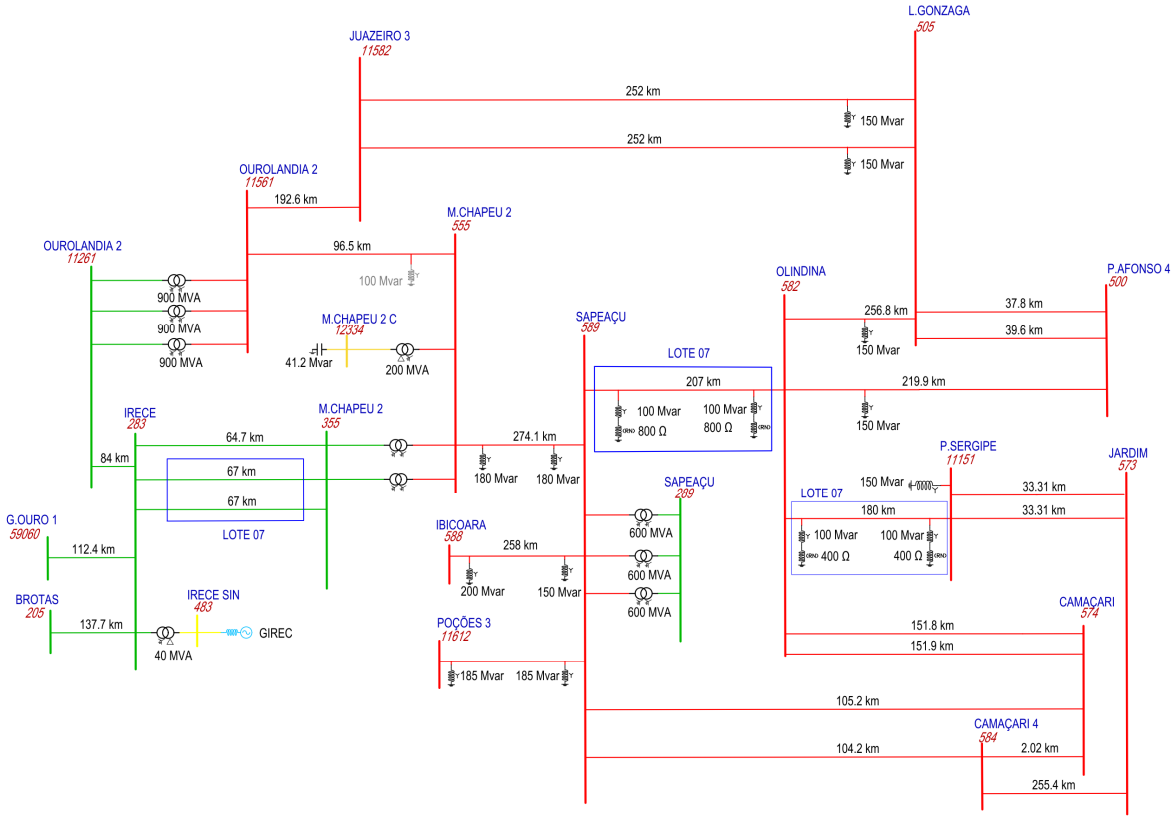


**Figura 1.2 – Diagrama da região dos empreendimentos do Lote em Estudo**

## 2. METODOLOGIA

A rede retida deve reproduzir os fenômenos transitórios do sistema de forma satisfatória. Por restrições computacionais é inviável a representação de todo o sistema elétrico no programa ATP (Alternative Transient Program), por isso, uma parcela da rede no entrono do empreendimento em estudo é modelada e o restante do sistema é representado em forma de equivalente nas fronteiras.

Para a elaboração do sistema elétrico representado nos estudos com foco em fenômenos transitórios eletromagnéticos foram utilizadas as Diretrizes para Elaboração de Projetos Básicos – Estudos Elétricos e especificações das instalações e equipamentos do ONS [3] e o procedimento de rede 23. 3 – “Diretrizes e Critérios para Estudos Elétricos”, novembro de 2016 [4] como referência.

A determinação dessa rede equivalente deve respeitar, segundo as atuais diretrizes, os seguintes aspectos:

- Configuração do sistema e impedâncias de sequência positiva e zero de acordo com os bancos de dados referentes ao período de entrada do empreendimento e, quando for o caso, referente ao horizonte de planejamento em observação;
- Tensão pré-manobra ajustada de acordo com a premissa do estudo a ser realizado;
- Os equivalentes de rede devem ser representados por suas impedâncias de curto-circuito de sequência positiva e zero seguido de uma fonte de tensão ideal, ligadas à barras de fronteiras;
- De acordo com o tipo de estudo realizado devem ser representados os elementos não-lineares da rede, tais como: curvas de saturação de transformadores, curva de histerese do transformador a ser chaveado e para-raios de subestações e linhas;
- Entre as barras focalizadas nos estudos e as barras de fronteira devem existir, pelo menos, duas barras. Mas deve se levar em conta não somente a distância elétrica, mas também a topologia da rede estudada;
- Os níveis de curto-circuito trifásico e fase-terra nas regiões próximas à barra de interesse devem ser próximos aos curtos-circuitos encontrados no programa ANAFAS, de forma a validar a rede equivalente quanto aos curtos-circuitos;
- Os fluxos de potência entre barramentos e tensões nas regiões próximas à barra de interesse devem ser, da melhor maneira possível, próximos dos resultados do programa ANAREDE.

Partindo destas informações e premissas, a rede equivalente representada na ferramenta computacional ATP é apresentado em um diagrama unifilar (ANEXO III– DIAGRAMA DO SISTEMA EQUIVALENTE REPRESENTADO NO ATP), onde são indicados os posicionamentos dos equivalentes de curto-circuito, das gerações representadas, das linhas com suas quilometragens, dos shunts de linhas e de barras com suas respectivas potencias e das cargas.

# 3. DADOS UTILIZADOS

## 3.1. CASO BASE

O ano de entrada do empreendimento em estudo está previsto para 2023. Na modelagem da rede equivalente utilizou-se as base de dados apresentados abaixo;

### 3.1.1. Curto Mínimo

- ANAFAS – PLANO DECENAL 2026 – CASO BASE EPE 2023 (CURTO-CIRCUITO MÍNIMO);
- ANAREDE – PLANO DECENAL 2026 – LEVE EPE - ANO 2023 NORTE SECO

### 3.1.2. Curto Máximo

- ANAFAS – PLANO DECENAL 2026 – CASO BASE EPE 2023 (CURTO-CIRCUITO MÀXIMO);
- ANAREDE – PLANO DECENAL 2026 – PESADA EPE – ANO 2023 NORTE ÚMIDO

### 3.2. BARRAS REPRESENTADAS

Abaixo são apresentados os dados das barras representadas na rede equivalente.

**Tabela 3.1 – Barras Representas**

| Número da Barra | Nome da Barra | Base de Tensão (kV) |
|---|---|---|
| 500 | P.AFONSO 4 | 500 |
| 504 | XINGO | 500 |
| 505 | L.GONZAGA | 500 |
| 506 | SOBRADINHO | 500 |
| 540 | ANGELIM | 500 |
| 542 | MESSIAS | 500 |
| 549 | GARANHUNS 2 | 500 |
| 555 | M.CHAPEU 2 | 500 |
| 573 | JARDIM | 500 |
| 574 | CAMAÇARI | 500 |
| 582 | OLINDINA | 500 |
| 584 | CAMAÇARI 4 | 500 |
| 588 | IBICOARA | 500 |
| 589 | SAPEAÇU | 500 |
| 11151 | P.SERGIPE | 500 |
| 11560 | G.OURO 2 | 500 |
| 11561 | OUROLANDIA 2 | 500 |
| 11567 | MILAGRES 2 | 500 |
| 11582 | JUAZEIRO 3 | 500 |
| 11594 | IGAPORÃ 3 | 500 |
| 11612 | POÇÕES 3 | 500 |
| 38975 | P.PARAISO 2 | 500 |
| 200 | P.AFONSO A 3 | 230 |
| 203 | S.BONFIM | 230 |
| 205 | BROTAS | 230 |
| 206 | SOBRADINHO | 230 |
| 209 | POÇÕES 2 | 230 |
| 213 | ITAGIBA | 230 |
| 214 | EMBASA | 230 |
| 240 | ANGELIM | 230 |
| 263 | ITAPEBI | 230 |
| 264 | S.A.JESUS | 230 |
| 266 | TOMBA | 230 |
| 271 | ITABAINA | 230 |
| 272 | CATU | 230 |
| 273 | JARDIM | 230 |
| 274 | CAMAÇARI B1 | 230 |
| 275 | G.MANGABEIRA | 230 |
| 276 | FUNIL | 230 |
| 283 | IRECE | 230 |
| 284 | CAMAÇARI 4 | 230 |

| Número da Barra | Nome da Barra | Base de Tensão (kV) |
|---|---|---|
| 285 | B.J.LAPA | 230 |
| 288 | IBICOARA | 230 |
| 289 | SAPEAÇU | 230 |
| 294 | CAMAÇARI B2 | 230 |
| 300 | P.AFONSO B 3 | 230 |
| 301 | ASALE A | 230 |
| 302 | A.SALES B | 230 |
| 342 | MESSIAS | 230 |
| 349 | GARANHUNS | 230 |
| 355 | M.CHAPEU 2 | 230 |
| 375 | P.CAVALO | 230 |
| 11110 | F.SANTANA 3 | 230 |
| 11201 | SANTANA 2 | 230 |
| 11260 | G.OURO 2 | 230 |
| 11261 | OUROLANDIA 2 | 230 |
| 11273 | N.S.SOCORRO | 230 |
| 11282 | JUAZEIRO 3 | 230 |
| 11461 | C.FORMOSO | 230 |
| 18612 | POÇÕE3 | 230 |
| 58825 | UMBURANAS | 230 |
| 58833 | C.LARGO | 230 |
| 58844 | SE01 | 230 |
| 59015 | S.AZUL | 230 |
| 59058 | M.CHAPEU SUL | 230 |
| 59060 | G.OURO 1 | 230 |
| 59067 | V.BAHIA 2 | 230 |
| 59077 | S.BABILONIA | 230 |
| 59084 | BABILONIA | 230 |
| 103 | S.BONFIM | 138 |
| 183 | IRECE | 138 |
| 909 | POÇÕE 2 | 138 |
| 976 | FUNIL | 138 |
| 59029 | G.OURO 1 | 138 |
| 176 | FUNIL | 115 |
| 603 | S.BONFIM | 69 |
| 664 | S.A.JESUS | 69 |
| 673 | JARDIM | 69 |
| 674 | CAMAÇARI | 69 |
| 675 | G.MANGABEIRA | 69 |
| 683 | IRECE | 69 |
| 755 | M.CHAPEU | 69 |
| 11673 | N.S.SOCORRO | 69 |
| 18763 | F.SANTANA 3 | 69 |
| 11306 | BROTAS | 34,5 |
| 58806 | C.FORMOSO | 34,5 |

| Número da Barra | Nome da Barra | Base de Tensão (kV) |
|---|---|---|
| 58824 | UMBURANAS | 34,5 |
| 58832 | C.LARGO | 34,5 |
| 59014 | S.AZUL | 34,5 |
| 59035 | G.OURO 1B | 34,5 |
| 59057 | M.CHAPEUS | 34,5 |
| 59066 | V.BAHIA 2 | 34,5 |
| 59076 | S.BABILONIA | 34,5 |
| 59083 | BABILONIA | 34,5 |
| 11150 | P.SERGIPE 1G | 25 |
| 11149 | P.SERGIPE 1V | 24 |
| 1 | P.AFONSO UHE 1 | 13,8 |
| 4 | P.AFONSO 2-A1 UHE | 13,8 |
| 5 | P.AFONSO 2 A2 UHE | 13,8 |
| 6 | P.AFONSO 2 A3 UHE | 13,8 |
| 7 | P.AFONSO 2 B1 UHE | 13,8 |
| 8 | P.AFONSO 2 B2 UHE | 13,8 |
| 9 | P.AFONSO 2 B3 UHE | 13,8 |
| 10 | P.AFONSO 3-1 UHE | 13,8 |
| 11 | P.AFONSO 3-2 UHE | 13,8 |
| 14 | P.AFONSO 4-1 UHE | 13,8 |
| 21 | SOBRADINHO 1 UHE | 13,8 |
| 28 | ASALE 1 UHE | 13,8 |
| 29 | ASALE2 UHE | 13,8 |
| 33 | L.GONZAGA 1 UHE | 13,8 |
| 34 | L.GONZAGA 2 UHE | 13,8 |
| 48 | P.CAVALO 1 UHE | 13,8 |
| 63 | FUNIL 1 UHE | 13,8 |
| 81 | T.CAMAÇARI 1 | 13,8 |
| 89 | XINGO 1 UHE | 13,8 |
| 95 | ITAPEBI 1 UHE | 13,8 |
| 476 | FUNIL CER | 13,8 |
| 483 | IRECE SIN | 13,8 |
| 485 | B.J.LAPA SIN | 13,8 |
| 874 | CAMAÇARI D1 SIN | 13,8 |
| 876 | FUNIL | 13,8 |
| 974 | CAMAÇARI D2 SIN | 13,8 |
| 11562 | G.OURO CER | 13,8 |
| 12333 | SAPEAÇU CER | 13,8 |
| 12334 | M.CHAPEU 2 CER | 13,8 |
| 38976 | P.PARAISO 2 CER | 13,8 |
| 90030 | ASALB2 UHE | 13,8 |
| 90033 | ASAL B2 UHE | 13,8 |
| 90058 | SOBRADINHO 2 UHE | 13,8 |

### 3.3. EQUIVALENTE DE FRONTEIRA

Abaixo são apresentados os dados dos equivalentes de fronteira representados na rede equivalente.

As tabelas Tabela 3.2 e Tabela 3.3 apresentam os equivalentes de curto-circuito a 60 Hz, representados por uma fonte ideal, em serie com uma impedância.

**Tabela 3.2 - Dados dos equivalentes de geração – Curto Mínimo**

| Nome da Barra | Número da Barra | Tensão kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|
| SOBRADINHO | 506 | 500 | 8,77 | 61,75 | 42,04 | 188,74 |
| ANGELIM | 540 | 500 | 1,30 | 586,04 | 41,58 | 135,75 |
| MESSIAS | 542 | 500 | 0,00 | 1039,54 | 49,34 | 208,56 |
| GARANHUNS 2 | 549 | 500 | 0,00 | 582,21 | 18,32 | 130,18 |
| G.OURO 2 | 11560 | 500 | 7,83 | 138,81 | 38,54 | 174,99 |
| MILAGRES 2 | 11567 | 500 | 3,40 | 105,38 | 3,97 | 33,15 |
| IGAPORÃ 3 | 11594 | 500 | 5,06 | 81 | 3,86 | 42,31 |
| P.PARAISO 2 | 38975 | 500 | 5,08 | 75 | 14,41 | 100,84 |
| ITAPEBI | 263 | 230 | 0,00 | 488,23 | 6,08 | 188,83 |
| B.J.LAPA | 285 | 230 | 2,95 | 67,93 | 0,25 | 13,38 |
| P.AFONSO 3 B | 300 | 230 | 2042,57 | 5463,99 | 5,17 | 60,21 |
| ANGELIM | 240 | 230 | 23,79 | 210,04 | 1,39 | 12,46 |
| P.AFONSO 3 A | 200 | 230 | 1321,38 | 3585,28 | 1,01 | 27,63 |
| FUNIL | 976 | 138 | 602,96 | 2685,30 | 316,70 | 2415,98 |

**Tabela 3.3 - Dados dos equivalentes de geração – Curto Máximo**

| Nome da Barra | Número da Barra | Tensão kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|
| SOBRADINHO | 506 | 500 | 6,47 | 44,70 | 41,68 | 184,15 |
| ANGELIM | 540 | 500 | 4,63 | 132,27 | 40,54 | 130,07 |
| MESSIAS | 542 | 500 | 4,54 | 225,59 | 48,18 | 195,63 |
| GARANHUNS 2 | 549 | 500 | 1,96 | 111,64 | 18,05 | 126,18 |
| G.OURO 2 | 11560 | 500 | 6,45 | 108,31 | 38,54 | 173,84 |
| MILAGRES 2 | 11567 | 500 | 2,04 | 40,37 | 4,19 | 33,65 |
| IGAPORÃ 3 | 11594 | 500 | 2,12 | 43,91 | 2,98 | 34,91 |
| P.PARAISO 2 | 38975 | 500 | 4,55 | 63,73 | 14,62 | 101,54 |
| P.AFONSO 3 A | 200 | 230 | 439,88 | 1171,84 | 1,01 | 27,63 |
| ANGELIM | 240 | 230 | 6,26 | 44,42 | 1,41 | 12,42 |
| ITAPEBI | 263 | 230 | 0,10 | 136,72 | 3,47 | 62,34 |
| B.J.LAPA | 285 | 230 | 2,81 | 47,80 | 0,29 | 13,20 |
| P.AFONSO 3 B | 300 | 230 | 679,82 | 1785,85 | 5,17 | 60,22 |
| FUNIL | 976 | 138 | 506,02 | 2241,08 | 289,20 | 2113,88 |
| S.BONFIM | 203 | 230 | 0,00 | 4049,60 | 0,00 | 1089,95 |
| SOBRADINHO | 206 | 230 | 0,00 | 90,51 | 0,00 | 90,41 |
| POÇÕES 2 | 209 | 230 | 38,90 | 564,65 | 57,73 | 334,87 |
| CATU | 272 | 230 | 427,95 | 4301,51 | 0,78 | 13,31 |
| CAMAÇARI B1 | 274 | 230 | 0,00 | 952,31 | 7,79 | 61,68 |

| Nome da Barra | Número da Barra | Tensão kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|
| CAMAÇARI 4 | 284 | 230 | 0,46 | 17,77 | 0,98 | 7,04 |
| IBICOARA | 288 | 230 | 9,64 | 379,44 | 41,24 | 200,08 |
| CAMAÇARI B2 | 294 | 230 | 0,00 | 180,33 | 7,34 | 32,82 |
| GARANHUNS | 349 | 230 | 1,82 | 34,75 | 1,39 | 19,34 |
| JUAZEIRO 3 | 11282 | 230 | 5,45 | 63,97 | 1,08 | 11,86 |
| SE01 | 58844 | 230 | 2,19 | 112,55 | 7,09 | 139,24 |
| IRECE | 183 | 138 | 3,98 | 77,07 | 9,98 | 104,77 |
| G.OURO 1 | 59029 | 138 | 3,03 | 153,98 | 7,04 | 188,41 |
| JARDIM | 673 | 69 | 5,23 | 49,79 | 4761,00 | 4761,00 |
| CAMAÇARI | 674 | 69 | 0,31 | 5,96 | 4761,00 | 4761,00 |
| BROTAS | 11306 | 34.5 | 0,13 | 2,69 | 0,31 | 4,78 |
| UMBURANAS | 58824 | 34.5 | 0,01 | 0,60 | 0,02 | 0,72 |
| C.LARGO | 58832 | 34.5 | 0,02 | 1,27 | 0,05 | 1,57 |
| G.OURO 1B | 59035 | 34.5 | 0,05 | 4 | 0,11 | 4,55 |

A Tabela 3.4 e Tabela 3.5 apresentam os equivalentes de curto-circuito a 60 Hz, representados por uma com uma impedância de sequência conectada a terra.

**Tabela 3.4 - Dados dos equivalentes shunt – Curto Mínimo**

| Nome da Barra | Número da Barra | Tensão (kV) | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) | Tipo |
|---|---|---|---|---|---|---|---|
| S.BONFIM | 203 | 230 | 529000 | 529000 | 0,00 | 1143,80 | REATOR |
| SOBRADINHO | 206 | 230 | 529000 | 529000 | 0,00 | 264,83 | REATOR |
| POÇÕES 2 | 209 | 230 | 529000 | 529000 | 0,00 | 344,81 | REATOR |
| TOMBA | 266 | 230 | 529000 | 529000 | 0,00 | 16,93 | REATOR |
| ITABAINA | 271 | 230 | 529000 | 529000 | 0,00 | 32,36 | REATOR |
| CATU | 272 | 230 | 529000 | 529000 | 0,00 | 13,31 | REATOR |
| CAMAÇARI B1 | 274 | 230 | 529000 | 529000 | 0,00 | 62,19 | REATOR |
| CAMAÇARI 4 | 284 | 230 | 529000 | 529000 | 0,00 | 9,78 | REATOR |
| IBICOARA | 288 | 230 | 529000 | 529000 | 0,00 | 206,07 | REATOR |
| CAMAÇARI B2 | 294 | 230 | 529000 | 529000 | 0,00 | 34,56 | REATOR |
| MESSIAS | 342 | 230 | 529000 | 529000 | 0,00 | 9,31 | REATOR |
| GARANHUNS | 349 | 230 | 529000 | 529000 | 0,00 | 26,49 | REATOR |
| SANTANA 2 | 11201 | 230 | 529000 | 529000 | 0,00 | 33,88 | REATOR |
| N.S.SOCORRO | 11273 | 230 | 529000 | 529000 | 0,00 | 116,60 | REATOR |
| JUAZEIRO 3 | 11282 | 230 | 529000 | 529000 | 0,00 | 12,32 | REATOR |

**Tabela 3.5 - Dados dos equivalentes shunt – Curto Máximo**

| Nome da Barra | Número da Barra | Tensão (kV) | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) | Tipo |
|---|---|---|---|---|---|---|---|
| TOMBA | 266 | 230 | 529000 | 529000 | 0,00 | 16,93 | REATOR |
| ITABAINA | 271 | 230 | 529000 | 529000 | 0,00 | 32,36 | REATOR |
| MESSIAS | 342 | 230 | 529000 | 529000 | 0,00 | 9,31 | REATOR |
| SANTANA 2 | 11201 | 230 | 529000 | 529000 | 0,00 | 33,88 | REATOR |
| N.S.SOCORRO | 11273 | 230 | 529000 | 529000 | 0,00 | 116,72 | REATOR |

As Tabela 3.6 e Tabela 3.7 apresentam os equivalentes de transferência, representados através das suas impedâncias de curto circuito a 60 Hz de sequência zero e positiva.

**Tabela 3.6 - Dados das impedâncias de transferência – Curto Mínimo**

| Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Tensão kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|---|---|
| SOBRADINHO | 506 | IGAPORÃ 3 | 11594 | 500 | 139 | 731 | 596717,50 | 508022,50 |
| SOBRADINHO | 506 | MILAGRES 2 | 11567 | 500 | 11 | 86 | 845,81 | 1728,41 |
| SOBRADINHO | 506 | G.OURO 2 | 11560 | 500 | 26 | 216 | 4492,25 | 6797,40 |
| ANGELIM | 540 | MILAGRES 2 | 11567 | 500 | 29 | 343 | 14589,63 | 20531,45 |
| ANGELIM | 540 | GARANHUNS 2 | 549 | 500 | 9 | 127 | 535,24 | 1261 |
| ANGELIM | 540 | MESSIAS | 542 | 500 | 15 | 187 | 1072,33 | 1698,44 |
| MESSIAS | 542 | MILAGRES 2 | 11567 | 500 | 71,17 | 881,53 | 82717,00 | 105278,75 |
| MESSIAS | 542 | GARANHUNS 2 | 549 | 500 | 22 | 356 | 3403,85 | 7159,10 |
| GARANHUNS 2 | 549 | MILAGRES 2 | 11567 | 500 | 7,58 | 134,15 | 1024,81 | 2731,10 |
| G.OURO 2 | 11560 | IGAPORÃ 3 | 11594 | 500 | 10 | 112 | 995,39 | 2227,74 |
| G.OURO 2 | 11560 | MILAGRES 2 | 11567 | 500 | 10 | 206 | 1149,61 | 2286,05 |
| MILAGRES 2 | 11567 | IGAPORÃ 3 | 11594 | 500 | 122 | 1382 | 263105,00 | 282245,00 |
| IGAPORÃ 3 | 11594 | P.PARAISO 2 | 38975 | 500 | 44,54 | 500,86 | 212773,50 | 198266,50 |
| P.AFONSO 3 A | 200 | P.AFONSO 3 B | 300 | 230 | 1,00 | 5,19 | 4,97 | 17,17 |
| P.AFONSO 3 A | 200 | CATU | 272 | 230 | 34 | 171 | 809,44 | 1382,83 |
| S.BONFIM | 203 | JUAZEIRO 3 | 11282 | 230 | 9 | 38 | 55,11 | 144,35 |
| SOBRADINHO | 206 | JUAZEIRO 3 | 11282 | 230 | 2,54 | 11,02 | 12,80 | 33,37 |
| POÇÕES 2 | 209 | IBICOARA | 288 | 230 | 22 | 121 | 660,80 | 1467,41 |
| ITABAINA | 271 | CATU | 272 | 230 | 21,32 | 116,54 | 418,86 | 842,74 |
| CATU | 272 | P.AFONSO 3 B | 300 | 230 | 33,65 | 171,45 | 812,90 | 1437,54 |
| CATU | 272 | CAMAÇARI 4 | 284 | 230 | 81 | 279 | 52899,95 | 52899,95 |
| CATU | 272 | CAMAÇARI B2 | 294 | 230 | 114 | 485 | 52899,95 | 52899,95 |
| CAMAÇARI B1 | 274 | CAMAÇARI B2 | 294 | 230 | 7 | 65 | 357,09 | 626,26 |
| CAMAÇARI B1 | 274 | CAMAÇARI 4 | 284 | 230 | 3 | 26 | 71,83 | 196,06 |
| CAMAÇARI 4 | 284 | CAMAÇARI B2 | 294 | 230 | 2 | 12 | 42,35 | 74,07 |
| MESSIAS | 342 | N.S.SOCORRO | 11273 | 230 | 26 | 131 | 8915,03 | 10215,52 |

**Tabela 3.7 - Dados das impedâncias de transferência – Curto Máximo**

| Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Tensão kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|---|---|
| SOBRADINHO | 506 | G.OURO 2 | 11560 | 500 | 30,1 | 250,1 | 4844,3 | 7245,5 |
| SOBRADINHO | 506 | MILAGRES 2 | 11567 | 500 | 13,5 | 102,9 | 1000,0 | 1963,6 |
| SOBRADINHO | 506 | IGAPORÃ 3 | 11594 | 500 | 202,2 | 1045,0 | 620525,0 | 530525,0 |
| ANGELIM | 540 | MESSIAS | 542 | 500 | 21,0 | 228,4 | 1378,4 | 2069,2 |
| ANGELIM | 540 | MILAGRES 2 | 11567 | 500 | 60,0 | 565,8 | 16773,8 | 23304,3 |
| MESSIAS | 542 | GARANHUNS 2 | 549 | 500 | 41,6 | 489,8 | 5262,5 | 9822,8 |
| MESSIAS | 542 | MILAGRES 2 | 11567 | 500 | 180,3 | 1647,7 | 123166,5 | 146243,0 |
| GARANHUNS 2 | 549 | ANGELIM | 540 | 500 | 13,5 | 153,3 | 625,6 | 1403,1 |
| GARANHUNS 2 | 549 | MILAGRES 2 | 11567 | 500 | 13,6 | 191,2 | 1006,0 | 2767,0 |
| G.OURO 2 | 11560 | MILAGRES 2 | 11567 | 500 | 12,0 | 226,3 | 1191,0 | 2364,1 |
| G.OURO 2 | 11560 | IGAPORÃ 3 | 11594 | 500 | 10,0 | 116,3 | 994,2 | 2224,6 |
| MILAGRES 2 | 11567 | IGAPORÃ 3 | 11594 | 500 | 177,2 | 2017,3 | 272350,0 | 293175,0 |
| IGAPORÃ 3 | 11594 | P.PARAISO 2 | 38975 | 500 | 60,9 | 675,9 | 214454,3 | 203294,5 |
| P.AFONSO 3 A | 200 | CATU | 272 | 230 | 33,5 | 170,8 | 809,4 | 1382,9 |
| P.AFONSO 3 A | 200 | P.AFONSO 3 B | 300 | 230 | 1,0 | 5,2 | 5,0 | 17,2 |
| S.BONFIM | 203 | JUAZEIRO 3 | 11282 | 230 | 9 | 38 | 55,97 | 144,90 |
| SOBRADINHO | 206 | JUAZEIRO 3 | 11282 | 230 | 2,61 | 11,07 | 13,00 | 33,49 |
| POÇÕES 2 | 209 | IBICOARA | 288 | 230 | 27 | 138 | 720,50 | 1603,40 |
| ITABAINA | 271 | CATU | 272 | 230 | 21,32 | 116,54 | 418,86 | 842,75 |
| CATU | 272 | P.AFONSO 3 B | 300 | 230 | 33,65 | 171,45 | 812,91 | 1437,56 |
| CATU | 272 | CAMAÇARI 4 | 284 | 230 | 89 | 294 | 52899,95 | 52899,95 |
| CATU | 272 | CAMAÇARI B2 | 294 | 230 | 117 | 493 | 52899,95 | 52899,95 |
| CAMAÇARI B1 | 274 | CAMAÇARI 4 | 284 | 230 | 3 | 26 | 73,00 | 201,10 |
| CAMAÇARI B1 | 274 | CAMAÇARI B2 | 294 | 230 | 7 | 66 | 361,56 | 634,01 |
| CAMAÇARI 4 | 284 | CAMAÇARI B2 | 294 | 230 | 2 | 12 | 48,23 | 82,52 |
| MESSIAS | 342 | N.S.SOCORRO | 11273 | 230 | 26 | 131 | 8868,63 | 10169,07 |

As tabelas Tabela 3.8 e Tabela 3.9 apresentam os equivalentes de transformação, representados através das suas impedâncias de curto circuito a 60 Hz de sequência zero e positiva, referidas a barra de maior tensão, e um transformador ideal.

**Tabela 3.8 - Dados das impedâncias de transformação – Curto Mínimo**

| Nome da Barra "DE" | Número da Barra "DE" | Tensão "DE" kV | Nome da Barra "PARA" | Número da Barra "PARA" | Tensão "PARA" kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|---|---|---|
| P.AFONSO 3 A | 200 | 230 | MILAGRES 2 | 11567 | **500** | 54,1 | 252,5 | 683,5 | 1691,9 |
| ANGELIM | 240 | 230 | ANGELIM | 540 | **500** | 51,8 | 297,8 | 4679,9 | 6490,1 |
| ANGELIM | 240 | 230 | MESSIAS | 542 | **500** | 91,9 | 546,3 | 6919,5 | 10801,8 |
| ANGELIM | 240 | 230 | GARANHUNS 2 | 549 | **500** | 39,0 | 278,4 | 2808,1 | 6591,6 |
| ANGELIM | 240 | 230 | MILAGRES 2 | 11567 | **500** | 64,6 | 397,6 | 13450,1 | 24495,6 |
| B.J.LAPA | 285 | 230 | SOBRADINHO | 506 | **500** | 240,2 | 1458,6 | 75909,5 | 108140,0 |
| B.J.LAPA | 285 | 230 | G.OURO 2 | 11560 | **500** | 4 | 154 | 134,47 | 580,21 |
| B.J.LAPA | 285 | 230 | IGAPORÃ 3 | 11594 | **500** | 3 | 66 | 66,53 | 285,25 |
| P.AFONSO 3 B | 300 | 230 | MILAGRES 2 | 11567 | **500** | 84 | 385 | 820,71 | 2067,18 |
| ITAPEBI | 263 | **230** | FUNIL | 976 | 138 | 149 | 457 | 589,09 | 2092,01 |

**Tabela 3.9 - Dados das impedâncias de transformação – Curto Máximo**

| Nome da Barra "DE" | Número da Barra "DE" | Tensão "DE" kV | Nome da Barra "PARA" | Número da Barra "PARA" | Tensão "PARA" kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|---|---|---|
| P.AFONSO 3 A | 200 | 230 | MILAGRES 2 | 11567 | **500** | 54,6 | 257,3 | 682,4 | 1690,5 |
| ANGELIM | 240 | 230 | ANGELIM | 540 | **500** | 71,2 | 386,5 | 5392,8 | 7382,3 |
| ANGELIM | 240 | 230 | MESSIAS | 542 | **500** | 132,2 | 727,2 | 8818,3 | 13277,5 |
| ANGELIM | 240 | 230 | GARANHUNS 2 | 549 | **500** | 56,1 | 371,7 | 3378,8 | 7701,3 |
| ANGELIM | 240 | 230 | MILAGRES 2 | 11567 | **500** | 115,1 | 663,8 | 14755,3 | 27274,5 |
| B.J.LAPA | 285 | 230 | SOBRADINHO | 506 | **500** | 338,1 | 2006,2 | 108166,8 | 148696,3 |
| B.J.LAPA | 285 | 230 | G.OURO 2 | 11560 | **500** | 4 | 157 | 135,05 | 586,63 |
| B.J.LAPA | 285 | 230 | IGAPORÃ 3 | 11594 | **500** | 3 | 68 | 66,58 | 285,85 |
| P.AFONSO 3 B | 300 | 230 | MILAGRES 2 | 11567 | **500** | 85 | 392 | 819,43 | 2065,43 |
| ITAPEBI | 263 | **230** | FUNIL | 976 | 138 | 151 | 462 | 626,60 | 2185,62 |

### 3.4. TRANSFORMADORES

Da Tabela 3.10 a Tabela 3.13 são apresentados os parâmetros dos transformadores representados no equivalente elétrico

**Tabela 3.10 - Dados dos transformadores com 3 enrolamentos – Curto Mínimo**

| Nome da Barra | Número da Barra | Potência (MVA) | Relação de Tensões (kV) | Ligações | Impedância (% na base de 100 MVA) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Xp % | Xs % | Xt % |
| SOBRADINHO UHE - TRF1 | 506 | 400 | 500/13,8/13,8 | ¥ Δ Δ | 0,200 | 5,500 | 5,500 |
| L.GONZAGA UHE - TRF1 | 505 | --- | 500/13,8/13,8 | ¥ Δ Δ | 0,055 | 2,000 | 2,000 |
| MESSIAS - TRF1 | 342 | 600 | 500/230/13,8 | ¥ ¥ Δ | 1,030 | 0,130 | 3,340 |
| MESSIAS - TRF2 | 342 | 600 | 500/230/13,8 | ¥ ¥ Δ | 0,440 | 0,710 | 10,790 |
| MESSIAS - TRF3 | 342 | 600 | 500/230/13,8 | ¥ ¥ Δ | 0,440 | 0,710 | 10,790 |
| IRECE - TRF 1 | 283 | 55 | 230/13,8/13,8 | ¥ ¥ Δ | 13,080 | -2,010 | 42,390 |
| IRECE - TRF 2 | 283 | 55 | 230/13,8/13,8 | ¥ ¥ Δ | 13,100 | -1,810 | 34,170 |
| IRECE - TRF 3 | 283 | 55 | 230/13,8/13,8 | ¥ ¥ Δ | 13,080 | -2,010 | 42,390 |
| CAMAÇARI B1 SIN - TRF1 | 274 | 300 | 230/13,8/13,8 | ¥ Δ Δ | 0,030 | 8,210 | 8,210 |
| A.SALES A UHE - TRF1 | 301 | 120 | 230/13,8/13,8 | ¥ Δ Δ | 0,690 | 12,340 | 12,380 |

**Tabela 3.11 - Dados dos transformadores com 3 enrolamentos – Curto Máximo**

| Nome da Barra | Número da Barra | Potência (MVA) | Relação de Tensões (kV) | Ligações | Impedância (% na base de 100 MVA) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Xp % | Xs % | Xt % |
| SOBRADINHO UHE - TRF1 | 506 | 400 | 500/13,8/13,8 | ¥ Δ Δ | 0,200 | 5,500 | 5,500 |
| L.GONZAGA UHE - TRF1 | 505 | --- | 500/13,8/13,8 | ¥ Δ Δ | 0,055 | 2,000 | 2,000 |
| MESSIAS - TRF1 | 342 | 600 | 500/230/13,8 | ¥ ¥ Δ | 1,030 | 0,130 | 3,340 |
| MESSIAS - TRF2 | 342 | 600 | 500/230/13,8 | ¥ ¥ Δ | 0,440 | 0,710 | 10,790 |
| MESSIAS - TRF3 | 342 | 600 | 500/230/13,8 | ¥ ¥ Δ | 0,440 | 0,710 | 10,790 |
| IRECE - TRF 1 | 283 | 55 | 230/13,8/13,8 | ¥ ¥ Δ | 13,080 | -2,010 | 42,390 |
| IRECE - TRF 2 | 283 | 55 | 230/13,8/13,8 | ¥ ¥ Δ | 13,100 | -1,810 | 34,170 |
| IRECE - TRF 3 | 283 | 55 | 230/13,8/13,8 | ¥ ¥ Δ | 13,080 | -2,010 | 42,390 |
| CAMAÇARI B1 SIN - TRF1 | 274 | 300 | 230/13,8/13,8 | ¥ Δ Δ | 0,030 | 8,210 | 8,210 |
| A.SALES A UHE - TRF1 | 301 | 120 | 230/13,8/13,8 | ¥ Δ Δ | 0,690 | 12,340 | 12,380 |
| A.SALES B UHE - TRF1 | 302 | 120 | 230/13,8/13,8 | ¥ Δ Δ | 0,690 | 12,340 | 12,380 |

**Tabela 3.12 - Dados dos transformadores com 2 enrolamentos – Curto Mínimo**

| Nome da Barra | Número da Barra | Potência (MVA) | Relação de Tensões (kV) | Ligações | Impedância (% na base de 100 MVA) Xps % |
|---|---|---|---|---|---|
| JUAZEIRO 3 - TRF1 | 11582 | 300 | 500/230 | ¥ ¥ | 2,850 |
| JUAZEIRO 3 - TRF2 | 11582 | 300 | 500/230 | ¥ ¥ | 2,850 |
| OUROLANDIA 2 -TRF1 | 11561 | 900 | 500/230 | ¥ ¥ | 1,556 |
| OUROLANDIA 2 -TRF2 | 11561 | 900 | 500/230 | ¥ ¥ | 1,556 |
| OUROLANDIA 2 -TRF3 | 11561 | 900 | 500/230 | ¥ ¥ | 1,556 |
| G.OURO 2 - TRF1 | 11560 | 900 | 500/230 | ¥ ¥ | 1,556 |
| G.OURO 2 - TRF2 | 11560 | 900 | 500/230 | ¥ ¥ | 1,556 |
| IBICOARA - TRF1 | 588 | 300 | 500/230 | ¥ ¥ | 4,920 |
| IBICOARA - TRF1 | 588 | 300 | 500/230 | ¥ ¥ | 4,920 |
| POÇÕES 3 - TRF1 | 11612 | 600 | 500/230 | ¥ ¥ | 1,400 |
| P.PARAISO 2 CER - TRF1 | 38975 | 350 | 500/13,8 | ¥ Δ | 3,430 |
| CAMAÇARI 4 - TRF1 | 584 | 1200 | 500/230 | ¥ ¥ | 1,170 |
| CAMAÇARI 4 - TRF2 | 584 | 1200 | 500/230 | ¥ ¥ | 1,170 |
| P.AFONSO4 UHE - TRF1 | 500 | 450 | 500/13,8 | ¥ Δ | 0,451 |
| XINGO UHE - TRF1 | 504 | 3000 | 500/13,8 | ¥ Δ | 0,427 |
| SOBRADINHO - TRF1 | 206 | 300 | 230/500 | ¥ ¥ | 3,560 |
| SOBRADINHO - TRF1 | 206 | 300 | 230/500 | ¥ ¥ | 3,560 |
| M.CHAPEU 2 - TRF1 | 355 | 900 | 230/500 | ¥ ¥ | 1,556 |
| M.CHAPEU 2 - TRF2 | 355 | 900 | 230/500 | ¥ ¥ | 1,556 |
| SAPEAÇU - TRF1 | 289 | 600 | 230/500 | ¥ ¥ | 1,400 |
| SAPEAÇU - TRF2 | 289 | 600 | 230/500 | ¥ ¥ | 1,400 |
| SAPEAÇU - TRF3 | 289 | 600 | 230/500 | ¥ ¥ | 1,400 |
| CAMAÇARI B1 - TRF1 | 274 | 600 | 230/500 | ¥ ¥ | 1,170 |
| CAMAÇARI B1 - TRF2 | 274 | 600 | 230/500 | ¥ ¥ | 1,150 |
| CAMAÇARI B2 - TRF1 | 294 | 600 | 230/500 | ¥ ¥ | 1,130 |
| CAMAÇARI B2 - TRF2 | 294 | 600 | 230/500 | ¥ ¥ | 1,010 |
| JARDIM - TRF1 | 273 | 600 | 230/500 | ¥ ¥ | 1,270 |
| JARDIM - TRF2 | 273 | 600 | 230/500 | ¥ ¥ | 1,270 |
| JARDIM - TRF3 | 273 | 600 | 230/500 | ¥ ¥ | 1,270 |
| ANGELIM - TRF1 | 240 | 600 | 230/500 | ¥ ¥ | 1,777 |
| ANGELIM - TRF1 | 240 | 600 | 230/500 | ¥ ¥ | 1,777 |
| GARANHUNS - TRF1 | 349 | 600 | 230/500 | ¥ ¥ | 2,230 |
| P.AFONSO 3 A -TRF1 | 200 | 600 | 230/500 | ¥ ¥ | 1,414 |
| P.AFONSO 3 B -TRF1 | 300 | 600 | 230/500 | ¥ ¥ | 1,414 |
| S.BOMFIM - TRF1 | 203 | 33 | 230/69 | ¥ Δ | 59,500 |
| S.BOMFIM - TRF2 | 203 | 100 | 230/69 | ¥ Δ | 13,110 |
| S.BOMFIM - TRF3 | 203 | 100 | 230/69 | ¥ Δ | 13,11 |
| S.BOMFIM - TRF4 | 203 | 100 | 230/138 | ¥ ¥ | 9,2 |
| S.BOMFIM - TRF5 | 203 | 100 | 230/138 | ¥ ¥ | 6,30 |
| S.BOMFIM - TRF6 | 203 | 100 | 230/138 | ¥ ¥ | 6,3 |
| B.J.LAPA-SIN - TRF1 | 285 | 80 | 230/13,8 | ¥ Δ | 15,25 |
| IRECE - TRF1 | 283 | 39 | 230/69 | ¥ Δ | 32,82 |
| IRECE - TRF2 | 283 | 40 | 230/69 | ¥ Δ | 32,82 |
| IRECE - TRF3 | 283 | 40 | 230/69 | ¥ Δ | 57,5 |
| IRECE - TRF4 | 283 | 40 | 230/69 | ¥ Δ | 32,82 |
| IRECE-SIN - TRF5 | 283 | 40 | 230/13,8 | ¥ ¥ | 26,75 |

| Nome da Barra | Número da Barra | Potência (MVA) | Relação de Tensões (kV) | Ligações | Impedância (% na base de 100 MVA) |
|---|---|---|---|---|---|
| | | | | | Xps % |
| POÇÕES 2 - TRF1 | 209 | 100 | 230/138 | ¥ ¥ | 11,80 |
| POÇÕES 2 - TRF2 | 209 | 100 | 230/138 | ¥ ¥ | 11,8 |
| FUNIL CER - TRF1 | 276 | 200 | 230/13,,8 | ¥ Δ | 4,55 |
| FUNIL - TRF2 | 276 | 100 | 230/138 | ¥ ¥ | 11,8 |
| FUNIL - TRF3 | 276 | 100 | 230/138 | ¥ ¥ | 11,80 |
| FUNIL - TRF4 | 276 | 100 | 230/138 | ¥ ¥ | 11,24 |
| FUNIL - TRF5 | 276 | 100 | 230/138 | ¥ ¥ | 12,06 |
| ITAPEBI UHE - TRF1 | 263 | 160 | 230/13,8 | ¥ Δ | 2,719 |
| S.A.JESUS - TRF1 | 264 | 100 | 230/69 | ¥ Δ | 12,80 |
| S.A.JESUS - TRF2 | 264 | 100 | 230/69 | ¥ Δ | 13 |
| S.A.JESUS - TRF3 | 264 | 100 | 230/69 | ¥ Δ | 13,00 |
| G.MANGABEIRA - TRF1 | 275 | 100 | 230/69 | ¥ Δ | 13 |
| G.MANGABEIRA - TRF1 | 275 | 100 | 230/69 | ¥ Δ | 13,00 |
| P.CAVALO UHE - TRF1 | 375 | 90 | 230/13,8 | ¥ Δ | 6,735 |
| F.SANTANA3 - TRF1 | 11110 | 150 | 230/69 | ¥ Δ | 9,33 |
| F.SANTANA3 - TRF2 | 11110 | 150 | 230/69 | ¥ Δ | 9,33 |
| CAMAÇARI B1 - TRF1 | 274 | 100 | 230/69 | ¥ Δ | 12,92 |
| CAMAÇARI B2 - TRF1 | 294 | 100 | 230/69 | ¥ Δ | 12,81 |
| JARDIM - TRF1 | 273 | 100 | 230/69 | ¥ Δ | 12,99 |
| JARDIM - TRF2 | 273 | 100 | 230/69 | ¥ Δ | 13,95 |
| JARDIM - TRF3 | 273 | 100 | 230/69 | ¥ Δ | 12,81 |
| JARDIM - TRF4 | 273 | 100 | 230/69 | ¥ Δ | 12,99 |
| N.S.SOCORRO - TRF1 | 11273 | 150 | 230/69 | ¥ Δ | 9,33 |
| N.S.SOCORRO - TRF2 | 11273 | 150 | 230/69 | ¥ Δ | 9,33 |
| N.S.SOCORRO - TRF3 | 11273 | 150 | 230/69 | ¥ Δ | 9,33 |
| P.AFONSO 3 B UHE - TRF1 | 300 | 67 | 230/13,8 | ¥ Δ | 7,109 |
| P.AFONSO 3 B UHE - TRF2 | 300 | 240 | 230/13,8 | ¥ Δ | 3,04 |
| P.AFONSO 3 A UHE - TRF1 | 200 | 75 | 230/13,8 | ¥ Δ | 20,06 |
| P.AFONSO 3 A UHE - TRF2 | 200 | 90 | 230/13,8 | ¥ Δ | 15,99 |
| P.AFONSO 3 A UHE - TRF3 | 200 | 90 | 230/13,8 | ¥ Δ | 15,73 |
| P.AFONSO 3 A UHE - TRF4 | 200 | 240 | 230/13,8 | ¥ Δ | 2,78 |
| C.FORMOSO - TRF1 | 58806 | 120 | 34,5/230 | ¥ ¥ | 8,333 |
| C.FORMOSO - TRF2 | 58806 | 120 | 34,5/230 | ¥ ¥ | 8,33 |
| UMBURANAS -TRF1 | 58824 | 200 | 34,5/230 | ¥ ¥ | 5 |
| UMBURANAS -TRF2 | 58824 | 200 | 34,5/230 | ¥ ¥ | 5,00 |
| C.LARGO - TRF1 | 58832 | 185 | 34,5/230 | ¥ ¥ | 7,568 |
| C.LARGO - TRF2 | 58832 | 185 | 34,5/230 | ¥ ¥ | 7,57 |
| C.LARGO - TRF3 | 58832 | 170 | 34,5/230 | ¥ ¥ | 8,235 |
| C.LARGO - TRF3 | 58832 | 170 | 34,5/230 | ¥ ¥ | 8,24 |
| G.OURO CER - TRF1 | 11562 | 200 | 13,8/500 | ¥ Δ | 5 |
| G.OURO 1 - TRF1 | 59029 | 192 | 138/230 | ¥ ¥ | 6,08 |
| G.OURO 1B - TRF1 | 59035 | 176 | 34,5/230 | ¥ ¥ | 5,682 |
| BROTAS - TRF1 | 11306 | 100 | 34,5/230 | ¥ ¥ | 14,00 |
| M.CHAPEU 2 CER - TRF1 | 12334 | 200 | 13,8/500 | ¥ Δ | 5 |
| M.CHAPEU - TRF1 | 755 | 150 | 69/230 | ¥ Δ | 6,67 |
| S.AZUL - TRF1 | 59014 | 150 | 34,5/230 | ¥ ¥ | 6,667 |
| M.CHAPEUS - TRF1 | 59057 | 120 | 34,5/230 | ¥ ¥ | 11,67 |
| M.CHAPEUS - TRF2 | 59057 | 120 | 34,5/230 | ¥ ¥ | 11,666 |

| Nome da Barra | Número da Barra | Potência (MVA) | Relação de Tensões (kV) | Ligações | Impedância (% na base de 100 MVA) |
|---|---|---|---|---|---|
| | | | | | Xps % |
| V.BAHIA 2 - TRF1 | 59066 | 130 | 34,5/230 | ¥ ¥ | 10,77 |
| S.BABILONIA - TRF1 | 59076 | 150 | 34,5/230 | ¥ ¥ | 9,333 |
| S.BABILONIA - TRF2 | 59076 | 150 | 34,5/230 | ¥ ¥ | 9,33 |
| BABILONIA - TRF1 | 59083 | 90 | 34,5/230 | ¥ ¥ | 15,555 |
| BABILONIA - TRF2 | 59083 | 90 | 34,5/230 | ¥ ¥ | 15,56 |
| FUNIL - TRF1 | 976 | 28 | 138/13,8 | ¥ Δ | 35,67 |
| FUNIL - TRF1 | 176 | 50 | 115/13,8 | ¥ ¥ | 8,78 |
| FUNIL UHE - TRF2 | 176 | 14 | 115/13,8 | ¥ Δ | 22,824 |
| SAPEAÇU CER - TRF1 | 12333 | 250 | 13,8/230 | ¥ Δ | 3,20 |
| P.AFONSO 2-A1 UHE - TRF1 | 4 | 75 | 13,8/230 | ¥ Δ | 17,97 |
| P.AFONSO 2 A2 UHE - TRF1 | 5 | 75 | 13,8/230 | ¥ Δ | 17,97 |
| P.AFONSO 2 B1 UHE - TRF1 | 7 | 90 | 13,8/230 | ¥ Δ | 15,09 |

**Tabela 3.13 - Dados dos transformadores com 2 enrolamentos – Curto Máximo**

| Nome da Barra | Número da Barra | Potência (MVA) | Relação de Tensões (kV) | Ligações | Impedância (% na base de 100 MVA) Xps % |
|---|---|---|---|---|---|
| JUAZEIRO 3 - TRF1 | 11582 | 300 | 500/230 | ¥ ¥ | 2,850 |
| JUAZEIRO 3 - TRF2 | 11582 | 300 | 500/230 | ¥ ¥ | 2,850 |
| OUROLANDIA 2 -TRF1 | 11561 | 900 | 500/230 | ¥ ¥ | 1,556 |
| OUROLANDIA 2 -TRF2 | 11561 | 900 | 500/230 | ¥ ¥ | 1,556 |
| OUROLANDIA 2 -TRF3 | 11561 | 900 | 500/230 | ¥ ¥ | 1,556 |
| G.OURO 2 - TRF1 | 11560 | 900 | 500/230 | ¥ ¥ | 1,556 |
| G.OURO 2 - TRF2 | 11560 | 900 | 500/230 | ¥ ¥ | 1,556 |
| IBICOARA - TRF1 | 588 | 300 | 500/230 | ¥ ¥ | 4,920 |
| IBICOARA - TRF1 | 588 | 300 | 500/230 | ¥ ¥ | 4,920 |
| POÇÕES 3 - TRF1 | 11612 | 600 | 500/230 | ¥ ¥ | 1,400 |
| P.PARAISO 2 CER - TRF1 | 38975 | 350 | 500/13,8 | ¥ Δ | 3,430 |
| CAMAÇARI 4 - TRF1 | 584 | 1200 | 500/230 | ¥ ¥ | 1,170 |
| CAMAÇARI 4 - TRF2 | 584 | 1200 | 500/230 | ¥ ¥ | 1,170 |
| P.AFONSO4 UHE - TRF1 | 500 | 450 | 500/13,8 | ¥ Δ | 0,451 |
| XINGO UHE - TRF1 | 504 | 3000 | 500/13,8 | ¥ Δ | 0,427 |
| SOBRADINHO - TRF1 | 206 | 300 | 230/500 | ¥ ¥ | 3,560 |
| SOBRADINHO - TRF1 | 206 | 300 | 230/500 | ¥ ¥ | 3,560 |
| M.CHAPEU 2 - TRF1 | 355 | 900 | 230/500 | ¥ ¥ | 1,556 |
| M.CHAPEU 2 - TRF2 | 355 | 900 | 230/500 | ¥ ¥ | 1,556 |
| SAPEAÇU - TRF1 | 289 | 600 | 230/500 | ¥ ¥ | 1,400 |
| SAPEAÇU - TRF2 | 289 | 600 | 230/500 | ¥ ¥ | 1,400 |
| SAPEAÇU - TRF3 | 289 | 600 | 230/500 | ¥ ¥ | 1,400 |
| CAMAÇARI B1 - TRF1 | 274 | 600 | 230/500 | ¥ ¥ | 1,170 |
| CAMAÇARI B1 - TRF2 | 274 | 600 | 230/500 | ¥ ¥ | 1,150 |
| CAMAÇARI B2 - TRF1 | 294 | 600 | 230/500 | ¥ ¥ | 1,130 |
| CAMAÇARI B2 - TRF2 | 294 | 600 | 230/500 | ¥ ¥ | 1,010 |
| JARDIM - TRF1 | 273 | 600 | 230/500 | ¥ ¥ | 1,270 |
| JARDIM - TRF2 | 273 | 600 | 230/500 | ¥ ¥ | 1,270 |
| JARDIM - TRF3 | 273 | 600 | 230/500 | ¥ ¥ | 1,270 |
| ANGELIM - TRF1 | 240 | 600 | 230/500 | ¥ ¥ | 1,777 |
| ANGELIM - TRF1 | 240 | 600 | 230/500 | ¥ ¥ | 1,777 |
| GARANHUNS - TRF1 | 349 | 600 | 230/500 | ¥ ¥ | 2,230 |
| P.AFONSO 3 A -TRF1 | 200 | 600 | 230/500 | ¥ ¥ | 1,414 |
| P.AFONSO 3 B -TRF1 | 300 | 600 | 230/500 | ¥ ¥ | 1,414 |
| S.BOMFIM - TRF1 | 203 | 33 | 230/69 | ¥ Δ | 59,500 |
| S.BOMFIM - TRF2 | 203 | 100 | 230/69 | ¥ Δ | 13,110 |
| S.BOMFIM - TRF3 | 203 | 100 | 230/69 | ¥ Δ | 13,11 |
| S.BOMFIM - TRF4 | 203 | 100 | 230/138 | ¥ ¥ | 9,2 |
| S.BOMFIM - TRF5 | 203 | 100 | 230/138 | ¥ ¥ | 6,30 |
| S.BOMFIM - TRF6 | 203 | 100 | 230/138 | ¥ ¥ | 6,3 |
| B.J.LAPA-SIN - TRF1 | 285 | 80 | 230/13,8 | ¥ Δ | 15,25 |
| IRECE - TRF1 | 283 | 39 | 230/69 | ¥ Δ | 32,82 |
| IRECE - TRF2 | 283 | 40 | 230/69 | ¥ Δ | 32,82 |
| IRECE - TRF3 | 283 | 40 | 230/69 | ¥ Δ | 57,5 |
| IRECE - TRF4 | 283 | 40 | 230/69 | ¥ Δ | 32,82 |
| IRECE-SIN - TRF5 | 283 | 40 | 230/13,8 | ¥ ¥ | 26,75 |

| Nome da Barra | Número da Barra | Potência (MVA) | Relação de Tensões (kV) | Ligações | Impedância (% na base de 100 MVA) |
|---|---|---|---|---|---|
| | | | | | Xps % |
| POÇÕES 2 - TRF1 | 209 | 100 | 230/138 | ¥ ¥ | 11,80 |
| POÇÕES 2 - TRF2 | 209 | 100 | 230/138 | ¥ ¥ | 11,8 |
| FUNIL CER - TRF1 | 276 | 200 | 230/13,,8 | ¥ Δ | 4,55 |
| FUNIL - TRF2 | 276 | 100 | 230/138 | ¥ ¥ | 11,8 |
| FUNIL - TRF3 | 276 | 100 | 230/138 | ¥ ¥ | 11,80 |
| FUNIL - TRF4 | 276 | 100 | 230/138 | ¥ ¥ | 11,24 |
| FUNIL - TRF5 | 276 | 100 | 230/138 | ¥ ¥ | 12,06 |
| ITAPEBI UHE - TRF1 | 263 | 160 | 230/13,8 | ¥ Δ | 2,719 |
| S.A.JESUS - TRF1 | 264 | 100 | 230/69 | ¥ Δ | 12,80 |
| S.A.JESUS - TRF2 | 264 | 100 | 230/69 | ¥ Δ | 13 |
| S.A.JESUS - TRF3 | 264 | 100 | 230/69 | ¥ Δ | 13,00 |
| G.MANGABEIRA - TRF1 | 275 | 100 | 230/69 | ¥ Δ | 13 |
| G.MANGABEIRA - TRF1 | 275 | 100 | 230/69 | ¥ Δ | 13,00 |
| P.CAVALO UHE - TRF1 | 375 | 90 | 230/13,8 | ¥ Δ | 6,735 |
| F.SANTANA3 - TRF1 | 11110 | 150 | 230/69 | ¥ Δ | 9,33 |
| F.SANTANA3 - TRF2 | 11110 | 150 | 230/69 | ¥ Δ | 9,33 |
| CAMAÇARI B1 - TRF1 | 274 | 100 | 230/69 | ¥ Δ | 12,92 |
| CAMAÇARI B2 - TRF1 | 294 | 100 | 230/69 | ¥ Δ | 12,81 |
| JARDIM - TRF1 | 273 | 100 | 230/69 | ¥ Δ | 12,99 |
| JARDIM - TRF2 | 273 | 100 | 230/69 | ¥ Δ | 13,95 |
| JARDIM - TRF3 | 273 | 100 | 230/69 | ¥ Δ | 12,81 |
| JARDIM - TRF4 | 273 | 100 | 230/69 | ¥ Δ | 12,99 |
| N.S.SOCORRO - TRF1 | 11273 | 150 | 230/69 | ¥ Δ | 9,33 |
| N.S.SOCORRO - TRF2 | 11273 | 150 | 230/69 | ¥ Δ | 9,33 |
| N.S.SOCORRO - TRF3 | 11273 | 150 | 230/69 | ¥ Δ | 9,33 |
| P.AFONSO 3 B UHE - TRF1 | 300 | 67 | 230/13,8 | ¥ Δ | 7,109 |
| P.AFONSO 3 B UHE - TRF2 | 300 | 240 | 230/13,8 | ¥ Δ | 3,04 |
| P.AFONSO 3 A UHE - TRF1 | 200 | 75 | 230/13,8 | ¥ Δ | 20,06 |
| P.AFONSO 3 A UHE - TRF2 | 200 | 90 | 230/13,8 | ¥ Δ | 15,99 |
| P.AFONSO 3 A UHE - TRF3 | 200 | 90 | 230/13,8 | ¥ Δ | 15,73 |
| P.AFONSO 3 A UHE - TRF4 | 200 | 240 | 230/13,8 | ¥ Δ | 2,78 |
| C.FORMOSO - TRF1 | 58806 | 120 | 34,5/230 | ¥ ¥ | 8,333 |
| C.FORMOSO - TRF2 | 58806 | 120 | 34,5/230 | ¥ ¥ | 8,33 |
| UMBURANAS -TRF1 | 58824 | 200 | 34,5/230 | ¥ ¥ | 5 |
| UMBURANAS -TRF2 | 58824 | 200 | 34,5/230 | ¥ ¥ | 5,00 |
| C.LARGO - TRF1 | 58832 | 185 | 34,5/230 | ¥ ¥ | 7,568 |
| C.LARGO - TRF2 | 58832 | 185 | 34,5/230 | ¥ ¥ | 7,57 |
| C.LARGO - TRF3 | 58832 | 170 | 34,5/230 | ¥ ¥ | 8,235 |
| C.LARGO - TRF3 | 58832 | 170 | 34,5/230 | ¥ ¥ | 8,24 |
| G.OURO CER - TRF1 | 11562 | 200 | 13,8/500 | ¥ Δ | 5 |
| G.OURO 1 - TRF1 | 59029 | 192 | 138/230 | ¥ ¥ | 6,08 |
| G.OURO 1B - TRF1 | 59035 | 176 | 34,5/230 | ¥ ¥ | 5,682 |
| BROTAS - TRF1 | 11306 | 100 | 34,5/230 | ¥ ¥ | 14,00 |
| M.CHAPEU 2 CER - TRF1 | 12334 | 200 | 13,8/500 | ¥ Δ | 5 |
| M.CHAPEU - TRF1 | 755 | 150 | 69/230 | ¥ Δ | 6,67 |
| S.AZUL - TRF1 | 59014 | 150 | 34,5/230 | ¥ ¥ | 6,667 |
| M.CHAPEUS - TRF1 | 59057 | 120 | 34,5/230 | ¥ ¥ | 11,67 |
| M.CHAPEUS - TRF2 | 59057 | 120 | 34,5/230 | ¥ ¥ | 11,666 |

| Nome da Barra | Número da Barra | Potência (MVA) | Relação de Tensões (kV) | Ligações | Impedância (% na base de 100 MVA) |
|---|---|---|---|---|---|
| | | | | | Xps % |
| V.BAHIA 2 - TRF1 | 59066 | 130 | 34,5/230 | ¥ ¥ | 10,77 |
| S.BABILONIA - TRF1 | 59076 | 150 | 34,5/230 | ¥ ¥ | 9,333 |
| S.BABILONIA - TRF2 | 59076 | 150 | 34,5/230 | ¥ ¥ | 9,33 |
| BABILONIA - TRF1 | 59083 | 90 | 34,5/230 | ¥ ¥ | 15,555 |
| BABILONIA - TRF2 | 59083 | 90 | 34,5/230 | ¥ ¥ | 15,56 |
| FUNIL - TRF1 | 976 | 28 | 138/13,8 | ¥ Δ | 35,67 |
| FUNIL - TRF1 | 176 | 50 | 115/13,8 | ¥ ¥ | 8,78 |
| FUNIL UHE - TRF2 | 176 | 14 | 115/13,8 | ¥ Δ | 22,824 |
| SAPEAÇU CER - TRF1 | 12333 | 250 | 13,8/230 | ¥ Δ | 3,20 |
| P.AFONSO 2-A1 UHE - TRF1 | 4 | 75 | 13,8/230 | ¥ Δ | 17,97 |
| P.AFONSO 2 A2 UHE - TRF1 | 5 | 75 | 13,8/230 | ¥ Δ | 17,97 |
| P.AFONSO 2 B1 UHE - TRF1 | 7 | 90 | 13,8/230 | ¥ Δ | 15,09 |
| T.CAMAÇARI 1 UTE - TRF1 | 294 | 310 | 230/13,8 | ¥ Δ | 3,300 |
| P.SERGIPE 1V UTE - TRF1 | 11149 | 736 | 24/500 | ¥ Δ | 2,055 |
| P.SERGIPE 1G UTE - TRF1 | 11150 | 436 | 25/500 | ¥ Δ | 1,066 |

## 3.5. LINHAS DE TRANSMISSÃO

A Tabela 3.14 apresenta os dados das linhas de transmissão modeladas com parâmetros distribuídos.

**Tabela 3.14 - Dados de linhas de transmissão**

| ID | Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Tensão (kV) | L (km) | $R_1$ (Ω/km) | $X_1$ (Ω/km) | $B_1$ (μS/km) | $R_0$ (Ω/km) | $X_0$ (Ω/km) | $B_0$ (μS/km) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C1 | G.OURO 2 | 11560 | OUROLANDIA 2 | 11561 | 500 | 153 | 0,020 | 0,284 | 7,068 | 0,426 | 1,370 | 3,534 |
| C1 | OUROLANDIA 2 | 11561 | M.CHAPEU 2 | 555 | 500 | 97 | 0,021 | 0,297 | 7,344 | 0,426 | 1,608 | 3,672 |
| C1 | M.CHAPEU 2 | 555 | SAPEAÇU | 589 | 500 | 274 | 0,019 | 0,279 | 7,130 | 0,305 | 1,088 | 3,565 |
| C1 | IBICOARA | 588 | SAPEAÇU | 589 | 500 | 258 | 0,019 | 0,272 | 6,187 | 0,436 | 1,541 | 3,093 |
| C1 | SAPEAÇU | 589 | POÇÕES 3 | 11612 | 500 | 250 | 0,013 | 0,186 | 8,597 | 0,259 | 1,006 | 4,298 |
| C1 | IBICOARA | 588 | POÇÕES 3 | 11612 | 500 | 162 | 0,014 | 0,194 | 8,835 | 0,121 | 0,638 | 4,417 |
| C1 | POÇÕES 3 | 11612 | P.PARAISO 2 | 38975 | 500 | 331 | 0,013 | 0,187 | 8,836 | 0,260 | 0,998 | 4,418 |
| C2 | POÇÕES 3 | 11612 | P.PARAISO 2 | 38975 | 500 | 350 | 0,012 | 0,177 | 8,344 | 0,245 | 0,942 | 4,172 |
| C1 | IGAPORÃ 3 | 11594 | IBICOARA | 588 | 500 | 175 | 0,017 | 0,269 | 6,299 | 0,338 | 1,137 | 3,150 |
| C1 | CAMAÇARI | 574 | SAPEAÇU | 589 | 500 | 105 | 0,025 | 0,316 | 5,150 | 0,383 | 1,362 | 2,575 |
| C1 | SAPEAÇU | 589 | CAMAÇARI 4 | 584 | 500 | 104 | 0,025 | 0,314 | 5,063 | 0,387 | 1,375 | 2,532 |
| C1 | CAMAÇARI 4 | 584 | CAMAÇARI | 574 | 500 | 2(*) | 0,025 | 0,321 | 5,036 | 0,368 | 1,350 | 2,518 |
| C1 | JARDIM | 573 | CAMAÇARI 4 | 584 | 500 | 255,4 | 0,023 | 0,308 | 4,965 | 0,200 | 0,943 | 2,483 |
| C1 | P.SERGIPE | 11151 | JARDIM | 573 | 500 | 33,3 | 0,024 | 0,295 | 5,477 | 0,351 | 1,240 | 2,738 |
| C2 | P.SERGIPE | 11151 | JARDIM | 573 | 500 | 33,3 | 0,024 | 0,295 | 5,477 | 0,351 | 1,240 | 2,738 |
| C1 | XINGO | 504 | JARDIM | 573 | 500 | 164,8 | 0,023 | 0,299 | 5,138 | 0,250 | 1,285 | 2,569 |
| C2 | XINGO | 504 | JARDIM | 573 | 500 | 165,6 | 0,023 | 0,297 | 5,149 | 0,329 | 1,237 | 2,575 |
| C1 | XINGO | 504 | MESSIAS | 542 | 500 | 219,3 | 0,024 | 0,317 | 5,105 | 0,301 | 1,262 | 2,552 |
| C1 | XINGO | 504 | ANGELIM | 540 | 500 | 195,1 | 0,026 | 0,323 | 5,371 | 0,414 | 1,310 | 2,685 |
| C1 | P.AFONSO 4 | 500 | XINGO | 504 | 500 | 54,5 | 0,023 | 0,312 | 4,947 | 0,188 | 0,844 | 2,473 |
| C1 | P.AFONSO 4 | 500 | OLINDINA | 582 | 500 | 219,9 | 0,024 | 0,306 | 4,920 | 0,308 | 0,977 | 2,460 |
| C1 | P.AFONSO 4 | 500 | L.GONZAGA | 505 | 500 | 37,8 | 0,026 | 0,311 | 4,912 | 0,212 | 0,992 | 2,456 |
| C2 | P.AFONSO 4 | 500 | L.GONZAGA | 505 | 500 | 39,6 | 0,025 | 0,297 | 4,689 | 0,126 | 0,622 | 2,344 |
| C1 | L.GONZAGA | 505 | OLINDINA | 582 | 500 | 256,8 | 0,030 | 0,302 | 4,968 | 0,307 | 0,918 | 2,484 |
| C1 | OLINDINA | 582 | CAMAÇARI | 574 | 500 | 151,8 | 0,033 | 0,310 | 5,107 | 0,321 | 0,921 | 2,553 |
| C2 | OLINDINA | 582 | CAMAÇARI | 574 | 500 | 151,9 | 0,025 | 0,313 | 5,036 | 0,290 | 0,958 | 2,518 |
| C1 | P.AFONSO 4 | 500 | ANGELIM | 540 | 500 | 222,8 | 0,025 | 0,313 | 5,111 | 0,315 | 0,909 | 2,555 |
| C1 | GARANHUNS 2 | 549 | ANGELIM | 540 | 500 | 13,3 | 0,030 | 0,286 | 4,692 | 0,368 | 1,019 | 2,346 |
| C1 | L.GONZAGA | 505 | GARANHUNS 2 | 549 | 500 | 240,8 | 0,029 | 0,289 | 4,848 | 0,316 | 0,849 | 2,424 |
| C2 | L.GONZAGA | 505 | GARANHUNS 2 | 549 | 500 | 218,0 | 0,017 | 0,270 | 6,157 | 0,172 | 0,915 | 3,078 |
| C1 | L.GONZAGA | 505 | MILAGRES 2 | 11567 | 500 | 237,0 | 0,022 | 0,269 | 5,744 | 0,406 | 1,598 | 2,872 |
| C1 | JUAZEIRO 3 | 11582 | L.GONZAGA | 505 | 500 | 252,0 | 0,024 | 0,315 | 5,177 | 0,198 | 1,020 | 2,589 |
| C2 | JUAZEIRO 3 | 11582 | L.GONZAGA | 505 | 500 | 252,0 | 0,024 | 0,315 | 5,177 | 0,198 | 1,020 | 2,589 |
| C1 | SOBRADINHO | 506 | JUAZEIRO 3 | 11582 | 500 | 42,8 | 0,023 | 0,321 | 5,178 | 0,204 | 1,062 | 2,589 |
| C2 | SOBRADINHO | 506 | JUAZEIRO 3 | 11582 | 500 | 42,8 | 0,023 | 0,321 | 5,178 | 0,204 | 1,062 | 2,589 |
| C1 | JUAZEIRO 3 | 11582 | OUROLANDIA 2 | 11561 | 500 | 192,6 | 0,016 | 0,257 | 6,019 | 0,322 | 1,084 | 3,009 |
| C1 | C.FORMOSO | 11461 | S.BONFIM | 203 | 230 | 65,3 | 0,101 | 0,485 | 3,181 | 0,469 | 1,610 | 2,100 |
| C1 | C.FORMOSO | 11461 | OUROLANDIA 2 | 11261 | 230 | 105,0 | 0,127 | 0,611 | 4,027 | 0,584 | 2,019 | 2,658 |
| C1 | UMBURANAS | 58825 | OUROLANDIA 2 | 11261 | 230 | 38,5 | 0,088 | 0,514 | 3,486 | 0,486 | 1,728 | 2,301 |
| C1 | C.LARGO | 58833 | OUROLANDIA 2 | 11261 | 230 | 52,1 | 0,091 | 0,435 | 2,847 | 0,422 | 1,444 | 1,879 |
| C2 | C.LARGO | 58833 | OUROLANDIA 2 | 11261 | 230 | 52,1 | 0,091 | 0,435 | 2,847 | 0,422 | 1,444 | 1,879 |

| ID | Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Tensão (kV) | L (km) | $R_1$ (Ω/km) | $X_1$ (Ω/km) | $B_1$ (μS/km) | $R_0$ (Ω/km) | $X_0$ (Ω/km) | $B_0$ (μS/km) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C1 | SE01 | 58844 | OUROLANDIA 2 | 11261 | 230 | 63,2 | 0,070 | 0,484 | 3,324 | 0,446 | 1,632 | 2,194 |
| C2 | SE01 | 58844 | OUROLANDIA 2 | 11261 | 230 | 63,2 | 0,070 | 0,484 | 3,324 | 0,446 | 1,632 | 2,194 |
| C1 | OUROLANDIA 2 | 11261 | IRECE | 283 | 230 | 84,0 | 0,131 | 0,627 | 4,126 | 0,603 | 2,078 | 2,723 |
| C1 | G.OURO 1 | 59060 | IRECE | 283 | 230 | 112,4 | 0,049 | 0,345 | 4,660 | 0,314 | 1,160 | 3,076 |
| C1 | BROTAS | 205 | IRECE | 283 | 230 | 137,7 | 0,092 | 0,501 | 3,201 | 0,345 | 0,994 | 2,113 |
| C1 | BROTAS | 205 | G.OURO 2 | 11260 | 230 | 122,9 | 0,111 | 0,534 | 3,521 | 0,510 | 1,765 | 2,324 |
| C1 | B.J.LAPA | 285 | BROTAS | 205 | 230 | 207,4 | 0,098 | 0,503 | 3,197 | 0,330 | 0,986 | 2,110 |
| C1 | IRECE | 283 | M.CHAPEU 2 | 355 | 230 | 64,7 | 0,102 | 0,518 | 3,418 | 0,338 | 1,310 | 2,256 |
| C1 | S.AZUL | 59015 | M.CHAPEU 2 | 355 | 230 | 18,8 | 0,112 | 0,658 | 4,462 | 0,623 | 2,213 | 2,945 |
| C1 | M.CHAPEU SUL | 59058 | M.CHAPEU 2 | 355 | 230 | 17,0 | 0,065 | 0,696 | 5,189 | 0,414 | 2,348 | 3,425 |
| C1 | V.BAHIA 2 | 59067 | M.CHAPEU 2 | 355 | 230 | 33,5 | 0,037 | 0,310 | 5,107 | 0,236 | 1,045 | 3,371 |
| C1 | S.BABILONIA | 59077 | M.CHAPEU 2 | 355 | 230 | 75,2 | 0,083 | 0,488 | 3,286 | 0,456 | 1,638 | 2,169 |
| C1 | BABILONIA | 59084 | M.CHAPEU 2 | 355 | 230 | 97,1 | 0,083 | 0,488 | 3,283 | 0,456 | 1,636 | 2,167 |
| C1 | POÇÕE3 | 18612 | POÇÕES 2 | 209 | 230 | 2,0(*) | 0,035 | 0,330 | 4,895 | 0,225 | 1,112 | 3,231 |
| C2 | POÇÕE3 | 18612 | POÇÕES 2 | 209 | 230 | 2,0(*) | 0,035 | 0,330 | 4,895 | 0,225 | 1,112 | 3,231 |
| C1 | FUNIL | 276 | POÇÕES 2 | 209 | 230 | 114,1 | 0,103 | 0,509 | 3,426 | 0,503 | 1,641 | 2,261 |
| C1 | ITAGIBA | 213 | POÇÕES 2 | 209 | 230 | 87,7 | 0,100 | 0,504 | 3,291 | 0,452 | 1,466 | 2,172 |
| C1 | FUNIL | 276 | ITAGIBA | 213 | 230 | 29,9 | 0,097 | 0,497 | 3,245 | 0,309 | 1,245 | 2,142 |
| C1 | FUNIL | 276 | ITAPEBI | 263 | 230 | 203,9 | 0,093 | 0,478 | 3,250 | 0,265 | 1,287 | 2,145 |
| C2 | FUNIL | 276 | ITAPEBI | 263 | 230 | 203,9 | 0,093 | 0,477 | 3,250 | 0,264 | 1,268 | 2,145 |
| C3 | FUNIL | 276 | ITAPEBI | 263 | 230 | 223,0 | 0,085 | 0,436 | 2,972 | 0,433 | 1,426 | 1,962 |
| C1 | SAPEAÇU | 289 | FUNIL | 276 | 230 | 199,2 | 0,093 | 0,500 | 3,109 | 0,351 | 1,267 | 2,052 |
| C1 | S.A.JESUS | 264 | FUNIL | 276 | 230 | 167,9 | 0,093 | 0,477 | 3,216 | 0,336 | 1,142 | 2,122 |
| C2 | S.A.JESUS | 264 | FUNIL | 276 | 230 | 167,8 | 0,091 | 0,464 | 3,285 | 0,329 | 1,149 | 2,168 |
| C1 | S.A.JESUS | 264 | SAPEAÇU | 289 | 230 | 32,7 | 0,073 | 0,390 | 2,393 | 0,335 | 1,158 | 1,580 |
| C2 | S.A.JESUS | 264 | SAPEAÇU | 289 | 230 | 32,7 | 0,073 | 0,362 | 2,567 | 0,341 | 1,152 | 1,694 |
| C3 | S.A.JESUS | 264 | SAPEAÇU | 289 | 230 | 31,2 | 0,076 | 0,380 | 2,690 | 0,358 | 1,207 | 1,775 |
| C1 | G.MANGABEIRA | 275 | SAPEAÇU | 289 | 230 | 22,9 | 0,104 | 0,557 | 3,418 | 0,379 | 1,338 | 2,256 |
| C2 | G.MANGABEIRA | 275 | SAPEAÇU | 289 | 230 | 22,9 | 0,104 | 0,517 | 3,665 | 0,340 | 1,176 | 2,419 |
| C3 | G.MANGABEIRA | 275 | SAPEAÇU | 289 | 230 | 22,9 | 0,104 | 0,517 | 3,665 | 0,344 | 1,164 | 2,419 |
| C1 | G.MANGABEIRA | 275 | CATU | 272 | 230 | 77,2 | 0,097 | 0,519 | 3,193 | 0,488 | 1,547 | 2,107 |
| C1 | CATU | 272 | CAMAÇARI 4 | 284 | 230 | 25,5 | 0,095 | 0,508 | 3,158 | 0,313 | 1,143 | 2,084 |
| C2 | CATU | 272 | CAMAÇARI 4 | 284 | 230 | 25,5 | 0,095 | 0,519 | 3,069 | 0,268 | 0,993 | 2,026 |
| C1 | CAMAÇARI B2 | 294 | G.MANGABEIRA | 275 | 230 | 84,5 | 0,096 | 0,491 | 3,289 | 0,486 | 1,528 | 2,170 |
| C1 | F.SANTANA 3 | 11110 | G.MANGABEIRA | 275 | 230 | 98,1 | 0,097 | 0,494 | 3,266 | 0,447 | 1,633 | 2,156 |
| C1 | F.SANTANA 3 | 11110 | CAMAÇARI B2 | 294 | 230 | 97,0 | 0,098 | 0,499 | 3,303 | 0,453 | 1,652 | 2,180 |
| C1 | G.MANGABEIRA | 275 | EMBASA | 214 | 230 | 11,3 | 0,099 | 0,494 | 3,226 | 0,386 | 1,453 | 2,129 |
| C1 | TOMBA | 266 | EMBASA | 214 | 230 | 30,0 | 0,099 | 0,483 | 3,188 | 0,377 | 1,421 | 2,104 |
| C1 | G.MANGABEIRA | 275 | TOMBA | 266 | 230 | 41,3 | 0,099 | 0,486 | 3,199 | 0,380 | 1,430 | 2,111 |
| C1 | P.CAVALO | 375 | G.MANGABEIRA | 275 | 230 | 4,8 | 0,077 | 0,430 | 2,662 | 0,441 | 1,521 | 1,757 |
| C1 | ITABAINA | 271 | JARDIM | 273 | 230 | 44,5 | 0,096 | 0,492 | 3,288 | 0,462 | 1,564 | 2,170 |
| C2 | ITABAINA | 271 | JARDIM | 273 | 230 | 44,5 | 0,096 | 0,492 | 3,288 | 0,462 | 1,564 | 2,170 |
| C1 | N.S.SOCORRO | 11273 | JARDIM | 273 | 230 | 1,3(*) | 0,052 | 0,334 | 4,795 | 0,218 | 0,598 | 3,165 |
| C2 | N.S.SOCORRO | 11273 | JARDIM | 273 | 230 | 1,3(*) | 0,052 | 0,334 | 4,795 | 0,315 | 1,211 | 3,165 |
| C1 | ANGELIM | 240 | MESSIAS | 342 | 230 | 80,2 | 0,095 | 0,485 | 3,239 | 0,471 | 1,464 | 2,137 |
| C2 | ANGELIM | 240 | MESSIAS | 342 | 230 | 80,2 | 0,095 | 0,485 | 3,239 | 0,482 | 1,445 | 2,137 |

| ID | Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Tensão (kV) | L (km) | $R_1$ (Ω/km) | $X_1$ (Ω/km) | $B_1$ (µS/km) | $R_0$ (Ω/km) | $X_0$ (Ω/km) | $B_0$ (µS/km) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C3 | ANGELIM | 240 | MESSIAS | 342 | 230 | 81,2 | 0,095 | 0,502 | 3,124 | 0,465 | 1,413 | 2,062 |
| C1 | SANTANA 2 | 11201 | ANGELIM | 240 | 230 | 161,2 | 0,103 | 0,496 | 3,283 | 0,469 | 1,635 | 2,167 |
| C1 | P.AFONSO A 3 | 200 | SANTANA 2 | 11201 | 230 | 109,7 | 0,103 | 0,494 | 3,251 | 0,474 | 1,636 | 2,145 |
| C1 | GARANHUNS | 349 | ANGELIM | 240 | 230 | 12,3 | 0,051 | 0,353 | 4,549 | 0,324 | 1,192 | 3,002 |
| C2 | GARANHUNS | 349 | ANGELIM | 240 | 230 | 12,2 | 0,046 | 0,252 | 6,167 | 0,244 | 0,911 | 4,070 |
| C3 | GARANHUNS | 349 | ANGELIM | 240 | 230 | 12,2 | 0,046 | 0,392 | 4,168 | 0,291 | 1,324 | 2,751 |
| C1 | P.AFONSO A 3 | 200 | GARANHUNS | 349 | 230 | 210,2 | 0,093 | 0,505 | 3,087 | 0,468 | 1,791 | 2,037 |
| C1 | ASALE A | 301 | P.AFONSO A 3 | 200 | 230 | 6,1(*) | 0,095 | 0,503 | 3,133 | 0,564 | 1,362 | 2,068 |
| C1 | P.AFONSO B 3 | 300 | GARANHUNS | 349 | 230 | 210,1 | 0,093 | 0,505 | 3,088 | 0,468 | 1,792 | 2,038 |
| C2 | P.AFONSO B 3 | 300 | GARANHUNS | 349 | 230 | 210,2 | 0,0458 | 0,3934 | 4,17 | 0,2864 | 1,3141 | 2,75 |
| C1 | A.SALES B | 302 | P.AFONSO B 3 | 300 | 230 | 6,1(*) | 0,0954 | 0,5030 | 3,13 | 0,5637 | 1,3615 | 2,07 |
| C1 | P.AFONSO A 3 | 200 | ITABAINA | 271 | 230 | 167,4 | 0,0936 | 0,4814 | 3,26 | 0,4647 | 1,4749 | 2,15 |
| C1 | P.AFONSO B 3 | 300 | ITABAINA | 271 | 230 | 167,4 | 0,0936 | 0,4814 | 3,26 | 0,4530 | 1,4857 | 2,15 |

(*) Linhas de transmissão com modelo PI equivalente

As linhas de transmissão objeto dos estudos do Lote 7 do Leilão 02/2018 da ANEEL[1][2], foram representadas através da rotina Line and Cables Constants, do programa ATP, conforme ANEXO I – MODELO DAS LINHAS DE TRANSMISSÃO OBJETO DOS ESTUDOS.

A Tabela 3.15 apresenta os parâmetros elétricos das linhas de transmissão.

**Tabela 3.15 - Dados das linhas de transmissão modeladas por Line and Cable Constants do ATP.**

| ID | Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Tensão (kV) | L (km) | $R_1$ (Ω/km) | $X_1$ (Ω/km) | $B_1$ (µS/km) | $R_0$ (Ω/km) | $X_0$ (Ω/km) | $B_0$ (µS/km) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C2 & C3 | Morro do Chapéu II | 355 | Irecê | 283 | 230 | 67 | 0,0345789 | 0,324134 | 5,17340 | 0,386393 | 1,28283 | 2,90663 |
| C1 | Olinda | 582 | Sapeaçu | 589 | 500 | 207 | 0,0173631 | 0,265275 | 6,20568 | 0,378667 | 1,11576 | 3,19819 |
| C1 | Porto Sergipe | 11151 | Olindina | 582 | 500 | 180 | 0,0173636 | 0,265361 | 6,20392 | 0,378528 | 1,11579 | 3,20080 |

## 3.6. REATORES

As tabelas Tabela 3.16 e Tabela 3.17 apresentam os reatores de linha representados.

**Tabela 3.16 - Dados dos reatores de linha - Curto Mínimo**

| Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Circuito | Tensão (kV) | Potência "De" (Mvar) | Potência "Para" (Mvar) |
|---|---|---|---|---|---|---|---|
| OLINDINA | 11560 | OUROLANDIA (D) | 11561 | 1 | 500 | - | 150 |
| JUAZEIRO 3 | 11582 | OUROLANDIA 2 | 11561 | 1 | 500 | - | 100 |
| OUROLANDIA 2 | 11561 | M.CHAPEU 2 (D) | 555 | 1 | 500 | - | 100 |
| M.CHAPEU 2 | 555 | SAPEAÇU | 589 | 1 | 500 | 180 | 180 |
| OLINDINA | 582 | SAPEAÇU | 589 | 1 | 500 | 100 | 100 |
| IGAPORÃ 3 | 11594 | IBICOARA | 588 | 1 | 500 | - | 200 |
| IBICOARA | 588 | SAPEAÇU | 589 | 1 | 500 | 200 | 150 |

| Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Circuito | Tensão (kV) | Potência "De" (Mvar) | Potência "Para" (Mvar) |
|---|---|---|---|---|---|---|---|
| IBICOARA | 588 | POÇÕES 3 | 11612 | 1 | 500 | 110 | 100 |
| SAPEAÇU | 589 | POÇÕES 3 | 11612 | 1 | 500 | 185 | 185 |
| POÇÕES 3 | 11612 | P.PARAISO 2 | 38975 | 1 | 500 | 270 | 270 |
| POÇÕES 3 | 11612 | P.PARAISO 2 | 38975 | 2 | 500 | 270 | 270 |
| SOBRADINHO | 506 | JUAZEIRO 3 | 11582 | 1 | 500 | 100 | - |
| SOBRADINHO | 506 | JUAZEIRO 3 | 11582 | 2 | 500 | 150 | - |
| JUAZEIRO 3 | 11582 | L.GONZAGA | 505 | 1 | 500 | - | 150 |
| JUAZEIRO 3 | 11582 | L.GONZAGA | 505 | 2 | 500 | - | 150 |
| L.GONZAGA | 505 | OLINDINA | 582 | 1 | 500 | - | 150 |
| P.AFONSO 4 | 500 | OLINDINA | 582 | 1 | 500 | - | 150 |
| L.GONZAGA | 505 | MILAGRES 2 | 11567 | 1 | 500 | 120 | 120 |
| L.GONZAGA | 505 | MILAGRES 2 | 11567 | 1 | 500 | 120 | 120 |
| L.GONZAGA | 505 | GARANHUNS 2 | 549 | 1 | 500 | - | 150 |
| L.GONZAGA | 505 | GARANHUNS 2 | 549 | 2 | 500 | - | 150 |
| GARANHUNS 2 | 549 | ANGELIM | 540 | 1 | 500 | - | 150 |
| XINGO | 504 | MESSIAS | 542 | 1 | 500 | - | 150 |
| XINGO | 504 | ANGELIM | 540 | 1 | 500 | - | 150 |
| XINGO | 504 | JARDIM | 573 | 1 | 500 | - | 100 |
| XINGO | 504 | JARDIM | 573 | 2 | 500 | - | 100 |
| P.AFONSO 4 | 500 | ANGELIM | 540 | 1 | 500 | - | 150 |
| P.SERGIPE | 11151 | OLINDINA | 582 | 1 | 500 | 100 | 100 |

(D) Reator Desligado

**Tabela 3.17 - Dados dos reatores de linha - Curto Máximo**

| Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Circuito | Tensão (kV) | Potência "De" (Mvar) | Potência "Para" (Mvar) |
|---|---|---|---|---|---|---|---|
| G.OURO 2 | 11560 | OUROLANDIA 2 | 11561 | 1 | 500 | - | 150 |
| JUAZEIRO 3 | 11582 | OUROLANDIA 2 | 11561 | 1 | 500 | - | 100 |
| OUROLANDIA 2 | 11561 | M.CHAPEU 2 (D) | 555 | 1 | 500 | - | 100 |
| M.CHAPEU 2 | 555 | SAPEAÇU | 589 | 1 | 500 | 180 | 180 |
| OLINDINA | 582 | SAPEAÇU | 589 | 1 | 500 | 100 | 100 |
| IGAPORÃ 3 | 11594 | IBICOARA | 588 | 1 | 500 | - | 200 |
| IBICOARA | 588 | SAPEAÇU | 589 | 1 | 500 | 200 | 150 |
| IBICOARA | 588 | POÇÕES 3 | 11612 | 1 | 500 | 110 | 100 |
| SAPEAÇU | 589 | POÇÕES 3 | 11612 | 1 | 500 | 185 | 185 |
| POÇÕES 3 | 11612 | P.PARAISO 2 | 38975 | 1 | 500 | 270 | 270 |
| POÇÕES 3 | 11612 | P.PARAISO 2 | 38975 | 2 | 500 | 270 | 270 |
| SOBRADINHO | 506 | JUAZEIRO 3 | 11582 | 1 | 500 | 100 | - |
| SOBRADINHO | 506 | JUAZEIRO 3 | 11582 | 2 | 500 | 150 | - |
| JUAZEIRO 3 | 11582 | L.GONZAGA | 505 | 1 | 500 | - | 151 |
| JUAZEIRO 3 | 11582 | L.GONZAGA | 505 | 2 | 500 | - | 151 |
| L.GONZAGA | 505 | OLINDINA | 582 | 1 | 500 | - | 150 |
| P.AFONSO 4 | 500 | OLINDINA | 582 | 1 | 500 | - | 150 |
| L.GONZAGA | 505 | MILAGRES 2(D) | 11567 | 1 | 500 | 120 | 120 |

| Nome da Barra "DE" | Número da Barra "DE" | Nome da Barra "PARA" | Número da Barra "PARA" | Circuito | Tensão (kV) | Potência "De" (Mvar) | Potência "Para" (Mvar) |
|---|---|---|---|---|---|---|---|
| L.GONZAGA | 505 | MILAGRES 2 | 11567 | 1 | 500 | 120 | 120 |
| L.GONZAGA | 505 | GARANHUNS 2(D) | 549 | 1 | 500 | - | 150 |
| L.GONZAGA | 505 | GARANHUNS 2(D) | 549 | 2 | 500 | - | 150 |
| GARANHUNS 2 | 549 | ANGELIM | 540 | 1 | 500 | - | 150 |
| XINGO | 504 | MESSIAS | 542 | 1 | 500 | - | 150 |
| XINGO | 504 | ANGELIM | 540 | 1 | 500 | - | 150 |
| XINGO | 504 | JARDIM | 573 | 1 | 500 | - | 100 |
| XINGO | 504 | JARDIM | 573 | 1 | 500 | - | 100 |
| P.AFONSO 4 | 500 | ANGELIM | 540 | 1 | 500 | - | 150 |
| P.SERGIPE | 11151 | OLINDINA | 582 | 1 | 500 | 100 | 100 |

(D) Reator Desligado

As tabelas Tabela 3.18 e Tabela 3.19 apresentam os reatores de barra representados.

**Tabela 3.18 - Dados dos reatores de barra – Curto Mínimo**

| Nome da Barra | Número da Barra | Tensão (kV) | Unid. em operação | Potência (Mvar) por unidade |
|---|---|---|---|---|
| G.OURO 2(D) | 11560 | 500 | 1 | 100 |
| G.OURO 2 | 11560 | 500 | 1 | 400 |
| G.OURO 2 | 11560 | 500 | 1 | 200 |
| OUROLANDIA 2(D) | 11561 | 500 | 1 | 100 |
| OUROLANDIA 2 | 11561 | 500 | 1 | 100 |
| SOBRADINHO | 506 | 500 | 1 | 400 |
| M.CHAPEU 2 | 555 | 500 | 1 | 150 |
| IGAPORÃ 3 | 11594 | 500 | 1 | 350 |
| IGAPORÃ 3 | 11594 | 500 | 1 | 150 |
| IBICOARA(D) | 588 | 500 | 1 | 100 |
| JUAZEIRO 3 | 11582 | 500 | 1 | 150 |
| POÇÕES 3 | 11612 | 500 | 1 | 150 |
| P.PARAISO 2 | 38975 | 500 | 1 | 150 |
| P.PARAISO 2 | 38975 | 500 | 1 | 300 |
| OLINDINA | 582 | 500 | 1 | 150 |
| P.SERGIPE | 11151 | 500 | 1 | 150 |
| MILAGRES 2 | 11567 | 500 | 1 | 575 |
| MILAGRES 2 | 11567 | 500 | 1 | 200 |
| GARANHUNS 2 | 549 | 500 | 1 | 100 |
| GARANHUNS 2 | 549 | 500 | 1 | 150 |
| ANGELIM | 540 | 500 | 1 | 150 |
| B.J.LAPA | 285 | 230 | 1 | 10 |
| M.CHAPEU 2 | 355 | 230 | 1 | 20 |
| ITAGIBA | 213 | 230 | 1 | 10 |
| FUNIL(D) | 276 | 230 | 1 | 20 |
| FUNIL(D) | 276 | 230 | 1 | 22 |
| SAPEAÇU CER | 12333 | 13,8 | 1 | 90 |
| FUNIL CER | 476 | 13,8 | 1 | 67 |
| G.OURO CER | 11562 | 13,8 | 1 | 26 |

(D) Reator Desligado

**Tabela 3.19 - Dados dos reatores de barra – Curto Máximo**

| Nome da Barra | Número da Barra | Tensão (kV) | Unid. em operação | Potência (Mvar) por unidade |
|---|---|---|---|---|
| G.OURO 2(D) | 11560 | 500 | 1 | 100 |
| G.OURO 2 | 11560 | 500 | 1 | 400 |
| G.OURO 2 | 11560 | 500 | 1 | 200 |
| OUROLANDIA 2(D) | 11561 | 500 | 1 | 100 |
| OUROLANDIA 2 | 11561 | 500 | 1 | 100 |
| SOBRADINHO | 506 | 500 | 1 | 400 |
| M.CHAPEU 2(D) | 555 | 500 | 1 | 150 |
| IGAPORÃ 3 | 11594 | 500 | 1 | 350 |
| IGAPORÃ 3 | 11594 | 500 | 1 | 150 |
| IBICOARA(D) | 588 | 500 | 1 | 100 |
| JUAZEIRO 3 | 11582 | 500 | 1 | 150 |
| POÇÕES 3(D) | 11612 | 500 | 1 | 150 |
| P.PARAISO 2(D) | 38975 | 500 | 1 | 150 |
| P.PARAISO 2 | 38975 | 500 | 1 | 300 |
| OLINDINA(D) | 582 | 500 | 1 | 150 |
| P.SERGIPE | 11151 | 500 | 1 | 150 |
| MILAGRES 2 | 11567 | 500 | 1 | 575 |
| MILAGRES 2 | 11567 | 500 | 1 | 100 |
| GARANHUNS 2(D) | 549 | 500 | 1 | 100 |
| GARANHUNS 2 | 549 | 500 | 1 | 150 |
| ANGELIM | 540 | 500 | 1 | 150 |
| B.J.LAPA | 285 | 230 | 1 | 10 |
| M.CHAPEU 2(D) | 355 | 230 | 1 | 20 |
| ITAGIBA | 213 | 230 | 1 | 10 |
| FUNIL(D) | 276 | 230 | 1 | 20 |
| FUNIL(D) | 276 | 230 | 1 | 22 |
| G.OURO CER | 11562 | 13,8 | 1 | 50 |

(D) Reator Desligado

## 3.7. BANCO DE CAPACITORES

As tabelas Tabela 3.20 e Tabela 3.21 apresentam os bancos de capacitores representados.

**Tabela 3.20 - Banco de Capacitores Representados – Curto Mínimo**

| Nome da Barra | Número da Barra | Tensão (kV) | Unid. em operação | Potência (MVar) por unidade |
|---|---|---|---|---|
| POÇÕE3 | 18612 | 230 | 1 | 50,0 |
| FUNIL(D) | 276 | 230 | 1 | 50,5 |
| FUNIL(D) | 276 | 230 | 1 | 50,5 |
| JARDIM | 673 | 69 | 1 | 20,3 |
| CAMAÇARI | 674 | 69 | 1 | 21,3 |
| FUNIL | 876 | 13,8 | 1 | 3,1 |
| M.CHAPEU 2 CER | 12334 | 13,8 | 1 | 137,9 |
| P.PARAISO 2 CER | 38976 | 13,8 | 1 | 201,2 |

(D) Capacitor Desligado

**Tabela 3.21 - Banco de Capacitores Representados – Curto Máximo**

| Nome da Barra | Número da Barra | Tensão (kV) | Unid. em operação | Potência (MVar) por unidade |
|---|---|---|---|---|
| POÇÕE3 | 18612 | 230 | 1 | 50,0 |
| FUNIL(D) | 276 | 230 | 1 | 50,5 |
| FUNIL | 276 | 230 | 1 | 50,5 |
| JARDIM | 673 | 69 | 1 | 40,6 |
| CAMAÇARI | 674 | 69 | 1 | 21,3 |
| FUNIL | 876 | 13,8 | 1 | 3,1 |
| M.CHAPEU 2 CER | 12334 | 13,8 | 1 | 41,2 |
| P.PARAISO 2 CER | 38976 | 13,8 | 1 | 129,9 |
| F.SANTANA 3 | 18763 | 69 | 1 | 20,0 |
| FUNIL CER | 476 | 13,8 | 1 | 9,7 |
| SAPEAÇU CER | 12333 | 13,8 | 1 | 37,3 |

(D) Capacitor Desligado

## 3.8. MÁQUINAS ELÉTRICAS

As tabelas Tabela 3.22 e Tabela 3.23 apresentam as máquinas elétricas representadas.

**Tabela 3.22 - Máquinas Elétricas Representadas – Curto Mínimo**

| Nome da Barra | Número da Barra | Tensão kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|
| CAMAÇARI D1 SIN | 874 | 13,8 | 0,000 | 0,203 | 60,369 | 1,670 |
| CAMAÇARI D2 SIN | 974 | 13,8 | 0,000 | 0,203 | 60,369 | 1,670 |
| ITAPEBI 1 UHE | 95 | 13,8 | 0,000 | 0,255 | 190,440 | 190,440 |
| P.CAVALO 1 UHE | 48 | 13,8 | 0,000 | 0,487 | 190,440 | 190,440 |
| ASAL B1 UHE | 90033 | 13,8 | 0,000 | 0,256 | 190,440 | 190,440 |
| ASAL E1 UHE | 28 | 13,8 | 0,000 | 0,256 | 190,440 | 190,440 |
| L.GONZAGA 1 UHE | 33 | 13,8 | 0,000 | 0,076 | 190,440 | 190,440 |
| L.GONZAGA 2 UHE | 34 | 13,8 | 0,000 | 0,076 | 190,440 | 190,440 |
| P.AFONSO UHE 1 | 1 | 13,8 | 0,000 | 0,289 | 0,000 | 0,212 |
| PAF2A1 | 4 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| PAF2A2 | 5 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| PAF2A3 | 6 | 13,8 | 0,000 | 0,608 | 190,440 | 190,440 |
| PAF2B1 | 7 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| PAF2B2 | 8 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| PAF2B3 | 9 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| P.AFONSO 3-2 UHE | 11 | 13,8 | 0,000 | 0,167 | 190,440 | 190,440 |
| P.AFONSO 4-1 UHE | 14 | 13,8 | 0,000 | 0,033 | 190,440 | 190,440 |
| XINGO 1 UHE | 89 | 13,8 | 0,000 | 0,042 | 190,440 | 190,440 |
| B.J.LAPA SIN | 485 | 13,8 | 0,000 | 1,270 | 0,000 | 1,270 |
| IRECE SIN | 483 | 13,8 | 0,000 | 1,358 | 0,000 | 1,358 |
| SOBRADINHO 1 UHE | 21 | 13,8 | 0,000 | 0,225 | 190,440 | 190,440 |
| SOBRADINHO 2 UHE | 90058 | 13,8 | 0,000 | 0,225 | 190,440 | 190,440 |
| FUNIL 1 UHE | 63 | 13,8 | 0,000 | 3,199 | 190,440 | 190,440 |

**Tabela 3.23 - Máquinas Elétricas Representadas – Curto Máximo**

| Nome da Barra | Número da Barra | Tensão kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|
| CAMAÇARI D1 SIN | 874 | 13,8 | 0,000 | 0,203 | 60,369 | 1,670 |
| CAMAÇARI D2 SIN | 974 | 13,8 | 0,000 | 0,203 | 60,369 | 1,670 |
| ITAPEBI 1 UHE | 95 | 13,8 | 0,000 | 0,085 | 190,440 | 190,440 |
| P.CAVALO 1 UHE | 48 | 13,8 | 0,000 | 0,243 | 190,440 | 190,440 |
| ASAL B1 UHE | 90033 | 13,8 | 0,000 | 0,256 | 190,440 | 190,440 |
| ASAL E1 UHE | 28 | 13,8 | 0,000 | 0,256 | 190,440 | 190,440 |
| L.GONZAGA 1 UHE | 33 | 13,8 | 0,000 | 0,051 | 190,440 | 190,440 |
| L.GONZAGA 2 UHE | 34 | 13,8 | 0,000 | 0,051 | 190,440 | 190,440 |
| P.AFONSO UHE 1 | 1 | 13,8 | 0,000 | 0,193 | 0,000 | 0,141 |
| PAF2A1 | 4 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| PAF2A2 | 5 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| PAF2A3 | 6 | 13,8 | 0,000 | 0,608 | 190,440 | 190,440 |
| PAF2B1 | 7 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| PAF2B2 | 8 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| PAF2B3 | 9 | 13,8 | 0,000 | 0,457 | 190,440 | 190,440 |
| P.AFONSO 3-2 UHE | 11 | 13,8 | 0,000 | 0,084 | 190,440 | 190,440 |
| P.AFONSO 4-1 UHE | 14 | 13,8 | 0,000 | 0,016 | 190,440 | 190,440 |
| XINGO 1 UHE | 89 | 13,8 | 0,000 | 0,014 | 190,440 | 190,440 |
| B.J.LAPA SIN | 485 | 13,8 | 0,000 | 1,270 | 0,000 | 1,270 |
| IRECE SIN | 483 | 13,8 | 0,000 | 1,358 | 0,000 | 1,358 |

| Nome da Barra | Número da Barra | Tensão kV | $R_1$ (Ω) | $X_1$ (Ω) | $R_0$ (Ω) | $X_0$ (Ω) |
|---|---|---|---|---|---|---|
| SOBRADINHO 1 UHE | 21 | 13,8 | 0,000 | 0,075 | 190,440 | 190,440 |
| SOBRADINHO 2 UHE | 90058 | 13,8 | 0,000 | 0,075 | 190,440 | 190,440 |
| FUNIL 1 UHE | 63 | 13,8 | 0,000 | 1,066 | 190,440 | 190,440 |
| P.SERGIPE 1G UTE | 11150 | 25 | 0,000 | 0,113 | 0,000 | 0,113 |
| P.SERGIPE 1V UTE | 11149 | 24 | 0,000 | 0,200 | 0,000 | 0,200 |
| T.CAMAÇARI 1 UTE | 81 | 13,8 | 0,000 | 0,076 | 190,440 | 190,440 |
| ASAL B2 UHE | 90030 | 13,8 | 0,000 | 0,256 | 190,440 | 190,440 |
| ASAL E2 UHE | 29 | 13,8 | 0,000 | 0,256 | 190,440 | 190,440 |

## 3.9. CARGAS

As tabelas Tabela 3.24 e Tabela 3.25 apresentam as cargas elétricas representadas.

**Tabela 3.24 - Cargas Representadas – Curto Mínimo**

| Nome da Barra | Número da Barra | Tensão (kV) | P (MW) | Q (Mvar) |
|---|---|---|---|---|
| S.BONFIM | 103 | 138 | 61,64 | -6,78 |
| S.BONFIM | 603 | 69 | 38,74 | 9,54 |
| IRECE | 183 | 138 | 33,80 | -11,50 |
| IRECE | 683 | 69 | 70,06 | 8,92 |
| POÇÕE 2 | 909 | 138 | 57,46 | -0,93 |
| FUNIL | 976 | 138 | 117,90 | 5,28 |
| FUNIL | 876 | 13,8 | 4,86 | 2,15 |
| S.A.JESUS | 664 | 69 | 72,40 | 14,32 |
| G.MANGABEIRA | 675 | 69 | 38,39 | 11,64 |
| F.SANTANA 3 | 18763 | 69 | 55,03 | 14,96 |
| CAMAÇARI | 674 | 69 | 66,92 | 26,87 |
| N.S.SOCORRO | 11673 | 69 | 94,49 | 34,06 |
| JARDIM | 673 | 69 | 139,90 | 46,63 |

**Tabela 3.25 - Cargas Representadas – Curto Máximo**

| Nome da Barra | Número da Barra | Tensão (kV) | P (MW) | Q (Mvar) |
|---|---|---|---|---|
| S.BONFIM | 603 | 69 | 57,51 | 12,55 |
| S.BONFIM | 103 | 138 | 117,20 | 12,89 |
| IRECE | 183 | 138 | 93,14 | 34,72 |
| IRECE | 683 | 69 | 126,80 | 21,45 |
| POÇÕE 2 | 909 | 138 | 114,50 | 20,36 |
| FUNIL | 976 | 138 | 234,90 | 38,24 |
| FUNIL | 876 | 13,8 | 9,87 | 2,96 |
| S.A.JESUS | 664 | 69 | 129,90 | 31,41 |
| G.MANGABEIRA | 675 | 69 | 67,27 | 18,28 |
| F.SANTANA 3 | 18763 | 69 | 120,90 | 27,55 |
| CAMAÇARI | 674 | 69 | 81,75 | 28,57 |
| N.S.SOCORRO | 11673 | 69 | 114,20 | 38,32 |
| JARDIM | 673 | 69 | 210,80 | 78,22 |

## 3.10. PARA-RAIOS ZNO

Os modelos dos para-raios modelados para os estudos dos empreendimentos do Lote 7 foram:

- Setor de 500 kV – ZnO – Classe 5 – $U_m$ = 420 kV – $U_r$ = 420 kV - MCOV = 336 kV
- Setor de 230 kV – ZnO – Classe 3 – $U_m$ = 245 kV – $U_r$ = 192 kV - MCOV = 154 kV
- Reatores de Neutro – ZnO – Classe 3 – $U_m$ = 72 kV – $U_r$ = 84 kV - MCOV = 68 kV

As curvas V x I, com forma de onda 30x60 µs, que foram consideradas nos estudos são apresentadas a seguir conforme Tabela 3.26, Tabela 3.27,e Tabela 3.28:

**Tabela 3.26 – Dados dos Para-raios do setor de 500 kV**

| Corrente (kA) | Tensão Residual (kV) | |
|---|---|---|
| | Para-raios 420 kV Classe 5 | |
| | Curva normal | Curva reduzida (5%) |
| 0,001 | 475,180 | 451,420 |
| 0,5 | 775,000 | 736,250 |
| 1,0 | 807,000 | 766,650 |
| 2,0 | 830,000 | 788,500 |
| 3,0 | 846,000 | 803,700 |

**Tabela 3.27 – Dados dos Para-raios do setor de 230 kV**

| Corrente (kA) | Tensão Residual (kV) | |
|---|---|---|
| | Para-raios 192 kV Classe 3 | |
| | Curva normal | Curva reduzida (5%) |
| 0,001 | 217,223 | 206,362 |
| 0,5 | 369,000 | 350,550 |
| 1,0 | 381,000 | 361,950 |
| 2,0 | 396,000 | 376,200 |

**Tabela 3.28 – Dados dos Para-raios de Neutro**

| Corrente (kA) | Tensão Residual (kV) |
|---|---|
| | Para-raios 84 kV Classe 3 |
| 0,001 | 95,035 |
| 0,5 | 162,000 |
| 1,0 | 167,000 |
| 2,0 | 173,000 |

## 3.11. DISJUNTORES

Para os estudos dos empreendimentos do Lote 7 foram modelados disjuntores sem e com resistor de pré-inserção com as características descritas a seguir.

### 3.11.1. Disjuntores sem resistor de pre inserção

Utilizou-se a distribuição normal dos tempos de fechamento, com um desvio de ± 2 σ, de forma a tornar o sorteio mais conservativo.

Os parâmetros adotados para os contatos principais do disjuntor foram:

- Desvio padrão para contato principal do disjuntor: σ = 1,25 ms;

O valor de 1,25 ms foi convencionado para o desvio-padrão do contato principal dessa distribuição. Dessa forma, a dispersão máxima dos instantes de fechamento dos contatos nos três polos (pole spread) corresponde a 5 ms (4 σ).

### 3.11.2. Disjuntores com resistor de pre inserção

Utilizou-se a distribuição normal dos tempos de fechamento, com um desvio de ± 2 σ, de forma a tornar o sorteio mais conservativo.

Os parâmetros adotados para os contatos principais e auxiliares do disjuntor foram:

- Desvio padrão para contato principal do disjuntor: σ = 1,25 ms;
- Desvio padrão para contato secundário (resistor de fechamento): σ = 1,00 ms;
- Tempo médio de permanência do resistor de pré-inserção: 10,0 ± 2 ms;
- Valor do resistor de fechamento (resistor de pré-inserção – RPI): R = 400 Ω

O valor de 1,25 ms foi convencionado para o desvio-padrão do contato principal dessa distribuição. Dessa forma, a dispersão máxima dos instantes de fechamento dos contatos nos três polos (pole spread) corresponde a 5 ms (4 σ).

O valor de 1,00 ms foi convencionado para o desvio-padrão do contato secundário dessa distribuição. Dessa forma, a dispersão máxima dos instantes de fechamento dos contatos nos três polos (pole spread) corresponde a 4 ms (4 σ).

# 4. VALIDAÇÃO

A validação da modelagem da rede no ATP tem por objetivo certificar-se de que as relações de impedância (de sequência positiva e zero) estão adequadas. Ou seja, se a topologia de fato corresponde à rede real [3]. Desta forma, na validação da rede equivalente deve-se comparar os níveis de curto-circuito trifásico e monofásicos na região próxima à barra de manobra.

As tabelas Tabela 4.1 e Tabela 4.2 apresentam um comparativo entre os curtos-circuitos no ANAFAS e da rede equivalente no ATP.

**Tabela 4.1 – Validação dos Níveis de Curto Circuito – Curto Mínimo**

| Nome da Barra | Número da Barra | Tensão Nominal | NÍVEIS DE CURTO-CIRCUITO [kA] | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | CURTO MÍNIMO | | | | | |
| | | | Trifásico | | | Monofásico | | |
| | | [kV] | Anafas | ATP | % | Anafas | ATP | % |
| P.AFONSO 4 | 500 | 500 | 22,14 | 21,79 | 1,58 | 25,34 | 24,94 | 1,58 |
| L.GONZAGA | 505 | 500 | 21,56 | 21,18 | 1,76 | 23,34 | 22,93 | 1,76 |
| M.CHAPEU 2 | 555 | 500 | 7,02 | 6,87 | 2,14 | 7,02 | 6,88 | 1,99 |
| JARDIM | 573 | 500 | 11,03 | 10,83 | 1,81 | 11,07 | 10,88 | 1,72 |
| OLINDINA | 582 | 500 | 12,38 | 12,14 | 1,94 | 10,4 | 10,19 | 2,02 |
| IBICOARA | 588 | 500 | 8,72 | 8,52 | 2,29 | 6,52 | 6,37 | 2,30 |
| SAPEAÇU | 589 | 500 | 12,25 | 11,97 | 2,29 | 12,44 | 12,17 | 2,17 |
| P.SERGIPE | 11151 | 500 | 10,1 | 9,92 | 1,78 | 8,8 | 8,64 | 1,82 |
| POÇÕES 3 | 11612 | 500 | 9,33 | 9,12 | 2,25 | 7,57 | 7,37 | 2,64 |
| BROTAS | 205 | 230 | 4,12 | 4,03 | 2,18 | 3,03 | 2,97 | 1,98 |
| IRECE | 283 | 230 | 8,39 | 8,21 | 2,15 | 8,68 | 8,61 | 0,81 |
| SAPEAÇU | 289 | 230 | 19,91 | 19,46 | 2,26 | 22,35 | 21,85 | 2,24 |
| M.CHAPEU 2 | 355 | 230 | 11,33 | 11,09 | 2,12 | 12,11 | 11,87 | 1,98 |
| OUROLANDIA 2 | 11261 | 230 | 14,59 | 14,28 | 2,12 | 11,53 | 11,28 | 2,17 |

**Tabela 4.2 - Validação dos Níveis de Curto Circuito – Curto Máximo**

| Nome da Barra | Número da Barra | Tensão Nominal [kV] | NÍVEIS DE CURTO-CIRCUITO [kA] CURTO MÀXIMO | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Trifásico | | | Monofásico | | |
| | | | Anafas | ATP | % | Anafas | ATP | % |
| P.AFONSO 4 | 500 | 500 | 38,72 | 37,98 | 1,91 | 42,30 | 41,49 | 1,91 |
| L.GONZAGA | 505 | 500 | 35,19 | 34,43 | 2,16 | 35,25 | 34,49 | 2,16 |
| M.CHAPEU 2 | 555 | 500 | 8,94 | 8,76 | 2,01 | 8,21 | 8,07 | 1,71 |
| JARDIM | 573 | 500 | 19,63 | 19,13 | 2,55 | 19,06 | 18,58 | 2,52 |
| OLINDINA | 582 | 500 | 18,15 | 17,77 | 2,09 | 12,78 | 12,51 | 2,11 |
| IBICOARA | 588 | 500 | 10,53 | 10,33 | 1,90 | 7,13 | 7,00 | 1,82 |
| SAPEAÇU | 589 | 500 | 17,74 | 17,40 | 1,92 | 15,88 | 15,57 | 1,95 |
| P.SERGIPE | 11151 | 500 | 19,13 | 18,62 | 2,67 | 20,37 | 19,84 | 2,60 |
| POÇÕES 3 | 11612 | 500 | 11,26 | 11,03 | 2,04 | 8,18 | 8,02 | 1,96 |
| BROTAS | 205 | 230 | 5,00 | 4,91 | 1,80 | 3,70 | 3,64 | 1,62 |
| IRECE | 283 | 230 | 10,72 | 10,53 | 1,77 | 10,52 | 10,47 | 0,48 |
| SAPEAÇU | 289 | 230 | 26,44 | 25,90 | 2,04 | 27,61 | 27,05 | 2,03 |
| M.CHAPEU 2 | 355 | 230 | 14,03 | 13,76 | 1,92 | 14,07 | 13,83 | 1,71 |
| OUROLANDIA 2 | 11261 | 230 | 21,62 | 21,22 | 1,85 | 16,47 | 16,17 | 1,82 |

## 5. CONCLUSÕES

Pode-se concluir que a rede equivalente representada, reproduz de forma fiel os fenômenos transitórios, isso pode ser constato através do processo de validação.

Portanto, a rede equivalente aqui apresentada pode ser utilizada nos estudos de transitórios eletromagnéticos do Lote 7.

# 6. REFERÊNCIAS

[1] ANEEL - Edital de Leilão N°02/2018 – Anexo 6 – Especificações Técnicas Gerais;

[2] ANEEL - Edital de Leilão N°02/2019 – Anexo 6-07 – Lote 07 – Características e requisitos técnicos das instalações de transmissão do Lote 07;

[3] ONS – Diretrizes para a Elaboração de Projetos Básicos para Empreendimentos de Transmissão. Estudos Elétricos, Especificação das Instalações, de Equipamentos e de Linhas de Transmissão, de 2013;

[4] ONS – Procedimentos de Rede – Submódulo 23.3, – “Diretrizes e Critérios para Estudos Elétricos”, dezembro de 2016;

# ANEXO I – MODELO DAS LINHAS DE TRANSMISSÃO OBJETO DOS ESTUDOS

## LT 500 KV PORTO SERGIPE – OLINDINA C1

```
   ---   22   cards of disk file read into card cache cells  1   onward.
Alternative Transients Program (ATP),  GNU Linux or DOS.  All rights reserved by Can/Am user group of Portland, Oregon, USA.
 Date (dd-mth-yy) and time of day (hh.mm.ss) = 16-Oct-18  15:27:26   Name of disk plot file is  C:\ATP\ATPMINGW\LTD.pl4
Consult the 860-page ATP Rule Book of the Can/Am EMTP User Group in Portland,  Oregon, USA.  Source code date is 23 July 2007.
Total size of LABCOM tables = 10913313 INTEGER words.  31 VARDIM  List Sizes follow:  6002  10K  192K  900  420K  1200  15K
  120K  2250  3800  720  2K  72800  510  90K  800  90  254  120K  100K  3K  15K  192K  120  45K  260K  600  210K  600  19  200
-----------------------------------------------+-----------------------------------------------------------------------------
Descriptive interpretation of input data cards.  |  Input data card images are shown below, all 80 columns, character by character
                                                0         1         2         3         4         5         6         7         8
                                                01234567890123456789012345678901234567890123456789012345678901234567890123456789
-----------------------------------------------+-----------------------------------------------------------------------------
Comment card.   NUMDCD = 1.                     |C data:C:\ATP\ATPMINGW\LTD.DAT
Marker card preceding new EMTP data case.       |BEGIN NEW DATA CASE
Compute overhead line constants.  Limit = 190   |LINE CONSTANTS
Request for metric (not English) units.         |METRIC
Comment card.   NUMDCD = 5.                     |C  LINHA:  LT 500 KV PORTO SERGIPE - OLINDINA
Comment card.   NUMDCD = 6.                     |C  CABO UTILIZADOS:
Comment card.   NUMDCD = 7.                     |C  AUTOR:  MARTE\VITOR.LIMA
Comment card.   NUMDCD = 8.                     |C  GERADO EM 16/10/2018
Comment card.   NUMDCD = 9.                     |C  MARTE ENGENHARIA
Comment card.   NUMDCD = 10.                    |C  SKIN  RESIS     REACT   DIAM    HORIZ   VTOWER   VMID   SEPAR  ALPHA       NB
Comment card.   NUMDCD = 11.                    |C |----|-------|-|-------|-------|-------|-------|-------|-------|-----|-----|-|
Comment card.   NUMDCD = 12.                    |C 345678901234567890123456789012345678901234567890123456789012345678901234567890
Line conductor card.  5.000E-01  6.560E-02     4  |  1.5000  0.0656 4          2.9340 -7.3000 34.7950 13.4750   95.00   45.       4
Line conductor card.  5.000E-01  6.560E-02     4  |  2.5000  0.0656 4          2.9340  0.0000 42.2950 20.9750   95.00   45.       4
Line conductor card.  5.000E-01  6.560E-02     4  |  3.5000  0.0656 4          2.9340  7.3000 34.7950 13.4750   95.00   45.       4
Line conductor card.  5.000E-01  4.230E+00     4  |  0.5000  4.2300 4          0.9144 -6.0750 47.8200 29.7900    0.00    0.       1
Line conductor card.  2.313E-01  8.033E-01     4  |  0.2313  0.8033 4          1.3400  6.0750 47.8200 29.7900    0.00    0.       1
Blank card terminating conductor cards.         |BLANK - FIM DOS DADOS DE CONDUTORES
Frequency card.  1.000E+03  6.000E+01  0.000E+00  |  1000       60.00         1    111 111    1   0.00      0


Line conductor table after sorting and initial processing.
 Table    Phase    Skin effect    Resistance   Reactance data specification     Diameter   Horizontal   Avg height
   Row  Number        R-type    R (ohm/km)    X-type      X(ohm/km) or GMR     (  cm  )     X (mtrs)     Y (mtrs)        Name
     1       1        .50000        .06560        4               .000000      2.93400       -6.825       20.107
     2       2        .50000        .06560        4               .000000      2.93400        0.475       27.607
     3       3        .50000        .06560        4               .000000      2.93400        7.775       20.107
     4       1        .50000        .06560        4               .000000      2.93400       -7.775       20.107
     5       1        .50000        .06560        4               .000000      2.93400       -7.775       21.057
     6       1        .50000        .06560        4               .000000      2.93400       -6.825       21.057
     7       2        .50000        .06560        4               .000000      2.93400       -0.475       27.607
     8       2        .50000        .06560        4               .000000      2.93400       -0.475       28.557
     9       2        .50000        .06560        4               .000000      2.93400        0.475       28.557
    10       3        .50000        .06560        4               .000000      2.93400        6.825       20.107
    11       3        .50000        .06560        4               .000000      2.93400        6.825       21.057
    12       3        .50000        .06560        4               .000000      2.93400        7.775       21.057
    13       0        .50000       4.23000        4               .000000       .91440       -6.075       35.800
    14       0        .23130        .80330        4               .000000      1.34000        6.075       35.800

Matrices are for earth resistivity = 1.00000000E+03  ohm-meters  and frequency 6.00000000E+01  Hz.   Correction factor =
```

1.00000000E-06

Capacitance matrix, in units of [farads/kmeter ] for the system of physical conductors.
Rows and columns proceed in the same order as the sorted input.

1 1.065661E-08

2 -1.871883E-10 1.070154E-08

3 -1.166685E-10 -1.880586E-10 1.062661E-08

4 -2.792695E-09 -1.479143E-10 -8.922509E-11 1.062634E-08

5 -1.674694E-09 -1.811894E-10 -8.238089E-11 -2.805700E-09 1.063160E-08

6 -2.771601E-09 -2.276831E-10 -1.078472E-10 -1.675244E-09 -2.783406E-09 1.067040E-08

7 -2.310585E-10 -2.734957E-09 -1.476996E-10 -1.884485E-10 -2.436938E-10 -2.976053E-10 1.070115E-08

8 -1.793915E-10 -1.635162E-09 -1.223175E-10 -1.579828E-10 -2.089804E-10 -2.371425E-10 -2.747377E-09 1.067709E-08

9 -1.436018E-10 -2.746868E-09 -1.574695E-10 -1.226142E-10 -1.545518E-10 -1.797512E-10 -1.635183E-09 -2.758412E-09 1.067774E-08

10 -1.561755E-10 -2.307459E-10 -2.792468E-09 -1.166913E-10 -1.075918E-10 -1.446021E-10 -1.870393E-10 -1.433937E-10 -1.789811E-10
1.065680E-08

11 -1.445852E-10 -2.971619E-10 -1.674933E-09 -1.078585E-10 -1.048997E-10 -1.406091E-10 -2.274505E-10 -1.794286E-10 -2.365594E-10
-2.771338E-09 1.067076E-08

12 -1.075498E-10 -2.431643E-10 -2.805344E-09 -8.236710E-11 -8.055479E-11 -1.048687E-10 -1.808839E-10 -1.541309E-10 -2.082826E-10
-1.674390E-09 -2.782993E-09 1.063208E-08

13 -1.934806E-10 -3.214404E-10 -1.008978E-10 -2.178628E-10 -2.844702E-10 -2.570135E-10 -3.979529E-10 -5.291940E-10 -4.346093E-10
-1.041663E-10 -1.262351E-10 -1.229333E-10 6.400720E-09

14 -1.099580E-10 -4.179181E-10 -2.284045E-10 -1.066653E-10 -1.300588E-10 -1.333704E-10 -3.382826E-10 -4.573352E-10 -5.557805E-10
-2.029178E-10 -2.694868E-10 -2.981892E-10 -7.200650E-10 6.691368E-09

Capacitance matrix, in units of [farads/kmeter ] for the system of equivalent phase conductors.
Rows and columns proceed in the same order as the sorted input.

1 1.357828E-08

2 -3.088798E-09 1.424160E-08

3 -1.794475E-09 -3.082768E-09 1.358332E-08

Capacitance matrix, in units of [farads/kmeter ] for symmetrical components of the equivalent phase conductor
Rows proceed in the sequence (0, 1, 2), (0, 1, 2), etc.; columns proceed in the sequence (0, 2, 1), (0, 2, 1), etc.

```
   0  8.490374E-09
      0.000000E+00

   1  1.023160E-10 -5.388151E-10
     -1.836083E-10 -9.373077E-10

   2  1.023160E-10  1.645641E-08 -5.388151E-10
      1.836083E-10 -1.997302E-25  9.373077E-10
```

Impedance matrix, in units of [ohms/kmeter ] for the system of physical conductors.
Rows and columns proceed in the same order as the sorted input.

```
   1  1.256364E-01
      9.333412E-01

   2  5.809839E-02  1.252968E-01
      4.195518E-01  9.337032E-01

   3  5.826648E-02  5.809839E-02  1.256364E-01
      3.942728E-01  4.195518E-01  9.333412E-01

   4  5.826977E-02  5.809818E-02  5.826604E-02  1.256364E-01
      6.002842E-01  4.147826E-01  3.895199E-01  9.333412E-01

   5  5.824806E-02  5.807669E-02  5.824436E-02  5.824808E-02  1.255930E-01
      5.741761E-01  4.190875E-01  3.894024E-01  6.003072E-01  9.333872E-01

   6  5.824808E-02  5.807691E-02  5.824480E-02  5.824806E-02  5.822639E-02  1.255930E-01
      6.003072E-01  4.244733E-01  3.941365E-01  5.741761E-01  6.003301E-01  9.333872E-01

   7  5.809858E-02  5.793023E-02  5.809818E-02  5.809839E-02  5.807691E-02  5.807710E-02  1.252968E-01
      4.243017E-01  6.006462E-01  4.147826E-01  4.195518E-01  4.244733E-01  4.299323E-01  9.337032E-01

   8  5.807710E-02  5.790894E-02  5.807669E-02  5.807691E-02  5.805545E-02  5.805564E-02  5.790896E-02  1.252543E-01
      4.188301E-01  5.745380E-01  4.104696E-01  4.146904E-01  4.195977E-01  4.243476E-01  6.006691E-01  9.337490E-01

   9  5.807691E-02  5.790896E-02  5.807691E-02  5.807669E-02  5.805524E-02  5.805545E-02  5.790894E-02  5.788769E-02  1.252543E-01
      4.146904E-01  6.006691E-01  4.146904E-01  4.104696E-01  4.148284E-01  4.195977E-01  5.745380E-01  6.006920E-01  9.337490E-01

  10  5.826690E-02  5.809858E-02  5.826977E-02  5.826648E-02  5.824480E-02  5.824521E-02  5.809839E-02  5.807691E-02  5.807710E-02
      3.993457E-01  4.243017E-01  6.002842E-01  3.942728E-01  3.941365E-01  3.991865E-01  4.195518E-01  4.146904E-01  4.188301E-01

      1.256364E-01
      9.333412E-01

  11  5.824521E-02  5.807710E-02  5.824806E-02  5.824480E-02  5.822315E-02  5.822355E-02  5.807691E-02  5.805545E-02  5.805564E-02
      3.991865E-01  4.299323E-01  5.741761E-01  3.941365E-01  3.943188E-01  3.993916E-01  4.244733E-01  4.195977E-01  4.243476E-01
```

```
      5.824808E-02  1.255930E-01
      6.003072E-01  9.333872E-01

  12  5.824480E-02  5.807691E-02  5.824808E-02  5.824436E-02  5.822271E-02  5.822315E-02  5.807669E-02  5.805524E-02  5.805545E-02
      3.941365E-01  4.244733E-01  6.003072E-01  3.894024E-01  3.895658E-01  3.943188E-01  4.190875E-01  4.148284E-01  4.195977E-01

      5.824806E-02  5.822639E-02  1.255930E-01
      5.741761E-01  6.003301E-01  9.333872E-01

  13  5.791470E-02  5.774692E-02  5.791201E-02  5.791466E-02  5.789340E-02  5.789343E-02  5.774708E-02  5.772601E-02  5.772585E-02
      3.891200E-01  4.197603E-01  3.674925E-01  3.887662E-01  3.934392E-01  3.938396E-01  4.239381E-01  4.300388E-01  4.251755E-01

      5.791237E-02  5.789111E-02  5.789076E-02  4.287595E+00
      3.697452E-01  3.725065E-01  3.700895E-01  1.022254E+00

  14  5.791237E-02  5.774708E-02  5.791466E-02  5.791201E-02  5.789076E-02  5.789111E-02  5.774692E-02  5.772585E-02  5.772601E-02
      3.697452E-01  4.239381E-01  3.887662E-01  3.674925E-01  3.700895E-01  3.725065E-01  4.197603E-01  4.251755E-01  4.300388E-01

      5.791470E-02  5.789343E-02  5.789340E-02  5.756466E-02  8.609073E-01
      3.891200E-01  3.938396E-01  3.934392E-01  4.088785E-01  9.858519E-01

Impedance matrix,  in units of  [ohms/kmeter ]  for the system of equivalent phase conductors.
Rows and columns proceed in the same order as the sorted input.

   1  1.301096E-01
      5.619311E-01

   2  1.221804E-01  1.495423E-01
      2.901912E-01  5.316276E-01

   3  1.147813E-01  1.242024E-01  1.336029E-01
      2.750117E-01  2.852269E-01  5.529532E-01

Impedance matrix,  in units of  [ohms/kmeter ]  for symmetrical components of the equivalent phase conductor
Rows proceed in the sequence  (0, 1, 2),  (0, 1, 2),  etc.;  columns proceed in the sequence  (0, 2, 1),  (0, 2, 1),  etc.

   0  3.785277E-01
      1.115790E+00

   1 -3.953987E-03 -1.492673E-02
      1.240901E-02  7.967802E-03

   2 -7.502430E-03  1.736359E-02  1.491344E-02
     -1.065487E-03  2.653607E-01  8.626624E-03
```

| Sequence | Surge impedance magnitude(ohm) | angle(degr.) | Attenuation db/km | velocity km/sec | Wavelength km | Resistance ohm/km | Reactance ohm/km | Susceptance mho/km |
|---|---|---|---|---|---|---|---|---|
| Zero : | 6.06722E+02 | -9.36965E+00 | 2.74616E-03 | 1.96751E+05 | 3.27918E+03 | 3.78528E-01 | 1.11579E+00 | 3.20080E-06 |
| Positive: | 2.07037E+02 | -1.87188E+00 | 3.64424E-04 | 2.93662E+05 | 4.89436E+03 | 1.73636E-02 | 2.65361E-01 | 6.20392E-06 |

## LT 500 KV OLINDINA – SAPEAÇU C1

```
   ---   22   cards of disk file read into card cache cells  1   onward.
Alternative Transients Program (ATP),  GNU Linux or DOS.  All rights reserved by Can/Am user group of Portland, Oregon, USA.
 Date (dd-mth-yy) and time of day (hh.mm.ss) = 16-Oct-18  15:33:21   Name of disk plot file is  C:\ATP\ATPMINGW\LTD.pl4
Consult the 860-page ATP Rule Book of the Can/Am EMTP User Group in Portland,  Oregon, USA.  Source code date is 23 July 2007.
Total size of LABCOM tables = 10913313 INTEGER words.  31 VARDIM  List Sizes follow:  6002  10K  192K  900  420K  1200  15K
  120K  2250  3800  720  2K  72800  510  90K  800  90  254  120K  100K  3K  15K  192K  120  45K  260K  600  210K  600  19  200
-----------------------------------------------+-----------------------------------------------------------------------------
Descriptive interpretation of input data cards.  |  Input data card images are shown below, all 80 columns, character by character
                                                0         1         2         3         4         5         6         7         8
                                                01234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
-----------------------------------------------+-----------------------------------------------------------------------------
Comment card.   NUMDCD = 1.                     |C data:C:\ATP\ATPMINGW\LTD.DAT
Marker card preceding new EMTP data case.       |BEGIN NEW DATA CASE
Compute overhead line constants.  Limit = 190   |LINE CONSTANTS
Request for metric (not English) units.         |METRIC
Comment card.   NUMDCD = 5.                     |C  LINHA:  LT 500 KV OLINDINA - SAPEAÇU
Comment card.   NUMDCD = 6.                     |C  CABO UTILIZADOS:
Comment card.   NUMDCD = 7.                     |C  AUTOR:  MARTE\VITOR.LIMA
Comment card.   NUMDCD = 8.                     |C  GERADO EM 16/10/2018
Comment card.   NUMDCD = 9.                     |C  MARTE ENGENHARIA
Comment card.   NUMDCD = 10.                    |C  SKIN  RESIS     REACT   DIAM    HORIZ   VTOWER   VMID   SEPAR  ALPHA       NB
Comment card.   NUMDCD = 11.                    |C |----|-------|-|-------|-------|-------|-------|-------|-------|-----|-----|-|
Comment card.   NUMDCD = 12.                    |C 345678901234567890123456789012345678901234567890123456789012345678901234567890
Line conductor card.  5.000E-01  6.560E-02     4  |  1.5000  0.0656 4          2.9340 -7.3000 34.8950 13.5250   95.00   45.       4
Line conductor card.  5.000E-01  6.560E-02     4  |  2.5000  0.0656 4          2.9340  0.0000 42.3700 21.0000   95.00   45.       4
Line conductor card.  5.000E-01  6.560E-02     4  |  3.5000  0.0656 4          2.9340  7.3000 34.8950 13.5250   95.00   45.       4
Line conductor card.  5.000E-01  4.230E+00     4  |  0.5000  4.2300 4          0.9144 -6.0750 47.8700 29.8100    0.00    0.       1
Line conductor card.  2.313E-01  8.033E-01     4  |  0.2313  0.8033 4          1.3400  6.0750 47.8700 29.8100    0.00    0.       1
Blank card terminating conductor cards.         |BLANK - FIM DOS DADOS DE CONDUTORES
Frequency card.  1.000E+03  6.000E+01  0.000E+00  |  1000       60.00         1    111 111    1   0.00      0


Line conductor table after sorting and initial processing.
 Table   Phase   Skin effect    Resistance   Reactance data specification     Diameter   Horizontal   Avg height
   Row  Number        R-type    R (ohm/km)   X-type      X(ohm/km) or GMR     (  cm  )     X (mtrs)     Y (mtrs)        Name
     1       1        .50000        .06560        4               .000000      2.93400       -6.825       20.173
     2       2        .50000        .06560        4               .000000      2.93400        0.475       27.648
     3       3        .50000        .06560        4               .000000      2.93400        7.775       20.173
     4       1        .50000        .06560        4               .000000      2.93400       -7.775       20.173
     5       1        .50000        .06560        4               .000000      2.93400       -7.775       21.123
     6       1        .50000        .06560        4               .000000      2.93400       -6.825       21.123
     7       2        .50000        .06560        4               .000000      2.93400       -0.475       27.648
     8       2        .50000        .06560        4               .000000      2.93400       -0.475       28.598
     9       2        .50000        .06560        4               .000000      2.93400        0.475       28.598
    10       3        .50000        .06560        4               .000000      2.93400        6.825       20.173
    11       3        .50000        .06560        4               .000000      2.93400        6.825       21.123
    12       3        .50000        .06560        4               .000000      2.93400        7.775       21.123
    13       0        .50000       4.23000        4               .000000       .91440       -6.075       35.830
    14       0        .23130        .80330        4               .000000      1.34000        6.075       35.830

Matrices are for earth resistivity = 1.00000000E+03  ohm-meters  and frequency 6.00000000E+01  Hz.   Correction factor =
```

1.00000000E-06

Capacitance matrix, in units of [farads/kmeter ] for the system of physical conductors.
Rows and columns proceed in the same order as the sorted input.

1 1.065648E-08

2 -1.875746E-10 1.070193E-08

3 -1.167653E-10 -1.884126E-10 1.062635E-08

4 -2.792891E-09 -1.481512E-10 -8.934536E-11 1.062608E-08

5 -1.674793E-09 -1.813467E-10 -8.244272E-11 -2.805865E-09 1.063152E-08

6 -2.771626E-09 -2.279997E-10 -1.078752E-10 -1.675340E-09 -2.783414E-09 1.067048E-08

7 -2.316449E-10 -2.734594E-09 -1.479357E-10 -1.888041E-10 -2.440257E-10 -2.982183E-10 1.070154E-08

8 -1.798345E-10 -1.634830E-09 -1.225229E-10 -1.582936E-10 -2.093359E-10 -2.376717E-10 -2.747023E-09 1.067742E-08

9 -1.438895E-10 -2.746513E-09 -1.577781E-10 -1.228208E-10 -1.547447E-10 -1.800374E-10 -1.634851E-09 -2.758100E-09 1.067807E-08

10 -1.562360E-10 -2.313310E-10 -2.792663E-09 -1.167882E-10 -1.076182E-10 -1.445798E-10 -1.874249E-10 -1.436804E-10 -1.794222E-10
1.065667E-08

11 -1.445628E-10 -2.977730E-10 -1.675027E-09 -1.078865E-10 -1.048633E-10 -1.405088E-10 -2.277659E-10 -1.797132E-10 -2.370860E-10
-2.771362E-09 1.067084E-08

12 -1.075759E-10 -2.434940E-10 -2.805506E-09 -8.242878E-11 -8.056476E-11 -1.048322E-10 -1.810399E-10 -1.543220E-10 -2.086351E-10
-1.674487E-09 -2.782997E-09 1.063200E-08

13 -1.940784E-10 -3.213685E-10 -1.010947E-10 -2.185332E-10 -2.853470E-10 -2.578117E-10 -3.979858E-10 -5.293549E-10 -4.346192E-10
-1.043704E-10 -1.264324E-10 -1.231255E-10 6.401514E-09

14 -1.101742E-10 -4.179529E-10 -2.291076E-10 -1.068743E-10 -1.302638E-10 -1.335804E-10 -3.382074E-10 -4.573463E-10 -5.559498E-10
-2.035448E-10 -2.703236E-10 -2.991083E-10 -7.193637E-10 6.692244E-09

Capacitance matrix, in units of [farads/kmeter ] for the system of equivalent phase conductors.
Rows and columns proceed in the same order as the sorted input.

1 1.357670E-08

2 -3.094393E-09 1.424714E-08

3 -1.794874E-09 -3.088337E-09 1.358178E-08

Capacitance matrix, in units of [farads/kmeter ] for symmetrical components of the equivalent phase conductor
Rows proceed in the sequence (0, 1, 2), (0, 1, 2), etc.; columns proceed in the sequence (0, 2, 1), (0, 2, 1), etc.

```
   0  8.483473E-09
      0.000000E+00

   1  1.019819E-10 -5.417212E-10
     -1.830653E-10 -9.423516E-10

   2  1.019819E-10  1.646108E-08 -5.417212E-10
      1.830653E-10  1.458553E-25  9.423516E-10
```

Impedance matrix, in units of [ohms/kmeter ] for the system of physical conductors.
Rows and columns proceed in the same order as the sorted input.

```
   1  1.256333E-01
      9.333444E-01

   2  5.809594E-02  1.252950E-01
      4.196835E-01  9.337052E-01

   3  5.826344E-02  5.809594E-02  1.256333E-01
      3.942760E-01  4.196835E-01  9.333444E-01

   4  5.826672E-02  5.809572E-02  5.826300E-02  1.256333E-01
      6.002874E-01  4.148989E-01  3.895231E-01  9.333444E-01

   5  5.824502E-02  5.807424E-02  5.824132E-02  5.824503E-02  1.255900E-01
      5.741793E-01  4.192014E-01  3.894056E-01  6.003104E-01  9.333904E-01

   6  5.824503E-02  5.807446E-02  5.824176E-02  5.824502E-02  5.822335E-02  1.255900E-01
      6.003104E-01  4.246043E-01  3.941397E-01  5.741793E-01  6.003334E-01  9.333904E-01

   7  5.809613E-02  5.792836E-02  5.809572E-02  5.809594E-02  5.807446E-02  5.807465E-02  1.252950E-01
      4.244508E-01  6.006482E-01  4.148989E-01  4.196835E-01  4.246043E-01  4.300832E-01  9.337052E-01

   8  5.807465E-02  5.790708E-02  5.807424E-02  5.807446E-02  5.805301E-02  5.805319E-02  5.790709E-02  1.252524E-01
      4.189754E-01  5.745400E-01  4.105864E-01  4.148208E-01  4.197294E-01  4.244966E-01  6.006711E-01  9.337510E-01

   9  5.807446E-02  5.790709E-02  5.807446E-02  5.807424E-02  5.805279E-02  5.805301E-02  5.790708E-02  5.788582E-02  1.252524E-01
      4.148208E-01  6.006711E-01  4.148208E-01  4.105864E-01  4.149448E-01  4.197294E-01  5.745400E-01  6.006940E-01  9.337510E-01

  10  5.826385E-02  5.809613E-02  5.826672E-02  5.826344E-02  5.824176E-02  5.824217E-02  5.809594E-02  5.807446E-02  5.807465E-02
      3.993489E-01  4.244508E-01  6.002874E-01  3.942760E-01  3.941397E-01  3.991897E-01  4.196835E-01  4.148208E-01  4.189754E-01

      1.256333E-01
      9.333444E-01

  11  5.824217E-02  5.807465E-02  5.824502E-02  5.824176E-02  5.822011E-02  5.822052E-02  5.807446E-02  5.805301E-02  5.805319E-02
      3.991897E-01  4.300832E-01  5.741793E-01  3.941397E-01  3.943220E-01  3.993948E-01  4.246043E-01  4.197294E-01  4.244966E-01
```

```
      5.824503E-02  1.255900E-01
      6.003104E-01  9.333904E-01

  12  5.824176E-02  5.807446E-02  5.824503E-02  5.824132E-02  5.821967E-02  5.822011E-02  5.807424E-02  5.805279E-02  5.805301E-02
      3.941397E-01  4.246043E-01  6.003104E-01  3.894056E-01  3.895690E-01  3.943220E-01  4.192014E-01  4.149448E-01  4.197294E-01

      5.824502E-02  5.822335E-02  1.255900E-01
      5.741793E-01  6.003334E-01  9.333904E-01

  13  5.791253E-02  5.774533E-02  5.790985E-02  5.791250E-02  5.789124E-02  5.789127E-02  5.774549E-02  5.772442E-02  5.772427E-02
      3.892982E-01  4.198276E-01  3.675939E-01  3.889428E-01  3.936268E-01  3.940292E-01  4.240131E-01  4.301166E-01  4.252440E-01

      5.791020E-02  5.788895E-02  5.788860E-02  4.287593E+00
      3.698527E-01  3.726151E-01  3.701914E-01  1.022255E+00

  14  5.791020E-02  5.774549E-02  5.791250E-02  5.790985E-02  5.788860E-02  5.788895E-02  5.774533E-02  5.772427E-02  5.772442E-02
      3.698527E-01  4.240131E-01  3.889428E-01  3.675939E-01  3.701914E-01  3.726151E-01  4.198276E-01  4.252440E-01  4.301166E-01

      5.791253E-02  5.789127E-02  5.789124E-02  5.756334E-02  8.609060E-01
      3.892982E-01  3.940292E-01  3.936268E-01  4.088799E-01  9.858533E-01

Impedance matrix,  in units of  [ohms/kmeter ]  for the system of equivalent phase conductors.
Rows and columns proceed in the same order as the sorted input.

   1  1.301564E-01
      5.618703E-01

   2  1.222202E-01  1.495727E-01
      2.902674E-01  5.315843E-01

   3  1.148338E-01  1.242501E-01  1.336644E-01
      2.749347E-01  2.852841E-01  5.528564E-01

Impedance matrix,  in units of  [ohms/kmeter ]  for symmetrical components of the equivalent phase conductor
Rows proceed in the sequence  (0, 1, 2),  (0, 1, 2),  etc.;  columns proceed in the sequence  (0, 2, 1),  (0, 2, 1),  etc.

   0  3.786672E-01
      1.115761E+00

   1 -4.013867E-03 -1.499841E-02
      1.238025E-02  8.010924E-03

   2 -7.442968E-03  1.736312E-02  1.498772E-02
     -1.069032E-03  2.652750E-01  8.666493E-03
```

| Sequence | Surge impedance magnitude(ohm) | angle(degr.) | Attenuation db/km | velocity km/sec | Wavelength km | Resistance ohm/km | Reactance ohm/km | Susceptance mho/km |
|---|---|---|---|---|---|---|---|---|
| Zero : | 6.06973E+02 | -9.37310E+00 | 2.74606E-03 | 1.96831E+05 | 3.28052E+03 | 3.78667E-01 | 1.11576E+00 | 3.19819E-06 |
| Positive: | 2.06975E+02 | -1.87243E+00 | 3.64524E-04 | 2.93668E+05 | 4.89446E+03 | 1.73631E-02 | 2.65275E-01 | 6.20568E-06 |

## LT 230 KV MORRO DO CHAPÉU II – IRECÊ C2&C3

```
   ---   25   cards of disk file read into card cache cells  1   onward.
Alternative Transients Program (ATP),  GNU Linux or DOS.  All rights reserved by Can/Am user group of Portland, Oregon, USA.
 Date (dd-mth-yy) and time of day (hh.mm.ss) = 16-Oct-18  12:22:32   Name of disk plot file is  C:\ATP\ATPMINGW\LTD.pl4
Consult the 860-page ATP Rule Book of the Can/Am EMTP User Group in Portland,  Oregon, USA.  Source code date is 23 July 2007.
Total size of LABCOM tables = 10913313 INTEGER words.  31 VARDIM  List Sizes follow:  6002  10K  192K  900  420K  1200  15K
  120K  2250  3800  720  2K  72800  510  90K  800  90  254  120K  100K  3K  15K  192K  120  45K  260K  600  210K  600  19  200
```

```
Descriptive interpretation of input data cards.   |  Input data card images are shown below, all 80 columns, character by character
                                                  0         1         2         3         4         5         6         7         8
                                                  01234567890123456789012345678901234567890123456789012345678901234567890123456789
Comment card.   NUMDCD = 1.                       |C data:C:\ATP\ATPMINGW\LTD.DAT
Marker card preceding new EMTP data case.         |BEGIN NEW DATA CASE
Compute overhead line constants.  Limit = 190     |LINE CONSTANTS
Request for metric (not English) units.           |METRIC
Comment card.   NUMDCD = 5.                       |C  LINHA:  LT 230 KV MORRO DO CHAPÉU II - IRECÊ
Comment card.   NUMDCD = 6.                       |C  CABO UTILIZADOS:
Comment card.   NUMDCD = 7.                       |C  AUTOR:  MARTE\VITOR.LIMA
Comment card.   NUMDCD = 8.                       |C  GERADO EM 16/10/2018
Comment card.   NUMDCD = 9.                       |C  MARTE ENGENHARIA
Comment card.   NUMDCD = 10.                      |C  SKIN  RESIS     REACT   DIAM    HORIZ   VTOWER   VMID   SEPAR  ALPHA       NB
Comment card.   NUMDCD = 11.                      |C |----|-------|-|-------|-------|-------|-------|-------|-------|-----|-----|-|
Comment card.   NUMDCD = 12.                      |C 345678901234567890123456789012345678901234567890123456789012345678901234567890
Line conductor card.  5.000E-01  6.640E-02     4  |  1.5000  0.0664 4          2.9160 -5.0000 36.4800 19.5000   90.00   90.       2
Line conductor card.  5.000E-01  6.640E-02     4  |  2.5000  0.0664 4          2.9160 -5.0000 30.4800 13.5000   90.00   90.       2
Line conductor card.  5.000E-01  6.640E-02     4  |  3.5000  0.0664 4          2.9160 -5.0000 24.4800  7.5000   90.00   90.       2
Line conductor card.  5.000E-01  6.640E-02     4  |  4.5000  0.0664 4          2.9160  5.0000 24.4800  7.5000   90.00   90.       2
Line conductor card.  5.000E-01  6.640E-02     4  |  5.5000  0.0664 4          2.9160  5.0000 30.4800 13.5000   90.00   90.       2
Line conductor card.  5.000E-01  6.640E-02     4  |  6.5000  0.0664 4          2.9160  5.0000 36.4800 19.5000   90.00   90.       2
Line conductor card.  5.000E-01  4.230E+00     4  |  0.5000  4.2300 4          0.9144 -3.0000 42.5300 28.4700    0.00    0.       1
Line conductor card.  2.313E-01  8.033E-01     4  |  0.2313  0.8033 4          1.3400  3.0000 42.6100 28.4700    0.00    0.       1
Blank card terminating conductor cards.           |BLANK - FIM DOS DADOS DE CONDUTORES
Frequency card.  1.000E+03  6.000E+01  0.000E+00  |  1000       60.00         1    111 111    1   0.00      0
```

Line conductor table after sorting and initial processing.

| Table Row | Phase Number | Skin effect R-type | Resistance R (ohm/km) | Reactance data specification X-type | X(ohm/km) or GMR | Diameter ( cm ) | Horizontal X (mtrs) | Avg height Y (mtrs) | Name |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | .50000 | .06640 | 4 | .000000 | 2.91600 | -5.000 | 24.710 | |
| 2 | 2 | .50000 | .06640 | 4 | .000000 | 2.91600 | -5.000 | 18.710 | |
| 3 | 3 | .50000 | .06640 | 4 | .000000 | 2.91600 | -5.000 | 12.710 | |
| 4 | 4 | .50000 | .06640 | 4 | .000000 | 2.91600 | 5.000 | 12.710 | |
| 5 | 5 | .50000 | .06640 | 4 | .000000 | 2.91600 | 5.000 | 18.710 | |
| 6 | 6 | .50000 | .06640 | 4 | .000000 | 2.91600 | 5.000 | 24.710 | |
| 7 | 1 | .50000 | .06640 | 4 | .000000 | 2.91600 | -5.000 | 25.610 | |
| 8 | 2 | .50000 | .06640 | 4 | .000000 | 2.91600 | -5.000 | 19.610 | |
| 9 | 3 | .50000 | .06640 | 4 | .000000 | 2.91600 | -5.000 | 13.610 | |
| 10 | 4 | .50000 | .06640 | 4 | .000000 | 2.91600 | 5.000 | 13.610 | |
| 11 | 5 | .50000 | .06640 | 4 | .000000 | 2.91600 | 5.000 | 19.610 | |
| 12 | 6 | .50000 | .06640 | 4 | .000000 | 2.91600 | 5.000 | 25.610 | |
| 13 | 0 | .50000 | 4.23000 | 4 | .000000 | .91440 | -3.000 | 33.157 | |

```
    14       0        .23130        .80330        4               .000000      1.34000        3.000       33.183

Matrices are for earth resistivity = 1.00000000E+03  ohm-meters  and frequency 6.00000000E+01  Hz.   Correction factor =
1.00000000E-06

Capacitance matrix,  in units of  [farads/kmeter ]  for the system of physical conductors.
Rows and columns proceed in the same order as the sorted input.

   1  9.661520E-09

   2 -6.265776E-10  9.757153E-09

   3 -2.020060E-10 -6.191997E-10  9.646773E-09

   4 -1.003898E-10 -1.995536E-10 -3.172939E-10  9.646801E-09

   5 -2.048216E-10 -2.661477E-10 -1.995509E-10 -6.191391E-10  9.757286E-09

   6 -3.231884E-10 -2.047603E-10 -1.003536E-10 -2.018184E-10 -6.261681E-10  9.662751E-09

   7 -3.889757E-09 -4.826156E-10 -1.715663E-10 -8.925041E-11 -1.872228E-10 -3.374802E-10  9.569079E-09

   8 -8.816668E-10 -3.756949E-09 -4.562896E-10 -1.704038E-10 -2.619588E-10 -2.367365E-10 -6.523387E-10  9.751992E-09

   9 -2.485703E-10 -8.564533E-10 -3.825612E-09 -2.964193E-10 -2.206929E-10 -1.172048E-10 -2.080283E-10 -6.074904E-10  9.713920E-09

  10 -1.172451E-10 -2.206954E-10 -2.964190E-10 -3.825580E-09 -8.563829E-10 -2.483524E-10 -1.042402E-10 -1.926267E-10 -2.897288E-10
      9.713957E-09

  11 -2.368034E-10 -2.619558E-10 -1.703991E-10 -4.562141E-10 -3.756783E-09 -8.811588E-10 -2.207262E-10 -2.694424E-10 -1.926219E-10
     -6.074027E-10  9.752198E-09

  12 -3.373801E-10 -1.871053E-10 -8.918552E-11 -1.713058E-10 -4.820488E-10 -3.888068E-09 -3.671289E-10 -2.205930E-10 -1.041672E-10
     -2.077260E-10 -6.516363E-10  9.571388E-09

  13 -5.662210E-10 -2.024084E-10 -9.376986E-11 -6.923046E-11 -1.449110E-10 -3.547377E-10 -7.515050E-10 -2.493997E-10 -1.086800E-10
     -7.983273E-11 -1.760618E-10 -4.409432E-10  6.646111E-09

  14 -3.759910E-10 -1.534059E-10 -7.330689E-11 -9.877135E-11 -2.130304E-10 -5.950039E-10 -4.677683E-10 -1.863892E-10 -8.452745E-11
     -1.144590E-10 -2.624224E-10 -7.892757E-10 -1.197224E-09  6.951333E-09

Capacitance matrix,  in units of  [farads/kmeter ]  for the system of equivalent phase conductors.
Rows and columns proceed in the same order as the sorted input.

   1  1.145108E-08
```

```
   2 -2.643199E-09  1.199525E-08

   3 -8.301709E-10 -2.539433E-09  1.170947E-08

   4 -4.111255E-10 -7.832795E-10 -1.199861E-09  1.170960E-08

   5 -8.495741E-10 -1.059505E-09 -7.832648E-10 -2.539139E-09  1.199592E-08

   6 -1.365178E-09 -8.491951E-10 -4.109111E-10 -8.292026E-10 -2.641012E-09  1.145800E-08

Capacitance matrix,  in units of  [farads/kmeter ]  for symmetrical components of the equivalent phase conductor
Rows proceed in the sequence  (0, 1, 2),  (0, 1, 2),  etc.;  columns proceed in the sequence  (0, 2, 1),  (0, 2, 1),  etc.

   0  7.710065E-09
      0.000000E+00

   1  1.338250E-10 -6.689231E-10
     -4.408790E-10 -1.129249E-09

   2  1.338250E-10  1.372287E-08 -6.689231E-10
      4.408790E-10  9.055828E-26  1.129249E-09

   0 -2.570631E-09 -2.762301E-11 -2.762301E-11  7.714937E-09
      0.000000E+00 -8.600852E-11  8.600852E-11  0.000000E+00

   1  8.818251E-11  2.635228E-10  3.445449E-10  3.131597E-10 -6.436814E-10
     -1.935846E-11  4.563315E-10  9.552737E-12 -3.383333E-10 -1.142515E-09

   2  8.818251E-11  3.445449E-10  2.635228E-10  3.131597E-10  1.372429E-08 -6.436814E-10
      1.935846E-11 -9.552737E-12 -4.563315E-10  3.383333E-10 -3.594306E-25  1.142515E-09

Impedance matrix,  in units of  [ohms/kmeter ]  for the system of physical conductors.
Rows and columns proceed in the same order as the sorted input.

   1  1.262068E-01
      9.340335E-01

   2  5.819663E-02  1.264800E-01
      4.613985E-01  9.337436E-01

   3  5.833376E-02  5.847203E-02  1.267577E-01
      4.089913E-01  4.611081E-01  9.334526E-01

   4  5.833218E-02  5.847038E-02  5.860975E-02  1.267577E-01
      3.891107E-01  4.110011E-01  4.224474E-01  9.334526E-01

   5  5.819512E-02  5.833218E-02  5.847038E-02  5.847203E-02  1.264800E-01
      4.112915E-01  4.227383E-01  4.110011E-01  4.611081E-01  9.337436E-01

   6  5.805913E-02  5.819512E-02  5.833218E-02  5.833376E-02  5.819663E-02  1.262068E-01
      4.230283E-01  4.112915E-01  3.891107E-01  4.089913E-01  4.613985E-01  9.340335E-01
```

```
   7  5.804028E-02  5.817616E-02  5.831312E-02  5.831155E-02  5.817465E-02  5.803883E-02  1.261662E-01
      6.046049E-01  4.508824E-01  4.035602E-01  3.858200E-01  4.082250E-01  4.227459E-01  9.340769E-01

   8  5.817616E-02  5.831312E-02  5.845122E-02  5.844957E-02  5.831155E-02  5.817465E-02  5.815571E-02  1.264387E-01
      4.736739E-01  6.043150E-01  4.505921E-01  4.079346E-01  4.224560E-01  4.141895E-01  4.614420E-01  9.337871E-01

   9  5.831312E-02  5.845122E-02  5.859050E-02  5.858877E-02  5.844957E-02  5.831155E-02  5.829250E-02  5.843043E-02  1.267157E-01
      4.148912E-01  4.733836E-01  6.040241E-01  4.221651E-01  4.138991E-01  3.924898E-01  4.090348E-01  4.611517E-01  9.334963E-01

  10  5.831155E-02  5.844957E-02  5.858877E-02  5.859050E-02  5.845122E-02  5.831312E-02  5.829094E-02  5.842880E-02  5.856781E-02
      3.924898E-01  4.138991E-01  4.221651E-01  6.040241E-01  4.733836E-01  4.148912E-01  3.891543E-01  4.110447E-01  4.224911E-01

      1.267157E-01
      9.334963E-01

  11  5.817465E-02  5.831155E-02  5.844957E-02  5.845122E-02  5.831312E-02  5.817616E-02  5.815421E-02  5.829094E-02  5.842880E-02
      4.141895E-01  4.224560E-01  4.079346E-01  4.505921E-01  6.043150E-01  4.736739E-01  4.113350E-01  4.227819E-01  4.110447E-01

      5.843043E-02  1.264387E-01
      4.611517E-01  9.337871E-01

  12  5.803883E-02  5.817465E-02  5.831155E-02  5.831312E-02  5.817616E-02  5.804028E-02  5.801855E-02  5.815421E-02  5.829094E-02
      4.227459E-01  4.082250E-01  3.858200E-01  4.035602E-01  4.508824E-01  6.046049E-01  4.230717E-01  4.113350E-01  3.891543E-01

      5.829250E-02  5.815571E-02  1.261662E-01
      4.090348E-01  4.614420E-01  9.340769E-01

  13  5.787080E-02  5.800537E-02  5.814097E-02  5.814007E-02  5.800450E-02  5.786997E-02  5.785071E-02  5.798512E-02  5.812056E-02
      4.339033E-01  3.946338E-01  3.686557E-01  3.636450E-01  3.852664E-01  4.118215E-01  4.419173E-01  3.994082E-01  3.720378E-01

      5.811967E-02  5.798426E-02  5.784987E-02  4.287711E+00
      3.665922E-01  3.889425E-01  4.160820E-01  1.022127E+00

  14  5.786937E-02  5.800390E-02  5.813947E-02  5.814036E-02  5.800477E-02  5.787021E-02  5.784928E-02  5.798366E-02  5.811907E-02
      4.116966E-01  3.851606E-01  3.635604E-01  3.685590E-01  3.944980E-01  4.336788E-01  4.159572E-01  3.888331E-01  3.665047E-01

      5.811996E-02  5.798452E-02  5.785011E-02  5.768204E-02  8.610227E-01
      3.719368E-01  3.992637E-01  4.416694E-01  4.619500E-01  9.857263E-01

Impedance matrix,  in units of  [ohms/kmeter ]  for the system of equivalent phase conductors.
Rows and columns proceed in the same order as the sorted input.

   1  1.627298E-01
      6.284916E-01

   2  1.222642E-01  1.506163E-01
      3.299302E-01  6.450597E-01

   3  1.174204E-01  1.121297E-01  1.422048E-01
      2.844104E-01  3.443579E-01  6.575484E-01
```

```
   4  1.178955E-01  1.125572E-01  1.085148E-01  1.430450E-01
      2.631432E-01  2.926789E-01  3.101665E-01  6.554118E-01

   5  1.231181E-01  1.173219E-01  1.128938E-01  1.133826E-01  1.523498E-01
      2.771200E-01  2.967160E-01  2.917888E-01  3.412029E-01  6.407718E-01

   6  1.306936E-01  1.242266E-01  1.192871E-01  1.198336E-01  1.253056E-01  1.673574E-01
      2.767677E-01  2.742838E-01  2.595074E-01  2.783313E-01  3.224683E-01  6.173820E-01

Impedance matrix,  in units of  [ohms/kmeter ]  for symmetrical components of the equivalent phase conductor
Rows proceed in the sequence  (0, 1, 2),  (0, 1, 2),  etc.;  columns proceed in the sequence  (0, 2, 1),  (0, 2, 1),  etc.

   0  3.863931E-01
      1.282832E+00

   1 -1.524609E-03 -2.958803E-02
     -1.617355E-02  1.755598E-02

   2  1.754584E-02  3.457886E-02  3.018406E-02
     -2.382650E-02  3.241337E-01  1.681914E-02

   0  3.555029E-01  7.462477E-03  8.741889E-03  3.932652E-01
      8.473907E-01 -1.130880E-02 -1.905103E-02  1.265857E+00

   1 -2.416386E-02  1.544427E-02 -5.958650E-04 -3.340353E-02 -2.935142E-02
      3.273266E-03 -9.540106E-03 -1.409437E-02 -1.649997E-03  1.785357E-02

   2  7.628480E-03 -4.024399E-04 -1.593122E-02  1.639949E-02  3.474345E-02  2.974234E-02
      1.532458E-02 -1.392984E-02 -8.634899E-03  1.073916E-02  3.238544E-01  1.663792E-02
```

| Sequence | Surge impedance magnitude(ohm) | Surge impedance angle(degr.) | Attenuation db/km | velocity km/sec | Wavelength km | Resistance ohm/km | Reactance ohm/km | Susceptance mho/km |
|---|---|---|---|---|---|---|---|---|
| Zero : | 6.78921E+02 | -8.38123E+00 | 2.49838E-03 | 1.93102E+05 | 3.21836E+03 | 3.86393E-01 | 1.28283E+00 | 2.90663E-06 |
| Positive: | 2.51017E+02 | -3.04467E+00 | 5.99109E-04 | 2.90714E+05 | 4.84523E+03 | 3.45789E-02 | 3.24134E-01 | 5.17340E-06 |

# ANEXO II – SISTEMA EQUIVALENTE REPRESENTADO NO ATP

## CURTO MÍNIMO

```
C data:EQ-2023.40_MIN.ATP
BEGIN NEW DATA CASE
C ------------------------------------------------------------
C Generated by ATPDRAW  novembro, quinta-feira 8, 2018
C A Bonneville Power Administration program
C by H. K. Høidalen at SEfAS/NTNU - NORWAY 1994-2009
C ------------------------------------------------------------
POWER FREQUENCY                      60.
C $DUMMY, XYZ000
C  dT  >< Tmax >< Xopt >< Copt ><Epsiln>
   5.E-6      .5     60.     60.  1.E-18
     500       1       1       1       1       0       0       1       0
$PARAMETER
AI =1.0 $$
BI =1.0 $$
CI =1.0 $$
DI =1.0 $$
GIRECI =11267.65282 * 1.0 * AI $$
GSOB1I =11267.65282 * 1.00 * AI $$
GLGZ1I =11267.65282 * 1.00 * CI $$
GPAA1I =11267.65282 * 1.23 * CI $$
GASE1I =11267.65282 * 1.23 * CI $$
GPAF1I =11267.65282 * 1.0 * CI $$
GBJLAI =11267.65282 * 1.00 * AI $$
GFUN1I =11267.65282 * 1.0 * BI $$
GITA1I =11267.65282 * 1.05 * BI $$
GPA41I =11267.65282 * 0.9 * DI $$
GXIN1I =11267.65282 * 0.9 * DI $$
GCAD1I =11267.65282 * 0.6 * DI $$
GPCA1I =11267.6528 * 0.5 * BI $$
EANG5I =408248.290 * 0.9 * DI $$
ESOB5I =408248.290 * 1.0 * AI $$
EMES5I =408248.290 * 0.9 * DI $$
EGA25I =408248.290 * 1.0 * CI $$
EGO25I =408248.290 * 1.00 * AI $$
EMI25I =408248.290 * 1.0 * CI $$
EIG35I =408248.290 * 1.0 * BI $$
EPP25I =408248.290 * 1.0 * BI $$
EITA2I =187794.214 * 0.6 * BI $$
EBJL2I =187794.214 * 1.0 * AI $$
EP3B2I =187794.214 * 1.0 * CI $$
EANG2I =187794.214 * 0.9 * DI $$
EP3A2I =187794.214 * 1.0 * CI $$
EFUN1I =112676.528 * 1.0 * BI $$
GXIN1_____=GXIN1I
GSOB1_____=GSOB1I
GPCA1_____=GPCA1I
GPAF1_____=GPAF1I
GPAA1_____=GPAA1I
GPA41_____=GPA41I
GLGZ1_____=GLGZ1I
GITA1_____=GITA1I
GIREC_____=GIRECI
GFUN1_____=GFUN1I
GCAD1_____=GCAD1I
GBJLA_____=GBJLAI
GASE1_____=GASE1I
ESOB5_____=ESOB5I
EPP25_____=EPP25I
EP3B2_____=EP3B2I
EP3A2_____=EP3A2I
EMI25_____=EMI25I
EMES5_____=EMES5I
EITA2_____=EITA2I
EIG35_____=EIG35I
EGO25_____=EGO25I
EGA25_____=EGA25I
EFUN1_____=EFUN1I
EBJL2_____=EBJL2I
EANG5_____=EANG5I
EANG2_____=EANG2I
BLANK $PARAMETER
C        1         2         3         4         5         6         7         8
C 34567890123456789012345678901234567890123456789012345678901234567890123456789
C < n1 >< n2 ><ref1><ref2>< R  >< L  >< C  >
C < n1 >< n2 ><ref1><ref2>< R  >< A  >< B  ><Leng><><>0
C G.OURO 2
```

```
C G.OURO CER
C G.OURO 2
C BROTAS
C B.J.LAPA
C B.J.LAPA SIN
C IRECE
C BROTAS
C IRECE
C IRECE SIN
C G.OURO 1
C G.OURO 1B
C G.OURO 1
C IRECE
C OUROLANDIA 2
C C.LARGO
C SE01
C UMBURANAS
C C.FORMOSO
C UMBURANAS
C C.LARGO
C C.FORMOSO
C C.FORMOSO
C S.BONFIM
C S.BONFIM
C M.CHAPEU 2
C BABILONIA
C S.BABILONIA
C V.BAHIA 2
C M.CHAPEUS
C S.AZUL
C M.CHAPEU
C M.CHAPEU 2
C BABILONIA
C S.BABILONIA
C V.BAHIA 2
C M.CHAPEUS
C S.AZUL
C M.CHAPEU 2 CER
C OUROLANDIA 2
C SAPEAÇU
C OLINDINA
C JUAZEIRO 3
C SOBRADINHO
C MILAGRES 2
C JUAZEIRO 3
C SOBRADINHO 1 UHE
C SOBRADINHO
C L.GONZAGA
C P.AFONSO 4
C L.GONZAGA 1 UHE
C L.GONZAGA 2 UHE
C SOBRADINHO 2 UHE
C P.AFONSO 3
C P.AFONSO 3
C ASALE 1 UHE
C P.AFONSO 2 A3 UHE
C P.AFONSO 2 B2 UHE
C P.AFONSO 2 B3 UHE
C P.AFONSO 3-1 UHE
C P.AFONSO 2-A1 UHE
C P.AFONSO 2 A2 UHE
C P.AFONSO 2 B1 UHE
C ASALE A
C ASAL B2 UHE
C P.AFONSO UHE 1
C P.AFONSO 3-2 UHE
C GARANHUNS
C A.SALES B
C GARANHUNS 2
C ANGELIM
C ANGELIM
C MESSIAS
C XINGO
C MESSIAS
C SANTANA 2
C XINGO 1 UHE
C CAMAÇARI B1
C P.SERGIPE
```

```
C CAMAÇARI
C JARDIM
C CAMAÇARI 4
C CAMAÇARI B2
C CAMAÇARI D1 SIN
C CAMAÇARI D2 SIN
C CAMAÇARI
  683A                    67.148.5482                                    0
  683B                    67.148.5482                                    0
  683C                    67.148.5482                                    0
C TRAFO IDEAL
  TRANSFORMER                         X0075A  1.E6                       0
           9999
 1X0074A                   .001  .001.57735
 2683A  683B               .001  .001    1.
  TRANSFORMER X0075A                 X0075B                             0
 1X0074B
 2683B  683C
  TRANSFORMER X0075A                 X0075C                             0
 1X0074C
 2683C  683A
C JARDIM
C ITABAINA
C N.S.SOCORRO
C JARDIM
C N.S.SOCORRO
  183A                     507.      5797.1                             0
  183B                     507.      5797.1                             0
  183C                     507.      5797.1                             0
C TRAFO IDEAL
  TRANSFORMER                         X0087A  1.E6                       0
           9999
 1X0086A                   .001  .001.57735
 2183A  183B               .001  .001    1.
  TRANSFORMER X0087A                 X0087B                             0
 1X0086B
 2183B  183C
  TRANSFORMER X0087A                 X0087C                             0
 1X0086C
 2183C  183A
  103A                   317.59      28626.                             0
  103B                   317.59      28626.                             0
  103C                   317.59      28626.                             0
C TRAFO IDEAL
  TRANSFORMER                         X0089A  1.E6                       0
           9999
 1X0088A                   .001  .001.57735
 2103A  103B               .001  .001    1.
  TRANSFORMER X0089A                 X0089B                             0
 1X0088B
 2103B  103C
  TRANSFORMER X0089A                 X0089C                             0
 1X0088C
 2103C  103A
  603A                   117.03 28.82                                   0
  603B                   117.03 28.82                                   0
  603C                   117.03 28.82                                   0
C TRAFO IDEAL
  TRANSFORMER                         X0091A  1.E6                       0
           9999
 1X0090A                   .001  .001.57735
 2603A  603B               .001  .001    1.
  TRANSFORMER X0091A                 X0091B                             0
 1X0090B
 2603B  603C
  TRANSFORMER X0091A                 X0091C                             0
 1X0090C
 2603C  603A
C F.SANTANA 3
C EMBASA
C TOMBA
C SAPEAÇU
C G.MANGABEIRA
C CATU
C CAMAÇARI 4
C G.MANGABEIRA
C F.SANTANA 3
C P.CAVALO 1 UHE
```

```
C P.CAVALO
  674A                  61.267  24.6                                  0
  674B                  61.267  24.6                                  0
  674C                  61.267  24.6                                  0
C TRAFO IDEAL
  TRANSFORMER                       X0103A  1.E6                      0
            9999
 1X0102A                  .001  .001.57735
 2674A  674B              .001  .001    1.
  TRANSFORMER X0103A               X0103B                             0
 1X0102B
 2674B  674C
  TRANSFORMER X0103A               X0103C                             0
 1X0102C
 2674C  674A
  11673A                45.30916.332                                  0
  11673B                45.30916.332                                  0
  11673C                45.30916.332                                  0
C TRAFO IDEAL
  TRANSFORMER                       X0105A  1.E6                      0
            9999
 1X0104A                  .001  .001.57735
 211673A11673B            .001  .001    1.
  TRANSFORMER X0105A               X0105B                             0
 1X0104B
 211673B11673C
  TRANSFORMER X0105A               X0105C                             0
 1X0104C
 211673C11673A
  673A                  30.26210.087                                  0
  673B                  30.26210.087                                  0
  673C                  30.26210.087                                  0
C TRAFO IDEAL
  TRANSFORMER                       X0107A  1.E6                      0
            9999
 1X0106A                  .001  .001.57735
 2673A  673B              .001  .001    1.
  TRANSFORMER X0107A               X0107B                             0
 1X0106B
 2673B  673C
  TRANSFORMER X0107A               X0107C                             0
 1X0106C
 2673C  673A
C POÇÕES 3
C S.A.JESUS
C FUNIL
C ITAGIBA
C POÇÕES 2
C P.PARAISO 2
C POÇÕE3
C ITAPEBI
C SAPEAÇU CER
C S.A.JESUS
C POÇÕE 2
C FUNIL CER
C FUNIL
C FUNIL
C FUNIL 1 UHE
C FUNIL 1 UHE
C ITAPEBI 1 UHE
  18763A                81.04722.033                                  0
  18763B                81.04722.033                                  0
  18763C                81.04722.033                                  0
C TRAFO IDEAL
  TRANSFORMER                       X0125A  1.E6                      0
            9999
 1X0124A                  .001  .001.57735
 218763A18763B            .001  .001    1.
  TRANSFORMER X0125A               X0125B                             0
 1X0124B
 218763B18763C
  TRANSFORMER X0125A               X0125C                             0
 1X0124C
 218763C18763A
  675A                  111.7733.888                                  0
  675B                  111.7733.888                                  0
  675C                  111.7733.888                                  0
C TRAFO IDEAL
```

```
  TRANSFORMER                          X0127A  1.E6                          0
            9999
 1X0126A                    .001  .001.57735
 2675A  675B                .001  .001    1.
  TRANSFORMER X0127A                   X0127B                                0
 1X0126B
 2675B  675C
  TRANSFORMER X0127A                   X0127C                                0
 1X0126C
 2675C  675A
  664A                     64.9412.844                                       0
  664B                     64.9412.844                                       0
  664C                     64.9412.844                                       0
C TRAFO IDEAL
  TRANSFORMER                          X0129A  1.E6                          0
            9999
 1X0128A                    .001  .001.57735
 2664A  664B                .001  .001    1.
  TRANSFORMER X0129A                   X0129B                                0
 1X0128B
 2664B  664C
  TRANSFORMER X0129A                   X0129C                                0
 1X0128C
 2664C  664A
  909A                     332.01      1.86E5                                0
  909B                     332.01      1.86E5                                0
  909C                     332.01      1.86E5                                0
C TRAFO IDEAL
  TRANSFORMER                          X0131A  1.E6                          0
            9999
 1X0130A                    .001  .001.57735
 2909A  909B                .001  .001    1.
  TRANSFORMER X0131A                   X0131B                                0
 1X0130B
 2909B  909C
  TRANSFORMER X0131A                   X0131C                                0
 1X0130C
 2909C  909A
  976A                     162.827.2917                                      0
  976B                     162.827.2917                                      0
  976C                     162.827.2917                                      0
C TRAFO IDEAL
  TRANSFORMER                          X0133A  1.E6                          0
            9999
 1X0132A                    .001  .001.57735
 2976A  976B                .001  .001    1.
  TRANSFORMER X0133A                   X0133B                                0
 1X0132B
 2976B  976C
  TRANSFORMER X0133A                   X0133C                                0
 1X0132C
 2976C  976A
  876A                     33.364 14.76                                      0
  876B                     33.364 14.76                                      0
  876C                     33.364 14.76                                      0
C TRAFO IDEAL
  TRANSFORMER                          X0135A  1.E6                          0
            9999
 1X0134A                    .001  .001.57735
 2876A  876B                .001  .001    1.
  TRANSFORMER X0135A                   X0135B                                0
 1X0134B
 2876B  876C
  TRANSFORMER X0135A                   X0135C                                0
 1X0134C
 2876C  876A
C P.PARAISO 2 CER
C IBICOARA
C IBICOARA
C IGAPORÃ 3
C P.AFONSO 4-1 UHE
  GPCA1A                     1.E6                                            0
  GPCA1B                     1.E6                                            0
  GPCA1C                     1.E6                                            0
C ITABAINA
C ITABAINA
C REATOR DE NEUTRO 800 OHM
        RN800A             2.666  800.                                       3
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C REATOR DE NEUTRO 800 OHM
        RN800B             2.666  800.                          3
C REATOR DE NEUTRO 400 OHM
        RN400C             1.333  400.                          3
C REATOR DE NEUTRO 400 OHM
        RN400D             1.333  400.                          3
        48A                 1.E6                                0
        48B                 1.E6                                0
        48C                 1.E6                                0
        4A                  1.E6                                0
        4B                  1.E6                                0
        4C                  1.E6                                0
        5A                  1.E6                                0
        5B                  1.E6                                0
        5C                  1.E6                                0
        7A                  1.E6                                0
        7B                  1.E6                                0
        7C                  1.E6                                0
        21A                 1.E6                                0
        21B                 1.E6                                0
        21C                 1.E6                                0
        90058A              1.E6                                0
        90058B              1.E6                                0
        90058C              1.E6                                0
        34A                 1.E6                                0
        34B                 1.E6                                0
        34C                 1.E6                                0
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        33B                 1.E6                                0
        33C                 1.E6                                0
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        28B                 1.E6                                0
        28C                 1.E6                                0
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        90033B              1.E6                                0
        90033C              1.E6                                0
        755A                1.E6                                0
        755B                1.E6                                0
        755C                1.E6                                0
        874A                1.E6                                0
        874B                1.E6                                0
        874C                1.E6                                0
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        974B                1.E6                                0
        974C                1.E6                                0
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        11562B              1.E6                                0
        11562C              1.E6                                0
        12333A              1.E6                                0
        12333B              1.E6                                0
        12333C              1.E6                                0
        12334A              1.E6                                0
        12334B              1.E6                                0
        12334C              1.E6                                0
        63A                 1.E6                                0
        63B                 1.E6                                0
        63C                 1.E6                                0
        95A                 1.E6                                0
        95B                 1.E6                                0
        95C                 1.E6                                0
        1A                  1.E6                                0
        1B                  1.E6                                0
        1C                  1.E6                                0
        11A                 1.E6                                0
        11B                 1.E6                                0
        11C                 1.E6                                0
        14A                 1.E6                                0
        14B                 1.E6                                0
        14C                 1.E6                                0
        89A                 1.E6                                0
        89B                 1.E6                                0
        89C                 1.E6                                0
        6A                  1.E6                                0
        6B                  1.E6                                0
        6C                  1.E6                                0
        8A                  1.E6                                0
        8B                  1.E6                                0
        8C                  1.E6                                0
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        9A                  1.E6                                        0
        9B                  1.E6                                        0
        9C                  1.E6                                        0
        10A                 1.E6                                        0
        10B                 1.E6                                        0
        10C                 1.E6                                        0
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        603B                1.E6                                        0
        603C                1.E6                                        0
        664A                1.E6                                        0
        664B                1.E6                                        0
        664C                1.E6                                        0
        673A                1.E6                                        0
        673B                1.E6                                        0
        673C                1.E6                                        0
        674A                1.E6                                        0
        674B                1.E6                                        0
        674C                1.E6                                        0
        675A                1.E6                                        0
        675B                1.E6                                        0
        675C                1.E6                                        0
        476A                1.E6                                        0
        476B                1.E6                                        0
        476C                1.E6                                        0
        683A                1.E6                                        0
        683B                1.E6                                        0
        683C                1.E6                                        0
        485A                1.E6                                        0
        485B                1.E6                                        0
        485C                1.E6                                        0
        876A                1.E6                                        0
        876B                1.E6                                        0
        876C                1.E6                                        0
        18763A              1.E6                                        0
        18763B              1.E6                                        0
        18763C              1.E6                                        0
        11673A              1.E6                                        0
        11673B              1.E6                                        0
        11673C              1.E6                                        0
        38976A              1.E6                                        0
        38976B              1.E6                                        0
        38976C              1.E6                                        0
$VINTAGE,1
C C1 LT 500 kV G.OURO 2 - OUROLANDIA 2
-111560A11561A                  .426        1.37       3.534      152.57 0 0 0
-211560B11561B                   .02        .284       7.068      152.57 0 0 0
-311560C11561C                                                             0
C C1 LT 230 kV BROTAS - G.OURO 2
-111260A205A                    .51       1.765       2.324       122.9 0 0 0
-211260B205B                   .111        .534       3.521       122.9 0 0 0
-311260C205C                                                               0
C C1 LT 230 kV B.J.LAPA - BROTAS
-1285A  205A                    .33        .986        2.11       207.4 0 0 0
-2285B  205B                   .098        .503       3.197       207.4 0 0 0
-3285C  205C                                                               0
C C1 LT 230 kV BROTAS - IRECE
-1205A  283A                   .345        .994       2.113       137.7 0 0 0
-2205B  283B                   .092        .501       3.201       137.7 0 0 0
-3205C  283C                                                               0
C C1 LT 230 kV G.OURO 1 - IRECE
-159060A283A                   .314        1.16       3.076       112.4 0 0 0
-259060B283B                   .049        .345        4.66       112.4 0 0 0
-359060C283C                                                               0
C C1 LT 230 kV UMBURANAS - OUROLANDIA 2
-158825A11261A                 .486       1.728       2.301        38.5 0 0 0
-258825B11261B                 .088        .514       3.486        38.5 0 0 0
-358825C11261C                                                             0
C C1 LT 230 kV C.FORMOSO - OUROLANDIA 2
-111461A11261A                 .584       2.019       2.658        105. 0 0 0
-211461B11261B                 .127        .611       4.027        105. 0 0 0
-311461C11261C                                                             0
C C1 LT 230 kV C.LARGO - OUROLANDIA 2
-158833A11261A                 .422       1.444       1.879        52.1 0 0 0
-258833B11261B                 .091        .435       2.847        52.1 0 0 0
-358833C11261C                                                             0
C C2 LT 230 kV C.LARGO - OUROLANDIA 2
-158833A11261A                 .422       1.444       1.879        52.1 0 0 0
-258833B11261B                 .091        .435       2.847        52.1 0 0 0
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-358833C11261C                                                        0
C C1 LT 230 kV SE01 - OUROLANDIA 2
-158844A11261A                .446      1.632      2.194      63.2 0 0 0
-258844B11261B                 .07       .484      3.324      63.2 0 0 0
-358844C11261C                                                        0
C C1 LT 230 kV OUROLANDIA 2 - IRECE
-111261A283A                  .603      2.078      2.723       84. 0 0 0
-211261B283B                  .131       .627      4.126       84. 0 0 0
-311261C283C                                                          0
C C1 LT 230 kV IRECE - M.CHAPEU 2
-1283A  355A                  .338       1.31      2.256      64.7 0 0 0
-2283B  355B                  .102       .518      3.418      64.7 0 0 0
-3283C  355C                                                          0
C C2 LT 230 kV SE01 - OUROLANDIA 2
-158844A11261A                .446      1.632      2.194      63.2 0 0 0
-258844B11261B                 .07       .484      3.324      63.2 0 0 0
-358844C11261C                                                        0
C C1 LT 230 kV C.FORMOSO - S.BONFIM
-1203A  11461A                .469       1.61        2.1      65.3 0 0 0
-2203B  11461B                .101       .485      3.181      65.3 0 0 0
-3203C  11461C                                                        0
C C1 LT 230 kV BABILONIA - M.CHAPEU 2
-1355A  59084A                .456      1.636      2.167      97.1 0 0 0
-2355B  59084B                .083       .488      3.283      97.1 0 0 0
-3355C  59084C                                                        0
C C1 LT 230 kV S.BABILONIA - M.CHAPEU 2
-1355A  59077A                .456      1.638      2.169      75.2 0 0 0
-2355B  59077B                .083       .488      3.286      75.2 0 0 0
-3355C  59077C                                                        0
C C1 LT 230 kV V.BAHIA 2 - M.CHAPEU 2
-1355A  59067A                .236      1.045      3.371      33.5 0 0 0
-2355B  59067B                .037        .31      5.107      33.5 0 0 0
-3355C  59067C                                                        0
C C1 LT 230 kV M.CHAPEU SUL - M.CHAPEU 2
-1355A  59058A                .414      2.348      3.425       17. 0 0 0
-2355B  59058B                .065       .696      5.189       17. 0 0 0
-3355C  59058C                                                        0
C C1 LT 230 kV S.AZUL - M.CHAPEU 2
-1355A  59015A                .623      2.213      2.945      18.8 0 0 0
-2355B  59015B                .112       .658      4.462      18.8 0 0 0
-3355C  59015C                                                        0
C C1 LT 500 kV OUROLANDIA 2 - M.CHAPEU 2
-111561A555A                  .426      1.608      3.672      96.5 0 0 0
-211561B555B                  .021       .297      7.344      96.5 0 0 0
-311561C555C                                                          0
C C1 LT 500 kV M.CHAPEU 2 - SAPEAÇU
-1555A  589A                  .305      1.088      3.565     274.1 0 0 0
-2555B  589B                  .019       .279       7.13     274.1 0 0 0
-3555C  589C                                                          0
C C1 LT 500 kV JUAZEIRO 3 - OUROLANDIA 2
-111561A11582A                .322      1.084      3.009     192.6 0 0 0
-211561B11582B                .016       .257      6.019     192.6 0 0 0
-311561C11582C                                                        0
C C2 LT 500 kV SOBRADINHO - JUAZEIRO 3
-1506A  11582A                .204      1.062      2.589      42.8 0 0 0
-2506B  11582B                .023       .321      5.178      42.8 0 0 0
-3506C  11582C                                                        0
C C1 LT 500 kV SOBRADINHO - JUAZEIRO 3
-1506A  11582A                .204      1.062      2.589      42.8 0 0 0
-2506B  11582B                .023       .321      5.178      42.8 0 0 0
-3506C  11582C                                                        0
C C2 LT 500 kV JUAZEIRO 3 - L.GONZAGA
-111582A505A                  .198       1.02      2.589       252. 0 0 0
-211582B505B                  .024       .315      5.177       252. 0 0 0
-311582C505C                                                          0
C C1 LT 500 kV JUAZEIRO 3 - L.GONZAGA
-111582A505A                  .198       1.02      2.589       252. 0 0 0
-211582B505B                  .024       .315      5.177       252. 0 0 0
-311582C505C                                                          0
C C1 LT 500 kV L.GONZAGA - MILAGRES 2
-111567A505A                  .406      1.598      2.872       237. 0 0 0
-211567B505B                  .022       .269      5.744       237. 0 0 0
-311567C505C                                                          0
C C1 LT 500 kV L.GONZAGA - OLINDINA
-1582A  505A                  .307       .918      2.484      256.8 0 0 0
-2582B  505B                   .03       .302      4.968      256.8 0 0 0
-3582C  505C                                                          0
C C1 LT 500 kV P.AFONSO 4 - L.GONZAGA
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-1505A  500A                    .212       .992      2.456       37.8 0 0 0
-2505B  500B                    .026       .311      4.912       37.8 0 0 0
-3505C  500C                                                             0
C C2 LT 500 kV P.AFONSO 4 - L.GONZAGA
-1505A  500A                    .126       .622      2.344       39.6 0 0 0
-2505B  500B                    .025       .297      4.689       39.6 0 0 0
-3505C  500C                                                             0
C C1 LT 500 kV P.AFONSO 4 - OLINDINA
-1582A  500A                    .308       .977       2.46       219.9 0 0 0
-2582B  500B                    .024       .306       4.92       219.9 0 0 0
-3582C  500C                                                             0
C C1 LT 230 kV P.AFONSO B 3 - GARANHUNS
-1300A  349A                    .468      1.792      2.038       210.1 0 0 0
-2300B  349B                    .093       .505      3.088       210.1 0 0 0
-3300C  349C                                                             0
C C2 LT 230 kV P.AFONSO B 3 - GARANHUNS
-1300A  349A                    .286      1.314      2.753       210.2 0 0 0
-2300B  349B                    .046       .393      4.171       210.2 0 0 0
-3300C  349C                                                             0
C C1 LT 500 kV L.GONZAGA - GARANHUNS 2
-1505A  549A                    .316       .849      2.424       240.8 0 0 0
-2505B  549B                    .029       .289      4.848       240.8 0 0 0
-3505C  549C                                                             0
C C2 LT 500 kV L.GONZAGA - GARANHUNS 2
-1505A  549A                    .172       .915      3.078        218. 0 0 0
-2505B  549B                    .017        .27      6.157        218. 0 0 0
-3505C  549C                                                             0
C C1 LT 230 kV P.AFONSO 3 A - GARANHUNS
-1200A  349A                    .468      1.791      2.037       210.2 0 0 0
-2200B  349B                    .093       .505      3.087       210.2 0 0 0
-3200C  349C                                                             0
C C1 LT 230 kV P.AFONSO 3 A - SANTANA 2
-1200A  11201A                  .474      1.636      2.145      109.67 0 0 0
-2200B  11201B                  .103       .494      3.251      109.67 0 0 0
-3200C  11201C                                                           0
C C1 LT 230 kV GARANHUNS - ANGELIM
-1349A  240A                    .324      1.192      3.002        12.3 0 0 0
-2349B  240B                    .051       .353      4.549        12.3 0 0 0
-3349C  240C                                                             0
C C2 LT 230 kV GARANHUNS - ANGELIM
-1349A  240A                    .244       .911       4.07        12.2 0 0 0
-2349B  240B                    .046       .252      6.167        12.2 0 0 0
-3349C  240C                                                             0
C C3 LT 230 kV GARANHUNS - ANGELIM
-1349A  240A                    .291      1.324      2.751        12.2 0 0 0
-2349B  240B                    .046       .392      4.168        12.2 0 0 0
-3349C  240C                                                             0
C C1 LT 230 kV SANTANA 2 - ANGELIM
-111201A240A                    .469      1.635      2.167      161.18 0 0 0
-211201B240B                    .103       .496      3.283      161.18 0 0 0
-311201C240C                                                             0
C C1 LT 230 kV ANGELIM - MESSIAS
-1342A  240A                    .471      1.464      2.137        80.2 0 0 0
-2342B  240B                    .095       .485      3.239        80.2 0 0 0
-3342C  240C                                                             0
C C2 LT 230 kV ANGELIM - MESSIAS
-1342A  240A                    .482      1.445      2.137        80.2 0 0 0
-2342B  240B                    .095       .485      3.239        80.2 0 0 0
-3342C  240C                                                             0
C C3 LT 230 kV ANGELIM - MESSIAS
-1342A  240A                    .465      1.413      2.062        81.2 0 0 0
-2342B  240B                    .095       .502      3.124        81.2 0 0 0
-3342C  240C                                                             0
C C1 LT 500 kV XINGO - MESSIAS
-1504A  542A                    .301      1.262      2.552       219.3 0 0 0
-2504B  542B                    .024       .317      5.105       219.3 0 0 0
-3504C  542C                                                             0
C C1 LT 500 kV XINGO - ANGELIM
-1504A  540A                    .414       1.31      2.685       195.1 0 0 0
-2504B  540B                    .026       .323      5.371       195.1 0 0 0
-3504C  540C                                                             0
C C1 LT 500 kV P.AFONSO 4 - ANGELIM
-1500A  540A                    .315       .909      2.555       222.8 0 0 0
-2500B  540B                    .025       .313      5.111       222.8 0 0 0
-3500C  540C                                                             0
C C1 LT 500 kV P.AFONSO 4 - XINGO
-1500A  504A                    .188       .844      2.473        54.5 0 0 0
-2500B  504B                    .023       .312      4.947        54.5 0 0 0
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-3500C  504C                                                          0
C C2 LT 500 kV XINGO - JARDIM
-1504A  573A                    .329      1.237      2.575      165.6 0 0 0
-2504B  573B                    .023       .297      5.149      165.6 0 0 0
-3504C  573C                                                          0
C C1 LT 500 kV XINGO - JARDIM
-1504A  573A                     .25      1.285      2.569      164.8 0 0 0
-2504B  573B                    .023       .299      5.138      164.8 0 0 0
-3504C  573C                                                          0
C C1 LT 500 kV OLINDINA - CAMAÇARI
-1582A  574A                    .321       .921      2.553      151.8 0 0 0
-2582B  574B                    .033        .31      5.107      151.8 0 0 0
-3582C  574C                                                          0
C C2 LT 500 kV OLINDINA - CAMAÇARI
-1582A  574A                     .29       .958      2.518      151.9 0 0 0
-2582B  574B                    .025       .313      5.036      151.9 0 0 0
-3582C  574C                                                          0
C C1 LT 500 kV CAMAÇARI - SAPEAÇU
-1589A  574A                    .383      1.362      2.575      105.2 0 0 0
-2589B  574B                    .025       .316       5.15      105.2 0 0 0
-3589C  574C                                                          0
C C1 LT 500 kV SAPEAÇU - CAMAÇARI 4
-1589A  584A                    .387      1.375      2.532      104.2 0 0 0
-2589B  584B                    .025       .314      5.063      104.2 0 0 0
-3589C  584C                                                          0
C C1 LT 230 kV ITABAINA - JARDIM
-1273A  271A                    .462      1.564       2.17       44.5 0 0 0
-2273B  271B                    .096       .492      3.288       44.5 0 0 0
-3273C  271C                                                          0
C C2 LT 230 kV ITABAINA - JARDIM
-1273A  271A                    .462      1.564       2.17       44.5 0 0 0
-2273B  271B                    .096       .492      3.288       44.5 0 0 0
-3273C  271C                                                          0
C C1 LT 230 kV CATU - CAMAÇARI 4
-1272A  284A                    .313      1.143      2.084       25.5 0 0 0
-2272B  284B                    .095       .508      3.158       25.5 0 0 0
-3272C  284C                                                          0
C C2 LT 230 kV CATU - CAMAÇARI 4
-1272A  284A                    .268       .993      2.026       25.5 0 0 0
-2272B  284B                    .095       .519      3.069       25.5 0 0 0
-3272C  284C                                                          0
C C1 LT 230 kV G.MANGABEIRA - CATU
-1275A  272A                    .488      1.547      2.107       77.2 0 0 0
-2275B  272B                    .097       .519      3.193       77.2 0 0 0
-3275C  272C                                                          0
C C1 LT 230 kV G.MANGABEIRA - SAPEAÇU
-1289A  275A                    .379      1.338      2.256       22.9 0 0 0
-2289B  275B                    .104       .557      3.418       22.9 0 0 0
-3289C  275C                                                          0
C C2 LT 230 kV G.MANGABEIRA - SAPEAÇU
-1289A  275A                     .34      1.176      2.419       22.9 0 0 0
-2289B  275B                    .104       .517      3.665       22.9 0 0 0
-3289C  275C                                                          0
C C3 LT 230 kV G.MANGABEIRA - SAPEAÇU
-1289A  275A                    .344      1.164      2.419       22.9 0 0 0
-2289B  275B                    .104       .517      3.665       22.9 0 0 0
-3289C  275C                                                          0
C C1 LT 230 kV CAMAÇARI B2 - G.MANGABEIRA
-1275A  294A                    .486      1.528       2.17       84.5 0 0 0
-2275B  294B                    .096       .491      3.289       84.5 0 0 0
-3275C  294C                                                          0
C C1 LT 230 kV F.SANTANA 3 - CAMAÇARI B2
-111110A294A                    .453      1.652       2.18        97. 0 0 0
-211110B294B                    .098       .499      3.303        97. 0 0 0
-311110C294C                                                          0
C C1 LT 230 kV F.SANTANA 3 - G.MANGABEIRA
-1275A  11110A                  .447      1.633      2.156       98.1 0 0 0
-2275B  11110B                  .097       .494      3.266       98.1 0 0 0
-3275C  11110C                                                        0
C C1 LT 230 kV G.MANGABEIRA - EMBASA
-1275A  214A                    .386      1.453      2.129      11.25 0 0 0
-2275B  214B                    .099       .494      3.226      11.25 0 0 0
-3275C  214C                                                          0
C C1 LT 230 kV TOMBA - EMBASA
-1214A  266A                    .377      1.421      2.104        30. 0 0 0
-2214B  266B                    .099       .483      3.188        30. 0 0 0
-3214C  266C                                                          0
C C1 LT 230 kV G.MANGABEIRA - TOMBA
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-1275A  266A                    .38       1.43      2.111      41.25 0 0 0
-2275B  266B                   .099       .486      3.199      41.25 0 0 0
-3275C  266C                                                          0
C C2 LT 230 kV S.A.JESUS - FUNIL
-1276A  264A                   .329      1.149      2.168      167.8 0 0 0
-2276B  264B                   .091       .464      3.285      167.8 0 0 0
-3276C  264C                                                          0
C C1 LT 500 kV SAPEAÇU - POÇÕES 3
-111612A589A                   .259      1.006      4.298       250. 0 0 0
-211612B589B                   .013       .186      8.597       250. 0 0 0
-311612C589C                                                          0
C C1 LT 500 kV POÇÕES 3 - P.PARAISO 2
-111612A38975A                  .26       .998      4.418      330.6 0 0 0
-211612B38975B                 .013       .187      8.836      330.6 0 0 0
-311612C38975C                                                        0
C C2 LT 500 kV POÇÕES 3 - P.PARAISO 2
-111612A38975A                 .245       .942      4.172      350.1 0 0 0
-211612B38975B                 .012       .177      8.344      350.1 0 0 0
-311612C38975C                                                        0
C C1 LT 230 kV SAPEAÇU - FUNIL
-1276A  289A                   .351      1.267      2.052      199.2 0 0 0
-2276B  289B                   .093         .5      3.109      199.2 0 0 0
-3276C  289C                                                          0
C C1 LT 230 kV S.A.JESUS - SAPEAÇU
-1264A  289A                   .335      1.158       1.58       32.7 0 0 0
-2264B  289B                   .073        .39      2.393       32.7 0 0 0
-3264C  289C                                                          0
C C2 LT 230 kV S.A.JESUS - SAPEAÇU
-1264A  289A                   .341      1.152      1.694       32.7 0 0 0
-2264B  289B                   .073       .362      2.567       32.7 0 0 0
-3264C  289C                                                          0
C C3 LT 230 kV S.A.JESUS - SAPEAÇU
-1264A  289A                   .358      1.207      1.775       31.2 0 0 0
-2264B  289B                   .076        .38       2.69       31.2 0 0 0
-3264C  289C                                                          0
C C1 LT 230 kV S.A.JESUS - FUNIL
-1276A  264A                   .336      1.142      2.122      167.9 0 0 0
-2276B  264B                   .093       .477      3.216      167.9 0 0 0
-3276C  264C                                                          0
C C1 LT 230 kV FUNIL - POÇÕES 2
-1209A  276A                   .503      1.641      2.261      114.1 0 0 0
-2209B  276B                   .103       .509      3.426      114.1 0 0 0
-3209C  276C                                                          0
C C1 LT 230 kV ITAGIBA - POÇÕES 2
-1209A  213A                   .452      1.466      2.172       87.7 0 0 0
-2209B  213B                     .1       .504      3.291       87.7 0 0 0
-3209C  213C                                                          0
C C1 LT 230 kV FUNIL - ITAGIBA
-1213A  276A                   .309      1.245      2.142       29.9 0 0 0
-2213B  276B                   .097       .497      3.245       29.9 0 0 0
-3213C  276C                                                          0
C C1 LT 230 kV FUNIL - ITAPEBI
-1263A  276A                   .265      1.287      2.145      203.9 0 0 0
-2263B  276B                   .093       .478       3.25      203.9 0 0 0
-3263C  276C                                                          0
C C2 LT 230 kV FUNIL - ITAPEBI
-1263A  276A                   .264      1.268      2.145      203.9 0 0 0
-2263B  276B                   .093       .477       3.25      203.9 0 0 0
-3263C  276C                                                          0
C C3 LT 230 kV FUNIL - ITAPEBI
-1263A  276A                   .433      1.426      1.962       223. 0 0 0
-2263B  276B                   .085       .436      2.972       223. 0 0 0
-3263C  276C                                                          0
C C1 LT 500 kV IBICOARA - SAPEAÇU
-1588A  589A                   .436      1.541      3.093       258. 0 0 0
-2588B  589B                   .019       .272      6.187       258. 0 0 0
-3588C  589C                                                          0
C C1 LT 500 kV IBICOARA - POÇÕES 3
-1588A  11612A                 .121       .638      4.417      162.4 0 0 0
-2588B  11612B                 .014       .194      8.835      162.4 0 0 0
-3588C  11612C                                                        0
C C1 LT 500 kV IGAPORÃ 3 - IBICOARA
-111594A588A                   .338      1.137       3.15       175. 0 0 0
-211594B588B                   .017       .269      6.299       175. 0 0 0
-311594C588C                                                          0
C C1 LT 500 kV JARDIM - CAMAÇARI 4
-1584A  573A                     .2       .943      2.483      255.4 0 0 0
-2584B  573B                   .023       .308      4.965      255.4 0 0 0
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-3584C  573C                                                              0
C C1 LT 500 kV GARANHUNS 2 - ANGELIM
-1549A  540A                    .368       1.019       2.346        13.3 0 0 0
-2549B  540B                     .03        .286       4.692        13.3 0 0 0
-3549C  540C                                                              0
C C2 LT 500 kV P.SERGIPE - JARDIM
-111151A573A                    .351        1.24       2.738       33.31 0 0 0
-211151B573B                    .024        .295       5.477       33.31 0 0 0
-311151C573C                                                              0
C C1 LT 500 kV P.SERGIPE - JARDIM
-111151A573A                    .351        1.24       2.738       33.31 0 0 0
-211151B573B                    .024        .295       5.477       33.31 0 0 0
-311151C573C                                                              0
C C1 LT 230 kV P.AFONSO A 3 - ITABAINA
-1271A  200A                    .465       1.475       2.155      167.35 0 0 0
-2271B  200B                    .094        .481       3.264      167.35 0 0 0
-3271C  200C                                                              0
C C1 LT 230 kV P.AFONSO B 3 - ITABAINA
-1271A  300A                    .453       1.486       2.155      167.35 0 0 0
-2271B  300B                    .094        .481       3.264      167.35 0 0 0
-3271C  300C                                                              0
$VINTAGE,0
C C1 LT 230 kV ASALE A - P.AFONSO 3 A
1 200A  301A             1.53314.814916.946
2 200B  301B             0.95361.7466-2.1651.53314.814916.946
3 200C  301C             0.95361.7466-2.1650.95361.7466-2.1651.53314.814916.946
C C1 LT 230 kV A.SALES B - P.AFONSO 3 B
1 300A  302A             1.53314.814916.946
2 300B  302B             0.95361.7466-2.1651.53314.814916.946
3 300C  302C             0.95361.7466-2.1650.95361.7466-2.1651.53314.814916.946
C C1 LT 230 kV N.S.SOCORRO - JARDIM
1 273A  11273A           0.1417 0.5575.6122
2 273B  11273B            0.0730.1162-0.7170.1417 0.5575.6122
3 273C  11273C            0.0730.1162-0.717 0.0730.1162-0.7170.1417 0.5575.6122
C C2 LT 230 kV N.S.SOCORRO - JARDIM
1 273A  11273A           0.18440.82685.6122
2 273B  11273B           0.11570.3859-0.7170.18440.82685.6122
3 273C  11273C           0.11570.3859-0.7170.11570.3859-0.7170.18440.82685.6122
C C1 LT 500 kV CAMAÇARI 4 - CAMAÇARI
1 584A  574A             0.28151.34138.4773
2 584B  574B              0.2310.6929-1.6950.28151.34138.4773
3 584C  574C              0.2310.6929-1.695 0.2310.6929-1.6950.28151.34138.4773
C C1 LT 230 kV P.CAVALO - G.MANGABEIRA
1 275A  375A              0.9523.8096 11.33
2 275B  375B             0.58241.7456-1.448 0.9523.8096 11.33
3 275C  375C             0.58241.7456-1.4480.58241.7456-1.448 0.9523.8096 11.33
C C1 LT 230 kV POÇÕE3 - POÇÕES 2
1 18612A209A             0.2006 1.2058.8543
2 18612B209B             0.12920.5318-1.1320.2006 1.2058.8543
3 18612C209C             0.12920.5318-1.1320.12920.5318-1.1320.2006 1.2058.8543
C C2 LT 230 kV POÇÕE3 - POÇÕES 2
1 18612A209A             0.2006 1.2058.8543
2 18612B209B             0.12920.5318-1.1320.2006 1.2058.8543
3 18612C209C             0.12920.5318-1.1320.12920.5318-1.1320.2006 1.2058.8543
C Gerador IRECE SIN - 13,8 kV
51GIRECA483A                        1.35841
52GIRECB483B                        1.35841
53GIRECC483C
C Gerador SOBRADINHO 2 UHE - 13,8 kV
51GSOB2A90058A           190.44   190.43981
52GSOB2B90058B                       .2251
53GSOB2C90058C
C Gerador SOBRADINHO 1 UHE - 13,8 kV
51GSOB1A21A              190.44   190.43981
52GSOB1B21B                          .2251
53GSOB1C21C
C Gerador L.GONZAGA 2 UHE - 13,8 kV
51GLGZ2A34A              190.44   190.43981
52GLGZ2B34B                         .07646
53GLGZ2C34C
C Gerador L.GONZAGA 1 UHE - 13,8 kV
51GLGZ1A33A              190.44   190.43981
52GLGZ1B33B                         .07646
53GLGZ1C33C
C Gerador P.AFONSO 3-2 UHE - 13,8 kV
51GPA32A11A              190.44   190.43981
52GPA32B11B                         .16721
53GPA32C11C
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C Gerador ASAL B1 UHE - 13,8 kV
51GASB1A90033A            190.44   190.43981
52GASB1B90033B                        .25557
53GASB1C90033C
C Gerador PAF2A1 - 13,8 kV
51GPAA1A4A                190.44   190.43981
52GPAA1B4B                            .45725
53GPAA1C4C
C Gerador PAF2A2 - 13,8 kV
51GPAA2A5A                190.44   190.43981
52GPAA2B5B                            .45725
53GPAA2C5C
C Gerador PAF2B1 - 13,8 kV
51GPAB1A7A                190.44   190.43981
52GPAB1B7B                            .45725
53GPAB1C7C
C Gerador PAF2B3 - 13,8 kV
51GPAB3A9A                190.44   190.43981
52GPAB3B9B                            .45725
53GPAB3C9C
C Gerador PAF2B2 - 13,8 kV
51GPAB2A8A                190.44   190.43981
52GPAB2B8B                            .45725
53GPAB2C8C
C Gerador PAF2A3 - 13,8 kV
51GPAA3A6A                190.44   190.43981
52GPAA3B6B                            .60788
53GPAA3C6C
C Gerador ASAL E1 UHE - 13,8 kV
51GASE1A28A               190.44   190.43981
52GASE1B28B                           .25557
53GASE1C28C
C Gerador P.AFONSO UHE 1 - 13,8 kV
51GPAF1A1A                            .21204
52GPAF1B1B                            .28924
53GPAF1C1C
C Gerador CAMAÇARI D1 SIN - 13,8 kV
51GCAD1A874A              60.369     1.66959
52GCAD1B874B                           .2032
53GCAD1C874C
C Gerador CAMAÇARI D2 SIN - 13,8 kV
51GCAD2A974A              60.369     1.66959
52GCAD2B974B                           .2032
53GCAD2C974C
C Gerador P.CAVALO 1 UHE - 13,8 kV
51GPCA1A48A               190.44   190.43981
52GPCA1B48B                1.E-6      .48676
53GPCA1C48C
C Gerador FUNIL 1 UHE - 13,8 kV
51GFUN1A63A               190.44   190.43981
52GFUN1B63B                          3.19939
53GFUN1C63C
C Gerador ITAPEBI 1 UHE - 13,8 kV
51GITA1A95A               190.44   190.43981
52GITA1B95B                           .25519
53GITA1C95C
C Gerador P.AFONSO 4-1 UHE - 13,8 kV
51GPA41A14A               190.44   190.43981
52GPA41B14B                           .03269
53GPA41C14C
C Gerador XINGO 1 UHE - 13,8 kV
51GXIN1A89A               190.44   190.43981
52GXIN1B89B                           .04171
53GXIN1C89C
C Gerador B.J.LAPA SIN - 13,8 kV
51GBJLAA485A                         1.26966
52GBJLAB485B                         1.26966
53GBJLAC485C
C EQ - GERADOR - ANGELIM 500 kV
51EANG5A540A              41.582     135.746
52EANG5B540B              1.3012     586.035
53EANG5C540C
C EQ - GERADOR - SOBRADINHO 500 kV
51ESOB5A506A              42.037    188.7375
52ESOB5B506B              8.7726     61.7478
53ESOB5C506C
C EQ - GERADOR - MESSIAS 500 kV
51EMES5A542A              49.341    208.5588
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52EMES5B542B                        1039.5425
53EMES5C542C
C EQ - GERADOR - GARANHUNS 2 500 kV
51EGA25A549A              18.317    130.1805
52EGA25B549B                          582.21
53EGA25C549C
C EQ - GERADOR - G.OURO 2 500 kV
51EGO25A11560A            38.544     174.994
52EGO25B11560B            7.8294     138.805
53EGO25C11560C
C EQ - GERADOR - MILAGRES 2 500 kV
51EMI25A11567A            3.9714      33.146
52EMI25B11567B            3.3993      105.38
53EMI25C11567C
C EQ - GERADOR - IGAPORÃ 3 500 kV
51EIG35A11594A            3.8626       42.31
52EIG35B11594B            5.0575     81.3213
53EIG35C11594C
C EQ - GERADOR - P.PARAISO 2 500 kV
51EPP25A38975A            14.407    100.8363
52EPP25B38975B            5.0828     74.5123
53EPP25C38975C
C EQ - GERADOR - ITAPEBI 230 kV
51EITA2A263A              6.0797     188.826
52EITA2B263B                        488.2347
53EITA2C263C
C EQ - GERADOR - B.J.LAPA 230 kV
51EBJL2A285A               .2473     13.3831
52EBJL2B285B              2.9458     67.9284
53EBJL2C285C
C EQ - GERADOR - P.AFONSO 3 B 230 kV
51EP3B2A300A               5.166     60.2071
52EP3B2B300B              2042.6   5463.9881
53EP3B2C300C
C EQ - GERADOR - ANGELIM 230 kV
51EANG2A240A              1.3945     12.4647
52EANG2B240B              23.793    210.0421
53EANG2C240C
C EQ - GERADOR - P.AFONSO 3 A 230 kV
51EP3A2A200A              1.0105     27.6301
52EP3A2B200B              1321.4   3585.2816
53EP3A2C200C
C EQ - GERADOR - FUNIL 138 kV
51EFUN1A976A               316.7    2415.979
52EFUN1B976B              602.96   2685.2992
53EFUN1C976C
C EQ - REATOR - CAMAÇARI B1 230 kV
51274A                                62.1924
52274B                    5.29E5      5.29E5
53274C
C EQ - REATOR - S.BONFIM 230 kV
51203A                              1143.7985
52203B                    5.29E5      5.29E5
53203C
C EQ - REATOR - SOBRADINHO 230 kV
51206A                                264.828
52206B                    5.29E5      5.29E5
53206C
C EQ - REATOR - POÇÕES 2 230 kV
51209A                              344.8138
52209B                    5.29E5      5.29E5
53209C
C EQ - REATOR - TOMBA 230 kV
51266A                                16.9257
52266B                    5.29E5      5.29E5
53266C
C EQ - REATOR - ITABAINA 230 kV
51271A                                32.3551
52271B                    5.29E5      5.29E5
53271C
C EQ - REATOR - CATU 230 kV
51272A                                13.3053
52272B                    5.29E5      5.29E5
53272C
C EQ - REATOR - CAMAÇARI 4 230 kV
51284A                                 9.7831
52284B                    5.29E5      5.29E5
53284C
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C EQ - REATOR - IBICOARA 230 kV
51288A                                206.0725
52288B                    5.29E5       5.29E5
53288C
C EQ - REATOR - CAMAÇARI B2 230 kV
51294A                                34.5565
52294B                    5.29E5       5.29E5
53294C
C EQ - REATOR - MESSIAS 230 kV
51342A                                 9.306
52342B                    5.29E5       5.29E5
53342C
C EQ - REATOR - GARANHUNS 230 kV
51349A                                26.4907
52349B                    5.29E5       5.29E5
53349C
C EQ - REATOR - SANTANA 2 230 kV
5111201A                              33.8825
5211201B                  5.29E5       5.29E5
5311201C
C EQ - REATOR - N.S.SOCORRO 230 kV
5111273A                             116.5953
5211273B                  5.29E5       5.29E5
5311273C
C EQ - REATOR - JUAZEIRO 3 230 kV
5111282A                              12.315
5211282B                  5.29E5       5.29E5
5311282C
C EQ - TRF - P.AFONSO 3 A 230 kV para MILAGRES 2 500 kV - em 500 kV
5111567AX0140A            683.49     1691.92
5211567BX0140B            54.119     252.535
5311567CX0140C
C EQ - TRF - P.AFONSO 3 A 230 kV para MILAGRES 2 500 kV - em 230 kV
  TRANSFORMER                         X0141A  1.E6                          0
            9999
 1X0140A                  1.E-6 1.E-6  500.
 2200A                    1.E-6 1.E-6  230.
  TRANSFORMER X0141A                  X0141B                                0
 1X0140B
 2200B
  TRANSFORMER X0141A                  X0141C                                0
 1X0140C
 2200C
C EQ - TRF - ANGELIM 230 kV para ANGELIM 500 kV - em 500 kV
51540A  X0142A            4679.9    6490.125
52540B  X0142B            51.842    297.8375
53540C  X0142C
C EQ - TRF - ANGELIM 230 kV para ANGELIM 500 kV - em 500 kV
  TRANSFORMER                         X0143A  1.E6                          0
            9999
 1X0142A                  1.E-6 1.E-6  500.
 2240A                    1.E-6 1.E-6  230.
  TRANSFORMER X0143A                  X0143B                                0
 1X0142B
 2240B
  TRANSFORMER X0143A                  X0143C                                0
 1X0142C
 2240C
C EQ - TRF - ANGELIM 230 kV para MESSIAS 500 kV - em 500 kV
51542A  X0144A            6919.5   10801.775
52542B  X0144B            91.853      546.25
53542C  X0144C
C EQ - TRF - ANGELIM 230 kV para MESSIAS 500 kV - em 500 kV
  TRANSFORMER                         X0145A  1.E6                          0
            9999
 1X0144A                  1.E-6 1.E-6  500.
 2240A                    1.E-6 1.E-6  230.
  TRANSFORMER X0145A                  X0145B                                0
 1X0144B
 2240B
  TRANSFORMER X0145A                  X0145C                                0
 1X0144C
 2240C
C EQ - TRF - ANGELIM 230 kV para GARANHUNS 2 500 kV - em 500 kV
51549A  X0146A            2808.1     6591.55
52549B  X0146B            39.028    278.4175
53549C  X0146C
C EQ - TRF - ANGELIM 230 kV para GARANHUNS 2 500 kV - em 500 kV
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  TRANSFORMER                          X0147A  1.E6                              0
            9999
 1X0146A                  1.E-6 1.E-6  500.
 2240A                    1.E-6 1.E-6  230.
  TRANSFORMER X0147A                   X0147B                                    0
 1X0146B
 2240B
  TRANSFORMER X0147A                   X0147C                                    0
 1X0146C
 2240C
C EQ - TRF - ANGELIM 230 kV para MILAGRES 2 500 kV - em 500 kV
5111567AX0148A            13450.   24495.575
5211567BX0148B            64.642    397.5775
5311567CX0148C
C EQ - TRF - ANGELIM 230 kV para MILAGRES 2 500 kV - em 500 kV
  TRANSFORMER                          X0149A  1.E6                              0
            9999
 1X0148A                  1.E-6 1.E-6  500.
 2240A                    1.E-6 1.E-6  230.
  TRANSFORMER X0149A                   X0149B                                    0
 1X0148B
 2240B
  TRANSFORMER X0149A                   X0149C                                    0
 1X0148C
 2240C
C EQ - TRF - B.J.LAPA 230 kV para SOBRADINHO 500 kV - em 500 kV
51506A  X0150A            75910.     108140.
52506B  X0150B            240.16   1458.6175
53506C  X0150C
C EQ - TRF - B.J.LAPA 230 kV para SOBRADINHO 500 kV - em 500 kV
  TRANSFORMER                          X0151A  1.E6                              0
            9999
 1X0150A                  1.E-6 1.E-6  500.
 2285A                    1.E-6 1.E-6  230.
  TRANSFORMER X0151A                   X0151B                                    0
 1X0150B
 2285B
  TRANSFORMER X0151A                   X0151C                                    0
 1X0150C
 2285C
C EQ - TRF - B.J.LAPA 230 kV para G.OURO 2 500 kV - em 500 kV
5111560AX0152A            134.47    580.2125
5211560BX0152B            4.2555    153.5208
5311560CX0152C
C EQ - TRF - B.J.LAPA 230 kV para G.OURO 2 500 kV - em 500 kV
  TRANSFORMER                          X0153A  1.E6                              0
            9999
 1X0152A                  1.E-6 1.E-6  500.
 2285A                    1.E-6 1.E-6  230.
  TRANSFORMER X0153A                   X0153B                                    0
 1X0152B
 2285B
  TRANSFORMER X0153A                   X0153C                                    0
 1X0152C
 2285C
C EQ - TRF - B.J.LAPA 230 kV para IGAPORÃ 3 500 kV - em 500 kV
5111594AX0154A            66.534    285.2475
5211594BX0154B             2.842     66.3383
5311594CX0154C
C EQ - TRF - B.J.LAPA 230 kV para IGAPORÃ 3 500 kV - em 500 kV
  TRANSFORMER                          X0155A  1.E6                              0
            9999
 1X0154A                  1.E-6 1.E-6  500.
 2285A                    1.E-6 1.E-6  230.
  TRANSFORMER X0155A                   X0155B                                    0
 1X0154B
 2285B
  TRANSFORMER X0155A                   X0155C                                    0
 1X0154C
 2285C
C EQ - TRF - P.AFONSO 3 B 230 kV para MILAGRES 2 500 kV - em 500 kV
5111567AX0156A            820.71    2067.175
5211567BX0156B            84.403    385.1375
5311567CX0156C
C EQ - TRF - P.AFONSO 3 B 230 kV para MILAGRES 2 500 kV - em 500 kV
  TRANSFORMER                          X0157A  1.E6                              0
            9999
 1X0156A                  1.E-6 1.E-6  500.
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 2300A                    1.E-6 1.E-6  230.
  TRANSFORMER X0157A                  X0157B                                  0
 1X0156B
 2300B
  TRANSFORMER X0157A                  X0157C                                  0
 1X0156C
 2300C
C EQ - TRF - ITAPEBI 230 kV para FUNIL 138 kV - em 230 kV
51263A  X0158A            589.09   2092.0099
52263B  X0158B            148.92    457.2554
53263C  X0158C
C EQ - TRF - ITAPEBI 230 kV para FUNIL 138 kV - em 230 kV
  TRANSFORMER                         X0159A  1.E6                            0
           9999
 1X0158A                   1.E-6 1.E-6  230.
 2976A                     1.E-6 1.E-6  138.
  TRANSFORMER X0159A                  X0159B                                  0
 1X0158B
 2976B
  TRANSFORMER X0159A                  X0159C                                  0
 1X0158C
 2976C
C EQ - LINHA - SOBRADINHO para IGAPORÃ 3 500 kV
51506A  11594A            5.97E5    508022.5
52506B  11594B            138.67     731.215
53506C  11594C
C EQ - LINHA - SOBRADINHO para MILAGRES 2 500 kV
51506A  11567A            845.81     1728.41
52506B  11567B            10.947     85.6965
53506C  11567C
C EQ - LINHA - SOBRADINHO para G.OURO 2 500 kV
51506A  11560A            4492.3      6797.4
52506B  11560B            25.793    216.4318
53506C  11560C
C EQ - LINHA - ANGELIM para MILAGRES 2 500 kV
51540A  11567A            14590.    20531.45
52540B  11567B            29.225    342.7125
53540C  11567C
C EQ - LINHA - ANGELIM para GARANHUNS 2 500 kV
51540A  549A              535.24   1260.7575
52540B  549B              9.4169    126.6053
53540C  549C
C EQ - LINHA - ANGELIM para MESSIAS 500 kV
51540A  542A              1072.3   1698.4375
52540B  542B              14.509     186.848
53540C  542C
C EQ - LINHA - MESSIAS para MILAGRES 2 500 kV
51542A  11567A            82717.   105278.75
52542B  11567B            71.165      881.53
53542C  11567C
C EQ - LINHA - MESSIAS para GARANHUNS 2 500 kV
51542A  549A              3403.8      7159.1
52542B  549B               22.39     356.395
53542C  549C
C EQ - LINHA - GARANHUNS 2 para MILAGRES 2 500 kV
51549A  11567A            1024.8      2731.1
52549B  11567B            7.5828    134.1498
53549C  11567C
C EQ - LINHA - G.OURO 2 para IGAPORÃ 3 500 kV
5111560A11594A            995.39   2227.7375
5211560B11594B            9.5607    111.8695
5311560C11594C
C EQ - LINHA - G.OURO 2 para MILAGRES 2 500 kV
5111560A11567A            1149.6     2286.05
5211560B11567B            10.319     205.876
5311560C11567C
C EQ - LINHA - MILAGRES 2 para IGAPORÃ 3 500 kV
5111567A11594A            2.63E5     282245.
5211567B11594B            122.48    1382.055
5311567C11594C
C EQ - LINHA - IGAPORÃ 3 para P.PARAISO 2 500 kV
5111594A38975A            2.13E5    198266.5
5211594B38975B            44.538      500.86
5311594C38975C
C EQ - LINHA - P.AFONSO 3 A para P.AFONSO 3 B 230 kV
51200A  300A              4.9736     17.1681
52200B  300B               .9987       5.193
53200C  300C
```

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C EQ - LINHA - P.AFONSO 3 A para CATU 230 kV
51200A  272A              809.44   1382.8325
52200B  272B              33.511    170.7961
53200C  272C
C EQ - LINHA - S.BONFIM para JUAZEIRO 3 230 kV
51203A  11282A            55.108    144.3498
52203B  11282B            8.8496      38.055
53203C  11282C
C EQ - LINHA - SOBRADINHO para JUAZEIRO 3 230 kV
51206A  11282A              12.8      33.366
52206B  11282B            2.5404     11.0236
53206C  11282C
C EQ - LINHA - POÇÕES 2 para IBICOARA 230 kV
51209A  288A               660.8    1467.409
52209B  288B              21.583    120.5591
53209C  288C
C EQ - LINHA - ITABAINA para CATU 230 kV
51271A  272A              418.86    842.7393
52271B  272B              21.319    116.5387
53271C  272C
C EQ - LINHA - CATU para P.AFONSO 3 B 230 kV
51272A  300A               812.9   1437.5416
52272B  300B              33.647    171.4478
53272C  300C
C EQ - LINHA - CATU para CAMAÇARI 4 230 kV
51272A  284A              52900.  52899.9471
52272B  284B              81.195    279.1798
53272C  284C
C EQ - LINHA - CATU para CAMAÇARI B2 230 kV
51272A  294A              52900.  52899.9471
52272B  294B              113.75    485.1485
53272C  294C
C EQ - LINHA - CAMAÇARI B1 para CAMAÇARI B2 230 kV
51274A  294A              357.09    626.2567
52274B  294B              6.9417     65.2913
53274C  294C
C EQ - LINHA - CAMAÇARI B1 para CAMAÇARI 4 230 kV
51274A  284A              71.828    196.0612
52274B  284B              3.0832     25.8522
53274C  284C
C EQ - LINHA - CAMAÇARI 4 para CAMAÇARI B2 230 kV
51284A  294A              42.351     74.0727
52284B  294B              1.8628     11.7617
53284C  294C
C EQ - LINHA - MESSIAS para N.S.SOCORRO 230 kV
51342A  11273A             8915.   10215.519
52342B  11273B            26.081      131.31
53342C  11273C
C SE L.GONZAGA UHE - TRF1 ; 500/13.8/13.8 kV; Xp=0.06; Xs=2; Xt=2
  TRANSFORMER                          X0046A  1.E6                          0
            9999
 1505A                    .0344 1.3752.89E5
 233A   33B                .0029 .114313800.
 334A   34B                .0029 .114313800.
  TRANSFORMER X0046A                  X0046B                                 0
 1505B
 233B   33C
 334B   34C
  TRANSFORMER X0046A                  X0046C                                 0
 1505C
 233C   33A
 334C   34A
C SE A.SALES A UHE - TRF1 120 MVA; 230/13.8/13.8 kV; Xp=0.69; Xs=12.34; Xt=12.38
  TRANSFORMER                          X0047A  1.E6                          0
            9999
 1301A                    .58193.65011.33E5
 290033A90033B             .0176  .70513800.
 328A   28B                .0177 .707313800.
  TRANSFORMER X0047A                  X0047B                                 0
 1301B
 290033B90033C
 328B   28C
  TRANSFORMER X0047A                  X0047C                                 0
 1301C
 290033C90033A
 328C   28A
C SE MESSIAS - TRF1 600 MVA; 500/230/13.8 kV; Xp=1.03; Xs=0.13; Xt=3.34
  TRANSFORMER             6.6137 1211.X0059A  1.E6                          0
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```
     6.61373994       1210.9992
     19.1661823      1254.96465
     36.5399774      1316.68955
     158.861587      1349.28463
     784.903037      1436.34923
           9999
1542A                    .6438 25.752.89E5
2342A                    .0172 .68771.33E5
3X0174AX0174B            .0048 .190813800.
 TRANSFORMER X0059A                X0059B                                  0
1542B
2342B
3X0174BX0174C
 TRANSFORMER X0059A                X0059C                                  0
1542C
2342C
3X0174CX0174A
C SE MESSIAS - TRF3 600 MVA; 500/230/13.8 kV; Xp=0.44; Xs=0.71; Xt=10.79
  TRANSFORMER             6.6137 1211.X0062A  1.E6                        0
     6.61373994       1210.9992
     19.1661823      1254.96465
     36.5399774      1316.68955
     158.861587      1349.28463
     784.903037      1436.34923
           9999
1542A                     .275   11.2.89E5
2342A                    .09393.75591.33E5
3X0175AX0175B            .0154 .616513800.
 TRANSFORMER X0062A                X0062B                                  0
1542B
2342B
3X0175BX0175C
 TRANSFORMER X0062A                X0062C                                  0
1542C
2342C
3X0175CX0175A
C SE MESSIAS - TRF2 600 MVA; 500/230/13.8 kV; Xp=0.44; Xs=0.71; Xt=10.79
  TRANSFORMER             6.6137 1211.X0064A  1.E6                        0
     6.61373994       1210.9992
     19.1661823      1254.96465
     36.5399774      1316.68955
     158.861587      1349.28463
     784.903037      1436.34923
           9999
1542A                     .275   11.2.89E5
2342A                    .09393.75591.33E5
3X0176AX0176B            .0154 .616513800.
 TRANSFORMER X0064A                X0064B                                  0
1542B
2342B
3X0176BX0176C
 TRANSFORMER X0064A                X0064C                                  0
1542C
2342C
3X0176CX0176A
C SE CAMAÇARI B1 UHE - TRF1 300 MVA; 230/13.8/13.8 kV; Xp=0.03; Xs=8.21; Xt=8.21
  TRANSFORMER                       X0065A  1.E6                          0
           9999
1274A                     .004 .15871.33E5
2974A  974B              .0117 .469113800.
3874A  874B              .0117 .469113800.
 TRANSFORMER X0065A                X0065B                                  0
1274B
2974B  974C
3874B  874C
 TRANSFORMER X0065A                X0065C                                  0
1274C
2974C  974A
3874C  874A
C SE SOBRADINHO UHE - TRF1 400 MVA; 500/13.8/13.8 kV; Xp=0.2; Xs=5.5; Xt=5.5
  TRANSFORMER                       X0067A  1.E6                          0
           9999
1506A                     .125    5.2.89E5
221A   21B               .0079 .314213800.
390058A90058B            .0079 .314213800.
 TRANSFORMER X0067A                X0067B                                  0
1506B
221B   21C
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 390058B90058C
  TRANSFORMER X0067A                  X0067C                                  0
 1506C
 221C   21A
 390058C90058A
  X0174A                                  .1                                  0
  X0174B                                  .1                                  0
  X0174C                                  .1                                  0
  X0175A                                  .1                                  0
  X0175B                                  .1                                  0
  X0175C                                  .1                                  0
  X0176A                                  .1                                  0
  X0176B                                  .1                                  0
  X0176C                                  .1                                  0
  X0178A                                  .1                                  0
  X0178B                                  .1                                  0
  X0178C                                  .1                                  0
  X0179A                                  .1                                  0
  X0179B                                  .1                                  0
  X0179C                                  .1                                  0
  X0180A                                  .1                                  0
  X0180B                                  .1                                  0
  X0180C                                  .1                                  0
C SE IRECE - TRF 2 55 MVA; 230/138/13.8 kV; Xp=13.1; Xs=-1.81; Xt=34.17
  TRANSFORMER                         X0160A  1.E6                            0
            9999
 1283A                    1.493159.7241.33E5
 2183A                     .4037 1.E-679674.
 3X0178AX0178B             .04621.848813800.
  TRANSFORMER X0160A                  X0160B                                  0
 1283B
 2183B
 3X0178BX0178C
  TRANSFORMER X0160A                  X0160C                                  0
 1283C
 2183C
 3X0178CX0178A
C SE IRECE - TRF 1 55 MVA; 230/138/13.8 kV; Xp=13.08; Xs=-2.01; Xt=42.39
  TRANSFORMER                         X0161A  1.E6                            0
            9999
 1283A                     1.464 58.561.33E5
 2183A                     1.E-6 1.E-679674.
 3X0179AX0179B             .0577 2.30713800.
  TRANSFORMER X0161A                  X0161B                                  0
 1283B
 2183B
 3X0179BX0179C
  TRANSFORMER X0161A                  X0161C                                  0
 1283C
 2183C
 3X0179CX0179A
C SE IRECE - TRF 3 55 MVA; 230/138/13.8 kV; Xp=13.08; Xs=-2.01; Xt=42.39
  TRANSFORMER                         X0162A  1.E6                            0
            9999
 1283A                     1.464 58.561.33E5
 2183A                     1.E-6 1.E-679674.
 3X0180AX0180B             .0577 2.30713800.
  TRANSFORMER X0162A                  X0162B                                  0
 1283B
 2183B
 3X0180BX0180C
  TRANSFORMER X0162A                  X0162C                                  0
 1283C
 2183C
 3X0180CX0180A
C SE G.OURO CER - TRF1  200 MVA; 13.8/500 kV; Xps=5
  TRANSFORMER                         X0001A  1.E6                            0
            9999
 111562A11562C              .0036 .142813800.
 211560A                   1.5625  62.52.89E5
  TRANSFORMER X0001A                  X0001B                                  0
 111562B11562A
 211560B
  TRANSFORMER X0001A                  X0001C                                  0
 111562C11562B
 211560C
C SE G.OURO 2 - TRF1 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0002A  1.E6                            0
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      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111560A                   .4863 19.452.89E5
 211260A                   .10294.11561.33E5
  TRANSFORMER X0002A                  X0002B                                  0
 111560B
 211260B
  TRANSFORMER X0002A                  X0002C                                  0
 111560C
 211260C
C SE G.OURO 2 - TRF2 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0003A  1.E6                            0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111560A                   .4863 19.452.89E5
 211260A                   .10294.11561.33E5
  TRANSFORMER X0003A                  X0003B                                  0
 111560B
 211260B
  TRANSFORMER X0003A                  X0003C                                  0
 111560C
 211260C
C SE B.J.LAPA-SIN - TRF1 80 MVA; 230/13.8 kV; Xps=15.25
  TRANSFORMER                         X0004A  1.E6                            0
            9999
 1285A                    1.008440.3361.33E5
 2485A  485B                .0109 .435613800.
  TRANSFORMER X0004A                  X0004B                                  0
 1285B
 2485B  485C
  TRANSFORMER X0004A                  X0004C                                  0
 1285C
 2485C  485A
C SE BROTAS - TRF1 100 MVA; 34.5/230 kV; Xps=14
  TRANSFORMER                         X0005A  1.E6                            0
            9999
 111306A                   .0208 .833219919.
 2205A                     .9258 37.031.33E5
  TRANSFORMER X0005A                  X0005B                                  0
 111306B
 2205B
  TRANSFORMER X0005A                  X0005C                                  0
 111306C
 2205C
C SE IRECE - TRF1 39 MVA; 230/69 kV; Xps=32.82
  TRANSFORMER                         X0006A  1.E6                            0
            9999
 1283A                    2.170286.8091.33E5
 2683A  683B                .58623.438 6.9E4
  TRANSFORMER X0006A                  X0006B                                  0
 1283B
 2683B  683C
  TRANSFORMER X0006A                  X0006C                                  0
 1283C
 2683C  683A
C SE IRECE - TRF2 40 MVA; 230/69 kV; Xps=32.82
  TRANSFORMER                         X0007A  1.E6                            0
            9999
 1283A                    2.170286.8091.33E5
 2683A  683B                .58623.438 6.9E4
  TRANSFORMER X0007A                  X0007B                                  0
 1283B
 2683B  683C
  TRANSFORMER X0007A                  X0007C                                  0
 1283C
 2683C  683A
C SE IRECE - TRF3 40 MVA; 230/69 kV; Xps=57.5
  TRANSFORMER                         X0008A  1.E6                            0
            9999
 1283A                    3.8022152.091.33E5
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 2683A  683B             1.026641.064 6.9E4
  TRANSFORMER X0008A                 X0008B                              0
 1283B
 2683B  683C
  TRANSFORMER X0008A                 X0008C                              0
 1283C
 2683C  683A
C SE IRECE - TRF4 40 MVA; 230/69 kV; Xps=32.82
  TRANSFORMER                        X0009A  1.E6                        0
            9999
 1283A                   2.170286.8091.33E5
 2683A  683B               .58623.438 6.9E4
  TRANSFORMER X0009A                 X0009B                              0
 1283B
 2683B  683C
  TRANSFORMER X0009A                 X0009C                              0
 1283C
 2683C  683A
C SE IRECE-SIN - TRF5 40 MVA; 230/13.8 kV; Xps=26.75
  TRANSFORMER                        X0010A  1.E6                        0
            9999
 1283A                   1.768870.7541.33E5
 2483A  483B               .0191 .764113800.
  TRANSFORMER X0010A                 X0010B                              0
 1283B
 2483B  483C
  TRANSFORMER X0010A                 X0010C                              0
 1283C
 2483C  483A
C SE G.OURO 1 - TRF1 192 MVA; 138/230 kV; Xps=6.08
  TRANSFORMER                        X0011A  1.E6                        0
            9999
 159029A                  .14465.785679674.
 259060A                  .401816.0711.33E5
  TRANSFORMER X0011A                 X0011B                              0
 159029B
 259060B
  TRANSFORMER X0011A                 X0011C                              0
 159029C
 259060C
C SE G.OURO 1B - TRF1 176 MVA; 34.5/230 kV; Xps=5.68
  TRANSFORMER                        X0012A  1.E6                        0
            9999
 159035A                  .0085 .338119919.
 259060A                  .375715.0281.33E5
  TRANSFORMER X0012A                 X0012B                              0
 159035B
 259060B
  TRANSFORMER X0012A                 X0012C                              0
 159035C
 259060C
C SE C.LARGO - TRF4 170 MVA; 34.5/230 kV; Xps=8.24
  TRANSFORMER                        X0013A  1.E6                        0
            9999
 158832A                  .0123 .490119919.
 258833A                  .544621.7821.33E5
  TRANSFORMER X0013A                 X0013B                              0
 158832B
 258833B
  TRANSFORMER X0013A                 X0013C                              0
 158832C
 258833C
C SE C.LARGO - TRF3 170 MVA; 34.5/230 kV; Xps=8.24
  TRANSFORMER                        X0014A  1.E6                        0
            9999
 158832A                  .0123 .490119919.
 258833A                  .544621.7821.33E5
  TRANSFORMER X0014A                 X0014B                              0
 158832B
 258833B
  TRANSFORMER X0014A                 X0014C                              0
 158832C
 258833C
C SE C.LARGO - TRF2 185 MVA; 34.5/230 kV; Xps=7.57
  TRANSFORMER                        X0015A  1.E6                        0
            9999
 158832A                  .0113 .450419919.
 258833A                  .500420.0161.33E5
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  TRANSFORMER X0015A                  X0015B                              0
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 258833B
  TRANSFORMER X0015A                  X0015C                              0
 158832C
 258833C
C SE C.LARGO - TRF1 185 MVA; 34.5/230 kV; Xps=7.57
  TRANSFORMER                         X0016A  1.E6                        0
            9999
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 258833A                   .500420.0161.33E5
  TRANSFORMER X0016A                  X0016B                              0
 158832B
 258833B
  TRANSFORMER X0016A                  X0016C                              0
 158832C
 258833C
C SE UMBURANAS -TRF1 200 MVA; 34.5/230 kV; Xps=5
  TRANSFORMER                         X0017A  1.E6                        0
            9999
 158824A                   .0074 .297619919.
 258825A                   .330613.2251.33E5
  TRANSFORMER X0017A                  X0017B                              0
 158824B
 258825B
  TRANSFORMER X0017A                  X0017C                              0
 158824C
 258825C
C SE UMBURANAS -TRF2 200 MVA; 34.5/230 kV; Xps=5
  TRANSFORMER                         X0018A  1.E6                        0
            9999
 158824A                   .0074 .297619919.
 258825A                   .330613.2251.33E5
  TRANSFORMER X0018A                  X0018B                              0
 158824B
 258825B
  TRANSFORMER X0018A                  X0018C                              0
 158824C
 258825C
C SE C.FORMOSO - TRF1 120 MVA; 34.5/230 kV; Xps=8.33
  TRANSFORMER                         X0019A  1.E6                        0
            9999
 158806A                   .0124 .495919919.
 211461A                    .55122.0421.33E5
  TRANSFORMER X0019A                  X0019B                              0
 158806B
 211461B
  TRANSFORMER X0019A                  X0019C                              0
 158806C
 211461C
C SE C.FORMOSO - TRF2 120 MVA; 34.5/230 kV; Xps=8.33
  TRANSFORMER                         X0020A  1.E6                        0
            9999
 158806A                   .0124 .495919919.
 211461A                    .55122.0421.33E5
  TRANSFORMER X0020A                  X0020B                              0
 158806B
 211461B
  TRANSFORMER X0020A                  X0020C                              0
 158806C
 211461C
C SE S.BOMFIM - TRF1 33 MVA; 230/69 kV; Xps=59.5
  TRANSFORMER                         X0021A  1.E6                        0
            9999
 1203A                    3.9344157.381.33E5
 2603A  603B              1.062342.492 6.9E4
  TRANSFORMER X0021A                  X0021B                              0
 1203B
 2603B  603C
  TRANSFORMER X0021A                  X0021C                              0
 1203C
 2603C  603A
C SE S.BOMFIM - TRF2 100 MVA; 230/69 kV; Xps=13.11
  TRANSFORMER                         X0022A  1.E6                        0
            9999
 1203A                     .866934.6761.33E5
 2603A  603B               .23419.3625 6.9E4
  TRANSFORMER X0022A                  X0022B                              0
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 1203B
 2603B  603C
  TRANSFORMER X0022A                  X0022C                                0
 1203C
 2603C  603A
C SE S.BOMFIM - TRF3 100 MVA; 230/69 kV; Xps=13.11
  TRANSFORMER                         X0023A  1.E6                          0
            9999
 1203A                     .866934.6761.33E5
 2603A  603B               .23419.3625 6.9E4
  TRANSFORMER X0023A                  X0023B                                0
 1203B
 2603B  603C
  TRANSFORMER X0023A                  X0023C                                0
 1203C
 2603C  603A
C SE S.BOMFIM - TRF4 100 MVA; 230/138 kV; Xps=9.2
  TRANSFORMER                         X0024A  1.E6                          0
            9999
 1203A                     .608424.3341.33E5
 2103A                      .2198.760279674.
  TRANSFORMER X0024A                  X0024B                                0
 1203B
 2103B
  TRANSFORMER X0024A                  X0024C                                0
 1203C
 2103C
C SE S.BOMFIM - TRF5 100 MVA; 230/138 kV; Xps=6.3
  TRANSFORMER                         X0025A  1.E6                          0
            9999
 1203A                     .416616.6631.33E5
 2103A                       .155.998979674.
  TRANSFORMER X0025A                  X0025B                                0
 1203B
 2103B
  TRANSFORMER X0025A                  X0025C                                0
 1203C
 2103C
C SE S.BOMFIM - TRF6 100 MVA; 230/138 kV; Xps=6.3
  TRANSFORMER                         X0026A  1.E6                          0
            9999
 1203A                     .416616.6631.33E5
 2103A                       .155.998979674.
  TRANSFORMER X0026A                  X0026B                                0
 1203B
 2103B
  TRANSFORMER X0026A                  X0026C                                0
 1203C
 2103C
C SE S.AZUL - TRF1 150 MVA; 34.5/230 kV; Xps=6.67
  TRANSFORMER                         X0027A  1.E6                          0
            9999
 159014A                   .0099 .396819919.
 259015A                   .440817.6331.33E5
  TRANSFORMER X0027A                  X0027B                                0
 159014B
 259015B
  TRANSFORMER X0027A                  X0027C                                0
 159014C
 259015C
C SE M.CHAPEUS - TRF1 120 MVA; 34.5/230 kV; Xps=11.67
  TRANSFORMER                         X0028A  1.E6                          0
            9999
 159057A                   .0174 .694319919.
 259058A                   .771430.8571.33E5
  TRANSFORMER X0028A                  X0028B                                0
 159057B
 259058B
  TRANSFORMER X0028A                  X0028C                                0
 159057C
 259058C
C SE M.CHAPEUS - TRF2 120 MVA; 34.5/230 kV; Xps=11.67
  TRANSFORMER                         X0029A  1.E6                          0
            9999
 159057A                   .0174 .694319919.
 259058A                   .771430.8571.33E5
  TRANSFORMER X0029A                  X0029B                                0
 159057B
```

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 259058B
  TRANSFORMER X0029A                  X0029C                                0
 159057C
 259058C
C SE V.BAHIA 2 - TRF1 130 MVA; 34.5/230 kV; Xps=10.77
  TRANSFORMER                         X0030A  1.E6                          0
            9999
 159066A                    .016 .640919919.
 259067A                   .712228.4871.33E5
  TRANSFORMER X0030A                  X0030B                                0
 159066B
 259067B
  TRANSFORMER X0030A                  X0030C                                0
 159066C
 259067C
C SE S.BABILONIA - TRF1 150 MVA; 34.5/230 kV; Xps=9.33
  TRANSFORMER                         X0031A  1.E6                          0
            9999
 159076A                   .0139 .555419919.
 259077A                   .617224.6871.33E5
  TRANSFORMER X0031A                  X0031B                                0
 159076B
 259077B
  TRANSFORMER X0031A                  X0031C                                0
 159076C
 259077C
C SE S.BABILONIA - TRF2 150 MVA; 34.5/230 kV; Xps=9.33
  TRANSFORMER                         X0032A  1.E6                          0
            9999
 159076A                   .0139 .555419919.
 259077A                   .617224.6871.33E5
  TRANSFORMER X0032A                  X0032B                                0
 159076B
 259077B
  TRANSFORMER X0032A                  X0032C                                0
 159076C
 259077C
C SE BABILONIA - TRF1 90 MVA; 34.5/230 kV; Xps=15.56
  TRANSFORMER                         X0033A  1.E6                          0
            9999
 159083A                   .0231 .925719919.
 259084A                  1.028641.1431.33E5
  TRANSFORMER X0033A                  X0033B                                0
 159083B
 259084B
  TRANSFORMER X0033A                  X0033C                                0
 159083C
 259084C
C SE BABILONIA - TRF2 90 MVA; 34.5/230 kV; Xps=15.56
  TRANSFORMER                         X0034A  1.E6                          0
            9999
 159083A                   .0231 .925719919.
 259084A                  1.028641.1431.33E5
  TRANSFORMER X0034A                  X0034B                                0
 159083B
 259084B
  TRANSFORMER X0034A                  X0034C                                0
 159083C
 259084C
C SE M.CHAPEU - TRF1 150 MVA; 69/230 kV; Xps=6.67
  TRANSFORMER                         X0035A  1.E6                          0
            9999
 1755A  755C                .11914.7634 6.9E4
 2355A                      .441117.6421.33E5
  TRANSFORMER X0035A                  X0035B                                0
 1755B  755A
 2355B
  TRANSFORMER X0035A                  X0035C                                0
 1755C  755B
 2355C
C SE M.CHAPEU 2 - TRF2 900 MVA; 230/500 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0036A  1.E6                          0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
```

```
 1355A                    .10294.11561.33E5
 2555A                    .4863 19.452.89E5
  TRANSFORMER X0036A                  X0036B                                  0
 1355B
 2555B
  TRANSFORMER X0036A                  X0036C                                  0
 1355C
 2555C
C SE M.CHAPEU 2 - TRF1 900 MVA; 230/500 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0037A  1.E6                           0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 1355A                    .10294.11561.33E5
 2555A                    .4863 19.452.89E5
  TRANSFORMER X0037A                  X0037B                                  0
 1355B
 2555B
  TRANSFORMER X0037A                  X0037C                                  0
 1355C
 2555C
C SE M.CHAPEU 2 CER - TRF1 200 MVA; 13.8/500 kV; Xps=5
  TRANSFORMER                         X0038A  1.E6                           0
           9999
 112334A12334C             .0036 .142813800.
 2555A                   1.5625  62.52.89E5
  TRANSFORMER X0038A                  X0038B                                  0
 112334B12334A
 2555B
  TRANSFORMER X0038A                  X0038C                                  0
 112334C12334B
 2555C
C SE OUROLANDIA 2 -TRF1 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0039A  1.E6                           0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111561A                  .4863 19.452.89E5
 211261A                  .10294.11561.33E5
  TRANSFORMER X0039A                  X0039B                                  0
 111561B
 211261B
  TRANSFORMER X0039A                  X0039C                                  0
 111561C
 211261C
C SE OUROLANDIA 2 -TRF2 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0040A  1.E6                           0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111561A                  .4863 19.452.89E5
 211261A                  .10294.11561.33E5
  TRANSFORMER X0040A                  X0040B                                  0
 111561B
 211261B
  TRANSFORMER X0040A                  X0040C                                  0
 111561C
 211261C
C SE OUROLANDIA 2 -TRF3 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0041A  1.E6                           0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111561A                  .4863 19.452.89E5
 211261A                  .10294.11561.33E5
  TRANSFORMER X0041A                  X0041B                                  0
```

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 111561B
 211261B
  TRANSFORMER X0041A                 X0041C                                0
 111561C
 211261C
C SE JUAZEIRO 3 - TRF2 300 MVA; 500/230 kV; Xps=2.85
  TRANSFORMER                        X0042A  1.E6                          0
           9999
 111582A                  .890635.6252.89E5
 211282A                  .18857.53831.33E5
  TRANSFORMER X0042A                 X0042B                                0
 111582B
 211282B
  TRANSFORMER X0042A                 X0042C                                0
 111582C
 211282C
C SE JUAZEIRO 3 - TRF1 300 MVA; 500/230 kV; Xps=2.85
  TRANSFORMER                        X0043A  1.E6                          0
           9999
 111582A                  .890635.6252.89E5
 211282A                  .18857.53831.33E5
  TRANSFORMER X0043A                 X0043B                                0
 111582B
 211282B
  TRANSFORMER X0043A                 X0043C                                0
 111582C
 211282C
C SE SOBRADINHO - TRF1 300 MVA; 230/500 kV; Xps=3.56
  TRANSFORMER                        X0044A  1.E6                          0
           9999
 1206A                    .23549.41621.33E5
 2506A                   1.1125  44.52.89E5
  TRANSFORMER X0044A                 X0044B                                0
 1206B
 2506B
  TRANSFORMER X0044A                 X0044C                                0
 1206C
 2506C
C SE SOBRADINHO - TRF2 300 MVA; 230/500 kV; Xps=3.56
  TRANSFORMER                        X0045A  1.E6                          0
           9999
 1206A                    .23549.41621.33E5
 2506A                   1.1125  44.52.89E5
  TRANSFORMER X0045A                 X0045B                                0
 1206B
 2506B
  TRANSFORMER X0045A                 X0045C                                0
 1206C
 2506C
C SE P.AFONSO 3 B -TRF1 600 MVA; 230/500 kV; Xps=1.41
  TRANSFORMER             9.585557.07X0048A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
           9999
 1300A                    .0935  3.741.33E5
 2500A                    .441917.6752.89E5
  TRANSFORMER X0048A                 X0048B                                0
 1300B
 2500B
  TRANSFORMER X0048A                 X0048C                                0
 1300C
 2500C
C SE P.AFONSO 2 A2 UHE - TRF1 75 MVA; 13.8/230 kV; Xps=18
  TRANSFORMER                        X0049A  1.E6                          0
           9999
 15A    5C                .0003 .514213800.
 2200A                    .0265 47.611.33E5
  TRANSFORMER X0049A                 X0049B                                0
 15B    5A
 2200B
  TRANSFORMER X0049A                 X0049C                                0
 15C    5B
 2200C
C SE P.AFONSO 3 A UHE - TRF2 90 MVA; 230/13.8 kV; Xps=15.99
  TRANSFORMER                        X0050A  1.E6                          0
```

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           9999
 1200A                    .079442.2941.33E5
 28A    8B                .0009 .456813800.
  TRANSFORMER X0050A                  X0050B                                  0
 1200B
 28B    8C
  TRANSFORMER X0050A                  X0050C                                  0
 1200C
 28C    8A
C SE P.AFONSO 3 A UHE - TRF1 75 MVA; 230/13.8 kV; Xps=20.06
  TRANSFORMER                         X0051A  1.E6                            0
           9999
 1200A                    .079453.0591.33E5
 26A    6B                .0009  .57313800.
  TRANSFORMER X0051A                  X0051B                                  0
 1200B
 26B    6C
  TRANSFORMER X0051A                  X0051C                                  0
 1200C
 26C    6A
C SE P.AFONSO 3 A -TRF1 600 MVA; 230/500 kV; Xps=1.41
  TRANSFORMER             9.585557.07X0052A  1.E6                            0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
           9999
 1200A                    .0935  3.741.33E5
 2500A                    .441917.6752.89E5
  TRANSFORMER X0052A                  X0052B                                  0
 1200B
 2500B
  TRANSFORMER X0052A                  X0052C                                  0
 1200C
 2500C
C SE P.AFONSO 3 A UHE - TRF4 240 MVA; 230/13.8 kV; Xps=2.78
  TRANSFORMER                         X0053A  1.E6                            0
           9999
 1200A                    .18357.33991.33E5
 210A   10B                .002 .079313800.
  TRANSFORMER X0053A                  X0053B                                  0
 1200B
 210B   10C
  TRANSFORMER X0053A                  X0053C                                  0
 1200C
 210C   10A
C SE P.AFONSO 3 A UHE - TRF3 90 MVA; 230/13.8 kV; Xps=15.73
  TRANSFORMER                         X0054A  1.E6                            0
           9999
 1200A                    .079441.6061.33E5
 29A    9B                .0009 .449313800.
  TRANSFORMER X0054A                  X0054B                                  0
 1200B
 29B    9C
  TRANSFORMER X0054A                  X0054C                                  0
 1200C
 29C    9A
C SE P.AFONSO 2 B1 UHE - TRF1 90 MVA; 13.8/230 kV; Xps=15.1
  TRANSFORMER                         X0055A  1.E6                            0
           9999
 17A    7C                .0003 .431313800.
 2200A                    .0265 39.941.33E5
  TRANSFORMER X0055A                  X0055B                                  0
 17B    7A
 2200B
  TRANSFORMER X0055A                  X0055C                                  0
 17C    7B
 2200C
C SE P.AFONSO 2-A1 UHE - TRF1 75 MVA; 13.8/230 kV; Xps=18
  TRANSFORMER                         X0056A  1.E6                            0
           9999
 14A    4C                .0003 .514213800.
 2200A                    .0265 47.611.33E5
  TRANSFORMER X0056A                  X0056B                                  0
 14B    4A
 2200B
  TRANSFORMER X0056A                  X0056C                                  0
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 14C    4B
 2200C
C SE P.AFONSO 3 B UHE - TRF1 67 MVA; 230/13.8 kV; Xps=10.66
  TRANSFORMER                          X0057A  1.E6                          0
            9999
 1300A                     .039728.2061.33E5
 21A    1B                 .0004 .304613800.
  TRANSFORMER X0057A                   X0057B                                0
 1300B
 21B    1C
  TRANSFORMER X0057A                   X0057C                                0
 1300C
 21C    1A
C SE P.AFONSO 3 B UHE - TRF2 240 MVA; 230/13.8 kV; Xps=6.07
  TRANSFORMER                          X0058A  1.E6                          0
            9999
 1300A                     .026516.0551.33E5
 211A   11B                .0003 .173413800.
  TRANSFORMER X0058A                   X0058B                                0
 1300B
 211B   11C
  TRANSFORMER X0058A                   X0058C                                0
 1300C
 211C   11A
C SE GARANHUNS - TRF1 600 MVA; 230/500 kV; Xps=2.23
  TRANSFORMER               9.585557.07X0060A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1349A                     .14755.89841.33E5
 2549A                     .696927.8752.89E5
  TRANSFORMER X0060A                   X0060B                                0
 1349B
 2549B
  TRANSFORMER X0060A                   X0060C                                0
 1349C
 2549C
C SE ANGELIM - TRF1 600 MVA; 230/500 kV; Xps=1.78
  TRANSFORMER               9.585557.07X0061A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1240A                     .11754.70021.33E5
 2540A                     .555322.2122.89E5
  TRANSFORMER X0061A                   X0061B                                0
 1240B
 2540B
  TRANSFORMER X0061A                   X0061C                                0
 1240C
 2540C
C SE ANGELIM - TRF1 600 MVA; 230/500 kV; Xps=1.78
  TRANSFORMER               9.585557.07X0063A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1240A                     .11754.70021.33E5
 2540A                     .555322.2122.89E5
  TRANSFORMER X0063A                   X0063B                                0
 1240B
 2540B
  TRANSFORMER X0063A                   X0063C                                0
 1240C
 2540C
C SE XINGO UHE - TRF1 3000 MVA; 500/13.8 kV; Xps=1.28
  TRANSFORMER                          X0066A  1.E6                          0
            9999
 1504A                        .4   16.2.89E5
 289A   89B                .0009 .036613800.
  TRANSFORMER X0066A                   X0066B                                0
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 1504B
 289B   89C
  TRANSFORMER X0066A                  X0066C                                0
 1504C
 289C   89A
C SE CAMAÇARI B1 - TRF1 600 MVA; 230/500 kV; Xps=1.17
  TRANSFORMER              9.585557.07X0068A  1.E6                         0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1274A                     .07743.09471.33E5
 2574A                     .365614.6252.89E5
  TRANSFORMER X0068A                  X0068B                                0
 1274B
 2574B
  TRANSFORMER X0068A                  X0068C                                0
 1274C
 2574C
C SE CAMAÇARI B1 - TRF2 600 MVA; 230/500 kV; Xps=1.15
  TRANSFORMER              9.585557.07X0069A  1.E6                         0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1274A                      .0763.04181.33E5
 2574A                     .359414.3752.89E5
  TRANSFORMER X0069A                  X0069B                                0
 1274B
 2574B
  TRANSFORMER X0069A                  X0069C                                0
 1274C
 2574C
C SE CAMAÇARI B2 - TRF1 600 MVA; 230/500 kV; Xps=1.13
  TRANSFORMER              9.585557.07X0070A  1.E6                         0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1294A                     .07472.98891.33E5
 2574A                     .353114.1252.89E5
  TRANSFORMER X0070A                  X0070B                                0
 1294B
 2574B
  TRANSFORMER X0070A                  X0070C                                0
 1294C
 2574C
C SE CAMAÇARI B2 - TRF2 600 MVA; 230/500 kV; Xps=1.01
  TRANSFORMER              9.585557.07X0071A  1.E6                         0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1294A                     .06682.67151.33E5
 2574A                     .315612.6252.89E5
  TRANSFORMER X0071A                  X0071B                                0
 1294B
 2574B
  TRANSFORMER X0071A                  X0071C                                0
 1294C
 2574C
C SE JARDIM - TRF1 100 MVA; 230/69 kV; Xps=12.99
  TRANSFORMER                         X0072A  1.E6                          0
            9999
 1294A                      .85934.3591.33E5
 2674A  674B               .23199.2768 6.9E4
  TRANSFORMER X0072A                  X0072B                                0
 1294B
 2674B  674C
  TRANSFORMER X0072A                  X0072C                                0
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 1294C
 2674C  674A
C SE CAMAÇARI B1 - TRF1 100 MVA; 230/69 kV; Xps=12.92
  TRANSFORMER                          X0073A  1.E6                          0
            9999
 1274A                    .854334.1731.33E5
 2674A  674B              .23079.2268 6.9E4
  TRANSFORMER X0073A                   X0073B                                0
 1274B
 2674B  674C
  TRANSFORMER X0073A                   X0073C                                0
 1274C
 2674C  674A
C SE JARDIM - TRF1 600 MVA; 230/500 kV; Xps=1.27
  TRANSFORMER              9.585557.07X0076A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1273A                     .0843.35921.33E5
 2573A                    .396915.8752.89E5
  TRANSFORMER X0076A                   X0076B                                0
 1273B
 2573B
  TRANSFORMER X0076A                   X0076C                                0
 1273C
 2573C
C SE JARDIM - TRF2 600 MVA; 230/500 kV; Xps=1.27
  TRANSFORMER              9.585557.07X0077A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1273A                     .0843.35921.33E5
 2573A                    .396915.8752.89E5
  TRANSFORMER X0077A                   X0077B                                0
 1273B
 2573B
  TRANSFORMER X0077A                   X0077C                                0
 1273C
 2573C
C SE JARDIM - TRF3 600 MVA; 230/500 kV; Xps=1.27
  TRANSFORMER              9.585557.07X0078A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1273A                     .0843.35921.33E5
 2573A                    .396915.8752.89E5
  TRANSFORMER X0078A                   X0078B                                0
 1273B
 2573B
  TRANSFORMER X0078A                   X0078C                                0
 1273C
 2573C
C SE N.S.SOCORRO - TRF1 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                          X0079A  1.E6                          0
            9999
 111273A                  .616924.6781.33E5
 211673A11673B            .1666 6.663 6.9E4
  TRANSFORMER X0079A                   X0079B                                0
 111273B
 211673B11673C
  TRANSFORMER X0079A                   X0079C                                0
 111273C
 211673C11673A
C SE N.S.SOCORRO - TRF2 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                          X0080A  1.E6                          0
            9999
 111273A                  .616924.6781.33E5
 211673A11673B            .1666 6.663 6.9E4
  TRANSFORMER X0080A                   X0080B                                0
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 111273B
 211673B11673C
  TRANSFORMER X0080A                  X0080C                                0
 111273C
 211673C11673A
C SE N.S.SOCORRO - TRF3 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                         X0081A  1.E6                          0
            9999
 111273A                   .616924.6781.33E5
 211673A11673B             .1666 6.663 6.9E4
  TRANSFORMER X0081A                  X0081B                                0
 111273B
 211673B11673C
  TRANSFORMER X0081A                  X0081C                                0
 111273C
 211673C11673A
C SE JARDIM - TRF1 100 MVA; 230/69 kV; Xps=12.99
  TRANSFORMER                         X0082A  1.E6                          0
            9999
 1273A                      .85934.3591.33E5
 2673A  673B               .23199.2768 6.9E4
  TRANSFORMER X0082A                  X0082B                                0
 1273B
 2673B  673C
  TRANSFORMER X0082A                  X0082C                                0
 1273C
 2673C  673A
C SE JARDIM - TRF2 100 MVA; 230/69 kV; Xps=13.95
  TRANSFORMER                         X0083A  1.E6                          0
            9999
 1273A                     .922436.8981.33E5
 2673A  673B               .24919.9624 6.9E4
  TRANSFORMER X0083A                  X0083B                                0
 1273B
 2673B  673C
  TRANSFORMER X0083A                  X0083C                                0
 1273C
 2673C  673A
C SE JARDIM - TRF3 100 MVA; 230/69 kV; Xps=12.81
  TRANSFORMER                         X0084A  1.E6                          0
            9999
 1273A                     .847133.8831.33E5
 2673A  673B               .22879.1483 6.9E4
  TRANSFORMER X0084A                  X0084B                                0
 1273B
 2673B  673C
  TRANSFORMER X0084A                  X0084C                                0
 1273C
 2673C  673A
C SE JARDIM - TRF4 100 MVA; 230/69 kV; Xps=12.99
  TRANSFORMER                         X0085A  1.E6                          0
            9999
 1273A                      .85934.3591.33E5
 2673A  673B               .23199.2768 6.9E4
  TRANSFORMER X0085A                  X0085B                                0
 1273B
 2673B  673C
  TRANSFORMER X0085A                  X0085C                                0
 1273C
 2673C  673A
C SE CAMAÇARI 4 - TRF1 1200 MVA; 500/230 kV; Xps=1.17
  TRANSFORMER             8.8183 1211.X0092A  1.E6                          0
      8.81831992       1210.9992
      25.5549097      1254.96465
      48.7199698      1316.68955
      211.815449      1349.28463
      1046.53738      1436.34923
            9999
 1584A                     .365614.6252.89E5
 2284A                     .07743.09471.33E5
  TRANSFORMER X0092A                  X0092B                                0
 1584B
 2284B
  TRANSFORMER X0092A                  X0092C                                0
 1584C
 2284C
C SE CAMAÇARI 4 - TRF2 1200 MVA; 500/230 kV; Xps=1.17
  TRANSFORMER             8.8183 1211.X0093A  1.E6                          0
```

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      8.81831992       1210.9992
      25.5549097      1254.96465
      48.7199698      1316.68955
      211.815449      1349.28463
      1046.53738      1436.34923
            9999
 1584A                    .365614.6252.89E5
 2284A                    .07743.09471.33E5
  TRANSFORMER X0093A                 X0093B                                0
 1584B
 2284B
  TRANSFORMER X0093A                 X0093C                                0
 1584C
 2284C
C SE F.SANTANA3 - TRF1 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                        X0094A  1.E6                          0
            9999
 111110A                  .616924.6781.33E5
 218763A18763B            .1666 6.663 6.9E4
  TRANSFORMER X0094A                 X0094B                                0
 111110B
 218763B18763C
  TRANSFORMER X0094A                 X0094C                                0
 111110C
 218763C18763A
C SE F.SANTANA3 - TRF2 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                        X0095A  1.E6                          0
            9999
 111110A                  .616924.6781.33E5
 218763A18763B            .1666 6.663 6.9E4
  TRANSFORMER X0095A                 X0095B                                0
 111110B
 218763B18763C
  TRANSFORMER X0095A                 X0095C                                0
 111110C
 218763C18763A
C SE P.CAVALO UHE - TRF1 90 MVA; 230/13.8 kV; Xps=13.47
  TRANSFORMER                        X0096A  1.E6                          0
            9999
 1375A                    .890735.6281.33E5
 248A   48B               .0096 .384813800.
  TRANSFORMER X0096A                 X0096B                                0
 1375B
 248B   48C
  TRANSFORMER X0096A                 X0096C                                0
 1375C
 248C   48A
C SE G.MANGABEIRA - TRF1 100 MVA; 230/69 kV; Xps=13
  TRANSFORMER                        X0097A  1.E6                          0
            9999
 1275A                    .859634.3851.33E5
 2675A  675B              .2321 9.284 6.9E4
  TRANSFORMER X0097A                 X0097B                                0
 1275B
 2675B  675C
  TRANSFORMER X0097A                 X0097C                                0
 1275C
 2675C  675A
C SE G.MANGABEIRA - TRF1 100 MVA; 230/69 kV; Xps=13
  TRANSFORMER                        X0098A  1.E6                          0
            9999
 1275A                    .859634.3851.33E5
 2675A  675B              .2321 9.284 6.9E4
  TRANSFORMER X0098A                 X0098B                                0
 1275B
 2675B  675C
  TRANSFORMER X0098A                 X0098C                                0
 1275C
 2675C  675A
C SE SAPEAÇU - TRF1 600 MVA; 230/500 kV; Xps=1.4
  TRANSFORMER              9.585557.07X0099A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1289A                    .0926 3.7031.33E5
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 2589A                    .4375  17.52.89E5
  TRANSFORMER X0099A                  X0099B                                0
 1289B
 2589B
  TRANSFORMER X0099A                  X0099C                                0
 1289C
 2589C
C SE SAPEAÇU - TRF2 600 MVA; 230/500 kV; Xps=1.4
  TRANSFORMER              9.585557.07X0100A  1.E6                         0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1289A                    .0926 3.7031.33E5
 2589A                    .4375  17.52.89E5
  TRANSFORMER X0100A                  X0100B                                0
 1289B
 2589B
  TRANSFORMER X0100A                  X0100C                                0
 1289C
 2589C
C SE SAPEAÇU - TRF3 600 MVA; 230/500 kV; Xps=1.4
  TRANSFORMER              9.585557.07X0101A  1.E6                         0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1289A                    .0926 3.7031.33E5
 2589A                    .4375  17.52.89E5
  TRANSFORMER X0101A                  X0101B                                0
 1289B
 2589B
  TRANSFORMER X0101A                  X0101C                                0
 1289C
 2589C
C SE POÇÕES 2 - TRF1 100 MVA; 230/138 kV; Xps=11.8
  TRANSFORMER                         X0108A  1.E6                          0
            9999
 1209A                    .780331.2111.33E5
 2909A                    .280911.23679674.
  TRANSFORMER X0108A                  X0108B                                0
 1209B
 2909B
  TRANSFORMER X0108A                  X0108C                                0
 1209C
 2909C
C SE POÇÕES 2 - TRF2 100 MVA; 230/138 kV; Xps=11.8
  TRANSFORMER                         X0109A  1.E6                          0
            9999
 1209A                    .780331.2111.33E5
 2909A                    .280911.23679674.
  TRANSFORMER X0109A                  X0109B                                0
 1209B
 2909B
  TRANSFORMER X0109A                  X0109C                                0
 1209C
 2909C
C SE FUNIL CER - TRF1 200 MVA; 230/13.8 kV; Xps=4.55
  TRANSFORMER                         X0110A  1.E6                          0
            9999
 1276A                    .300912.0351.33E5
 2476A  476B              .0032   .1313800.
  TRANSFORMER X0110A                  X0110B                                0
 1276B
 2476B  476C
  TRANSFORMER X0110A                  X0110C                                0
 1276C
 2476C  476A
C SE FUNIL - TRF2 100 MVA; 230/138 kV; Xps=11.8
  TRANSFORMER            1.5973557.07X0111A  1.E6                          0
      1.59734032      557.067183
      4.62898693      577.291566
      8.82507926      605.685405
      38.3680067      620.679344
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      189.568577        660.7296
            9999
 1276A                     .780331.2111.33E5
 2976A                     .280911.23679674.
  TRANSFORMER X0111A                  X0111B                                0
 1276B
 2976B
  TRANSFORMER X0111A                  X0111C                                0
 1276C
 2976C
C SE FUNIL - TRF3 100 MVA; 230/138 kV; Xps=11.8
  TRANSFORMER             1.5973557.07X0112A  1.E6                          0
      1.59734032      557.067183
      4.62898693      577.291566
      8.82507926      605.685405
      38.3680067      620.679344
      189.568577        660.7296
            9999
 1276A                     .780331.2111.33E5
 2976A                     .280911.23679674.
  TRANSFORMER X0112A                  X0112B                                0
 1276B
 2976B
  TRANSFORMER X0112A                  X0112C                                0
 1276C
 2976C
C SE FUNIL - TRF4 100 MVA; 230/138 kV; Xps=11.24
  TRANSFORMER             1.5973557.07X0113A  1.E6                          0
      1.59734032      557.067183
      4.62898693      577.291566
      8.82507926      605.685405
      38.3680067      620.679344
      189.568577        660.7296
            9999
 1276A                     .7432 29.731.33E5
 2976A                     .267610.70379674.
  TRANSFORMER X0113A                  X0113B                                0
 1276B
 2976B
  TRANSFORMER X0113A                  X0113C                                0
 1276C
 2976C
C SE FUNIL - TRF5 100 MVA; 230/138 kV; Xps=12.06
  TRANSFORMER             1.5973557.07X0114A  1.E6                          0
      1.59734032      557.067183
      4.62898693      577.291566
      8.82507926      605.685405
      38.3680067      620.679344
      189.568577        660.7296
            9999
 1276A                     .797531.8991.33E5
 2976A                     .287111.48379674.
  TRANSFORMER X0114A                  X0114B                                0
 1276B
 2976B
  TRANSFORMER X0114A                  X0114C                                0
 1276C
 2976C
C SE ITAPEBI UHE - TRF1 160 MVA; 230/13.8 kV; Xps=8.16
  TRANSFORMER                         X0115A  1.E6                          0
            9999
 1263A                     .539321.5731.33E5
 295A   95B                .0058  .23313800.
  TRANSFORMER X0115A                  X0115B                                0
 1263B
 295B   95C
  TRANSFORMER X0115A                  X0115C                                0
 1263C
 295C   95A
C SE SAPEAÇU CER - TRF1 250 MVA; 13.8/230 kV; Xps=3.2
  TRANSFORMER                         X0116A  1.E6                          0
            9999
 112333A12333C             .0023 .091413800.
 2289A                     .2116 8.4641.33E5
  TRANSFORMER X0116A                  X0116B                                0
 112333B12333A
 2289B
  TRANSFORMER X0116A                  X0116C                                0
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 112333C12333B
 2289C
C SE S.A.JESUS - TRF1 100 MVA; 230/69 kV; Xps=12.8
  TRANSFORMER                          X0117A  1.E6                          0
            9999
 1264A                     .846433.8561.33E5
 2664A  664B               .22859.1411 6.9E4
  TRANSFORMER X0117A                   X0117B                                0
 1264B
 2664B  664C
  TRANSFORMER X0117A                   X0117C                                0
 1264C
 2664C  664A
C SE S.A.JESUS - TRF2 100 MVA; 230/69 kV; Xps=13
  TRANSFORMER                          X0118A  1.E6                          0
            9999
 1264A                     .859634.3851.33E5
 2664A  664B               .2321 9.284 6.9E4
  TRANSFORMER X0118A                   X0118B                                0
 1264B
 2664B  664C
  TRANSFORMER X0118A                   X0118C                                0
 1264C
 2664C  664A
C SE S.A.JESUS - TRF3 100 MVA; 230/69 kV; Xps=13
  TRANSFORMER                          X0119A  1.E6                          0
            9999
 1264A                     .859634.3851.33E5
 2664A  664B               .2321 9.284 6.9E4
  TRANSFORMER X0119A                   X0119B                                0
 1264B
 2664B  664C
  TRANSFORMER X0119A                   X0119C                                0
 1264C
 2664C  664A
C SE POÇÕES 3 - TRF1 600 MVA; 500/230 kV; Xps=1.4
  TRANSFORMER             4.4092 1211.X0120A  1.E6                          0
      4.40915996       1210.9992
      12.7774549      1254.96465
      24.3599849      1316.68955
      105.907725      1349.28463
      523.268692      1436.34923
            9999
 111612A                   .4375  17.52.89E5
 218612A                   .0926 3.7031.33E5
  TRANSFORMER X0120A                   X0120B                                0
 111612B
 218612B
  TRANSFORMER X0120A                   X0120C                                0
 111612C
 218612C
C SE FUNIL  - TRF1 50 MVA; 115/138 kV; Xps=8.78
  TRANSFORMER                          X0121A  1.E6                          0
            9999
 1176A                     .14515.805866395.
 2976A                      .2098.360379674.
  TRANSFORMER X0121A                   X0121B                                0
 1176B
 2976B
  TRANSFORMER X0121A                   X0121C                                0
 1176C
 2976C
C SE FUNIL UHE - TRF2 14 MVA; 115/13.8 kV; Xps=68.47
  TRANSFORMER                          X0122A  1.E6                          0
            9999
 1176A                    1.131945.27766395.
 263A   63B                .0489 1.95613800.
  TRANSFORMER X0122A                   X0122B                                0
 1176B
 263B   63C
  TRANSFORMER X0122A                   X0122C                                0
 1176C
 263C   63A
C SE FUNIL - TRF1  28 MVA; 138/13.8 kV; Xps=35.67
  TRANSFORMER                          X0123A  1.E6                          0
            9999
 1976A                     .849133.96579674.
 2876A  876B               .02551.018913800.
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  TRANSFORMER X0123A                  X0123B                                  0
 1976B
 2876B  876C
  TRANSFORMER X0123A                  X0123C                                  0
 1976C
 2876C  876A
C SE P.PARAISO 2 CER - TRF1 350 MVA; 500/13.8 kV; Xps=3.43
  TRANSFORMER                         X0136A  1.E6                            0
            9999
 138975A                  1.071942.8752.89E5
 238976A38976B             .0024  .09813800.
  TRANSFORMER X0136A                  X0136B                                  0
 138975B
 238976B38976C
  TRANSFORMER X0136A                  X0136C                                  0
 138975C
 238976C38976A
C SE IBICOARA - TRF1 300 MVA; 500/230 kV; Xps=4.92
  TRANSFORMER                         X0137A  1.E6                            0
            9999
 1588A                    1.5375  61.52.89E5
 2288A                     .325313.0131.33E5
  TRANSFORMER X0137A                  X0137B                                  0
 1588B
 2288B
  TRANSFORMER X0137A                  X0137C                                  0
 1588C
 2288C
C SE IBICOARA - TRF1 300 MVA; 500/230 kV; Xps=4.92
  TRANSFORMER                         X0138A  1.E6                            0
            9999
 1588A                    1.5375  61.52.89E5
 2288A                     .325313.0131.33E5
  TRANSFORMER X0138A                  X0138B                                  0
 1588B
 2288B
  TRANSFORMER X0138A                  X0138C                                  0
 1588C
 2288C
C SE P.AFONSO4 UHE - TRF1 450 MVA; 500/13.8 kV; Xps=0.9
  TRANSFORMER                         X0139A  1.E6                            0
            9999
 1500A                     .281811.2742.89E5
 214A   14B                .0006 .025813800.
  TRANSFORMER X0139A                  X0139B                                  0
 1500B
 214B   14C
  TRANSFORMER X0139A                  X0139C                                  0
 1500C
 214C   14A
C Reator LT M.CHAPEU 2 LT 500 kV M.CHAPEU 2 - SAPEAÇU C1 - 180 Mvar
  555A                      4.631388.9                                        0
  555B                      4.631388.9                                        0
  555C                      4.631388.9                                        0
C Reator LT SAPEAÇU LT 500 kV M.CHAPEU 2 - SAPEAÇU C1 - 180 Mvar
  589A                      4.631388.9                                        0
  589B                      4.631388.9                                        0
  589C                      4.631388.9                                        0
C Reator LT L.GONZAGA LT 500 kV JUAZEIRO 3 - L.GONZAGA C2 - 150 Mvar
  505A                      5.561666.7                                        0
  505B                      5.561666.7                                        0
  505C                      5.561666.7                                        0
C Reator LT L.GONZAGA LT 500 kV JUAZEIRO 3 - L.GONZAGA C1 - 150 Mvar
  505A                      5.561666.7                                        0
  505B                      5.561666.7                                        0
  505C                      5.561666.7                                        0
C Reator LT OLINDINA LT 500 kV P.SERGIPE - OLINDINA C1 - 100 Mvar
  582A  RN400C              8.33 2500.                                        0
  582B  RN400C              8.33 2500.                                        0
  582C  RN400C              8.33 2500.                                        0
C Reator LT P.SERGIPE LT 500 kV P.SERGIPE - OLINDINA C1 - 100 Mvar
  11151ARN400D              8.33 2500.                                        0
  11151BRN400D              8.33 2500.                                        0
  11151CRN400D              8.33 2500.                                        0
C Reator LT OUROLANDIA 2 LT 500 kV JUAZEIRO 3 - OUROLANDIA 2 C1 - 100 Mvar
  11561A                    8.33 2500.                                        0
  11561B                    8.33 2500.                                        0
  11561C                    8.33 2500.                                        0
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C Reator LT SOBRADINHO LT 500 kV SOBRADINHO - JUAZEIRO 3 C1 - 100 Mvar
  506A                    8.33 2500.                                    0
  506B                    8.33 2500.                                    0
  506C                    8.33 2500.                                    0
C Reator LT SOBRADINHO LT 500 kV SOBRADINHO - JUAZEIRO 3 C2 - 150 Mvar
  506A                    5.561666.7                                    0
  506B                    5.561666.7                                    0
  506C                    5.561666.7                                    0
C Reator LT OLINDINA LT 500 kV P.AFONSO 4 - OLINDINA C1 - 150 Mvar
  582A                    5.561666.7                                    0
  582B                    5.561666.7                                    0
  582C                    5.561666.7                                    0
C Reator LT OLINDINA LT 500 kV L.GONZAGA - OLINDINA C1 - 150 Mvar
  582A                    5.561666.7                                    0
  582B                    5.561666.7                                    0
  582C                    5.561666.7                                    0
C Reator LT MILAGRES 2 LT 500 kV L.GONZAGA - MILAGRES 2 C1 - 120 Mvar
  11567A                  6.942083.3                                    0
  11567B                  6.942083.3                                    0
  11567C                  6.942083.3                                    0
C Reator LT MILAGRES 2 LT 500 kV L.GONZAGA - MILAGRES 2 C1 - 120 Mvar
  11567A                  6.942083.3                                    0
  11567B                  6.942083.3                                    0
  11567C                  6.942083.3                                    0
C Reator LT L.GONZAGA LT 500 kV L.GONZAGA - MILAGRES 2 C1 - 120 Mvar
  505A                    6.942083.3                                    0
  505B                    6.942083.3                                    0
  505C                    6.942083.3                                    0
C Reator LT L.GONZAGA LT 500 kV L.GONZAGA - MILAGRES 2 C1 - 120 Mvar
  505A                    6.942083.3                                    0
  505B                    6.942083.3                                    0
  505C                    6.942083.3                                    0
C Reator LT GARANHUNS 2 LT 500 kV L.GONZAGA - GARANHUNS 2 C2 - 150 Mvar
  549A                    5.561666.7                                    0
  549B                    5.561666.7                                    0
  549C                    5.561666.7                                    0
C Reator LT GARANHUNS 2 LT 500 kV L.GONZAGA - GARANHUNS 2 C1 - 150 Mvar
  549A                    5.561666.7                                    0
  549B                    5.561666.7                                    0
  549C                    5.561666.7                                    0
C Reator LT ANGELIM LT 500 kV GARANHUNS 2 - ANGELIM C1 - 150 Mvar
  540A                    5.561666.7                                    0
  540B                    5.561666.7                                    0
  540C                    5.561666.7                                    0
C Reator LT MESSIAS LT 500 kV XINGO - MESSIAS C1 - 150 Mvar
  542A                    5.561666.7                                    0
  542B                    5.561666.7                                    0
  542C                    5.561666.7                                    0
C Reator LT ANGELIM LT 500 kV XINGO - ANGELIM C1 - 150 Mvar
  540A                    5.561666.7                                    0
  540B                    5.561666.7                                    0
  540C                    5.561666.7                                    0
C Reator LT ANGELIM LT 500 kV P.AFONSO 4 - ANGELIM C1 - 150 Mvar
  540A                    5.561666.7                                    0
  540B                    5.561666.7                                    0
  540C                    5.561666.7                                    0
C Reator LT JARDIM LT 500 kV XINGO - JARDIM C1 - 100 Mvar
  573A                    8.33 2500.                                    0
  573B                    8.33 2500.                                    0
  573C                    8.33 2500.                                    0
C Reator LT JARDIM LT 500 kV XINGO - JARDIM C1 - 100 Mvar
  573A                    8.33 2500.                                    0
  573B                    8.33 2500.                                    0
  573C                    8.33 2500.                                    0
C Reator LT P.PARAISO 2 LT 500 kV POÇÕES 3 - P.PARAISO 2 C1 - 270 Mvar
  38975A                  3.09925.93                                    0
  38975B                  3.09925.93                                    0
  38975C                  3.09925.93                                    0
C Reator LT POÇÕES 3 LT 500 kV POÇÕES 3 - P.PARAISO 2 C1 - 270 Mvar
  11612A                  3.09925.93                                    0
  11612B                  3.09925.93                                    0
  11612C                  3.09925.93                                    0
C Reator LT POÇÕES 3 LT 500 kV POÇÕES 3 - P.PARAISO 2 C2 - 270 Mvar
  11612A                  3.09925.84                                    0
  11612B                  3.09925.84                                    0
  11612C                  3.09925.84                                    0
C Reator LT P.PARAISO 2 LT 500 kV POÇÕES 3 - P.PARAISO 2 C2 - 270 Mvar
  38975A                  3.09925.93                                    0
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  38975B                    3.09925.93                                    0
  38975C                    3.09925.93                                    0
C Reator LT POÇÕES 3 LT 500 kV SAPEAÇU - POÇÕES 3 C1 - 185 Mvar
  11612A                     4.51351.3                                    0
  11612B                     4.51351.3                                    0
  11612C                     4.51351.3                                    0
C Reator LT SAPEAÇU LT 500 kV SAPEAÇU - POÇÕES 3 C1 - 185 Mvar
  589A                       4.51351.3                                    0
  589B                       4.51351.3                                    0
  589C                       4.51351.3                                    0
C Reator LT IBICOARA LT 500 kV IBICOARA - SAPEAÇU C1 - 200 Mvar
  588A                      4.17 1250.                                    0
  588B                      4.17 1250.                                    0
  588C                      4.17 1250.                                    0
C Reator LT IBICOARA LT 500 kV IBICOARA - POÇÕES 3 C1 - 110 Mvar
  588A                      7.582272.7                                    0
  588B                      7.582272.7                                    0
  588C                      7.582272.7                                    0
C Reator LT SAPEAÇU LT 500 kV IBICOARA - SAPEAÇU C1 - 150 Mvar
  589A                      5.561666.7                                    0
  589B                      5.561666.7                                    0
  589C                      5.561666.7                                    0
C Reator LT POÇÕES 3 LT 500 kV IBICOARA - POÇÕES 3 C1 - 100 Mvar
  11612A                    8.33 2500.                                    0
  11612B                    8.33 2500.                                    0
  11612C                    8.33 2500.                                    0
C Reator LT IBICOARA LT 500 kV IGAPORÃ 3 - IBICOARA C1 - 200 Mvar
  588A                      4.17 1250.                                    0
  588B                      4.17 1250.                                    0
  588C                      4.17 1250.                                    0
C Reator LT SAPEAÇU LT 500 kV OLINDINA - SAPEAÇU C1 - 100 Mvar
  589A  RN800A              8.33 2500.                                    0
  589B  RN800A              8.33 2500.                                    0
  589C  RN800A              8.33 2500.                                    0
C Reator LT OLINDINA LT 500 kV OLINDINA - SAPEAÇU C1 - 100 Mvar
  582A  RN800B              8.33 2500.                                    0
  582B  RN800B              8.33 2500.                                    0
  582C  RN800B              8.33 2500.                                    0
C Reator de Barra SE G.OURO 2 500 kV - 1x400 Mvar
  11560A                   2.137  641.                                    0
  11560B                   2.137  641.                                    0
  11560C                   2.137  641.                                    0
C Reator de Barra SE G.OURO 2 500 kV - 1x200 Mvar
  11560A                   4.167 1250.                                    0
  11560B                   4.167 1250.                                    0
  11560C                   4.167 1250.                                    0
C Reator de Barra SE G.OURO CER 13.8 kV - 1x26 Mvar
  11562A                    .025 7.381                                    0
  11562B                    .025 7.381                                    0
  11562C                    .025 7.381                                    0
C Reator de Barra SE B.J.LAPA 230 kV - 1x10 Mvar
  285A                    17.633 5290.                                    0
  285B                    17.633 5290.                                    0
  285C                    17.633 5290.                                    0
C Reator de Barra SE M.CHAPEU 2 230 kV - 1x20 Mvar
  355A                      8.817 2645.                                   0
  355B                      8.817 2645.                                   0
  355C                      8.817 2645.                                   0
C Reator de Barra SE M.CHAPEU 2 500 kV - 1x150 Mvar
  555A                      5.5561666.8                                   0
  555B                      5.5561666.8                                   0
  555C                      5.5561666.8                                   0
C Reator de Barra SE OUROLANDIA 2 500 kV - 1x100 Mvar
  11561A                    8.333 2500.                                   0
  11561B                    8.333 2500.                                   0
  11561C                    8.333 2500.                                   0
C Reator de Barra SE JUAZEIRO 3 500 kV - 1x150 Mvar
  11582A                    5.5561666.8                                   0
  11582B                    5.5561666.8                                   0
  11582C                    5.5561666.8                                   0
C Reator de Barra SE SOBRADINHO 500 kV - 1x400 Mvar
  506A                      2.083  625.                                   0
  506B                      2.083  625.                                   0
  506C                      2.083  625.                                   0
C Reator de Barra SE MILAGRES 2 500 kV - 1x575 Mvar
  11567A                    1.449434.75                                   0
  11567B                    1.449434.75                                   0
  11567C                    1.449434.75                                   0
```

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C Reator de Barra SE MILAGRES 2 500 kV - 1x200 Mvar
  11567A                  4.167 1250.                                  0
  11567B                  4.167 1250.                                  0
  11567C                  4.167 1250.                                  0
C Reator de Barra SE OLINDINA 500 kV - 1x150 Mvar
  582A                    5.5561666.8                                  0
  582B                    5.5561666.8                                  0
  582C                    5.5561666.8                                  0
C Reator de Barra SE GARANHUNS 2 500 kV - 1x100 Mvar
  549A                    8.333 2500.                                  0
  549B                    8.333 2500.                                  0
  549C                    8.333 2500.                                  0
C Reator de Barra SE GARANHUNS 2 500 kV - 1x150 Mvar
  549A                    5.5561666.8                                  0
  549B                    5.5561666.8                                  0
  549C                    5.5561666.8                                  0
C Reator de Barra SE ANGELIM 500 kV - 1x150 Mvar
  540A                    5.5561666.8                                  0
  540B                    5.5561666.8                                  0
  540C                    5.5561666.8                                  0
C Reator de Barra SE P.SERGIPE 500 kV - 1x150 Mvar
  11151A                  5.5561666.8                                  0
  11151B                  5.5561666.8                                  0
  11151C                  5.5561666.8                                  0
C Reator de Barra SE SAPEAÇU CER 13.8 kV - 1x90 Mvar
  12333A                   .007 2.119                                  0
  12333B                   .007 2.119                                  0
  12333C                   .007 2.119                                  0
C Reator de Barra SE ITAGIBA 230 kV - 1x10 Mvar
  213A                   17.633 5290.                                  0
  213B                   17.633 5290.                                  0
  213C                   17.633 5290.                                  0
C Reator de Barra SE FUNIL CER 13.8 kV - 1x67 Mvar
  476A                     .009 2.842                                  0
  476B                     .009 2.842                                  0
  476C                     .009 2.842                                  0
C Reator de Barra SE POÇÕES 3 500 kV - 1x150 Mvar
  11612A                  5.5561666.8                                  0
  11612B                  5.5561666.8                                  0
  11612C                  5.5561666.8                                  0
C Reator de Barra SE IGAPORÃ 3 500 kV - 1x350 Mvar
  11594A                  2.381714.25                                  0
  11594B                  2.381714.25                                  0
  11594C                  2.381714.25                                  0
C Reator de Barra SE IGAPORÃ 3 500 kV - 1x150 Mvar
  11594A                  5.5561666.8                                  0
  11594B                  5.5561666.8                                  0
  11594C                  5.5561666.8                                  0
C Reator de Barra SE P.PARAISO 2 500 kV - 1x150 Mvar
  38975A                  5.5561666.8                                  0
  38975B                  5.5561666.8                                  0
  38975C                  5.5561666.8                                  0
C Reator de Barra SE P.PARAISO 2 500 kV - 1x300 Mvar
  38975A                  2.778833.25                                  0
  38975B                  2.778833.25                                  0
  38975C                  2.778833.25                                  0
C Banco de Capacitores SE M.CHAPEU 2 CER 13.8 kV - 1x137.9 Mvar
  12334A                    7.24E5                                     0
  12334B                    7.24E5                                     0
  12334C                    7.24E5                                     0
C Banco de Capacitores SE CAMAÇARI 69 kV - 1x21.3 Mvar
  674A                      4474.6                                     0
  674B                      4474.6                                     0
  674C                      4474.6                                     0
C Banco de Capacitores SE JARDIM 69 kV - 1x20.3 Mvar
  673A                      4263.9                                     0
  673B                      4263.9                                     0
  673C                      4263.9                                     0
C Banco de Capacitores SE FUNIL 13.8 kV - 1x3.1 Mvar
  876A                      16277.                                     0
  876B                      16277.                                     0
  876C                      16277.                                     0
C Banco de Capacitores SE P.PARAISO 2 CER 13.8 kV - 1x201.2 Mvar
  38976A                    1.06E6                                     0
  38976B                    1.06E6                                     0
  38976C                    1.06E6                                     0
C Banco de Capacitores SE POÇÕE3 230 kV - 1x50 Mvar
  18612A                    945.18                                     0
```

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  18612B                              945.18                                    0
  18612C                              945.18                                    0
C LT 230 kV Morro do Chapéu II - Irecê C2&C3
C $INCLUDE, C:\Troca\TD-1271\230-MC-IR-C1_2-A.lib, X0171A, X0171B, X0171C $$
C   , X0172C, X0172B, X0172A, X0181A, X0181B, X0181C, X0173C, X0173B, X0173A
$VINTAGE, 1
-1X0171AX0181A             7.13504E-01 1.01271E+03 1.85836E+05-1.67500E+01 1  6
-2X0171BX0181B             3.90492E-02 3.01294E+02 2.89696E+05-1.67500E+01 1  6
-3X0171CX0181C             3.48128E-02 3.30845E+02 2.93331E+05-1.67500E+01 1  6
-4X0172CX0173C             3.39966E-02 2.55670E+02 2.95034E+05-1.67500E+01 1  6
-5X0172BX0173B             3.39813E-02 2.22916E+02 2.94744E+05-1.67500E+01 1  6
-6X0172AX0173A             3.40935E-02 2.31354E+02 2.94965E+05-1.67500E+01 1  6
$VINTAGE, 0
  0.39552328  0.53796083 -0.33259459  0.49473892 -0.32829631 -0.27653253
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31734519 -0.01600361 -0.45360564  0.05305079  0.53048920  0.58787848
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49993220 -0.48620404 -0.42673001 -0.47091420 -0.31277367 -0.30158082
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49809099 -0.47299499  0.43437803  0.50334280  0.30829306 -0.28775244
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31392010  0.00839823  0.45454735 -0.06557600 -0.54437580  0.57093820
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.38246659  0.50015285  0.32592435 -0.52249847  0.34869147 -0.27965294
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
C LT 230 kV Morro do Chapéu II - Irecê C2&C3
C $INCLUDE, C:\Troca\TD-1271\230-MC-IR-C1_2-A.lib, X0181A, X0181B, X0181C $$
C   , X0173C, X0173B, X0173A, X0182A, X0182B, X0182C, X0183C, X0183B, X0183A
$VINTAGE, 1
-1X0181AX0182A             7.13504E-01 1.01271E+03 1.85836E+05-1.67500E+01 1  6
-2X0181BX0182B             3.90492E-02 3.01294E+02 2.89696E+05-1.67500E+01 1  6
-3X0181CX0182C             3.48128E-02 3.30845E+02 2.93331E+05-1.67500E+01 1  6
-4X0173CX0183C             3.39966E-02 2.55670E+02 2.95034E+05-1.67500E+01 1  6
-5X0173BX0183B             3.39813E-02 2.22916E+02 2.94744E+05-1.67500E+01 1  6
-6X0173AX0183A             3.40935E-02 2.31354E+02 2.94965E+05-1.67500E+01 1  6
$VINTAGE, 0
  0.39552328  0.53796083 -0.33259459  0.49473892 -0.32829631 -0.27653253
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31734519 -0.01600361 -0.45360564  0.05305079  0.53048920  0.58787848
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49993220 -0.48620404 -0.42673001 -0.47091420 -0.31277367 -0.30158082
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49809099 -0.47299499  0.43437803  0.50334280  0.30829306 -0.28775244
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31392010  0.00839823  0.45454735 -0.06557600 -0.54437580  0.57093820
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.38246659  0.50015285  0.32592435 -0.52249847  0.34869147 -0.27965294
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
C LT 230 kV Morro do Chapéu II - Irecê C2&C3
C $INCLUDE, C:\Troca\TD-1271\230-MC-IR-C1_2-A.lib, X0182A, X0182B, X0182C $$
C   , X0183C, X0183B, X0183A, 355A##, 355B##, 355C##, 355C##, 355B##, 355A##
$VINTAGE, 1
-1X0182A355A               7.13504E-01 1.01271E+03 1.85836E+05-1.67500E+01 1  6
-2X0182B355B               3.90492E-02 3.01294E+02 2.89696E+05-1.67500E+01 1  6
-3X0182C355C               3.48128E-02 3.30845E+02 2.93331E+05-1.67500E+01 1  6
-4X0183C355C               3.39966E-02 2.55670E+02 2.95034E+05-1.67500E+01 1  6
-5X0183B355B               3.39813E-02 2.22916E+02 2.94744E+05-1.67500E+01 1  6
-6X0183A355A               3.40935E-02 2.31354E+02 2.94965E+05-1.67500E+01 1  6
$VINTAGE, 0
  0.39552328  0.53796083 -0.33259459  0.49473892 -0.32829631 -0.27653253
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31734519 -0.01600361 -0.45360564  0.05305079  0.53048920  0.58787848
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49993220 -0.48620404 -0.42673001 -0.47091420 -0.31277367 -0.30158082
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49809099 -0.47299499  0.43437803  0.50334280  0.30829306 -0.28775244
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31392010  0.00839823  0.45454735 -0.06557600 -0.54437580  0.57093820
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.38246659  0.50015285  0.32592435 -0.52249847  0.34869147 -0.27965294
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
C LT 230 kV Morro do Chapéu II - Irecê C2&C3
C $INCLUDE, C:\Troca\TD-1271\230-MC-IR-C1_2-A.lib, 283A##, 283B##, 283C## $$
C   , 283C##, 283B##, 283A##, X0171A, X0171B, X0171C, X0172C, X0172B, X0172A
$VINTAGE, 1
-1283A  X0171A             7.13504E-01 1.01271E+03 1.85836E+05-1.67500E+01 1  6
-2283B  X0171B             3.90492E-02 3.01294E+02 2.89696E+05-1.67500E+01 1  6
-3283C  X0171C             3.48128E-02 3.30845E+02 2.93331E+05-1.67500E+01 1  6
```

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-4283C  X0172C             3.39966E-02 2.55670E+02 2.95034E+05-1.67500E+01 1  6
-5283B  X0172B             3.39813E-02 2.22916E+02 2.94744E+05-1.67500E+01 1  6
-6283A  X0172A             3.40935E-02 2.31354E+02 2.94965E+05-1.67500E+01 1  6
$VINTAGE, 0
  0.39552328  0.53796083 -0.33259459  0.49473892 -0.32829631 -0.27653253
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31734519 -0.01600361 -0.45360564  0.05305079  0.53048920  0.58787848
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49993220 -0.48620404 -0.42673001 -0.47091420 -0.31277367 -0.30158082
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49809099 -0.47299499  0.43437803  0.50334280  0.30829306 -0.28775244
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31392010  0.00839823  0.45454735 -0.06557600 -0.54437580  0.57093820
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.38246659  0.50015285  0.32592435 -0.52249847  0.34869147 -0.27965294
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-A.lib, 589A##, 589B##, 589C## $$
C   , X0163A, X0163B, X0163C
$VINTAGE, 1
-1589A  X0163A             3.75604E-01 5.89009E+02 1.99528E+05-3.45000E+01 1  3
-2589B  X0163B             1.71064E-02 2.20567E+02 2.94638E+05-3.45000E+01 1  3
-3589C  X0163C             1.81754E-02 1.94081E+02 2.94281E+05-3.45000E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-B1.lib, X0163B, X0163C, X0163A $$
C   , X0164B, X0164C, X0164A
$VINTAGE, 1
-1X0163BX0164B             3.75604E-01 5.89009E+02 1.99528E+05-1.72500E+01 1  3
-2X0163CX0164C             1.71064E-02 2.20567E+02 2.94638E+05-1.72500E+01 1  3
-3X0163AX0164A             1.81754E-02 1.94081E+02 2.94281E+05-1.72500E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-B2.lib, X0164B, X0164C, X0164A $$
C   , X0184B, X0184C, X0184A
$VINTAGE, 1
-1X0164BX0184B             3.75604E-01 5.89009E+02 1.99528E+05-5.17500E+01 1  3
-2X0164CX0184C             1.71064E-02 2.20567E+02 2.94638E+05-5.17500E+01 1  3
-3X0164AX0184A             1.81754E-02 1.94081E+02 2.94281E+05-5.17500E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-B2.lib, X0184C, X0184A, X0184B $$
C   , X0165C, X0165A, X0165B
$VINTAGE, 1
-1X0184CX0165C             3.75604E-01 5.89009E+02 1.99528E+05-5.17500E+01 1  3
-2X0184AX0165A             1.71064E-02 2.20567E+02 2.94638E+05-5.17500E+01 1  3
-3X0184BX0165B             1.81754E-02 1.94081E+02 2.94281E+05-5.17500E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-B1.lib, X0165C, X0165A, X0165B $$
C   , X0166C, X0166A, X0166B
$VINTAGE, 1
-1X0165CX0166C             3.75604E-01 5.89009E+02 1.99528E+05-1.72500E+01 1  3
-2X0165AX0166A             1.71064E-02 2.20567E+02 2.94638E+05-1.72500E+01 1  3
```

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-3X0165BX0166B             1.81754E-02 1.94081E+02 2.94281E+05-1.72500E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-A.lib, X0166A, X0166B, X0166C $$
C   , 582A##, 582B##, 582C##
$VINTAGE, 1
-1X0166A582A               3.75604E-01 5.89009E+02 1.99528E+05-3.45000E+01 1  3
-2X0166B582B               1.71064E-02 2.20567E+02 2.94638E+05-3.45000E+01 1  3
-3X0166C582C               1.81754E-02 1.94081E+02 2.94281E+05-3.45000E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-A.lib, 582A##, 582B##, 582C## $$
C   , X0167A, X0167B, X0167C
$VINTAGE, 1
-1582A  X0167A             3.75441E-01 5.88762E+02 1.99444E+05-3.00000E+01 1  3
-2582B  X0167B             1.71045E-02 2.20560E+02 2.94626E+05-3.00000E+01 1  3
-3582C  X0167C             1.81837E-02 1.94207E+02 2.94270E+05-3.00000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-B1.lib, X0167B, X0167C, X0167A $$
C   , X0168B, X0168C, X0168A
$VINTAGE, 1
-1X0167BX0168B             3.75441E-01 5.88762E+02 1.99444E+05-1.05000E+01 1  3
-2X0167CX0168C             1.71045E-02 2.20560E+02 2.94626E+05-1.05000E+01 1  3
-3X0167AX0168A             1.81837E-02 1.94207E+02 2.94270E+05-1.05000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-B2.lib, X0168B, X0168C, X0168A $$
C   , X0177B, X0177C, X0177A
$VINTAGE, 1
-1X0168BX0177B             3.75441E-01 5.88762E+02 1.99444E+05-4.95000E+01 1  3
-2X0168CX0177C             1.71045E-02 2.20560E+02 2.94626E+05-4.95000E+01 1  3
-3X0168AX0177A             1.81837E-02 1.94207E+02 2.94270E+05-4.95000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-B2.lib, X0177C, X0177A, X0177B $$
C   , X0169C, X0169A, X0169B
$VINTAGE, 1
-1X0177CX0169C             3.75441E-01 5.88762E+02 1.99444E+05-4.95000E+01 1  3
-2X0177AX0169A             1.71045E-02 2.20560E+02 2.94626E+05-4.95000E+01 1  3
-3X0177BX0169B             1.81837E-02 1.94207E+02 2.94270E+05-4.95000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
```

```
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-B1.lib, X0169C, X0169A, X0169B $$
C   , X0170C, X0170A, X0170B
$VINTAGE, 1
-1X0169CX0170C             3.75441E-01 5.88762E+02 1.99444E+05-1.05000E+01 1  3
-2X0169AX0170A             1.71045E-02 2.20560E+02 2.94626E+05-1.05000E+01 1  3
-3X0169BX0170B             1.81837E-02 1.94207E+02 2.94270E+05-1.05000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-A.lib, X0170A, X0170B, X0170C $$
C   , 11151A, 11151B, 11151C
$VINTAGE, 1
-1X0170A11151A             3.75441E-01 5.88762E+02 1.99444E+05-3.00000E+01 1  3
-2X0170B11151B             1.71045E-02 2.20560E+02 2.94626E+05-3.00000E+01 1  3
-3X0170C11151C             1.81837E-02 1.94207E+02 2.94270E+05-3.00000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
BLANK BRANCH
BLANK SWITCH
C < n 1><>< Ampl.  >< Freq.  ><Phase/T0><   A1   ><   T1   >< TSTART >< TSTOP  >
C Gerador IRECE SIN - 13,8 kV
14GIRECA 0 11267.653       60.                                    -1.      1.E3
14GIRECB 0 11267.653       60.     -120.                          -1.      1.E3
14GIRECC 0 11267.653       60.      120.                          -1.      1.E3
C Gerador SOBRADINHO 2 UHE - 13,8 kV
14GSOB2A 0 11267.653       60.                                    -1.      1.E3
14GSOB2B 0 11267.653       60.     -120.                          -1.      1.E3
14GSOB2C 0 11267.653       60.      120.                          -1.      1.E3
C Gerador SOBRADINHO 1 UHE - 13,8 kV
14GSOB1A 0 11267.653       60.                                    -1.      1.E3
14GSOB1B 0 11267.653       60.     -120.                          -1.      1.E3
14GSOB1C 0 11267.653       60.      120.                          -1.      1.E3
C Gerador L.GONZAGA 2 UHE - 13,8 kV
14GLGZ2A 0 11267.653       60.                                    -1.      1.E3
14GLGZ2B 0 11267.653       60.     -120.                          -1.      1.E3
14GLGZ2C 0 11267.653       60.      120.                          -1.      1.E3
C Gerador L.GONZAGA 1 UHE - 13,8 kV
14GLGZ1A 0 11267.653       60.                                    -1.      1.E3
14GLGZ1B 0 11267.653       60.     -120.                          -1.      1.E3
14GLGZ1C 0 11267.653       60.      120.                          -1.      1.E3
C Gerador P.AFONSO 3-2 UHE - 13,8 kV
14GPA32A 0 11267.653       60.                                    -1.      1.E3
14GPA32B 0 11267.653       60.     -120.                          -1.      1.E3
14GPA32C 0 11267.653       60.      120.                          -1.      1.E3
C Gerador ASAL B1 UHE - 13,8 kV
14GASB1A 0 13859.213       60.                                    -1.      1.E3
14GASB1B 0 13859.213       60.     -120.                          -1.      1.E3
14GASB1C 0 13859.213       60.      120.                          -1.      1.E3
C Gerador PAF2A1 - 13,8 kV
14GPAA1A 0 13859.213       60.                                    -1.      1.E3
14GPAA1B 0 13859.213       60.     -120.                          -1.      1.E3
14GPAA1C 0 13859.213       60.      120.                          -1.      1.E3
C Gerador PAF2A2 - 13,8 kV
14GPAA2A 0 13859.213       60.                                    -1.      1.E3
14GPAA2B 0 13859.213       60.     -120.                          -1.      1.E3
14GPAA2C 0 13859.213       60.      120.                          -1.      1.E3
C Gerador PAF2B1 - 13,8 kV
14GPAB1A 0 13859.213       60.                                    -1.      1.E3
14GPAB1B 0 13859.213       60.     -120.                          -1.      1.E3
14GPAB1C 0 13859.213       60.      120.                          -1.      1.E3
C Gerador PAF2B3 - 13,8 kV
14GPAB3A 0 13859.213       60.                                    -1.      1.E3
14GPAB3B 0 13859.213       60.     -120.                          -1.      1.E3
14GPAB3C 0 13859.213       60.      120.                          -1.      1.E3
C Gerador PAF2B2 - 13,8 kV
14GPAB2A 0 13859.213       60.                                    -1.      1.E3
14GPAB2B 0 13859.213       60.     -120.                          -1.      1.E3
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14GPAB2C 0 13859.213       60.      120.                    -1.      1.E3
C Gerador PAF2A3 - 13,8 kV
14GPAA3A 0 13859.213       60.                              -1.      1.E3
14GPAA3B 0 13859.213       60.     -120.                    -1.      1.E3
14GPAA3C 0 13859.213       60.      120.                    -1.      1.E3
C Gerador ASAL E1 UHE - 13,8 kV
14GASE1A 0 13859.213       60.                              -1.      1.E3
14GASE1B 0 13859.213       60.     -120.                    -1.      1.E3
14GASE1C 0 13859.213       60.      120.                    -1.      1.E3
C Gerador P.AFONSO UHE 1 - 13,8 kV
14GPAF1A 0 11267.653       60.                              -1.      1.E3
14GPAF1B 0 11267.653       60.     -120.                    -1.      1.E3
14GPAF1C 0 11267.653       60.      120.                    -1.      1.E3
C Gerador CAMAÇARI D1 SIN - 13,8 kV
14GCAD1A 0 6760.5917       60.                              -1.      1.E3
14GCAD1B 0 6760.5917       60.     -120.                    -1.      1.E3
14GCAD1C 0 6760.5917       60.      120.                    -1.      1.E3
C Gerador B.J.LAPA SIN - 13,8 kV
14GBJLAA 0 11267.653       60.                              -1.      1.E3
14GBJLAB 0 11267.653       60.     -120.                    -1.      1.E3
14GBJLAC 0 11267.653       60.      120.                    -1.      1.E3
C Gerador CAMAÇARI D2 SIN - 13,8 kV
14GCAD2A 0 6760.5917       60.                              -1.      1.E3
14GCAD2B 0 6760.5917       60.     -120.                    -1.      1.E3
14GCAD2C 0 6760.5917       60.      120.                    -1.      1.E3
C Gerador P.CAVALO 1 UHE - 13,8 kV
14GPCA1A 0 5633.8264       60.                              -1.      1.E3
14GPCA1B 0 5633.8264       60.     -120.                    -1.      1.E3
14GPCA1C 0 5633.8264       60.      120.                    -1.      1.E3
C Gerador FUNIL 1 UHE - 13,8 kV
14GFUN1A 0 11267.653       60.                              -1.      1.E3
14GFUN1B 0 11267.653       60.     -120.                    -1.      1.E3
14GFUN1C 0 11267.653       60.      120.                    -1.      1.E3
C Gerador ITAPEBI 1 UHE - 13,8 kV
14GITA1A 0 11831.035       60.                              -1.      1.E3
14GITA1B 0 11831.035       60.     -120.                    -1.      1.E3
14GITA1C 0 11831.035       60.      120.                    -1.      1.E3
C Gerador P.AFONSO 4-1 UHE - 13,8 kV
14GPA41A 0 10140.888       60.                              -1.      1.E3
14GPA41B 0 10140.888       60.     -120.                    -1.      1.E3
14GPA41C 0 10140.888       60.      120.                    -1.      1.E3
C Gerador XINGO 1 UHE - 13,8 kV
14GXIN1A 0 10140.888       60.                              -1.      1.E3
14GXIN1B 0 10140.888       60.     -120.                    -1.      1.E3
14GXIN1C 0 10140.888       60.      120.                    -1.      1.E3
C EQ - GERADOR - ANGELIM 500 kV
14EANG5A 0 367423.46       60.                              -1.      1.E3
14EANG5B 0 367423.46       60.     -120.                    -1.      1.E3
14EANG5C 0 367423.46       60.      120.                    -1.      1.E3
C EQ - GERADOR - SOBRADINHO 500 kV
14ESOB5A 0 408248.29       60.                              -1.      1.E3
14ESOB5B 0 408248.29       60.     -120.                    -1.      1.E3
14ESOB5C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - MESSIAS 500 kV
14EMES5A 0 367423.46       60.                              -1.      1.E3
14EMES5B 0 367423.46       60.     -120.                    -1.      1.E3
14EMES5C 0 367423.46       60.      120.                    -1.      1.E3
C EQ - GERADOR - GARANHUNS 2 500 kV
14EGA25A 0 408248.29       60.                              -1.      1.E3
14EGA25B 0 408248.29       60.     -120.                    -1.      1.E3
14EGA25C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - G.OURO 2 500 kV
14EGO25A 0 408248.29       60.                              -1.      1.E3
14EGO25B 0 408248.29       60.     -120.                    -1.      1.E3
14EGO25C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - MILAGRES 2 500 kV
14EMI25A 0 408248.29       60.                              -1.      1.E3
14EMI25B 0 408248.29       60.     -120.                    -1.      1.E3
14EMI25C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - IGAPORÃ 3 500 kV
14EIG35A 0 408248.29       60.                              -1.      1.E3
14EIG35B 0 408248.29       60.     -120.                    -1.      1.E3
14EIG35C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - P.PARAISO 2 500 kV
14EPP25A 0 408248.29       60.                              -1.      1.E3
14EPP25B 0 408248.29       60.     -120.                    -1.      1.E3
14EPP25C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - ITAPEBI 230 kV
```

```
14EITA2A 0 112676.53       60.                              -1.      1.E3
14EITA2B 0 112676.53       60.     -120.                    -1.      1.E3
14EITA2C 0 112676.53       60.      120.                    -1.      1.E3
C EQ - GERADOR - B.J.LAPA 230 kV
14EBJL2A 0 187794.21       60.                              -1.      1.E3
14EBJL2B 0 187794.21       60.     -120.                    -1.      1.E3
14EBJL2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - P.AFONSO 3 B 230 kV
14EP3B2A 0 187794.21       60.                              -1.      1.E3
14EP3B2B 0 187794.21       60.     -120.                    -1.      1.E3
14EP3B2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - ANGELIM 230 kV
14EANG2A 0 169014.79       60.                              -1.      1.E3
14EANG2B 0 169014.79       60.     -120.                    -1.      1.E3
14EANG2C 0 169014.79       60.      120.                    -1.      1.E3
C EQ - GERADOR - P.AFONSO 3 A 230 kV
14EP3A2A 0 187794.21       60.                              -1.      1.E3
14EP3A2B 0 187794.21       60.     -120.                    -1.      1.E3
14EP3A2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - FUNIL 138 kV
14EFUN1A 0 112676.53       60.                              -1.      1.E3
14EFUN1B 0 112676.53       60.     -120.                    -1.      1.E3
14EFUN1C 0 112676.53       60.      120.                    -1.      1.E3
BLANK SOURCE
```

## CURTO MÁXIMO

```
C data:EQ-2023.40_MAX.ATP
BEGIN NEW DATA CASE
C ------------------------------------------------------------
C Generated by ATPDRAW  novembro, quinta-feira 8, 2018
C A Bonneville Power Administration program
C by H. K. Høidalen at SEfAS/NTNU - NORWAY 1994-2009
C ------------------------------------------------------------
POWER FREQUENCY                      60.
C $DUMMY, XYZ000
C  dT  >< Tmax >< Xopt >< Copt ><Epsiln>
   5.E-6      .5     60.     60.  1.E-18
     500       1       1       1       1       0       0       1       0
$PARAMETER
AI =1.0 $$
BI =1.0 $$
CI =1.0 $$
DI =1.0 $$
GIRECI =11267.65282 * 1.0 * AI $$
GSOB1I =11267.65282 * 1.0 * AI $$
GLGZ1I =11267.65282 * 1.0 * CI $$
GPA32I =11267.65282 * 1.0 * CI $$
GPAA1I =11267.65282 * 1.23 * CI $$
GASE1I =11267.65282 * 1.23 * CI $$
GPAF1I =11267.65282 * 1.0 * CI $$
GCAD1I =11267.65282 * 0.7 * DI $$
GBJLAI =11267.65282 * 1.0 * AI $$
GPCA1I =11267.65282 * 1.0 * BI $$
GFUN1I =11267.65282 * 1.0 * BI $$
GITA1I =11267.65282 * 1.0 * BI $$
GPA41I =11267.65282 * 1.0 * DI $$
GXIN1I =11267.65282 * 1.0 * DI $$
GPS1VI =19595.91794 * 1.0 * DI $$
GPS1GI =20412.41452 * 1.0 * DI $$
GTCA1I =11267.65282 * 1.02 * DI $$
GASE2I =11267.65282 * 1.0 * CI $$
ESOB2I =187794.214 * 1.0 * AI $$
EANG5I =408248.290 * 1.0 * DI $$
EMES5I =408248.290 * 1.0 * DI $$
EGA25I =408248.290 * 1.0 * CI $$
EGO25I =408248.290 * 1.0 * AI $$
EMI25I =408248.290 * 1.0 * CI $$
EIG35I =408248.290 * 1.0 * BI $$
EPP25I =408248.290 * 1.0 * BI $$
EP3A2I =187794.214 * 1.0 * CI $$
EANG2I =187794.214 * 1.0 * DI $$
EITA2I =187794.214 * 1.0 * BI $$
EBJL2I =187794.214 * 1.0 * AI $$
EP3B2I =187794.214 * 1.0 * CI $$
EFUN1I =112676.528 * 1.0 * BI $$
ESBO2I =187794.214 * 1.0 * AI $$
EPOC2I =187794.214 * 1.0 * BI $$
ECAT2I =187794.214 * 1.0 * BI $$
ECB12I =187794.214 * 0.5 * DI $$
ECB22I =187794.214 * 0.5 * DI $$
ECA42I =187794.214 * 1.0 * DI $$
EIBI2I =187794.214 * 1.0 * BI $$
EGAR2I =187794.214 * 1.0 * CI $$
EJUA2I =187794.214 * 1.0 * AI $$
EQSE2I =187794.214 * 1.0 * AI $$
EIRE1I =112676.528 * 1.0 * AI $$
EGOU1I =112676.528 * 1.0 * AI $$
EJAR6I =56338.2640 * 1.0 * DI $$
ECAM6I =56338.2640 * 1.0 * DI $$
EBRO6I =28169.1320 * 1.0 * AI $$
EUMU3I =28169.1320 * 1.0 * AI $$
ECLA3I =28169.1320 * 1.0 * AI $$
EGOU3I =28169.1320 * 1.0 * AI $$
ESOB5I =408248.290 * 1.0 * AI $$
GXIN1_____=GXIN1I
GTCA1_____=GTCA1I
GSOB1_____=GSOB1I
GPS1V_____=GPS1VI
GPS1G_____=GPS1GI
GPCA1_____=GPCA1I
GPAF1_____=GPAF1I
GPAA1_____=GPAA1I
GPA41_____=GPA41I
```

```
GPA32_____=GPA32I
GLGZ1_____=GLGZ1I
GITA1_____=GITA1I
GIREC_____=GIRECI
GFUN1_____=GFUN1I
GCAD1_____=GCAD1I
GBJLA_____=GBJLAI
GASE2_____=GASE2I
GASE1_____=GASE1I
EUMU3_____=EUMU3I
ESOB5_____=ESOB5I
ESOB2_____=ESOB2I
ESBO2_____=ESBO2I
EQSE2_____=EQSE2I
EPP25_____=EPP25I
EPOC2_____=EPOC2I
EP3B2_____=EP3B2I
EP3A2_____=EP3A2I
EMI25_____=EMI25I
EMES5_____=EMES5I
EJUA2_____=EJUA2I
EJAR6_____=EJAR6I
EITA2_____=EITA2I
EIRE1_____=EIRE1I
EIG35_____=EIG35I
EIBI2_____=EIBI2I
EGOU3_____=EGOU3I
EGOU1_____=EGOU1I
EGO25_____=EGO25I
EGAR2_____=EGAR2I
EGA25_____=EGA25I
EFUN1_____=EFUN1I
ECLA3_____=ECLA3I
ECB22_____=ECB22I
ECB12_____=ECB12I
ECAT2_____=ECAT2I
ECAM6_____=ECAM6I
ECA42_____=ECA42I
EBRO6_____=EBRO6I
EBJL2_____=EBJL2I
EANG5_____=EANG5I
EANG2_____=EANG2I
BLANK $PARAMETER
C        1         2         3         4         5         6         7         8
C 345678901234567890123456789012345678901234567890123456789012345678901234567890
C < n1 >< n2 ><ref1><ref2>< R  >< L  >< C  >
C < n1 >< n2 ><ref1><ref2>< R  >< A  >< B  ><Leng><><>0
C G.OURO 2
C G.OURO CER
C G.OURO 2
C BROTAS
C B.J.LAPA
C B.J.LAPA SIN
C IRECE
C BROTAS
C IRECE
C IRECE SIN
C G.OURO 1
C G.OURO 1B
C G.OURO 1
C IRECE
C OUROLANDIA 2
C C.LARGO
C SE01
C UMBURANAS
C C.FORMOSO
C UMBURANAS
C C.LARGO
C C.FORMOSO
C C.FORMOSO
C S.BONFIM
C S.BONFIM
C M.CHAPEU 2
C BABILONIA
C S.BABILONIA
C V.BAHIA 2
C M.CHAPEUS
C S.AZUL
```

C M.CHAPEU
C M.CHAPEU 2
C BABILONIA
C S.BABILONIA
C V.BAHIA 2
C M.CHAPEUS
C S.AZUL
C M.CHAPEU 2 CER
C OUROLANDIA 2
C SAPEAÇU
C OLINDINA
C JUAZEIRO 3
C SOBRADINHO
C MILAGRES 2
C JUAZEIRO 3
C SOBRADINHO 1 UHE
C SOBRADINHO
C L.GONZAGA
C P.AFONSO 4
C L.GONZAGA 1 UHE
C L.GONZAGA 2 UHE
C SOBRADINHO 2 UHE
C P.AFONSO 3
C P.AFONSO 3
C ASALE 1 UHE
C P.AFONSO 2 A3 UHE
C P.AFONSO 2 B2 UHE
C P.AFONSO 2 B3 UHE
C P.AFONSO 3-1 UHE
C P.AFONSO 2-A1 UHE
C P.AFONSO 2 A2 UHE
C P.AFONSO 2 B1 UHE
C ASALE A
C ASAL B2 UHE
C P.AFONSO UHE 1
C P.AFONSO 3-2 UHE
C GARANHUNS
C A.SALES B
C GARANHUNS 2
C ANGELIM
C ANGELIM
C MESSIAS
C XINGO
C MESSIAS
C SANTANA 2
C XINGO 1 UHE
C P.SERGIPE
C CAMAÇARI
C JARDIM
C CAMAÇARI 4
C CAMAÇARI B2
C CAMAÇARI B1
C CAMAÇARI D1 SIN
C CAMAÇARI D2 SIN
C CAMAÇARI
C JARDIM
C ITABAINA
C N.S.SOCORRO
C JARDIM
C N.S.SOCORRO
C F.SANTANA 3
C EMBASA
C TOMBA
C SAPEAÇU
C G.MANGABEIRA
C CATU
C CAMAÇARI 4
C G.MANGABEIRA
C F.SANTANA 3
C P.CAVALO 1 UHE
C P.CAVALO
C POÇÕES 3
C S.A.JESUS
C FUNIL
C ITAGIBA
C POÇÕES 2
C P.PARAISO 2
C POÇÕE3

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C ITAPEBI
C SAPEAÇU CER
C S.A.JESUS
C POÇÕE 2
C FUNIL CER
C FUNIL
C FUNIL
C FUNIL 1 UHE
C FUNIL 1 UHE
C ITAPEBI 1 UHE
C P.PARAISO 2 CER
C IBICOARA
C IBICOARA
C IGAPORÃ 3
C P.AFONSO 4-1 UHE
C ASALE2 UHE 013
C ASALB2 UHE 013
C T.CAMAÇARI 1 UTE
C P.SERGIPE 1V UTE
C P.SERGIPE 1G UTE
C ITABAINA
C ITABAINA
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 2603B  603C
  TRANSFORMER X0116A               X0116C                            0
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 2603C  603A
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 2183B  183C
  TRANSFORMER X0120A               X0120C                            0
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 2183C  183A
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 2683B  683C
  TRANSFORMER X0122A               X0122C                            0
 1X0121C
 2683C  683A
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 2909B  909C
  TRANSFORMER X0124A                 X0124C                            0
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 2909C  909A
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 2976B  976C
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 2876B  876C
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 2876C  876A
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 2675B  675C
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 2675C  675A
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 2674B  674C
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 211673B11673C
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 1X0139C
 211673C11673A
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        RN400C            1.333  400.                                     3
C REATOR DE NEUTRO 400 OHM
        RN400D            1.333  400.                                     3
C REATOR DE NEUTRO 800 OHM
        RN800A            2.666  800.                                     3
C REATOR DE NEUTRO 800 OHM
        RN800B            2.666  800.                                     3
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        4B                 1.E6                                           0
        4C                 1.E6                                           0
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        5B                 1.E6                                           0
        5C                 1.E6                                           0
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        7B                 1.E6                                           0
        7C                 1.E6                                           0
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| 8B | 1.E6 | 0 |
| 8C | 1.E6 | 0 |
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| 6B | 1.E6 | 0 |
| 6C | 1.E6 | 0 |
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| 10C | 1.E6 | 0 |
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| 476B | 1.E6 | 0 |
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| 58824C | 1.E6 | 0 |
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| 288C | 1.E6 | 0 |
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| 59014A | 1.E6 | 0 |

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C C1 LT 500 kV G.OURO 2 - OUROLANDIA 2
-111560A11561A                    .426        1.37       3.534      152.57 0 0 0
-211560B11561B                     .02        .284       7.068      152.57 0 0 0
-311560C11561C                                                              0
C C1 LT 230 kV BROTAS - G.OURO 2
-111260A205A                      .51       1.765       2.324       122.9 0 0 0
-211260B205B                     .111        .534       3.521       122.9 0 0 0
-311260C205C                                                                0
C C1 LT 230 kV B.J.LAPA - BROTAS
-1285A  205A                      .33        .986        2.11       207.4 0 0 0
-2285B  205B                     .098        .503       3.197       207.4 0 0 0
-3285C  205C                                                                0
C C1 LT 230 kV BROTAS - IRECE
-1205A  283A                      .345       .994       2.113       137.7 0 0 0
-2205B  283B                      .092       .501       3.201       137.7 0 0 0
-3205C  283C                                                                0
C C1 LT 230 kV G.OURO 1 - IRECE
-159060A283A                      .314       1.16       3.076       112.4 0 0 0
-259060B283B                      .049       .345        4.66       112.4 0 0 0
-359060C283C                                                                0
C C1 LT 230 kV UMBURANAS - OUROLANDIA 2
-158825A11261A                    .486       1.728      2.301        38.5 0 0 0
-258825B11261B                    .088        .514      3.486        38.5 0 0 0
-358825C11261C                                                              0
C C1 LT 230 kV C.FORMOSO - OUROLANDIA 2
-111461A11261A                    .584       2.019      2.658        105. 0 0 0
-211461B11261B                    .127        .611      4.027        105. 0 0 0
-311461C11261C                                                              0
C C1 LT 230 kV C.LARGO - OUROLANDIA 2
-158833A11261A                    .422       1.444      1.879        52.1 0 0 0
-258833B11261B                    .091        .435      2.847        52.1 0 0 0
-358833C11261C                                                              0
C C2 LT 230 kV C.LARGO - OUROLANDIA 2
-158833A11261A                    .422       1.444      1.879        52.1 0 0 0
-258833B11261B                    .091        .435      2.847        52.1 0 0 0
-358833C11261C                                                              0
C C1 LT 230 kV SE01 - OUROLANDIA 2
-158844A11261A                    .446       1.632      2.194        63.2 0 0 0
-258844B11261B                     .07        .484      3.324        63.2 0 0 0
-358844C11261C                                                              0
C C1 LT 230 kV OUROLANDIA 2 - IRECE
-111261A283A                      .603       2.078      2.723         84. 0 0 0
-211261B283B                      .131        .627      4.126         84. 0 0 0
-311261C283C                                                                0
C C1 LT 230 kV IRECE - M.CHAPEU 2
-1283A  355A                      .338        1.31      2.256        64.7 0 0 0
-2283B  355B                      .102        .518      3.418        64.7 0 0 0
-3283C  355C                                                                0
C C2 LT 230 kV SE01 - OUROLANDIA 2
-158844A11261A                    .446       1.632      2.194        63.2 0 0 0
-258844B11261B                     .07        .484      3.324        63.2 0 0 0
-358844C11261C                                                              0
C C1 LT 230 kV C.FORMOSO - S.BONFIM
-1203A  11461A                    .469        1.61        2.1        65.3 0 0 0
-2203B  11461B                    .101        .485      3.181        65.3 0 0 0
-3203C  11461C                                                              0
C C1 LT 230 kV BABILONIA - M.CHAPEU 2
-1355A  59084A                    .456       1.636      2.167        97.1 0 0 0
-2355B  59084B                    .083        .488      3.283        97.1 0 0 0
-3355C  59084C                                                              0
C C1 LT 230 kV S.BABILONIA - M.CHAPEU 2
-1355A  59077A                    .456       1.638      2.169        75.2 0 0 0
-2355B  59077B                    .083        .488      3.286        75.2 0 0 0
-3355C  59077C                                                              0
C C1 LT 230 kV V.BAHIA 2 - M.CHAPEU 2
-1355A  59067A                    .236       1.045      3.371        33.5 0 0 0
-2355B  59067B                    .037         .31      5.107        33.5 0 0 0
-3355C  59067C                                                              0
C C1 LT 230 kV M.CHAPEU SUL - M.CHAPEU 2
-1355A  59058A                    .414       2.348      3.425         17. 0 0 0
-2355B  59058B                    .065        .696      5.189         17. 0 0 0
-3355C  59058C                                                              0
C C1 LT 230 kV S.AZUL - M.CHAPEU 2
-1355A  59015A                    .623       2.213      2.945        18.8 0 0 0
-2355B  59015B                    .112        .658      4.462        18.8 0 0 0
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-3355C  59015C                                                        0
C C1 LT 500 kV OUROLANDIA 2 - M.CHAPEU 2
-111561A555A                    .426      1.608      3.672      96.5 0 0 0
-211561B555B                    .021       .297      7.344      96.5 0 0 0
-311561C555C                                                          0
C C1 LT 500 kV M.CHAPEU 2 - SAPEAÇU
-1555A  589A                    .305      1.088      3.565     274.1 0 0 0
-2555B  589B                    .019       .279       7.13     274.1 0 0 0
-3555C  589C                                                          0
C C1 LT 500 kV JUAZEIRO 3 - OUROLANDIA 2
-111561A11582A                  .322      1.084      3.009     192.6 0 0 0
-211561B11582B                  .016       .257      6.019     192.6 0 0 0
-311561C11582C                                                        0
C C2 LT 500 kV SOBRADINHO - JUAZEIRO 3
-1506A  11582A                  .204      1.062      2.589      42.8 0 0 0
-2506B  11582B                  .023       .321      5.178      42.8 0 0 0
-3506C  11582C                                                        0
C C1 LT 500 kV SOBRADINHO - JUAZEIRO 3
-1506A  11582A                  .204      1.062      2.589      42.8 0 0 0
-2506B  11582B                  .023       .321      5.178      42.8 0 0 0
-3506C  11582C                                                        0
C C2 LT 500 kV JUAZEIRO 3 - L.GONZAGA
-111582A505A                    .198       1.02      2.589      252. 0 0 0
-211582B505B                    .024       .315      5.177      252. 0 0 0
-311582C505C                                                          0
C C1 LT 500 kV JUAZEIRO 3 - L.GONZAGA
-111582A505A                    .198       1.02      2.589      252. 0 0 0
-211582B505B                    .024       .315      5.177      252. 0 0 0
-311582C505C                                                          0
C C1 LT 500 kV L.GONZAGA - MILAGRES 2
-111567A505A                    .406      1.598      2.872      237. 0 0 0
-211567B505B                    .022       .269      5.744      237. 0 0 0
-311567C505C                                                          0
C C1 LT 500 kV L.GONZAGA - OLINDINA
-1582A  505A                    .307       .918      2.484     256.8 0 0 0
-2582B  505B                     .03       .302      4.968     256.8 0 0 0
-3582C  505C                                                          0
C C1 LT 500 kV P.AFONSO 4 - L.GONZAGA
-1505A  500A                    .212       .992      2.456      37.8 0 0 0
-2505B  500B                    .026       .311      4.912      37.8 0 0 0
-3505C  500C                                                          0
C C2 LT 500 kV P.AFONSO 4 - L.GONZAGA
-1505A  500A                    .126       .622      2.344      39.6 0 0 0
-2505B  500B                    .025       .297      4.689      39.6 0 0 0
-3505C  500C                                                          0
C C1 LT 500 kV P.AFONSO 4 - OLINDINA
-1582A  500A                    .308       .977       2.46     219.9 0 0 0
-2582B  500B                    .024       .306       4.92     219.9 0 0 0
-3582C  500C                                                          0
C C1 LT 230 kV P.AFONSO B 3 - GARANHUNS
-1300A  349A                    .468      1.792      2.038     210.1 0 0 0
-2300B  349B                    .093       .505      3.088     210.1 0 0 0
-3300C  349C                                                          0
C C2 LT 230 kV P.AFONSO B 3 - GARANHUNS
-1300A  349A                    .286      1.314      2.753     210.2 0 0 0
-2300B  349B                    .046       .393      4.171     210.2 0 0 0
-3300C  349C                                                          0
C C1 LT 500 kV L.GONZAGA - GARANHUNS 2
-1505A  549A                    .316       .849      2.424     240.8 0 0 0
-2505B  549B                    .029       .289      4.848     240.8 0 0 0
-3505C  549C                                                          0
C C2 LT 500 kV L.GONZAGA - GARANHUNS 2
-1505A  549A                    .172       .915      3.078      218. 0 0 0
-2505B  549B                    .017        .27      6.157      218. 0 0 0
-3505C  549C                                                          0
C C1 LT 230 kV P.AFONSO 3 A - GARANHUNS
-1200A  349A                    .468      1.791      2.037     210.2 0 0 0
-2200B  349B                    .093       .505      3.087     210.2 0 0 0
-3200C  349C                                                          0
C C1 LT 230 kV P.AFONSO 3 A - SANTANA 2
-1200A  11201A                  .474      1.636      2.145     109.67 0 0 0
-2200B  11201B                  .103       .494      3.251     109.67 0 0 0
-3200C  11201C                                                        0
C C1 LT 230 kV GARANHUNS - ANGELIM
-1349A  240A                    .324      1.192      3.002      12.3 0 0 0
-2349B  240B                    .051       .353      4.549      12.3 0 0 0
-3349C  240C                                                          0
C C2 LT 230 kV GARANHUNS - ANGELIM
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-1349A  240A                    .244       .911       4.07       12.2 0 0 0
-2349B  240B                    .046       .252      6.167       12.2 0 0 0
-3349C  240C                                                             0
C C3 LT 230 kV GARANHUNS - ANGELIM
-1349A  240A                    .291      1.324      2.751       12.2 0 0 0
-2349B  240B                    .046       .392      4.168       12.2 0 0 0
-3349C  240C                                                             0
C C1 LT 230 kV SANTANA 2 - ANGELIM
-111201A240A                    .469      1.635      2.167     161.18 0 0 0
-211201B240B                    .103       .496      3.283     161.18 0 0 0
-311201C240C                                                             0
C C1 LT 230 kV ANGELIM - MESSIAS
-1342A  240A                    .471      1.464      2.137       80.2 0 0 0
-2342B  240B                    .095       .485      3.239       80.2 0 0 0
-3342C  240C                                                             0
C C2 LT 230 kV ANGELIM - MESSIAS
-1342A  240A                    .482      1.445      2.137       80.2 0 0 0
-2342B  240B                    .095       .485      3.239       80.2 0 0 0
-3342C  240C                                                             0
C C3 LT 230 kV ANGELIM - MESSIAS
-1342A  240A                    .465      1.413      2.062       81.2 0 0 0
-2342B  240B                    .095       .502      3.124       81.2 0 0 0
-3342C  240C                                                             0
C C1 LT 500 kV XINGO - MESSIAS
-1504A  542A                    .301      1.262      2.552      219.3 0 0 0
-2504B  542B                    .024       .317      5.105      219.3 0 0 0
-3504C  542C                                                             0
C C1 LT 500 kV XINGO - ANGELIM
-1504A  540A                    .414       1.31      2.685      195.1 0 0 0
-2504B  540B                    .026       .323      5.371      195.1 0 0 0
-3504C  540C                                                             0
C C1 LT 500 kV P.AFONSO 4 - ANGELIM
-1500A  540A                    .315       .909      2.555      222.8 0 0 0
-2500B  540B                    .025       .313      5.111      222.8 0 0 0
-3500C  540C                                                             0
C C1 LT 500 kV P.AFONSO 4 - XINGO
-1500A  504A                    .188       .844      2.473       54.5 0 0 0
-2500B  504B                    .023       .312      4.947       54.5 0 0 0
-3500C  504C                                                             0
C C2 LT 500 kV XINGO - JARDIM
-1504A  573A                    .329      1.237      2.575      165.6 0 0 0
-2504B  573B                    .023       .297      5.149      165.6 0 0 0
-3504C  573C                                                             0
C C1 LT 500 kV XINGO - JARDIM
-1504A  573A                     .25      1.285      2.569      164.8 0 0 0
-2504B  573B                    .023       .299      5.138      164.8 0 0 0
-3504C  573C                                                             0
C C1 LT 500 kV OLINDINA - CAMAÇARI
-1582A  574A                    .321       .921      2.553      151.8 0 0 0
-2582B  574B                    .033        .31      5.107      151.8 0 0 0
-3582C  574C                                                             0
C C2 LT 500 kV OLINDINA - CAMAÇARI
-1582A  574A                     .29       .958      2.518      151.9 0 0 0
-2582B  574B                    .025       .313      5.036      151.9 0 0 0
-3582C  574C                                                             0
C C1 LT 500 kV CAMAÇARI - SAPEAÇU
-1589A  574A                    .383      1.362      2.575      105.2 0 0 0
-2589B  574B                    .025       .316       5.15      105.2 0 0 0
-3589C  574C                                                             0
C C1 LT 500 kV SAPEAÇU - CAMAÇARI 4
-1589A  584A                    .387      1.375      2.532      104.2 0 0 0
-2589B  584B                    .025       .314      5.063      104.2 0 0 0
-3589C  584C                                                             0
C C1 LT 230 kV ITABAINA - JARDIM
-1273A  271A                    .462      1.564       2.17       44.5 0 0 0
-2273B  271B                    .096       .492      3.288       44.5 0 0 0
-3273C  271C                                                             0
C C2 LT 230 kV ITABAINA - JARDIM
-1273A  271A                    .462      1.564       2.17       44.5 0 0 0
-2273B  271B                    .096       .492      3.288       44.5 0 0 0
-3273C  271C                                                             0
C C1 LT 230 kV CATU - CAMAÇARI 4
-1272A  284A                    .313      1.143      2.084       25.5 0 0 0
-2272B  284B                    .095       .508      3.158       25.5 0 0 0
-3272C  284C                                                             0
C C2 LT 230 kV CATU - CAMAÇARI 4
-1272A  284A                    .268       .993      2.026       25.5 0 0 0
-2272B  284B                    .095       .519      3.069       25.5 0 0 0
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-3272C  284C                                                          0
C C1 LT 230 kV G.MANGABEIRA - CATU
-1275A  272A                    .488      1.547      2.107      77.2 0 0 0
-2275B  272B                    .097       .519      3.193      77.2 0 0 0
-3275C  272C                                                          0
C C1 LT 230 kV G.MANGABEIRA - SAPEAÇU
-1289A  275A                    .379      1.338      2.256      22.9 0 0 0
-2289B  275B                    .104       .557      3.418      22.9 0 0 0
-3289C  275C                                                          0
C C2 LT 230 kV G.MANGABEIRA - SAPEAÇU
-1289A  275A                     .34      1.176      2.419      22.9 0 0 0
-2289B  275B                    .104       .517      3.665      22.9 0 0 0
-3289C  275C                                                          0
C C3 LT 230 kV G.MANGABEIRA - SAPEAÇU
-1289A  275A                    .344      1.164      2.419      22.9 0 0 0
-2289B  275B                    .104       .517      3.665      22.9 0 0 0
-3289C  275C                                                          0
C C1 LT 230 kV CAMAÇARI B2 - G.MANGABEIRA
-1275A  294A                    .486      1.528       2.17      84.5 0 0 0
-2275B  294B                    .096       .491      3.289      84.5 0 0 0
-3275C  294C                                                          0
C C1 LT 230 kV F.SANTANA 3 - CAMAÇARI B2
-111110A294A                    .453      1.652       2.18       97. 0 0 0
-211110B294B                    .098       .499      3.303       97. 0 0 0
-311110C294C                                                          0
C C1 LT 230 kV F.SANTANA 3 - G.MANGABEIRA
-1275A  11110A                  .447      1.633      2.156      98.1 0 0 0
-2275B  11110B                  .097       .494      3.266      98.1 0 0 0
-3275C  11110C                                                        0
C C1 LT 230 kV G.MANGABEIRA - EMBASA
-1275A  214A                    .386      1.453      2.129     11.25 0 0 0
-2275B  214B                    .099       .494      3.226     11.25 0 0 0
-3275C  214C                                                          0
C C1 LT 230 kV TOMBA - EMBASA
-1214A  266A                    .377      1.421      2.104       30. 0 0 0
-2214B  266B                    .099       .483      3.188       30. 0 0 0
-3214C  266C                                                          0
C C1 LT 230 kV G.MANGABEIRA - TOMBA
-1275A  266A                     .38       1.43      2.111     41.25 0 0 0
-2275B  266B                    .099       .486      3.199     41.25 0 0 0
-3275C  266C                                                          0
C C2 LT 230 kV S.A.JESUS - FUNIL
-1276A  264A                    .329      1.149      2.168     167.8 0 0 0
-2276B  264B                    .091       .464      3.285     167.8 0 0 0
-3276C  264C                                                          0
C C1 LT 500 kV SAPEAÇU - POÇÕES 3
-111612A589A                    .259      1.006      4.298      250. 0 0 0
-211612B589B                    .013       .186      8.597      250. 0 0 0
-311612C589C                                                          0
C C1 LT 500 kV POÇÕES 3 - P.PARAISO 2
-111612A38975A                   .26       .998      4.418     330.6 0 0 0
-211612B38975B                  .013       .187      8.836     330.6 0 0 0
-311612C38975C                                                        0
C C2 LT 500 kV POÇÕES 3 - P.PARAISO 2
-111612A38975A                  .245       .942      4.172     350.1 0 0 0
-211612B38975B                  .012       .177      8.344     350.1 0 0 0
-311612C38975C                                                        0
C C1 LT 230 kV SAPEAÇU - FUNIL
-1276A  289A                    .351      1.267      2.052     199.2 0 0 0
-2276B  289B                    .093         .5      3.109     199.2 0 0 0
-3276C  289C                                                          0
C C1 LT 230 kV S.A.JESUS - SAPEAÇU
-1264A  289A                    .335      1.158       1.58      32.7 0 0 0
-2264B  289B                    .073        .39      2.393      32.7 0 0 0
-3264C  289C                                                          0
C C2 LT 230 kV S.A.JESUS - SAPEAÇU
-1264A  289A                    .341      1.152      1.694      32.7 0 0 0
-2264B  289B                    .073       .362      2.567      32.7 0 0 0
-3264C  289C                                                          0
C C3 LT 230 kV S.A.JESUS - SAPEAÇU
-1264A  289A                    .358      1.207      1.775      31.2 0 0 0
-2264B  289B                    .076        .38       2.69      31.2 0 0 0
-3264C  289C                                                          0
C C1 LT 230 kV S.A.JESUS - FUNIL
-1276A  264A                    .336      1.142      2.122     167.9 0 0 0
-2276B  264B                    .093       .477      3.216     167.9 0 0 0
-3276C  264C                                                          0
C C1 LT 230 kV FUNIL - POÇÕES 2
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-1209A  276A                    .503       1.641       2.261       114.1 0 0 0
-2209B  276B                    .103        .509       3.426       114.1 0 0 0
-3209C  276C                                                                 0
C C1 LT 230 kV ITAGIBA - POÇÕES 2
-1209A  213A                    .452       1.466       2.172        87.7 0 0 0
-2209B  213B                      .1        .504       3.291        87.7 0 0 0
-3209C  213C                                                                 0
C C1 LT 230 kV FUNIL - ITAGIBA
-1213A  276A                    .309       1.245       2.142        29.9 0 0 0
-2213B  276B                    .097        .497       3.245        29.9 0 0 0
-3213C  276C                                                                 0
C C1 LT 230 kV FUNIL - ITAPEBI
-1263A  276A                    .265       1.287       2.145       203.9 0 0 0
-2263B  276B                    .093        .478        3.25       203.9 0 0 0
-3263C  276C                                                                 0
C C2 LT 230 kV FUNIL - ITAPEBI
-1263A  276A                    .264       1.268       2.145       203.9 0 0 0
-2263B  276B                    .093        .477        3.25       203.9 0 0 0
-3263C  276C                                                                 0
C C3 LT 230 kV FUNIL - ITAPEBI
-1263A  276A                    .433       1.426       1.962        223. 0 0 0
-2263B  276B                    .085        .436       2.972        223. 0 0 0
-3263C  276C                                                                 0
C C1 LT 500 kV IBICOARA - SAPEAÇU
-1588A  589A                    .436       1.541       3.093        258. 0 0 0
-2588B  589B                    .019        .272       6.187        258. 0 0 0
-3588C  589C                                                                 0
C C1 LT 500 kV IBICOARA - POÇÕES 3
-1588A  11612A                  .121        .638       4.417       162.4 0 0 0
-2588B  11612B                  .014        .194       8.835       162.4 0 0 0
-3588C  11612C                                                               0
C C1 LT 500 kV IGAPORÃ 3 - IBICOARA
-111594A588A                    .338       1.137        3.15        175. 0 0 0
-211594B588B                    .017        .269       6.299        175. 0 0 0
-311594C588C                                                                 0
C C1 LT 500 kV JARDIM - CAMAÇARI 4
-1584A  573A                      .2        .943       2.483       255.4 0 0 0
-2584B  573B                    .023        .308       4.965       255.4 0 0 0
-3584C  573C                                                                 0
C C1 LT 500 kV GARANHUNS 2 - ANGELIM
-1549A  540A                    .368       1.019       2.346        13.3 0 0 0
-2549B  540B                     .03        .286       4.692        13.3 0 0 0
-3549C  540C                                                                 0
C C2 LT 500 kV P.SERGIPE - JARDIM
-111151A573A                    .351        1.24       2.738       33.31 0 0 0
-211151B573B                    .024        .295       5.477       33.31 0 0 0
-311151C573C                                                                 0
C C1 LT 500 kV P.SERGIPE - JARDIM
-111151A573A                    .351        1.24       2.738       33.31 0 0 0
-211151B573B                    .024        .295       5.477       33.31 0 0 0
-311151C573C                                                                 0
C C1 LT 230 kV P.AFONSO A 3 - ITABAINA
-1271A  200A                    .465       1.475       2.155      167.35 0 0 0
-2271B  200B                    .094        .481       3.264      167.35 0 0 0
-3271C  200C                                                                 0
C C1 LT 230 kV P.AFONSO B 3 - ITABAINA
-1271A  300A                    .453       1.486       2.155      167.35 0 0 0
-2271B  300B                    .094        .481       3.264      167.35 0 0 0
-3271C  300C                                                                 0
$VINTAGE,0
C C1 LT 230 kV ASALE A - P.AFONSO 3 A
1 200A  301A             1.53314.814916.946
2 200B  301B             0.95361.7466-2.1651.53314.814916.946
3 200C  301C             0.95361.7466-2.1650.95361.7466-2.1651.53314.814916.946
C C1 LT 230 kV A.SALES B - P.AFONSO 3 B
1 300A  302A             1.53314.814916.946
2 300B  302B             0.95361.7466-2.1651.53314.814916.946
3 300C  302C             0.95361.7466-2.1650.95361.7466-2.1651.53314.814916.946
C C1 LT 230 kV N.S.SOCORRO - JARDIM
1 273A  11273A           0.1417 0.5575.6122
2 273B  11273B            0.0730.1162-0.7170.1417 0.5575.6122
3 273C  11273C            0.0730.1162-0.717 0.0730.1162-0.7170.1417 0.5575.6122
C C2 LT 230 kV N.S.SOCORRO - JARDIM
1 273A  11273A           0.18440.82685.6122
2 273B  11273B           0.11570.3859-0.7170.18440.82685.6122
3 273C  11273C           0.11570.3859-0.7170.11570.3859-0.7170.18440.82685.6122
C C1 LT 500 kV CAMAÇARI 4 - CAMAÇARI
1 584A  574A             0.28151.34138.4773
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2 584B  574B               0.2310.6929-1.6950.28151.34138.4773
3 584C  574C               0.2310.6929-1.695 0.2310.6929-1.6950.28151.34138.4773
C C1 LT 230 kV P.CAVALO - G.MANGABEIRA
1 275A  375A               0.9523.8096 11.33
2 275B  375B              0.58241.7456-1.448 0.9523.8096 11.33
3 275C  375C              0.58241.7456-1.4480.58241.7456-1.448 0.9523.8096 11.33
C C1 LT 230 kV POÇÕE3 - POÇÕES 2
1 18612A209A              0.2006 1.2058.8543
2 18612B209B              0.12920.5318-1.1320.2006 1.2058.8543
3 18612C209C              0.12920.5318-1.1320.12920.5318-1.1320.2006 1.2058.8543
C C2 LT 230 kV POÇÕE3 - POÇÕES 2
1 18612A209A              0.2006 1.2058.8543
2 18612B209B              0.12920.5318-1.1320.2006 1.2058.8543
3 18612C209C              0.12920.5318-1.1320.12920.5318-1.1320.2006 1.2058.8543
C Gerador IRECE SIN - 13,8 kV
51GIRECA483A                          1.35841
52GIRECB483B                          1.35841
53GIRECC483C
C Gerador SOBRADINHO 2 UHE - 13,8 kV
51GSOB2A90058A            190.44   190.43981
52GSOB2B90058B                        .07503
53GSOB2C90058C
C Gerador SOBRADINHO 1 UHE - 13,8 kV
51GSOB1A21A               190.44   190.43981
52GSOB1B21B                           .07503
53GSOB1C21C
C Gerador L.GONZAGA 2 UHE - 13,8 kV
51GLGZ2A34A               190.44   190.43981
52GLGZ2B34B                           .05098
53GLGZ2C34C
C Gerador L.GONZAGA 1 UHE - 13,8 kV
51GLGZ1A33A               190.44   190.43981
52GLGZ1B33B                           .05098
53GLGZ1C33C
C Gerador P.AFONSO 3-2 UHE - 13,8 kV
51GPA32A11A               190.44   190.43981
52GPA32B11B                            .0836
53GPA32C11C
C Gerador ASAL B1 UHE - 13,8 kV
51GASB1A90033A            190.44   190.43981
52GASB1B90033B                        .25557
53GASB1C90033C
C Gerador PAF2A1 - 13,8 kV
51GPAA1A4A                190.44   190.43981
52GPAA1B4B                            .45725
53GPAA1C4C
C Gerador PAF2A2 - 13,8 kV
51GPAA2A5A                190.44   190.43981
52GPAA2B5B                            .45725
53GPAA2C5C
C Gerador PAF2B1 - 13,8 kV
51GPAB1A7A                190.44   190.43981
52GPAB1B7B                            .45725
53GPAB1C7C
C Gerador PAF2B3 - 13,8 kV
51GPAB3A9A                190.44   190.43981
52GPAB3B9B                            .45725
53GPAB3C9C
C Gerador PAF2B2 - 13,8 kV
51GPAB2A8A                190.44   190.43981
52GPAB2B8B                            .45725
53GPAB2C8C
C Gerador PAF2A3 - 13,8 kV
51GPAA3A6A                190.44   190.43981
52GPAA3B6B                            .60788
53GPAA3C6C
C Gerador ASAL E1 UHE - 13,8 kV
51GASE1A28A               190.44   190.43981
52GASE1B28B                           .25557
53GASE1C28C
C Gerador P.AFONSO UHE 1 - 13,8 kV
51GPAF1A1A                            .14136
52GPAF1B1B                            .19282
53GPAF1C1C
C Gerador CAMAÇARI D1 SIN - 13,8 kV
51GCAD1A874A              60.369     1.66959
52GCAD1B874B                           .2032
53GCAD1C874C
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C Gerador CAMAÇARI D2 SIN - 13,8 kV
51GCAD2A974A              60.369     1.66959
52GCAD2B974B                           .2032
53GCAD2C974C
C Gerador P.CAVALO 1 UHE - 13,8 kV
51GPCA1A48A               190.44   190.43981
52GPCA1B48B                           .24338
53GPCA1C48C
C Gerador FUNIL 1 UHE - 13,8 kV
51GFUN1A63A               190.44   190.43981
52GFUN1B63B                          1.06646
53GFUN1C63C
C Gerador ITAPEBI 1 UHE - 13,8 kV
51GITA1A95A               190.44   190.43981
52GITA1B95B                           .08506
53GITA1C95C
C Gerador P.AFONSO 4-1 UHE - 13,8 kV
51GPA41A14A               190.44   190.43981
52GPA41B14B                           .01635
53GPA41C14C
C Gerador XINGO 1 UHE - 13,8 kV
51GXIN1A89A               190.44   190.43981
52GXIN1B89B                            .0139
53GXIN1C89C
C Gerador B.J.LAPA SIN - 13,8 kV
51GBJLAA485A                         1.26966
52GBJLAB485B                         1.26966
53GBJLAC485C
C Gerador P.SERGIPE 1V UTE - 24 kV
51GPS1VA11149A                        .20035
52GPS1VB11149B                        .20035
53GPS1VC11149C
C Gerador P.SERGIPE 1G UTE - 25 kV
51GPS1GA11150A                        .11271
52GPS1GB11150B                        .11271
53GPS1GC11150C
C Gerador T.CAMAÇARI 1 UTE - 13,8 kV
51GTCA1A81A               190.44   190.43981
52GTCA1B81B                           .07618
53GTCA1C81C
C Gerador ASAL E2 UHE - 13,8 kV
51GASE2A29A               190.44   190.43981
52GASE2B29B                           .25557
53GASE2C29C
C Gerador ASAL B2 UHE - 13,8 kV
51GASB2A90030A            190.44   190.43981
52GASB2B90030B                        .25557
53GASB2C90030C
C EQ - GERADOR - SOBRADINHO 230 kV
51ESOB2A206A                          90.4114
52ESOB2B206B                          90.5066
53ESOB2C206C
C EQ - GERADOR - ANGELIM 500 kV
51EANG5A540A              40.538     130.065
52EANG5B540B              4.6255     132.265
53EANG5C540C
C EQ - GERADOR - MESSIAS 500 kV
51EMES5A542A               48.18      195.63
52EMES5B542B              4.5445      225.59
53EMES5C542C
C EQ - GERADOR - GARANHUNS 2 500 kV
51EGA25A549A              18.052    126.1775
52EGA25B549B              1.9558    111.6375
53EGA25C549C
C EQ - GERADOR - G.OURO 2 500 kV
51EGO25A11560A            38.542     173.835
52EGO25B11560B            6.4513    108.3075
53EGO25C11560C
C EQ - GERADOR - MILAGRES 2 500 kV
51EMI25A11567A            4.1878       33.65
52EMI25B11567B            2.0365     40.3675
53EMI25C11567C
C EQ - GERADOR - IGAPORÃ 3 500 kV
51EIG35A11594A            2.9813       34.91
52EIG35B11594B            2.1213     43.9125
53EIG35C11594C
C EQ - GERADOR - P.PARAISO 2 500 kV
51EPP25A38975A            14.619     101.535
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52EPP25B38975B             4.553     63.7325
53EPP25C38975C
C EQ - GERADOR - P.AFONSO 3 A 230 kV
51EP3A2A200A               1.0104     27.6318
52EP3A2B200B               439.88   1171.8408
53EP3A2C200C
C EQ - GERADOR - ANGELIM 230 kV
51EANG2A240A               1.4058     12.4204
52EANG2B240B               6.2644     44.4175
53EANG2C240C
C EQ - GERADOR - ITAPEBI 230 kV
51EITA2A263A               3.4658     62.3374
52EITA2B263B                .1025    136.7201
53EITA2C263C
C EQ - GERADOR - B.J.LAPA 230 kV
51EBJL2A285A                .2942     13.2017
52EBJL2B285B               2.8144     47.8036
53EBJL2C285C
C EQ - GERADOR - P.AFONSO 3 B 230 kV
51EP3B2A300A               5.1664     60.2161
52EP3B2B300B               679.82   1785.8511
53EP3B2C300C
C EQ - GERADOR - FUNIL 138 kV
51EFUN1A976A                289.2    2113.884
52EFUN1B976B               506.02   2241.0789
53EFUN1C976C
C EQ - GERADOR - S.BONFIM 230 kV
51ESBO2A203A                        1089.9516
52ESBO2B203B                        4049.6008
53ESBO2C203C
C EQ - GERADOR - POÇÕES 2 230 kV
51EPOC2A209A                57.73    334.8676
52EPOC2B209B               38.905    564.6546
53EPOC2C209C
C EQ - GERADOR - CATU 230 kV
51ECAT2A272A                .7847     13.3054
52ECAT2B272B               427.95   4301.5106
53ECAT2C272C
C EQ - GERADOR - CAMAÇARI B1 230 kV
51ECB12A274A               7.7885     61.6814
52ECB12B274B                         952.3058
53ECB12C274C
C EQ - GERADOR - CAMAÇARI 4 230 kV
51ECA42A284A                 .976      7.0352
52ECA42B284B                .4598     17.7733
53ECA42C284C
C EQ - GERADOR - IBICOARA 230 kV
51EIBI2A288A                41.24    200.0784
52EIBI2B288B               9.6416    379.4358
53EIBI2C288C
C EQ - GERADOR - CAMAÇARI B2 230 kV
51ECB22A294A                7.342      32.817
52ECB22B294B                         180.3308
53ECB22C294C
C EQ - GERADOR - GARANHUNS 230 kV
51EGAR2A349A               1.3884     19.3381
52EGAR2B349B               1.8165     34.7532
53EGAR2C349C
C EQ - GERADOR - JUAZEIRO 3 230 kV
51EJUA2A11282A             1.0782     11.8565
52EJUA2B11282B             5.4455     63.9667
53EJUA2C11282C
C EQ - GERADOR - SE01 230 kV
51EQSE2A58844A             7.0897    139.2381
52EQSE2B58844B              2.194      112.55
53EQSE2C58844C
C EQ - GERADOR - IRECE 138 kV
51EIRE1A183A               9.9789    104.7725
52EIRE1B183B               3.9752     77.0692
53EIRE1C183C
C EQ - GERADOR - G.OURO 1 138 kV
51EGOU1A59029A             7.0421     188.408
52EGOU1B59029B             3.0251    153.9841
53EGOU1C59029C
C EQ - GERADOR - JARDIM 69 kV
51EJAR6A673A                4761.   4760.9952
52EJAR6B673B               5.2266     49.7858
53EJAR6C673C
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C EQ - GERADOR - CAMAÇARI 69 kV
51ECAM6A674A               4761.   4760.9952
52ECAM6B674B               .3073      5.9574
53ECAM6C674C
C EQ - GERADOR - BROTAS 34.5 kV
51EBRO6A11306A             .3109      4.7827
52EBRO6B11306B             .1315      2.6882
53EBRO6C11306C
C EQ - GERADOR - UMBURANAS 34.5 kV
51EUMU3A58824A             .0194       .7155
52EUMU3B58824B             .0087       .6038
53EUMU3C58824C
C EQ - GERADOR - C.LARGO 34.5 kV
51ECLA3A58832A             .0527      1.5728
52ECLA3B58832B             .0233      1.2717
53ECLA3C58832C
C EQ - GERADOR - G.OURO 1B 34.5 kV
51EGOU3A59035A             .1055       4.546
52EGOU3B59035B             .0467      3.9425
53EGOU3C59035C
C EQ - GERADOR - SOBRADINHO 500 kV
51ESOB5A506A              41.682    184.1525
52ESOB5B506B               6.468        44.7
53ESOB5C506C
C EQ - REATOR - TOMBA 230 kV
51266A                                16.9257
52266B                    5.29E5      5.29E5
53266C
C EQ - REATOR - ITABAINA 230 kV
51271A                                32.3551
52271B                    5.29E5      5.29E5
53271C
C EQ - REATOR - MESSIAS 230 kV
51342A                                 9.306
52342B                    5.29E5      5.29E5
53342C
C EQ - REATOR - SANTANA 2 230 kV
5111201A                              33.8825
5211201B                  5.29E5      5.29E5
5311201C
C EQ - REATOR - N.S.SOCORRO 230 kV
5111273A                             116.7239
5211273B                  5.29E5      5.29E5
5311273C
C EQ - TRF - P.AFONSO 3 A 230 kV para MILAGRES 2 500 kV - em 500 kV
5111567AX0095A             682.42      1690.5
5211567BX0095B              54.55       257.3
5311567CX0095C
C EQ - TRF - P.AFONSO 3 A 230 kV para MILAGRES 2 500 kV - em 230 kV
  TRANSFORMER                         X0096A  1.E6                          0
            9999
 1X0095A                   1.E-6 1.E-6  500.
 2200A                     1.E-6 1.E-6  230.
  TRANSFORMER X0096A                  X0096B                                0
 1X0095B
 2200B
  TRANSFORMER X0096A                  X0096C                                0
 1X0095C
 2200C
C EQ - TRF - ANGELIM 230 kV para ANGELIM 500 kV - em 500 kV
51540A  X0097A             5392.8     7382.25
52540B  X0097B             71.172       386.5
53540C  X0097C
C EQ - TRF - ANGELIM 230 kV para ANGELIM 500 kV - em 500 kV
  TRANSFORMER                         X0098A  1.E6                          0
            9999
 1X0097A                   1.E-6 1.E-6  500.
 2240A                     1.E-6 1.E-6  230.
  TRANSFORMER X0098A                  X0098B                                0
 1X0097B
 2240B
  TRANSFORMER X0098A                  X0098C                                0
 1X0097C
 2240C
C EQ - TRF - ANGELIM 230 kV para MESSIAS 500 kV - em 500 kV
51542A  X0099A             8818.3     13277.5
52542B  X0099B             132.16       727.2
53542C  X0099C
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C EQ - TRF - ANGELIM 230 kV para MESSIAS 500 kV - em 500 kV
  TRANSFORMER                          X0100A  1.E6                          0
            9999
 1X0099A                  1.E-6 1.E-6  500.
 2240A                    1.E-6 1.E-6  230.
  TRANSFORMER X0100A                   X0100B                                0
 1X0099B
 2240B
  TRANSFORMER X0100A                   X0100C                                0
 1X0099C
 2240C
C EQ - TRF - ANGELIM 230 kV para GARANHUNS 2 500 kV - em 500 kV
51549A  X0101A            3378.8     7701.25
52549B  X0101B            56.053     371.675
53549C  X0101C
C EQ - TRF - ANGELIM 230 kV para GARANHUNS 2 500 kV - em 500 kV
  TRANSFORMER                          X0102A  1.E6                          0
            9999
 1X0101A                  1.E-6 1.E-6  500.
 2240A                    1.E-6 1.E-6  230.
  TRANSFORMER X0102A                   X0102B                                0
 1X0101B
 2240B
  TRANSFORMER X0102A                   X0102C                                0
 1X0101C
 2240C
C EQ - TRF - ANGELIM 230 kV para MILAGRES 2 500 kV - em 500 kV
5111567AX0103A            14755.     27274.5
5211567BX0103B            115.11       663.8
5311567CX0103C
C EQ - TRF - ANGELIM 230 kV para MILAGRES 2 500 kV - em 500 kV
  TRANSFORMER                          X0104A  1.E6                          0
            9999
 1X0103A                  1.E-6 1.E-6  500.
 2240A                    1.E-6 1.E-6  230.
  TRANSFORMER X0104A                   X0104B                                0
 1X0103B
 2240B
  TRANSFORMER X0104A                   X0104C                                0
 1X0103C
 2240C
C EQ - TRF - B.J.LAPA 230 kV para SOBRADINHO 500 kV - em 500 kV
51506A  X0105A            1.08E5   148696.25
52506B  X0105B             338.1    2006.225
53506C  X0105C
C EQ - TRF - B.J.LAPA 230 kV para SOBRADINHO 500 kV - em 500 kV
  TRANSFORMER                          X0106A  1.E6                          0
            9999
 1X0105A                  1.E-6 1.E-6  500.
 2285A                    1.E-6 1.E-6  230.
  TRANSFORMER X0106A                   X0106B                                0
 1X0105B
 2285B
  TRANSFORMER X0106A                   X0106C                                0
 1X0105C
 2285C
C EQ - TRF - B.J.LAPA 230 kV para G.OURO 2 500 kV - em 500 kV
5111560AX0107A            135.05     586.625
5211560BX0107B             4.251    157.4475
5311560CX0107C
C EQ - TRF - B.J.LAPA 230 kV para G.OURO 2 500 kV - em 500 kV
  TRANSFORMER                          X0108A  1.E6                          0
            9999
 1X0107A                  1.E-6 1.E-6  500.
 2285A                    1.E-6 1.E-6  230.
  TRANSFORMER X0108A                   X0108B                                0
 1X0107B
 2285B
  TRANSFORMER X0108A                   X0108C                                0
 1X0107C
 2285C
C EQ - TRF - B.J.LAPA 230 kV para IGAPORÃ 3 500 kV - em 500 kV
5111594AX0109A            66.575     285.85
5211594BX0109B            2.8658      67.78
5311594CX0109C
C EQ - TRF - B.J.LAPA 230 kV para IGAPORÃ 3 500 kV - em 500 kV
  TRANSFORMER                          X0110A  1.E6                          0
            9999
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 1X0109A                   1.E-6 1.E-6  500.
 2285A                     1.E-6 1.E-6  230.
  TRANSFORMER X0110A                  X0110B                                  0
 1X0109B
 2285B
  TRANSFORMER X0110A                  X0110C                                  0
 1X0109C
 2285C
C EQ - TRF - P.AFONSO 3 B 230 kV para MILAGRES 2 500 kV - em 500 kV
5111567AX0111A            819.42    2065.425
5211567BX0111B            85.093     392.425
5311567CX0111C
C EQ - TRF - P.AFONSO 3 B 230 kV para MILAGRES 2 500 kV - em 500 kV
  TRANSFORMER                         X0112A  1.E6                            0
            9999
 1X0111A                   1.E-6 1.E-6  500.
 2300A                     1.E-6 1.E-6  230.
  TRANSFORMER X0112A                  X0112B                                  0
 1X0111B
 2300B
  TRANSFORMER X0112A                  X0112C                                  0
 1X0111C
 2300C
C EQ - TRF - ITAPEBI 230 kV para FUNIL 138 kV - em 230 kV
51263A  X0113A             626.6   2185.6164
52263B  X0113B            151.23    462.4677
53263C  X0113C
C EQ - TRF - ITAPEBI 230 kV para FUNIL 138 kV - em 230 kV
  TRANSFORMER                         X0114A  1.E6                            0
            9999
 1X0113A                   1.E-6 1.E-6  230.
 2976A                     1.E-6 1.E-6  138.
  TRANSFORMER X0114A                  X0114B                                  0
 1X0113B
 2976B
  TRANSFORMER X0114A                  X0114C                                  0
 1X0113C
 2976C
C EQ - LINHA - GARANHUNS 2 para ANGELIM 500 kV
51549A  540A              625.63    1403.125
52549B  540B              13.485    153.3275
53549C  540C
C EQ - LINHA - SOBRADINHO para IGAPORÃ 3 500 kV
51506A  11594A            6.21E5     530525.
52506B  11594B            202.18    1045.025
53506C  11594C
C EQ - LINHA - SOBRADINHO para MILAGRES 2 500 kV
51506A  11567A            999.98    1963.625
52506B  11567B            13.476     102.855
53506C  11567C
C EQ - LINHA - SOBRADINHO para G.OURO 2 500 kV
51506A  11560A            4844.3      7245.5
52506B  11560B             30.12       250.1
53506C  11560C
C EQ - LINHA - ANGELIM para MILAGRES 2 500 kV
51540A  11567A            16774.    23304.25
52540B  11567B             60.04      565.75
53540C  11567C
C EQ - LINHA - ANGELIM para MESSIAS 500 kV
51540A  542A              1378.4    2069.175
52540B  542B              21.037    228.4375
53540C  542C
C EQ - LINHA - MESSIAS para MILAGRES 2 500 kV
51542A  11567A            1.23E5     146243.
52542B  11567B            180.31      1647.7
53542C  11567C
C EQ - LINHA - MESSIAS para GARANHUNS 2 500 kV
51542A  549A              5262.5     9822.75
52542B  549B              41.605       489.8
53542C  549C
C EQ - LINHA - GARANHUNS 2 para MILAGRES 2 500 kV
51549A  11567A             1006.       2767.
52549B  11567B            13.552    191.1625
53549C  11567C
C EQ - LINHA - G.OURO 2 para IGAPORÃ 3 500 kV
5111560A11594A             994.2     2224.55
5211560B11594B            9.9905    116.2575
5311560C11594C
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C EQ - LINHA - G.OURO 2 para MILAGRES 2 500 kV
5111560A11567A             1191.     2364.05
5211560B11567B            11.958    226.3475
5311560C11567C
C EQ - LINHA - MILAGRES 2 para IGAPORÃ 3 500 kV
5111567A11594A             2.72E5     293175.
5211567B11594B             177.2      2017.3
5311567C11594C
C EQ - LINHA - IGAPORÃ 3 para P.PARAISO 2 500 kV
5111594A38975A             2.14E5    203294.5
5211594B38975B             60.862      675.85
5311594C38975C
C EQ - LINHA - P.AFONSO 3 A para P.AFONSO 3 B 230 kV
51200A  300A               4.9736     17.1682
52200B  300B                .9987      5.1931
53200C  300C
C EQ - LINHA - P.AFONSO 3 A para CATU 230 kV
51200A  272A               809.42   1382.8589
52200B  272B               33.511    170.7982
53200C  272C
C EQ - LINHA - S.BONFIM para JUAZEIRO 3 230 kV
51203A  11282A             55.968    144.8984
52203B  11282B             9.1051     38.2298
53203C  11282C
C EQ - LINHA - SOBRADINHO para JUAZEIRO 3 230 kV
51206A  11282A                13.     33.4926
52206B  11282B             2.6143     11.0741
53206C  11282C
C EQ - LINHA - POÇÕES 2 para IBICOARA 230 kV
51209A  288A                720.5    1603.399
52209B  288B               27.337     137.831
53209C  288C
C EQ - LINHA - ITABAINA para CATU 230 kV
51271A  272A               418.86    842.7499
52271B  272B               21.319    116.5387
53271C  272C
C EQ - LINHA - CATU para P.AFONSO 3 B 230 kV
51272A  300A               812.91   1437.5575
52272B  300B               33.647    171.4489
53272C  300C
C EQ - LINHA - CATU para CAMAÇARI 4 230 kV
51272A  284A               52900.  52899.9471
52272B  284B               88.846    294.2351
53272C  284C
C EQ - LINHA - CATU para CAMAÇARI B2 230 kV
51272A  294A               52900.  52899.9471
52272B  294B               117.09    493.1814
53272C  294C
C EQ - LINHA - CAMAÇARI B1 para CAMAÇARI B2 230 kV
51274A  294A               361.56    634.0065
52274B  294B               7.1267     65.9451
53274C  294C
C EQ - LINHA - CAMAÇARI B1 para CAMAÇARI 4 230 kV
51274A  284A               73.002    201.0994
52274B  284B               3.2392     26.4257
53274C  284C
C EQ - LINHA - CAMAÇARI 4 para CAMAÇARI B2 230 kV
51284A  294A               48.232     82.5187
52284B  294B               2.0734     12.4066
53284C  294C
C EQ - LINHA - MESSIAS para N.S.SOCORRO 230 kV
51342A  11273A             8868.6  10169.0728
52342B  11273B             26.081    131.3084
53342C  11273C
C SE L.GONZAGA UHE - TRF1 --- MVA; 500/13.8/13.8 kV; Xp=0.04; Xs=1.34; Xt=1.34
  TRANSFORMER                        X0004A  1.E6                              0
           9999
 1505A                      .0225    .92.89E5
 233A   33B                 .0019 .076313800.
 334A   34B                 .0019 .076313800.
  TRANSFORMER X0004A                 X0004B                                    0
 1505B
 233B   33C
 334B   34C
  TRANSFORMER X0004A                 X0004C                                    0
 1505C
 233C   33A
 334C   34A
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C SE A.SALES A UHE - TRF1 120 MVA; 230/13.8/13.8 kV; Xp=0.69; Xs=12.34; Xt=12.38
  TRANSFORMER                          X0005A  1.E6                              0
            9999
 1301A                     .58193.65011.33E5
 290033A90033B             .0176  .70513800.
 328A   28B                .0177 .707313800.
  TRANSFORMER X0005A                   X0005B                                    0
 1301B
 290033B90033C
 328B   28C
  TRANSFORMER X0005A                   X0005C                                    0
 1301C
 290033C90033A
 328C   28A
C SE CAMAÇARI B1 UHE - TRF1 300 MVA; 230/13.8/13.8 kV; Xp=0.03; Xs=8.21; Xt=8.21
  TRANSFORMER                          X0006A  1.E6                              0
            9999
 1274A                      .004 .15871.33E5
 2974A  974B               .0117 .469113800.
 3874A  874B               .0117 .469113800.
  TRANSFORMER X0006A                   X0006B                                    0
 1274B
 2974B  974C
 3874B  874C
  TRANSFORMER X0006A                   X0006C                                    0
 1274C
 2974C  974A
 3874C  874A
C SE SOBRADINHO UHE - TRF1 400 MVA; 500/13.8/13.8 kV; Xp=0.07; Xs=1.83; Xt=1.83
  TRANSFORMER                          X0007A  1.E6                              0
            9999
 1506A                     .04171.66752.89E5
 221A   21B                .0026 .104713800.
 390058A90058B             .0026 .104713800.
  TRANSFORMER X0007A                   X0007B                                    0
 1506B
 221B   21C
 390058B90058C
  TRANSFORMER X0007A                   X0007C                                    0
 1506C
 221C   21A
 390058C90058A
C SE A.SALES B UHE - TRF1 120 MVA; 230/13.8/13.8 kV; Xp=0.69; Xs=12.34; Xt=12.38
  TRANSFORMER                          X0008A  1.E6                              0
            9999
 1302A                     .58193.65011.33E5
 290030A90030B             .0176  .70513800.
 329A   29B                .0177 .707313800.
  TRANSFORMER X0008A                   X0008B                                    0
 1302B
 290030B90030C
 329B   29C
  TRANSFORMER X0008A                   X0008C                                    0
 1302C
 290030C90030A
 329C   29A
C SE MESSIAS - TRF1 600 MVA; 500/230/13.8 kV; Xp=1.03; Xs=0.13; Xt=3.34
  TRANSFORMER             6.6137 1211.X0141A  1.E6                              0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 1542A                     .6438 25.752.89E5
 2342A                     .0172 .68771.33E5
 3X0181AX0181B             .0048 .190813800.
  TRANSFORMER X0141A                   X0141B                                    0
 1542B
 2342B
 3X0181BX0181C
  TRANSFORMER X0141A                   X0141C                                    0
 1542C
 2342C
 3X0181CX0181A
C SE MESSIAS - TRF3 600 MVA; 500/230/13.8 kV; Xp=0.44; Xs=0.71; Xt=10.79
  TRANSFORMER             6.6137 1211.X0142A  1.E6                              0
      6.61373994       1210.9992
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      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 1542A                     .275   11.2.89E5
 2342A                   .09393.75591.33E5
 3X0182AX0182B           .0154 .616513800.
  TRANSFORMER X0142A                X0142B                                  0
 1542B
 2342B
 3X0182BX0182C
  TRANSFORMER X0142A                X0142C                                  0
 1542C
 2342C
 3X0182CX0182A
C SE MESSIAS - TRF2 600 MVA; 500/230/13.8 kV; Xp=0.44; Xs=0.71; Xt=10.79
  TRANSFORMER            6.6137 1211.X0143A  1.E6                          0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 1542A                     .275   11.2.89E5
 2342A                   .09393.75591.33E5
 3X0183AX0183B           .0154 .616513800.
  TRANSFORMER X0143A                X0143B                                  0
 1542B
 2342B
 3X0183BX0183C
  TRANSFORMER X0143A                X0143C                                  0
 1542C
 2342C
 3X0183CX0183A
  X0175A                               .1                                   0
  X0175B                               .1                                   0
  X0175C                               .1                                   0
  X0176A                               .1                                   0
  X0176B                               .1                                   0
  X0176C                               .1                                   0
  X0177A                               .1                                   0
  X0177B                               .1                                   0
  X0177C                               .1                                   0
C SE IRECE - TRF 2 55 MVA; 230/138/13.8 kV; Xp=13.1; Xs=-1.81; Xt=34.17
  TRANSFORMER                       X0001A  1.E6                            0
            9999
 1283A                   1.493159.7241.33E5
 2183A                    .4037 1.E-679674.
 3X0175AX0175B            .04621.848813800.
  TRANSFORMER X0001A                X0001B                                  0
 1283B
 2183B
 3X0175BX0175C
  TRANSFORMER X0001A                X0001C                                  0
 1283C
 2183C
 3X0175CX0175A
C SE IRECE - TRF 1 55 MVA; 230/138/13.8 kV; Xp=13.08; Xs=-2.01; Xt=42.39
  TRANSFORMER                       X0002A  1.E6                            0
            9999
 1283A                   1.464 58.561.33E5
 2183A                   1.E-6 1.E-679674.
 3X0176AX0176B           .0577 2.30713800.
  TRANSFORMER X0002A                X0002B                                  0
 1283B
 2183B
 3X0176BX0176C
  TRANSFORMER X0002A                X0002C                                  0
 1283C
 2183C
 3X0176CX0176A
C SE IRECE - TRF 3 55 MVA; 230/138/13.8 kV; Xp=13.08; Xs=-2.01; Xt=42.39
  TRANSFORMER                       X0003A  1.E6                            0
            9999
 1283A                   1.464 58.561.33E5
 2183A                   1.E-6 1.E-679674.
 3X0177AX0177B           .0577 2.30713800.
```

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 TRANSFORMER X0003A                  X0003B                                0
1283B
2183B
3X0177BX0177C
 TRANSFORMER X0003A                  X0003C                                0
1283C
2183C
3X0177CX0177A
 X0181A                                  .1                                0
 X0181B                                  .1                                0
 X0181C                                  .1                                0
 X0182A                                  .1                                0
 X0182B                                  .1                                0
 X0182C                                  .1                                0
 X0183A                                  .1                                0
 X0183B                                  .1                                0
 X0183C                                  .1                                0
C SE G.OURO CER - TRF1  200 MVA; 13.8/500 kV; Xps=5
 TRANSFORMER                         X0009A  1.E6                          0
          9999
111562A11562C            .0036 .142813800.
211560A                 1.5625  62.52.89E5
 TRANSFORMER X0009A                  X0009B                                0
111562B11562A
211560B
 TRANSFORMER X0009A                  X0009C                                0
111562C11562B
211560C
C SE B.J.LAPA-SIN - TRF1 80 MVA; 230/13.8 kV; Xps=15.25
 TRANSFORMER                         X0010A  1.E6                          0
          9999
1285A                   1.008440.3361.33E5
2485A  485B              .0109 .435613800.
 TRANSFORMER X0010A                  X0010B                                0
1285B
2485B  485C
 TRANSFORMER X0010A                  X0010C                                0
1285C
2485C  485A
C SE BROTAS - TRF1 100 MVA; 34.5/230 kV; Xps=14
 TRANSFORMER                         X0011A  1.E6                          0
          9999
111306A                  .0208 .833219919.
2205A                    .9258 37.031.33E5
 TRANSFORMER X0011A                  X0011B                                0
111306B
2205B
 TRANSFORMER X0011A                  X0011C                                0
111306C
2205C
C SE IRECE - TRF1 39 MVA; 230/69 kV; Xps=32.82
 TRANSFORMER                         X0012A  1.E6                          0
          9999
1283A                   2.170286.8091.33E5
2683A  683B               .58623.438 6.9E4
 TRANSFORMER X0012A                  X0012B                                0
1283B
2683B  683C
 TRANSFORMER X0012A                  X0012C                                0
1283C
2683C  683A
C SE IRECE - TRF2 40 MVA; 230/69 kV; Xps=32.82
 TRANSFORMER                         X0013A  1.E6                          0
          9999
1283A                   2.170286.8091.33E5
2683A  683B               .58623.438 6.9E4
 TRANSFORMER X0013A                  X0013B                                0
1283B
2683B  683C
 TRANSFORMER X0013A                  X0013C                                0
1283C
2683C  683A
C SE IRECE - TRF3 40 MVA; 230/69 kV; Xps=57.5
 TRANSFORMER                         X0014A  1.E6                          0
          9999
1283A                   3.8022152.091.33E5
2683A  683B             1.026641.064 6.9E4
 TRANSFORMER X0014A                  X0014B                                0
```

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 1283B
 2683B  683C
  TRANSFORMER X0014A                  X0014C                                0
 1283C
 2683C  683A
C SE IRECE - TRF4 40 MVA; 230/69 kV; Xps=32.82
  TRANSFORMER                         X0015A  1.E6                          0
            9999
 1283A                     2.170286.8091.33E5
 2683A  683B                 .58623.438 6.9E4
  TRANSFORMER X0015A                  X0015B                                0
 1283B
 2683B  683C
  TRANSFORMER X0015A                  X0015C                                0
 1283C
 2683C  683A
C SE IRECE-SIN - TRF5 40 MVA; 230/13.8 kV; Xps=26.75
  TRANSFORMER                         X0016A  1.E6                          0
            9999
 1283A                     1.768870.7541.33E5
 2483A  483B                 .0191 .764113800.
  TRANSFORMER X0016A                  X0016B                                0
 1283B
 2483B  483C
  TRANSFORMER X0016A                  X0016C                                0
 1283C
 2483C  483A
C SE G.OURO 1 - TRF1 192 MVA; 138/230 kV; Xps=6.08
  TRANSFORMER                         X0017A  1.E6                          0
            9999
 159029A                    .14465.785679674.
 259060A                    .401816.0711.33E5
  TRANSFORMER X0017A                  X0017B                                0
 159029B
 259060B
  TRANSFORMER X0017A                  X0017C                                0
 159029C
 259060C
C SE G.OURO 1B - TRF1 176 MVA; 34.5/230 kV; Xps=5.68
  TRANSFORMER                         X0018A  1.E6                          0
            9999
 159035A                    .0085 .338119919.
 259060A                    .375715.0281.33E5
  TRANSFORMER X0018A                  X0018B                                0
 159035B
 259060B
  TRANSFORMER X0018A                  X0018C                                0
 159035C
 259060C
C SE C.LARGO - TRF4 170 MVA; 34.5/230 kV; Xps=8.24
  TRANSFORMER                         X0019A  1.E6                          0
            9999
 158832A                    .0123 .490119919.
 258833A                    .544621.7821.33E5
  TRANSFORMER X0019A                  X0019B                                0
 158832B
 258833B
  TRANSFORMER X0019A                  X0019C                                0
 158832C
 258833C
C SE C.LARGO - TRF3 170 MVA; 34.5/230 kV; Xps=8.24
  TRANSFORMER                         X0020A  1.E6                          0
            9999
 158832A                    .0123 .490119919.
 258833A                    .544621.7821.33E5
  TRANSFORMER X0020A                  X0020B                                0
 158832B
 258833B
  TRANSFORMER X0020A                  X0020C                                0
 158832C
 258833C
C SE C.LARGO - TRF2 185 MVA; 34.5/230 kV; Xps=7.57
  TRANSFORMER                         X0021A  1.E6                          0
            9999
 158832A                    .0113 .450419919.
 258833A                    .500420.0161.33E5
  TRANSFORMER X0021A                  X0021B                                0
 158832B
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 258833B
  TRANSFORMER X0021A                  X0021C                                0
 158832C
 258833C
C SE C.LARGO - TRF1 185 MVA; 34.5/230 kV; Xps=7.57
  TRANSFORMER                         X0022A  1.E6                          0
            9999
 158832A                   .0113 .450419919.
 258833A                   .500420.0161.33E5
  TRANSFORMER X0022A                  X0022B                                0
 158832B
 258833B
  TRANSFORMER X0022A                  X0022C                                0
 158832C
 258833C
C SE UMBURANAS -TRF1 200 MVA; 34.5/230 kV; Xps=5
  TRANSFORMER                         X0023A  1.E6                          0
            9999
 158824A                   .0074 .297619919.
 258825A                   .330613.2251.33E5
  TRANSFORMER X0023A                  X0023B                                0
 158824B
 258825B
  TRANSFORMER X0023A                  X0023C                                0
 158824C
 258825C
C SE UMBURANAS -TRF2 200 MVA; 34.5/230 kV; Xps=5
  TRANSFORMER                         X0024A  1.E6                          0
            9999
 158824A                   .0074 .297619919.
 258825A                   .330613.2251.33E5
  TRANSFORMER X0024A                  X0024B                                0
 158824B
 258825B
  TRANSFORMER X0024A                  X0024C                                0
 158824C
 258825C
C SE C.FORMOSO - TRF1 120 MVA; 34.5/230 kV; Xps=8.33
  TRANSFORMER                         X0025A  1.E6                          0
            9999
 158806A                   .0124 .495919919.
 211461A                    .55122.0421.33E5
  TRANSFORMER X0025A                  X0025B                                0
 158806B
 211461B
  TRANSFORMER X0025A                  X0025C                                0
 158806C
 211461C
C SE C.FORMOSO - TRF2 120 MVA; 34.5/230 kV; Xps=8.33
  TRANSFORMER                         X0026A  1.E6                          0
            9999
 158806A                   .0124 .495919919.
 211461A                    .55122.0421.33E5
  TRANSFORMER X0026A                  X0026B                                0
 158806B
 211461B
  TRANSFORMER X0026A                  X0026C                                0
 158806C
 211461C
C SE S.BOMFIM - TRF1 33 MVA; 230/69 kV; Xps=59.5
  TRANSFORMER                         X0027A  1.E6                          0
            9999
 1203A                    3.9344157.381.33E5
 2603A  603B              1.062342.492 6.9E4
  TRANSFORMER X0027A                  X0027B                                0
 1203B
 2603B  603C
  TRANSFORMER X0027A                  X0027C                                0
 1203C
 2603C  603A
C SE S.BOMFIM - TRF2 100 MVA; 230/69 kV; Xps=13.11
  TRANSFORMER                         X0028A  1.E6                          0
            9999
 1203A                    .866934.6761.33E5
 2603A  603B              .23419.3625 6.9E4
  TRANSFORMER X0028A                  X0028B                                0
 1203B
 2603B  603C
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  TRANSFORMER X0028A                  X0028C                                0
 1203C
 2603C  603A
C SE S.BOMFIM - TRF3 100 MVA; 230/69 kV; Xps=13.11
  TRANSFORMER                         X0029A  1.E6                          0
            9999
 1203A                     .866934.6761.33E5
 2603A  603B               .23419.3625 6.9E4
  TRANSFORMER X0029A                  X0029B                                0
 1203B
 2603B  603C
  TRANSFORMER X0029A                  X0029C                                0
 1203C
 2603C  603A
C SE S.BOMFIM - TRF4 100 MVA; 230/138 kV; Xps=9.2
  TRANSFORMER                         X0030A  1.E6                          0
            9999
 1203A                     .608424.3341.33E5
 2103A                      .2198.760279674.
  TRANSFORMER X0030A                  X0030B                                0
 1203B
 2103B
  TRANSFORMER X0030A                  X0030C                                0
 1203C
 2103C
C SE S.BOMFIM - TRF5 100 MVA; 230/138 kV; Xps=6.3
  TRANSFORMER                         X0031A  1.E6                          0
            9999
 1203A                     .416616.6631.33E5
 2103A                       .155.998979674.
  TRANSFORMER X0031A                  X0031B                                0
 1203B
 2103B
  TRANSFORMER X0031A                  X0031C                                0
 1203C
 2103C
C SE S.BOMFIM - TRF6 100 MVA; 230/138 kV; Xps=6.3
  TRANSFORMER                         X0032A  1.E6                          0
            9999
 1203A                     .416616.6631.33E5
 2103A                       .155.998979674.
  TRANSFORMER X0032A                  X0032B                                0
 1203B
 2103B
  TRANSFORMER X0032A                  X0032C                                0
 1203C
 2103C
C SE S.AZUL - TRF1 150 MVA; 34.5/230 kV; Xps=6.67
  TRANSFORMER                         X0033A  1.E6                          0
            9999
 159014A                   .0099 .396819919.
 259015A                   .440817.6331.33E5
  TRANSFORMER X0033A                  X0033B                                0
 159014B
 259015B
  TRANSFORMER X0033A                  X0033C                                0
 159014C
 259015C
C SE M.CHAPEUS - TRF1 120 MVA; 34.5/230 kV; Xps=11.67
  TRANSFORMER                         X0034A  1.E6                          0
            9999
 159057A                   .0174 .694319919.
 259058A                   .771430.8571.33E5
  TRANSFORMER X0034A                  X0034B                                0
 159057B
 259058B
  TRANSFORMER X0034A                  X0034C                                0
 159057C
 259058C
C SE M.CHAPEUS - TRF2 120 MVA; 34.5/230 kV; Xps=11.67
  TRANSFORMER                         X0035A  1.E6                          0
            9999
 159057A                   .0174 .694319919.
 259058A                   .771430.8571.33E5
  TRANSFORMER X0035A                  X0035B                                0
 159057B
 259058B
  TRANSFORMER X0035A                  X0035C                                0
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 159057C
 259058C
C SE V.BAHIA 2 - TRF1 130 MVA; 34.5/230 kV; Xps=10.77
  TRANSFORMER                          X0036A  1.E6                          0
            9999
 159066A                    .016 .640919919.
 259067A                   .712228.4871.33E5
  TRANSFORMER X0036A                   X0036B                                0
 159066B
 259067B
  TRANSFORMER X0036A                   X0036C                                0
 159066C
 259067C
C SE S.BABILONIA - TRF1 150 MVA; 34.5/230 kV; Xps=9.33
  TRANSFORMER                          X0037A  1.E6                          0
            9999
 159076A                   .0139 .555419919.
 259077A                   .617224.6871.33E5
  TRANSFORMER X0037A                   X0037B                                0
 159076B
 259077B
  TRANSFORMER X0037A                   X0037C                                0
 159076C
 259077C
C SE S.BABILONIA - TRF2 150 MVA; 34.5/230 kV; Xps=9.33
  TRANSFORMER                          X0038A  1.E6                          0
            9999
 159076A                   .0139 .555419919.
 259077A                   .617224.6871.33E5
  TRANSFORMER X0038A                   X0038B                                0
 159076B
 259077B
  TRANSFORMER X0038A                   X0038C                                0
 159076C
 259077C
C SE BABILONIA - TRF1 90 MVA; 34.5/230 kV; Xps=15.56
  TRANSFORMER                          X0039A  1.E6                          0
            9999
 159083A                   .0231 .925719919.
 259084A                  1.028641.1431.33E5
  TRANSFORMER X0039A                   X0039B                                0
 159083B
 259084B
  TRANSFORMER X0039A                   X0039C                                0
 159083C
 259084C
C SE BABILONIA - TRF2 90 MVA; 34.5/230 kV; Xps=15.56
  TRANSFORMER                          X0040A  1.E6                          0
            9999
 159083A                   .0231 .925719919.
 259084A                  1.028641.1431.33E5
  TRANSFORMER X0040A                   X0040B                                0
 159083B
 259084B
  TRANSFORMER X0040A                   X0040C                                0
 159083C
 259084C
C SE M.CHAPEU - TRF1 150 MVA; 69/230 kV; Xps=6.67
  TRANSFORMER                          X0041A  1.E6                          0
            9999
 1755A  755C               .11914.7634 6.9E4
 2355A                     .441117.6421.33E5
  TRANSFORMER X0041A                   X0041B                                0
 1755B  755A
 2355B
  TRANSFORMER X0041A                   X0041C                                0
 1755C  755B
 2355C
C SE M.CHAPEU 2 CER - TRF1 200 MVA; 13.8/500 kV; Xps=5
  TRANSFORMER                          X0042A  1.E6                          0
            9999
 112334A12334C             .0036 .142813800.
 2555A                    1.5625  62.52.89E5
  TRANSFORMER X0042A                   X0042B                                0
 112334B12334A
 2555B
  TRANSFORMER X0042A                   X0042C                                0
 112334C12334B
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 2555C
C SE JUAZEIRO 3 - TRF1 300 MVA; 500/230 kV; Xps=2.85
  TRANSFORMER                          X0043A  1.E6                          0
            9999
 111582A                    .890635.6252.89E5
 211282A                    .18857.53831.33E5
  TRANSFORMER X0043A                   X0043B                                0
 111582B
 211282B
  TRANSFORMER X0043A                   X0043C                                0
 111582C
 211282C
C SE JUAZEIRO 3 - TRF2 300 MVA; 500/230 kV; Xps=2.85
  TRANSFORMER                          X0044A  1.E6                          0
            9999
 111582A                    .890635.6252.89E5
 211282A                    .18857.53831.33E5
  TRANSFORMER X0044A                   X0044B                                0
 111582B
 211282B
  TRANSFORMER X0044A                   X0044C                                0
 111582C
 211282C
C SE SOBRADINHO - TRF1 300 MVA; 230/500 kV; Xps=3.56
  TRANSFORMER                          X0045A  1.E6                          0
            9999
 1206A                      .23549.41621.33E5
 2506A                     1.1125  44.52.89E5
  TRANSFORMER X0045A                   X0045B                                0
 1206B
 2506B
  TRANSFORMER X0045A                   X0045C                                0
 1206C
 2506C
C SE SOBRADINHO - TRF2 300 MVA; 230/500 kV; Xps=3.56
  TRANSFORMER                          X0046A  1.E6                          0
            9999
 1206A                      .23549.41621.33E5
 2506A                     1.1125  44.52.89E5
  TRANSFORMER X0046A                   X0046B                                0
 1206B
 2506B
  TRANSFORMER X0046A                   X0046C                                0
 1206C
 2506C
C SE P.AFONSO 2 A2 UHE - TRF1 75 MVA; 13.8/230 kV; Xps=17.97
  TRANSFORMER                          X0047A  1.E6                          0
            9999
 15A    5C                  .0003 .513313800.
 2200A                      .026547.5311.33E5
  TRANSFORMER X0047A                   X0047B                                0
 15B    5A
 2200B
  TRANSFORMER X0047A                   X0047C                                0
 15C    5B
 2200C
C SE P.AFONSO 3 A UHE - TRF2 90 MVA; 230/13.8 kV; Xps=15.99
  TRANSFORMER                          X0048A  1.E6                          0
            9999
 1200A                      .079442.2941.33E5
 28A    8B                  .0009 .456813800.
  TRANSFORMER X0048A                   X0048B                                0
 1200B
 28B    8C
  TRANSFORMER X0048A                   X0048C                                0
 1200C
 28C    8A
C SE P.AFONSO 3 A UHE - TRF1 75 MVA; 230/13.8 kV; Xps=20.06
  TRANSFORMER                          X0049A  1.E6                          0
            9999
 1200A                      .079453.0591.33E5
 26A    6B                  .0009  .57313800.
  TRANSFORMER X0049A                   X0049B                                0
 1200B
 26B    6C
  TRANSFORMER X0049A                   X0049C                                0
 1200C
 26C    6A
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C SE P.AFONSO 3 A UHE - TRF4 240 MVA; 230/13.8 kV; Xps=2.78
  TRANSFORMER                          X0050A  1.E6                          0
            9999
 1200A                    .18357.33991.33E5
 210A   10B                .002 .079313800.
  TRANSFORMER X0050A                   X0050B                                0
 1200B
 210B   10C
  TRANSFORMER X0050A                   X0050C                                0
 1200C
 210C   10A
C SE P.AFONSO 3 A UHE - TRF3 90 MVA; 230/13.8 kV; Xps=15.73
  TRANSFORMER                          X0051A  1.E6                          0
            9999
 1200A                    .079441.6061.33E5
 29A    9B                .0009 .449313800.
  TRANSFORMER X0051A                   X0051B                                0
 1200B
 29B    9C
  TRANSFORMER X0051A                   X0051C                                0
 1200C
 29C    9A
C SE P.AFONSO 2 B1 UHE - TRF1 90 MVA; 13.8/230 kV; Xps=15.09
  TRANSFORMER                          X0052A  1.E6                          0
            9999
 17A    7C                .0003 .431113800.
 2200A                    .026539.9131.33E5
  TRANSFORMER X0052A                   X0052B                                0
 17B    7A
 2200B
  TRANSFORMER X0052A                   X0052C                                0
 17C    7B
 2200C
C SE P.AFONSO 2-A1 UHE - TRF1 75 MVA; 13.8/230 kV; Xps=17.97
  TRANSFORMER                          X0053A  1.E6                          0
            9999
 14A    4C                .0003 .513313800.
 2200A                    .026547.5311.33E5
  TRANSFORMER X0053A                   X0053B                                0
 14B    4A
 2200B
  TRANSFORMER X0053A                   X0053C                                0
 14C    4B
 2200C
C SE P.AFONSO 3 B UHE - TRF1 67 MVA; 230/13.8 kV; Xps=7.11
  TRANSFORMER                          X0054A  1.E6                          0
            9999
 1300A                    .026518.8041.33E5
 21A    1B                .0003 .203113800.
  TRANSFORMER X0054A                   X0054B                                0
 1300B
 21B    1C
  TRANSFORMER X0054A                   X0054C                                0
 1300C
 21C    1A
C SE P.AFONSO 3 B UHE - TRF2 240 MVA; 230/13.8 kV; Xps=3.04
  TRANSFORMER                          X0055A  1.E6                          0
            9999
 1300A                    .01328.02761.33E5
 211A   11B                .0001 .086713800.
  TRANSFORMER X0055A                   X0055B                                0
 1300B
 211B   11C
  TRANSFORMER X0055A                   X0055C                                0
 1300C
 211C   11A
C SE GARANHUNS - TRF1 600 MVA; 230/500 kV; Xps=2.23
  TRANSFORMER              9.585557.07X0056A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1349A                    .14755.89841.33E5
 2549A                    .696927.8752.89E5
  TRANSFORMER X0056A                   X0056B                                0
 1349B
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 2549B
  TRANSFORMER X0056A                  X0056C                                0
 1349C
 2549C
C SE XINGO UHE - TRF1 3000 MVA; 500/13.8 kV; Xps=0.43
  TRANSFORMER                         X0057A  1.E6                          0
            9999
 1504A                     .13335.33382.89E5
 289A   89B                .0003 .012213800.
  TRANSFORMER X0057A                  X0057B                                0
 1504B
 289B   89C
  TRANSFORMER X0057A                  X0057C                                0
 1504C
 289C   89A
C SE CAMAÇARI B1 - TRF1 600 MVA; 230/500 kV; Xps=1.17
  TRANSFORMER              9.585557.07X0058A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1274A                     .07743.09471.33E5
 2574A                     .365614.6252.89E5
  TRANSFORMER X0058A                  X0058B                                0
 1274B
 2574B
  TRANSFORMER X0058A                  X0058C                                0
 1274C
 2574C
C SE CAMAÇARI B1 - TRF2 600 MVA; 230/500 kV; Xps=1.15
  TRANSFORMER              9.585557.07X0059A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1274A                      .0763.04181.33E5
 2574A                     .359414.3752.89E5
  TRANSFORMER X0059A                  X0059B                                0
 1274B
 2574B
  TRANSFORMER X0059A                  X0059C                                0
 1274C
 2574C
C SE CAMAÇARI B2 - TRF1 600 MVA; 230/500 kV; Xps=1.13
  TRANSFORMER              9.585557.07X0060A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1294A                     .07472.98891.33E5
 2574A                     .353114.1252.89E5
  TRANSFORMER X0060A                  X0060B                                0
 1294B
 2574B
  TRANSFORMER X0060A                  X0060C                                0
 1294C
 2574C
C SE CAMAÇARI B2 - TRF2 600 MVA; 230/500 kV; Xps=1.01
  TRANSFORMER              9.585557.07X0061A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1294A                     .06682.67151.33E5
 2574A                     .315612.6252.89E5
  TRANSFORMER X0061A                  X0061B                                0
 1294B
 2574B
  TRANSFORMER X0061A                  X0061C                                0
 1294C
```

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 2574C
C SE JARDIM - TRF1 100 MVA; 230/69 kV; Xps=12.99
  TRANSFORMER                          X0062A  1.E6                          0
            9999
 1294A                      .85934.3591.33E5
 2674A  674B               .23199.2768 6.9E4
  TRANSFORMER X0062A                   X0062B                                0
 1294B
 2674B  674C
  TRANSFORMER X0062A                   X0062C                                0
 1294C
 2674C  674A
C SE CAMAÇARI B1 - TRF1 100 MVA; 230/69 kV; Xps=12.92
  TRANSFORMER                          X0063A  1.E6                          0
            9999
 1274A                     .854334.1731.33E5
 2674A  674B               .23079.2268 6.9E4
  TRANSFORMER X0063A                   X0063B                                0
 1274B
 2674B  674C
  TRANSFORMER X0063A                   X0063C                                0
 1274C
 2674C  674A
C SE N.S.SOCORRO - TRF1 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                          X0064A  1.E6                          0
            9999
 111273A                   .616924.6781.33E5
 211673A11673B             .1666 6.663 6.9E4
  TRANSFORMER X0064A                   X0064B                                0
 111273B
 211673B11673C
  TRANSFORMER X0064A                   X0064C                                0
 111273C
 211673C11673A
C SE N.S.SOCORRO - TRF2 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                          X0065A  1.E6                          0
            9999
 111273A                   .616924.6781.33E5
 211673A11673B             .1666 6.663 6.9E4
  TRANSFORMER X0065A                   X0065B                                0
 111273B
 211673B11673C
  TRANSFORMER X0065A                   X0065C                                0
 111273C
 211673C11673A
C SE N.S.SOCORRO - TRF3 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                          X0066A  1.E6                          0
            9999
 111273A                   .616924.6781.33E5
 211673A11673B             .1666 6.663 6.9E4
  TRANSFORMER X0066A                   X0066B                                0
 111273B
 211673B11673C
  TRANSFORMER X0066A                   X0066C                                0
 111273C
 211673C11673A
C SE JARDIM - TRF1 100 MVA; 230/69 kV; Xps=12.99
  TRANSFORMER                          X0067A  1.E6                          0
            9999
 1273A                      .85934.3591.33E5
 2673A  673B               .23199.2768 6.9E4
  TRANSFORMER X0067A                   X0067B                                0
 1273B
 2673B  673C
  TRANSFORMER X0067A                   X0067C                                0
 1273C
 2673C  673A
C SE JARDIM - TRF2 100 MVA; 230/69 kV; Xps=13.95
  TRANSFORMER                          X0068A  1.E6                          0
            9999
 1273A                     .922436.8981.33E5
 2673A  673B               .24919.9624 6.9E4
  TRANSFORMER X0068A                   X0068B                                0
 1273B
 2673B  673C
  TRANSFORMER X0068A                   X0068C                                0
 1273C
 2673C  673A
```

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C SE JARDIM - TRF3 100 MVA; 230/69 kV; Xps=12.81
  TRANSFORMER                          X0069A  1.E6                          0
             9999
 1273A                     .847133.8831.33E5
 2673A  673B               .22879.1483 6.9E4
  TRANSFORMER X0069A                   X0069B                                0
 1273B
 2673B  673C
  TRANSFORMER X0069A                   X0069C                                0
 1273C
 2673C  673A
C SE JARDIM - TRF4 100 MVA; 230/69 kV; Xps=12.99
  TRANSFORMER                          X0070A  1.E6                          0
             9999
 1273A                      .85934.3591.33E5
 2673A  673B               .23199.2768 6.9E4
  TRANSFORMER X0070A                   X0070B                                0
 1273B
 2673B  673C
  TRANSFORMER X0070A                   X0070C                                0
 1273C
 2673C  673A
C SE F.SANTANA3 - TRF1 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                          X0071A  1.E6                          0
             9999
 111110A                   .616924.6781.33E5
 218763A18763B             .1666 6.663 6.9E4
  TRANSFORMER X0071A                   X0071B                                0
 111110B
 218763B18763C
  TRANSFORMER X0071A                   X0071C                                0
 111110C
 218763C18763A
C SE F.SANTANA3 - TRF2 150 MVA; 230/69 kV; Xps=9.33
  TRANSFORMER                          X0072A  1.E6                          0
             9999
 111110A                   .616924.6781.33E5
 218763A18763B             .1666 6.663 6.9E4
  TRANSFORMER X0072A                   X0072B                                0
 111110B
 218763B18763C
  TRANSFORMER X0072A                   X0072C                                0
 111110C
 218763C18763A
C SE P.CAVALO UHE - TRF1 90 MVA; 230/13.8 kV; Xps=6.74
  TRANSFORMER                          X0073A  1.E6                          0
             9999
 1375A                     .445417.8141.33E5
 248A   48B                .0048 .192413800.
  TRANSFORMER X0073A                   X0073B                                0
 1375B
 248B   48C
  TRANSFORMER X0073A                   X0073C                                0
 1375C
 248C   48A
C SE G.MANGABEIRA - TRF1 100 MVA; 230/69 kV; Xps=13
  TRANSFORMER                          X0074A  1.E6                          0
             9999
 1275A                     .859634.3851.33E5
 2675A  675B               .2321 9.284 6.9E4
  TRANSFORMER X0074A                   X0074B                                0
 1275B
 2675B  675C
  TRANSFORMER X0074A                   X0074C                                0
 1275C
 2675C  675A
C SE G.MANGABEIRA - TRF1 100 MVA; 230/69 kV; Xps=13
  TRANSFORMER                          X0075A  1.E6                          0
             9999
 1275A                     .859634.3851.33E5
 2675A  675B               .2321 9.284 6.9E4
  TRANSFORMER X0075A                   X0075B                                0
 1275B
 2675B  675C
  TRANSFORMER X0075A                   X0075C                                0
 1275C
 2675C  675A
C SE POÇÕES 2 - TRF1 100 MVA; 230/138 kV; Xps=11.8
```

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  TRANSFORMER                          X0076A  1.E6                          0
            9999
 1209A                     .780331.2111.33E5
 2909A                     .280911.23679674.
  TRANSFORMER X0076A                   X0076B                                0
 1209B
 2909B
  TRANSFORMER X0076A                   X0076C                                0
 1209C
 2909C
C SE POÇÕES 2 - TRF2 100 MVA; 230/138 kV; Xps=11.8
  TRANSFORMER                          X0077A  1.E6                          0
            9999
 1209A                     .780331.2111.33E5
 2909A                     .280911.23679674.
  TRANSFORMER X0077A                   X0077B                                0
 1209B
 2909B
  TRANSFORMER X0077A                   X0077C                                0
 1209C
 2909C
C SE FUNIL CER - TRF1 200 MVA; 230/13.8 kV; Xps=4.55
  TRANSFORMER                          X0078A  1.E6                          0
            9999
 1276A                     .300912.0351.33E5
 2476A  476B               .0032   .1313800.
  TRANSFORMER X0078A                   X0078B                                0
 1276B
 2476B  476C
  TRANSFORMER X0078A                   X0078C                                0
 1276C
 2476C  476A
C SE ITAPEBI UHE - TRF1 160 MVA; 230/13.8 kV; Xps=2.72
  TRANSFORMER                          X0079A  1.E6                          0
            9999
 1263A                     .1798 7.1911.33E5
 295A   95B                .0019 .077713800.
  TRANSFORMER X0079A                   X0079B                                0
 1263B
 295B   95C
  TRANSFORMER X0079A                   X0079C                                0
 1263C
 295C   95A
C SE SAPEAÇU CER - TRF1 250 MVA; 13.8/230 kV; Xps=3.2
  TRANSFORMER                          X0080A  1.E6                          0
            9999
 112333A12333C             .0023 .091413800.
 2289A                     .2116 8.4641.33E5
  TRANSFORMER X0080A                   X0080B                                0
 112333B12333A
 2289B
  TRANSFORMER X0080A                   X0080C                                0
 112333C12333B
 2289C
C SE S.A.JESUS - TRF1 100 MVA; 230/69 kV; Xps=12.8
  TRANSFORMER                          X0081A  1.E6                          0
            9999
 1264A                     .846433.8561.33E5
 2664A  664B               .22859.1411 6.9E4
  TRANSFORMER X0081A                   X0081B                                0
 1264B
 2664B  664C
  TRANSFORMER X0081A                   X0081C                                0
 1264C
 2664C  664A
C SE S.A.JESUS - TRF2 100 MVA; 230/69 kV; Xps=13
  TRANSFORMER                          X0082A  1.E6                          0
            9999
 1264A                     .859634.3851.33E5
 2664A  664B               .2321 9.284 6.9E4
  TRANSFORMER X0082A                   X0082B                                0
 1264B
 2664B  664C
  TRANSFORMER X0082A                   X0082C                                0
 1264C
 2664C  664A
C SE S.A.JESUS - TRF3 100 MVA; 230/69 kV; Xps=13
  TRANSFORMER                          X0083A  1.E6                          0
```

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            9999
 1264A                     .859634.3851.33E5
 2664A  664B               .2321 9.284 6.9E4
  TRANSFORMER X0083A                  X0083B                                  0
 1264B
 2664B  664C
  TRANSFORMER X0083A                  X0083C                                  0
 1264C
 2664C  664A
C SE POÇÕES 3 - TRF1 600 MVA; 500/230 kV; Xps=1.4
  TRANSFORMER             4.4092 1211.X0084A  1.E6                            0
      4.40915996       1210.9992
      12.7774549      1254.96465
      24.3599849      1316.68955
      105.907725      1349.28463
      523.268692      1436.34923
            9999
 111612A                   .4375  17.52.89E5
 218612A                   .0926 3.7031.33E5
  TRANSFORMER X0084A                  X0084B                                  0
 111612B
 218612B
  TRANSFORMER X0084A                  X0084C                                  0
 111612C
 218612C
C SE FUNIL  - TRF1 50 MVA; 115/138 kV; Xps=8.78
  TRANSFORMER                         X0085A  1.E6                            0
            9999
 1176A                     .14515.805866395.
 2976A                      .2098.360379674.
  TRANSFORMER X0085A                  X0085B                                  0
 1176B
 2976B
  TRANSFORMER X0085A                  X0085C                                  0
 1176C
 2976C
C SE FUNIL UHE  - TRF2 14 MVA; 115/13.8 kV; Xps=22.82
  TRANSFORMER                         X0086A  1.E6                            0
            9999
 1176A                     .377315.09266395.
 263A   63B                .0163  .65213800.
  TRANSFORMER X0086A                  X0086B                                  0
 1176B
 263B   63C
  TRANSFORMER X0086A                  X0086C                                  0
 1176C
 263C   63A
C SE FUNIL - TRF1  28 MVA; 138/13.8 kV; Xps=35.67
  TRANSFORMER                         X0087A  1.E6                            0
            9999
 1976A                     .849133.96579674.
 2876A  876B               .02551.018913800.
  TRANSFORMER X0087A                  X0087B                                  0
 1976B
 2876B  876C
  TRANSFORMER X0087A                  X0087C                                  0
 1976C
 2876C  876A
C SE P.PARAISO 2 CER - TRF1 350 MVA; 500/13.8 kV; Xps=3.43
  TRANSFORMER                         X0088A  1.E6                            0
            9999
 138975A                  1.071942.8752.89E5
 238976A38976B             .0024  .09813800.
  TRANSFORMER X0088A                  X0088B                                  0
 138975B
 238976B38976C
  TRANSFORMER X0088A                  X0088C                                  0
 138975C
 238976C38976A
C SE IBICOARA - TRF1 300 MVA; 500/230 kV; Xps=4.92
  TRANSFORMER                         X0089A  1.E6                            0
            9999
 1588A                    1.5375  61.52.89E5
 2288A                     .325313.0131.33E5
  TRANSFORMER X0089A                  X0089B                                  0
 1588B
 2288B
  TRANSFORMER X0089A                  X0089C                                  0
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 1588C
 2288C
C SE IBICOARA - TRF1 300 MVA; 500/230 kV; Xps=4.92
  TRANSFORMER                          X0090A  1.E6                          0
            9999
 1588A                    1.5375  61.52.89E5
 2288A                     .325313.0131.33E5
  TRANSFORMER X0090A                   X0090B                                0
 1588B
 2288B
  TRANSFORMER X0090A                   X0090C                                0
 1588C
 2288C
C SE P.AFONSO4 UHE - TRF1 450 MVA; 500/13.8 kV; Xps=0.45
  TRANSFORMER                          X0091A  1.E6                          0
            9999
 1500A                     .14095.63752.89E5
 214A   14B                .0003 .012913800.
  TRANSFORMER X0091A                   X0091B                                0
 1500B
 214B   14C
  TRANSFORMER X0091A                   X0091C                                0
 1500C
 214C   14A
C SE T.CAMAÇARI 1 UTE - TRF1 310 MVA; 230/13.8 kV; Xps=3.3
  TRANSFORMER                          X0092A  1.E6                          0
            9999
 1294A                     .23288.72851.33E5
 281A   81B                .0025 .094313800.
  TRANSFORMER X0092A                   X0092B                                0
 1294B
 281B   81C
  TRANSFORMER X0092A                   X0092C                                0
 1294C
 281C   81A
C SE P.SERGIPE 1V UTE - TRF1 736 MVA; 24/500 kV; Xps=2.06
  TRANSFORMER                          X0093A  1.E6                          0
            9999
 111149A11149C             .0044 .1776 2.4E4
 211151A                   .642325.6912.89E5
  TRANSFORMER X0093A                   X0093B                                0
 111149B11149A
 211151B
  TRANSFORMER X0093A                   X0093C                                0
 111149C11149B
 211151C
C SE P.SERGIPE 1G UTE - TRF1 436 MVA; 25/500 kV; Xps=1.07
  TRANSFORMER                          X0094A  1.E6                          0
            9999
 111150A11150C             .0025 .0999 2.5E4
 211151A                    .33313.3212.89E5
  TRANSFORMER X0094A                   X0094B                                0
 111150B11150A
 211151B
  TRANSFORMER X0094A                   X0094C                                0
 111150C11150B
 211151C
C SE OUROLANDIA 2 -TRF1 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0144A  1.E6                          0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111561A                   .4863 19.452.89E5
 211261A                   .10294.11561.33E5
  TRANSFORMER X0144A                   X0144B                                0
 111561B
 211261B
  TRANSFORMER X0144A                   X0144C                                0
 111561C
 211261C
C SE OUROLANDIA 2 -TRF2 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0145A  1.E6                          0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
```

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      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111561A                   .4863 19.452.89E5
 211261A                   .10294.11561.33E5
  TRANSFORMER X0145A                  X0145B                                  0
 111561B
 211261B
  TRANSFORMER X0145A                  X0145C                                  0
 111561C
 211261C
C SE OUROLANDIA 2 -TRF3 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0146A  1.E6                           0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111561A                   .4863 19.452.89E5
 211261A                   .10294.11561.33E5
  TRANSFORMER X0146A                  X0146B                                  0
 111561B
 211261B
  TRANSFORMER X0146A                  X0146C                                  0
 111561C
 211261C
C SE G.OURO 2 - TRF1 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0147A  1.E6                           0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111560A                   .4863 19.452.89E5
 211260A                   .10294.11561.33E5
  TRANSFORMER X0147A                  X0147B                                  0
 111560B
 211260B
  TRANSFORMER X0147A                  X0147C                                  0
 111560C
 211260C
C SE G.OURO 2 - TRF2 900 MVA; 500/230 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0148A  1.E6                           0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 111560A                   .4863 19.452.89E5
 211260A                   .10294.11561.33E5
  TRANSFORMER X0148A                  X0148B                                  0
 111560B
 211260B
  TRANSFORMER X0148A                  X0148C                                  0
 111560C
 211260C
C SE CAMAÇARI 4 - TRF1 1200 MVA; 500/230 kV; Xps=1.17
  TRANSFORMER             8.8183 1211.X0149A  1.E6                           0
      8.81831992       1210.9992
      25.5549097      1254.96465
      48.7199698      1316.68955
      211.815449      1349.28463
      1046.53738      1436.34923
            9999
 1584A                     .365614.6252.89E5
 2284A                     .07743.09471.33E5
  TRANSFORMER X0149A                  X0149B                                  0
 1584B
 2284B
  TRANSFORMER X0149A                  X0149C                                  0
 1584C
 2284C
C SE CAMAÇARI 4 - TRF2 1200 MVA; 500/230 kV; Xps=1.17
  TRANSFORMER             8.8183 1211.X0150A  1.E6                           0
      8.81831992       1210.9992
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      25.5549097      1254.96465
      48.7199698      1316.68955
      211.815449      1349.28463
      1046.53738      1436.34923
            9999
 1584A                     .365614.6252.89E5
 2284A                     .07743.09471.33E5
  TRANSFORMER X0150A                 X0150B                                0
 1584B
 2284B
  TRANSFORMER X0150A                 X0150C                                0
 1584C
 2284C
C SE M.CHAPEU 2 - TRF2 900 MVA; 230/500 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0151A  1.E6                         0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 1355A                     .10294.11561.33E5
 2555A                     .4863 19.452.89E5
  TRANSFORMER X0151A                 X0151B                                0
 1355B
 2555B
  TRANSFORMER X0151A                 X0151C                                0
 1355C
 2555C
C SE M.CHAPEU 2 - TRF1 900 MVA; 230/500 kV; Xps=1.56
  TRANSFORMER             6.6137 1211.X0152A  1.E6                         0
      6.61373994       1210.9992
      19.1661823      1254.96465
      36.5399774      1316.68955
      158.861587      1349.28463
      784.903037      1436.34923
            9999
 1355A                     .10294.11561.33E5
 2555A                     .4863 19.452.89E5
  TRANSFORMER X0152A                 X0152B                                0
 1355B
 2555B
  TRANSFORMER X0152A                 X0152C                                0
 1355C
 2555C
C SE SAPEAÇU - TRF1 600 MVA; 230/500 kV; Xps=1.4
  TRANSFORMER             9.585557.07X0153A  1.E6                         0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1289A                     .0926 3.7031.33E5
 2589A                     .4375  17.52.89E5
  TRANSFORMER X0153A                 X0153B                                0
 1289B
 2589B
  TRANSFORMER X0153A                 X0153C                                0
 1289C
 2589C
C SE SAPEAÇU - TRF2 600 MVA; 230/500 kV; Xps=1.4
  TRANSFORMER             9.585557.07X0154A  1.E6                         0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1289A                     .0926 3.7031.33E5
 2589A                     .4375  17.52.89E5
  TRANSFORMER X0154A                 X0154B                                0
 1289B
 2589B
  TRANSFORMER X0154A                 X0154C                                0
 1289C
 2589C
C SE SAPEAÇU - TRF3 600 MVA; 230/500 kV; Xps=1.4
```

```
  TRANSFORMER              9.585557.07X0155A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1289A                     .0926 3.7031.33E5
 2589A                     .4375  17.52.89E5
  TRANSFORMER X0155A                 X0155B                                 0
 1289B
 2589B
  TRANSFORMER X0155A                 X0155C                                 0
 1289C
 2589C
C SE JARDIM - TRF1 600 MVA; 230/500 kV; Xps=1.27
  TRANSFORMER              9.585557.07X0156A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1273A                      .0843.35921.33E5
 2573A                     .396915.8752.89E5
  TRANSFORMER X0156A                 X0156B                                 0
 1273B
 2573B
  TRANSFORMER X0156A                 X0156C                                 0
 1273C
 2573C
C SE JARDIM - TRF2 600 MVA; 230/500 kV; Xps=1.27
  TRANSFORMER              9.585557.07X0157A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1273A                      .0843.35921.33E5
 2573A                     .396915.8752.89E5
  TRANSFORMER X0157A                 X0157B                                 0
 1273B
 2573B
  TRANSFORMER X0157A                 X0157C                                 0
 1273C
 2573C
C SE JARDIM - TRF3 600 MVA; 230/500 kV; Xps=1.27
  TRANSFORMER              9.585557.07X0158A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1273A                      .0843.35921.33E5
 2573A                     .396915.8752.89E5
  TRANSFORMER X0158A                 X0158B                                 0
 1273B
 2573B
  TRANSFORMER X0158A                 X0158C                                 0
 1273C
 2573C
C SE ANGELIM - TRF1 600 MVA; 230/500 kV; Xps=1.78
  TRANSFORMER              9.585557.07X0159A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1240A                      .11754.70021.33E5
 2540A                     .555322.2122.89E5
  TRANSFORMER X0159A                 X0159B                                 0
 1240B
 2540B
  TRANSFORMER X0159A                 X0159C                                 0
 1240C
```

```
 2540C
C SE ANGELIM - TRF1 600 MVA; 230/500 kV; Xps=1.78
  TRANSFORMER              9.585557.07X0160A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1240A                     .11754.70021.33E5
 2540A                     .555322.2122.89E5
  TRANSFORMER X0160A                  X0160B                                 0
 1240B
 2540B
  TRANSFORMER X0160A                  X0160C                                 0
 1240C
 2540C
C SE P.AFONSO 3 B -TRF1 600 MVA; 230/500 kV; Xps=1.41
  TRANSFORMER              9.585557.07X0161A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1300A                     .0935  3.741.33E5
 2500A                     .441917.6752.89E5
  TRANSFORMER X0161A                  X0161B                                 0
 1300B
 2500B
  TRANSFORMER X0161A                  X0161C                                 0
 1300C
 2500C
C SE P.AFONSO 3 A -TRF1 600 MVA; 230/500 kV; Xps=1.41
  TRANSFORMER              9.585557.07X0162A  1.E6                          0
      9.58500042      557.067183
      27.7766993      577.291566
      52.9557711      605.685405
      230.231063      620.679344
      1137.52521        660.7296
            9999
 1200A                     .0935  3.741.33E5
 2500A                     .441917.6752.89E5
  TRANSFORMER X0162A                  X0162B                                 0
 1200B
 2500B
  TRANSFORMER X0162A                  X0162C                                 0
 1200C
 2500C
C SE FUNIL - TRF2 100 MVA; 230/138 kV; Xps=11.8
  TRANSFORMER             1.5973557.07X0163A  1.E6                          0
      1.59734032      557.067183
      4.62898693      577.291566
      8.82507926      605.685405
      38.3680067      620.679344
      189.568577        660.7296
            9999
 1276A                     .780331.2111.33E5
 2976A                     .280911.23679674.
  TRANSFORMER X0163A                  X0163B                                 0
 1276B
 2976B
  TRANSFORMER X0163A                  X0163C                                 0
 1276C
 2976C
C SE FUNIL - TRF3 100 MVA; 230/138 kV; Xps=11.8
  TRANSFORMER             1.5973557.07X0164A  1.E6                          0
      1.59734032      557.067183
      4.62898693      577.291566
      8.82507926      605.685405
      38.3680067      620.679344
      189.568577        660.7296
            9999
 1276A                     .780331.2111.33E5
 2976A                     .280911.23679674.
  TRANSFORMER X0164A                  X0164B                                 0
 1276B
 2976B
```

```
  TRANSFORMER X0164A                 X0164C                                  0
 1276C
 2976C
C SE FUNIL - TRF4 100 MVA; 230/138 kV; Xps=11.24
  TRANSFORMER            1.5973557.07X0165A  1.E6                           0
      1.59734032      557.067183
      4.62898693      577.291566
      8.82507926      605.685405
      38.3680067      620.679344
      189.568577        660.7296
            9999
 1276A                     .7432 29.731.33E5
 2976A                     .267610.70379674.
  TRANSFORMER X0165A                 X0165B                                  0
 1276B
 2976B
  TRANSFORMER X0165A                 X0165C                                  0
 1276C
 2976C
C SE FUNIL - TRF5 100 MVA; 230/138 kV; Xps=12.06
  TRANSFORMER            1.5973557.07X0166A  1.E6                           0
      1.59734032      557.067183
      4.62898693      577.291566
      8.82507926      605.685405
      38.3680067      620.679344
      189.568577        660.7296
            9999
 1276A                     .797531.8991.33E5
 2976A                     .287111.48379674.
  TRANSFORMER X0166A                 X0166B                                  0
 1276B
 2976B
  TRANSFORMER X0166A                 X0166C                                  0
 1276C
 2976C
C Reator LT OLINDINA LT 500 kV P.SERGIPE - OLINDINA C1 - 100 Mvar
  582A  RN400C              8.33 2500.                                        0
  582B  RN400C              8.33 2500.                                        0
  582C  RN400C              8.33 2500.                                        0
C Reator LT M.CHAPEU 2 LT 500 kV M.CHAPEU 2 - SAPEAÇU C1 - 180 Mvar
  555A                      4.631388.9                                        0
  555B                      4.631388.9                                        0
  555C                      4.631388.9                                        0
C Reator LT SAPEAÇU LT 500 kV M.CHAPEU 2 - SAPEAÇU C1 - 180 Mvar
  589A                      4.631388.9                                        0
  589B                      4.631388.9                                        0
  589C                      4.631388.9                                        0
C Reator LT L.GONZAGA LT 500 kV JUAZEIRO 3 - L.GONZAGA C2 - 150 Mvar
  505A                      5.561666.7                                        0
  505B                      5.561666.7                                        0
  505C                      5.561666.7                                        0
C Reator LT L.GONZAGA LT 500 kV JUAZEIRO 3 - L.GONZAGA C1 - 150 Mvar
  505A                      5.561666.7                                        0
  505B                      5.561666.7                                        0
  505C                      5.561666.7                                        0
C Reator LT OUROLANDIA 2 LT 500 kV JUAZEIRO 3 - OUROLANDIA 2 C1 - 100 Mvar
  11561A                    8.33 2500.                                        0
  11561B                    8.33 2500.                                        0
  11561C                    8.33 2500.                                        0
C Reator LT SOBRADINHO LT 500 kV SOBRADINHO - JUAZEIRO 3 C1 - 100 Mvar
  506A                      8.33 2500.                                        0
  506B                      8.33 2500.                                        0
  506C                      8.33 2500.                                        0
C Reator LT SOBRADINHO LT 500 kV SOBRADINHO - JUAZEIRO 3 C2 - 150 Mvar
  506A                      5.561666.7                                        0
  506B                      5.561666.7                                        0
  506C                      5.561666.7                                        0
C Reator LT OLINDINA LT 500 kV P.AFONSO 4 - OLINDINA C1 - 150 Mvar
  582A                      5.561666.7                                        0
  582B                      5.561666.7                                        0
  582C                      5.561666.7                                        0
C Reator LT OLINDINA LT 500 kV L.GONZAGA - OLINDINA C1 - 150 Mvar
  582A                      5.561666.7                                        0
  582B                      5.561666.7                                        0
  582C                      5.561666.7                                        0
C Reator LT MILAGRES 2 LT 500 kV L.GONZAGA - MILAGRES 2 C1 - 120 Mvar
  11567A                    6.942083.3                                        0
  11567B                    6.942083.3                                        0
```

```
  11567C                    6.942083.3                                      0
C Reator LT MILAGRES 2 LT 500 kV L.GONZAGA - MILAGRES 2 C1 - 120 Mvar
  11567A                    6.942083.3                                      0
  11567B                    6.942083.3                                      0
  11567C                    6.942083.3                                      0
C Reator LT L.GONZAGA LT 500 kV L.GONZAGA - MILAGRES 2 C1 - 120 Mvar
  505A                      6.942083.3                                      0
  505B                      6.942083.3                                      0
  505C                      6.942083.3                                      0
C Reator LT ANGELIM LT 500 kV GARANHUNS 2 - ANGELIM C1 - 150 Mvar
  540A                      5.561666.7                                      0
  540B                      5.561666.7                                      0
  540C                      5.561666.7                                      0
C Reator LT MESSIAS LT 500 kV XINGO - MESSIAS C1 - 150 Mvar
  542A                      5.561666.7                                      0
  542B                      5.561666.7                                      0
  542C                      5.561666.7                                      0
C Reator LT ANGELIM LT 500 kV XINGO - ANGELIM C1 - 150 Mvar
  540A                      5.561666.7                                      0
  540B                      5.561666.7                                      0
  540C                      5.561666.7                                      0
C Reator LT ANGELIM LT 500 kV P.AFONSO 4 - ANGELIM C1 - 150 Mvar
  540A                      5.561666.7                                      0
  540B                      5.561666.7                                      0
  540C                      5.561666.7                                      0
C Reator LT JARDIM LT 500 kV XINGO - JARDIM C1 - 100 Mvar
  573A                      8.33 2500.                                      0
  573B                      8.33 2500.                                      0
  573C                      8.33 2500.                                      0
C Reator LT JARDIM LT 500 kV XINGO - JARDIM C1 - 100 Mvar
  573A                      8.33 2500.                                      0
  573B                      8.33 2500.                                      0
  573C                      8.33 2500.                                      0
C Reator LT P.SERGIPE LT 500 kV P.SERGIPE - OLINDINA C1 - 100 Mvar
  11151ARN400D              8.33 2500.                                      0
  11151BRN400D              8.33 2500.                                      0
  11151CRN400D              8.33 2500.                                      0
C Reator LT P.PARAISO 2 LT 500 kV POÇÕES 3 - P.PARAISO 2 C1 - 270 Mvar
  38975A                    3.09925.93                                      0
  38975B                    3.09925.93                                      0
  38975C                    3.09925.93                                      0
C Reator LT POÇÕES 3 LT 500 kV POÇÕES 3 - P.PARAISO 2 C1 - 270 Mvar
  11612A                    3.09925.93                                      0
  11612B                    3.09925.93                                      0
  11612C                    3.09925.93                                      0
C Reator LT POÇÕES 3 LT 500 kV POÇÕES 3 - P.PARAISO 2 C2 - 270 Mvar
  11612A                    3.09925.84                                      0
  11612B                    3.09925.84                                      0
  11612C                    3.09925.84                                      0
C Reator LT P.PARAISO 2 LT 500 kV POÇÕES 3 - P.PARAISO 2 C2 - 270 Mvar
  38975A                    3.09925.93                                      0
  38975B                    3.09925.93                                      0
  38975C                    3.09925.93                                      0
C Reator LT POÇÕES 3 LT 500 kV SAPEAÇU - POÇÕES 3 C1 - 185 Mvar
  11612A                     4.51351.3                                      0
  11612B                     4.51351.3                                      0
  11612C                     4.51351.3                                      0
C Reator LT SAPEAÇU LT 500 kV SAPEAÇU - POÇÕES 3 C1 - 185 Mvar
  589A                       4.51351.3                                      0
  589B                       4.51351.3                                      0
  589C                       4.51351.3                                      0
C Reator LT IBICOARA LT 500 kV IBICOARA - SAPEAÇU C1 - 200 Mvar
  588A                      4.17 1250.                                      0
  588B                      4.17 1250.                                      0
  588C                      4.17 1250.                                      0
C Reator LT IBICOARA LT 500 kV IBICOARA - POÇÕES 3 C1 - 110 Mvar
  588A                      7.582272.7                                      0
  588B                      7.582272.7                                      0
  588C                      7.582272.7                                      0
C Reator LT SAPEAÇU LT 500 kV IBICOARA - SAPEAÇU C1 - 150 Mvar
  589A                      5.561666.7                                      0
  589B                      5.561666.7                                      0
  589C                      5.561666.7                                      0
C Reator LT POÇÕES 3 LT 500 kV IBICOARA - POÇÕES 3 C1 - 100 Mvar
  11612A                    8.33 2500.                                      0
  11612B                    8.33 2500.                                      0
  11612C                    8.33 2500.                                      0
C Reator LT IBICOARA LT 500 kV IGAPORÃ 3 - IBICOARA C1 - 200 Mvar
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  588A                     4.17 1250.                                    0
  588B                     4.17 1250.                                    0
  588C                     4.17 1250.                                    0
C Reator LT SAPEAÇU LT 500 kV OLINDINA - SAPEAÇU C1 - 100 Mvar
  589A  RN800A             8.33 2500.                                    0
  589B  RN800A             8.33 2500.                                    0
  589C  RN800A             8.33 2500.                                    0
C Reator LT OLINDINA LT 500 kV OLINDINA - SAPEAÇU C1 - 100 Mvar
  582A  RN800B             8.33 2500.                                    0
  582B  RN800B             8.33 2500.                                    0
  582C  RN800B             8.33 2500.                                    0
C Reator de Barra SE G.OURO 2 500 kV - 1x400 Mvar
  11560A                  2.137  641.                                    0
  11560B                  2.137  641.                                    0
  11560C                  2.137  641.                                    0
C Reator de Barra SE G.OURO 2 500 kV - 1x200 Mvar
  11560A                 4.167 1250.                                    0
  11560B                 4.167 1250.                                    0
  11560C                 4.167 1250.                                    0
C Reator de Barra SE G.OURO CER 13.8 kV - 1x50 Mvar
  11562A                  .013 3.794                                    0
  11562B                  .013 3.794                                    0
  11562C                  .013 3.794                                    0
C Reator de Barra SE B.J.LAPA 230 kV - 1x10 Mvar
  285A                   17.633 5290.                                   0
  285B                   17.633 5290.                                   0
  285C                   17.633 5290.                                   0
C Reator de Barra SE OUROLANDIA 2 500 kV - 1x100 Mvar
  11561A                 8.333 2500.                                    0
  11561B                 8.333 2500.                                    0
  11561C                 8.333 2500.                                    0
C Reator de Barra SE JUAZEIRO 3 500 kV - 1x150 Mvar
  11582A                 5.5561666.8                                    0
  11582B                 5.5561666.8                                    0
  11582C                 5.5561666.8                                    0
C Reator de Barra SE SOBRADINHO 500 kV - 1x400 Mvar
  506A                   2.083  625.                                    0
  506B                   2.083  625.                                    0
  506C                   2.083  625.                                    0
C Reator de Barra SE MILAGRES 2 500 kV - 1x575 Mvar
  11567A                 1.449434.75                                    0
  11567B                 1.449434.75                                    0
  11567C                 1.449434.75                                    0
C Reator de Barra SE MILAGRES 2 500 kV - 1x100 Mvar
  11567A                 8.333 2500.                                    0
  11567B                 8.333 2500.                                    0
  11567C                 8.333 2500.                                    0
C Reator de Barra SE GARANHUNS 2 500 kV - 1x150 Mvar
  549A                   5.5561666.8                                    0
  549B                   5.5561666.8                                    0
  549C                   5.5561666.8                                    0
C Reator de Barra SE ANGELIM 500 kV - 1x150 Mvar
  540A                   5.5561666.8                                    0
  540B                   5.5561666.8                                    0
  540C                   5.5561666.8                                    0
C Reator de Barra SE P.SERGIPE 500 kV - 1x150 Mvar
  11151A                 5.5561666.8                                    0
  11151B                 5.5561666.8                                    0
  11151C                 5.5561666.8                                    0
C Reator de Barra SE ITAGIBA 230 kV - 1x10 Mvar
  213A                   17.633 5290.                                   0
  213B                   17.633 5290.                                   0
  213C                   17.633 5290.                                   0
C Reator de Barra SE IGAPORÃ 3 500 kV - 1x350 Mvar
  11594A                 2.381714.25                                    0
  11594B                 2.381714.25                                    0
  11594C                 2.381714.25                                    0
C Reator de Barra SE IGAPORÃ 3 500 kV - 1x150 Mvar
  11594A                 5.5561666.8                                    0
  11594B                 5.5561666.8                                    0
  11594C                 5.5561666.8                                    0
C Reator de Barra SE P.PARAISO 2 500 kV - 1x300 Mvar
  38975A                 2.778833.25                                    0
  38975B                 2.778833.25                                    0
  38975C                 2.778833.25                                    0
C Banco de Capacitores SE M.CHAPEU 2 CER 13.8 kV - 1x41.2 Mvar
  12334A                           2.16E5                               0
  12334B                           2.16E5                               0
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  12334C                          2.16E5                                    0
C Banco de Capacitores SE CAMAÇARI 69 kV - 1x21.3 Mvar
  674A                            4474.6                                    0
  674B                            4474.6                                    0
  674C                            4474.6                                    0
C Banco de Capacitores SE JARDIM 69 kV - 1x40.6 Mvar
  673A                            8527.8                                    0
  673B                            8527.8                                    0
  673C                            8527.8                                    0
C Banco de Capacitores SE SAPEAÇU CER 13.8 kV - 1x37.3 Mvar
  12333A                          1.96E5                                    0
  12333B                          1.96E5                                    0
  12333C                          1.96E5                                    0
C Banco de Capacitores SE FUNIL 13.8 kV - 1x3.1 Mvar
  876A                            16277.                                    0
  876B                            16277.                                    0
  876C                            16277.                                    0
C Banco de Capacitores SE FUNIL 230 kV - 1x50.5 Mvar
  276A                            954.63                                    0
  276B                            954.63                                    0
  276C                            954.63                                    0
C Banco de Capacitores SE FUNIL CER 13.8 kV - 1x9.7 Mvar
  476A                            50981.                                    0
  476B                            50981.                                    0
  476C                            50981.                                    0
C Banco de Capacitores SE P.PARAISO 2 CER 13.8 kV - 1x129.9 Mvar
  38976A                          6.82E5                                    0
  38976B                          6.82E5                                    0
  38976C                          6.82E5                                    0
C Banco de Capacitores SE POÇÕE3 230 kV - 1x50 Mvar
  18612A                          945.18                                    0
  18612B                          945.18                                    0
  18612C                          945.18                                    0
C Banco de Capacitores SE F.SANTANA 3 69 kV - 1x20 Mvar
  18763A                          4200.8                                    0
  18763B                          4200.8                                    0
  18763C                          4200.8                                    0
C LT 230 kV Morro do Chapéu II - Irecê C2&C3
C $INCLUDE, C:\Troca\TD-1271\230-MC-IR-C1_2-A.lib, X0178A, X0178B, X0178C $$
C   , X0179C, X0179B, X0179A, X0184A, X0184B, X0184C, X0180C, X0180B, X0180A
$VINTAGE, 1
-1X0178AX0184A            7.13504E-01 1.01271E+03 1.85836E+05-1.67500E+01 1  6
-2X0178BX0184B            3.90492E-02 3.01294E+02 2.89696E+05-1.67500E+01 1  6
-3X0178CX0184C            3.48128E-02 3.30845E+02 2.93331E+05-1.67500E+01 1  6
-4X0179CX0180C            3.39966E-02 2.55670E+02 2.95034E+05-1.67500E+01 1  6
-5X0179BX0180B            3.39813E-02 2.22916E+02 2.94744E+05-1.67500E+01 1  6
-6X0179AX0180A            3.40935E-02 2.31354E+02 2.94965E+05-1.67500E+01 1  6
$VINTAGE, 0
  0.39552328  0.53796083 -0.33259459  0.49473892 -0.32829631 -0.27653253
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31734519 -0.01600361 -0.45360564  0.05305079  0.53048920  0.58787848
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49993220 -0.48620404 -0.42673001 -0.47091420 -0.31277367 -0.30158082
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49809099 -0.47299499  0.43437803  0.50334280  0.30829306 -0.28775244
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31392010  0.00839823  0.45454735 -0.06557600 -0.54437580  0.57093820
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.38246659  0.50015285  0.32592435 -0.52249847  0.34869147 -0.27965294
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
C LT 230 kV Morro do Chapéu II - Irecê C2&C3
C $INCLUDE, C:\Troca\TD-1271\230-MC-IR-C1_2-A.lib, X0184A, X0184B, X0184C $$
C   , X0180C, X0180B, X0180A, X0185A, X0185B, X0185C, X0186C, X0186B, X0186A
$VINTAGE, 1
-1X0184AX0185A            7.13504E-01 1.01271E+03 1.85836E+05-1.67500E+01 1  6
-2X0184BX0185B            3.90492E-02 3.01294E+02 2.89696E+05-1.67500E+01 1  6
-3X0184CX0185C            3.48128E-02 3.30845E+02 2.93331E+05-1.67500E+01 1  6
-4X0180CX0186C            3.39966E-02 2.55670E+02 2.95034E+05-1.67500E+01 1  6
-5X0180BX0186B            3.39813E-02 2.22916E+02 2.94744E+05-1.67500E+01 1  6
-6X0180AX0186A            3.40935E-02 2.31354E+02 2.94965E+05-1.67500E+01 1  6
$VINTAGE, 0
  0.39552328  0.53796083 -0.33259459  0.49473892 -0.32829631 -0.27653253
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31734519 -0.01600361 -0.45360564  0.05305079  0.53048920  0.58787848
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49993220 -0.48620404 -0.42673001 -0.47091420 -0.31277367 -0.30158082
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49809099 -0.47299499  0.43437803  0.50334280  0.30829306 -0.28775244
```

```
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31392010  0.00839823  0.45454735 -0.06557600 -0.54437580  0.57093820
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.38246659  0.50015285  0.32592435 -0.52249847  0.34869147 -0.27965294
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
C LT 230 kV Morro do Chapéu II - Irecê C2&C3
C $INCLUDE, C:\Troca\TD-1271\230-MC-IR-C1_2-A.lib, X0185A, X0185B, X0185C $$
C   , X0186C, X0186B, X0186A, 355A##, 355B##, 355C##, 355C##, 355B##, 355A##
$VINTAGE, 1
-1X0185A355A               7.13504E-01 1.01271E+03 1.85836E+05-1.67500E+01 1  6
-2X0185B355B               3.90492E-02 3.01294E+02 2.89696E+05-1.67500E+01 1  6
-3X0185C355C               3.48128E-02 3.30845E+02 2.93331E+05-1.67500E+01 1  6
-4X0186C355C               3.39966E-02 2.55670E+02 2.95034E+05-1.67500E+01 1  6
-5X0186B355B               3.39813E-02 2.22916E+02 2.94744E+05-1.67500E+01 1  6
-6X0186A355A               3.40935E-02 2.31354E+02 2.94965E+05-1.67500E+01 1  6
$VINTAGE, 0
  0.39552328  0.53796083 -0.33259459  0.49473892 -0.32829631 -0.27653253
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31734519 -0.01600361 -0.45360564  0.05305079  0.53048920  0.58787848
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49993220 -0.48620404 -0.42673001 -0.47091420 -0.31277367 -0.30158082
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49809099 -0.47299499  0.43437803  0.50334280  0.30829306 -0.28775244
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31392010  0.00839823  0.45454735 -0.06557600 -0.54437580  0.57093820
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.38246659  0.50015285  0.32592435 -0.52249847  0.34869147 -0.27965294
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
C LT 230 kV Morro do Chapéu II - Irecê C2&C3
C $INCLUDE, C:\Troca\TD-1271\230-MC-IR-C1_2-A.lib, 283A##, 283B##, 283C## $$
C   , 283C##, 283B##, 283A##, X0178A, X0178B, X0178C, X0179C, X0179B, X0179A
$VINTAGE, 1
-1283A  X0178A             7.13504E-01 1.01271E+03 1.85836E+05-1.67500E+01 1  6
-2283B  X0178B             3.90492E-02 3.01294E+02 2.89696E+05-1.67500E+01 1  6
-3283C  X0178C             3.48128E-02 3.30845E+02 2.93331E+05-1.67500E+01 1  6
-4283C  X0179C             3.39966E-02 2.55670E+02 2.95034E+05-1.67500E+01 1  6
-5283B  X0179B             3.39813E-02 2.22916E+02 2.94744E+05-1.67500E+01 1  6
-6283A  X0179A             3.40935E-02 2.31354E+02 2.94965E+05-1.67500E+01 1  6
$VINTAGE, 0
  0.39552328  0.53796083 -0.33259459  0.49473892 -0.32829631 -0.27653253
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31734519 -0.01600361 -0.45360564  0.05305079  0.53048920  0.58787848
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49993220 -0.48620404 -0.42673001 -0.47091420 -0.31277367 -0.30158082
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.49809099 -0.47299499  0.43437803  0.50334280  0.30829306 -0.28775244
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.31392010  0.00839823  0.45454735 -0.06557600 -0.54437580  0.57093820
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
  0.38246659  0.50015285  0.32592435 -0.52249847  0.34869147 -0.27965294
  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-A.lib, 589A##, 589B##, 589C## $$
C   , X0167A, X0167B, X0167C
$VINTAGE, 1
-1589A  X0167A             3.75604E-01 5.89009E+02 1.99528E+05-3.45000E+01 1  3
-2589B  X0167B             1.71064E-02 2.20567E+02 2.94638E+05-3.45000E+01 1  3
-3589C  X0167C             1.81754E-02 1.94081E+02 2.94281E+05-3.45000E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-B1.lib, X0167B, X0167C, X0167A $$
C   , X0168B, X0168C, X0168A
$VINTAGE, 1
-1X0167BX0168B             3.75604E-01 5.89009E+02 1.99528E+05-1.72500E+01 1  3
-2X0167CX0168C             1.71064E-02 2.20567E+02 2.94638E+05-1.72500E+01 1  3
-3X0167AX0168A             1.81754E-02 1.94081E+02 2.94281E+05-1.72500E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
```

```
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-B2.lib, X0168B, X0168C, X0168A $$
C   , X0187B, X0187C, X0187A
$VINTAGE, 1
-1X0168BX0187B             3.75604E-01 5.89009E+02 1.99528E+05-5.17500E+01 1  3
-2X0168CX0187C             1.71064E-02 2.20567E+02 2.94638E+05-5.17500E+01 1  3
-3X0168AX0187A             1.81754E-02 1.94081E+02 2.94281E+05-5.17500E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-B2.lib, X0187C, X0187A, X0187B $$
C   , X0169C, X0169A, X0169B
$VINTAGE, 1
-1X0187CX0169C             3.75604E-01 5.89009E+02 1.99528E+05-5.17500E+01 1  3
-2X0187AX0169A             1.71064E-02 2.20567E+02 2.94638E+05-5.17500E+01 1  3
-3X0187BX0169B             1.81754E-02 1.94081E+02 2.94281E+05-5.17500E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-B1.lib, X0169C, X0169A, X0169B $$
C   , X0170C, X0170A, X0170B
$VINTAGE, 1
-1X0169CX0170C             3.75604E-01 5.89009E+02 1.99528E+05-1.72500E+01 1  3
-2X0169AX0170A             1.71064E-02 2.20567E+02 2.94638E+05-1.72500E+01 1  3
-3X0169BX0170B             1.81754E-02 1.94081E+02 2.94281E+05-1.72500E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Olindina - Sapeaçu C1
C $INCLUDE, C:\Troca\TD-1271\500-OL-SA-C1-A.lib, X0170A, X0170B, X0170C $$
C   , 582A##, 582B##, 582C##
$VINTAGE, 1
-1X0170A582A               3.75604E-01 5.89009E+02 1.99528E+05-3.45000E+01 1  3
-2X0170B582B               1.71064E-02 2.20567E+02 2.94638E+05-3.45000E+01 1  3
-3X0170C582C               1.81754E-02 1.94081E+02 2.94281E+05-3.45000E+01 1  3
$VINTAGE, 0
  0.60584683  0.66890008 -0.45327983
  0.00000000  0.00000000  0.00000000
  0.53045974  0.06780184  0.82056692
  0.00000000  0.00000000  0.00000000
  0.59292671 -0.74025374 -0.34814843
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-A.lib, 582A##, 582B##, 582C## $$
C   , X0171A, X0171B, X0171C
$VINTAGE, 1
-1582A  X0171A             3.75441E-01 5.88762E+02 1.99444E+05-3.00000E+01 1  3
-2582B  X0171B             1.71045E-02 2.20560E+02 2.94626E+05-3.00000E+01 1  3
-3582C  X0171C             1.81837E-02 1.94207E+02 2.94270E+05-3.00000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-B1.lib, X0171B, X0171C, X0171A $$
C   , X0172B, X0172C, X0172A
$VINTAGE, 1
-1X0171BX0172B             3.75441E-01 5.88762E+02 1.99444E+05-1.05000E+01 1  3
-2X0171CX0172C             1.71045E-02 2.20560E+02 2.94626E+05-1.05000E+01 1  3
-3X0171AX0172A             1.81837E-02 1.94207E+02 2.94270E+05-1.05000E+01 1  3
```

```
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-B2.lib, X0172B, X0172C, X0172A $$
C   , X0188B, X0188C, X0188A
$VINTAGE, 1
-1X0172BX0188B             3.75441E-01 5.88762E+02 1.99444E+05-4.95000E+01 1  3
-2X0172CX0188C             1.71045E-02 2.20560E+02 2.94626E+05-4.95000E+01 1  3
-3X0172AX0188A             1.81837E-02 1.94207E+02 2.94270E+05-4.95000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-B2.lib, X0188C, X0188A, X0188B $$
C   , X0173C, X0173A, X0173B
$VINTAGE, 1
-1X0188CX0173C             3.75441E-01 5.88762E+02 1.99444E+05-4.95000E+01 1  3
-2X0188AX0173A             1.71045E-02 2.20560E+02 2.94626E+05-4.95000E+01 1  3
-3X0188BX0173B             1.81837E-02 1.94207E+02 2.94270E+05-4.95000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-B1.lib, X0173C, X0173A, X0173B $$
C   , X0174C, X0174A, X0174B
$VINTAGE, 1
-1X0173CX0174C             3.75441E-01 5.88762E+02 1.99444E+05-1.05000E+01 1  3
-2X0173AX0174A             1.71045E-02 2.20560E+02 2.94626E+05-1.05000E+01 1  3
-3X0173BX0174B             1.81837E-02 1.94207E+02 2.94270E+05-1.05000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
C LT 500 kV Porto Sergipe - Olindina C1
C $INCLUDE, C:\Troca\TD-1271\500-PS-OL-C1-A.lib, X0174A, X0174B, X0174C $$
C   , 11151A, 11151B, 11151C
$VINTAGE, 1
-1X0174A11151A             3.75441E-01 5.88762E+02 1.99444E+05-3.00000E+01 1  3
-2X0174B11151B             1.71045E-02 2.20560E+02 2.94626E+05-3.00000E+01 1  3
-3X0174C11151C             1.81837E-02 1.94207E+02 2.94270E+05-3.00000E+01 1  3
$VINTAGE, 0
  0.60594149  0.66893142 -0.45322686
  0.00000000  0.00000000  0.00000000
  0.53018424  0.06780671  0.82063860
  0.00000000  0.00000000  0.00000000
  0.59307637 -0.74022497 -0.34804841
  0.00000000  0.00000000  0.00000000
BLANK BRANCH
BLANK SWITCH
C < n 1><>< Ampl.  >< Freq.  ><Phase/T0><   A1   ><   T1   >< TSTART >< TSTOP  >
C Gerador IRECE SIN - 13,8 kV
14GIRECA 0 11267.653       60.                                  -1.      1.E3
14GIRECB 0 11267.653       60.     -120.                        -1.      1.E3
14GIRECC 0 11267.653       60.      120.                        -1.      1.E3
C Gerador SOBRADINHO 2 UHE - 13,8 kV
14GSOB2A 0 11267.653       60.                                  -1.      1.E3
14GSOB2B 0 11267.653       60.     -120.                        -1.      1.E3
14GSOB2C 0 11267.653       60.      120.                        -1.      1.E3
C Gerador SOBRADINHO 1 UHE - 13,8 kV
14GSOB1A 0 11267.653       60.                                  -1.      1.E3
14GSOB1B 0 11267.653       60.     -120.                        -1.      1.E3
14GSOB1C 0 11267.653       60.      120.                        -1.      1.E3
```

```
C Gerador L.GONZAGA 2 UHE - 13,8 kV
14GLGZ2A 0 11267.653       60.                                -1.      1.E3
14GLGZ2B 0 11267.653       60.     -120.                      -1.      1.E3
14GLGZ2C 0 11267.653       60.      120.                      -1.      1.E3
C Gerador L.GONZAGA 1 UHE - 13,8 kV
14GLGZ1A 0 11267.653       60.                                -1.      1.E3
14GLGZ1B 0 11267.653       60.     -120.                      -1.      1.E3
14GLGZ1C 0 11267.653       60.      120.                      -1.      1.E3
C Gerador P.AFONSO 3-2 UHE - 13,8 kV
14GPA32A 0 11267.653       60.                                -1.      1.E3
14GPA32B 0 11267.653       60.     -120.                      -1.      1.E3
14GPA32C 0 11267.653       60.      120.                      -1.      1.E3
C Gerador ASAL B1 UHE - 13,8 kV
14GASB1A 0 13859.213       60.                                -1.      1.E3
14GASB1B 0 13859.213       60.     -120.                      -1.      1.E3
14GASB1C 0 13859.213       60.      120.                      -1.      1.E3
C Gerador PAF2A1 - 13,8 kV
14GPAA1A 0 13859.213       60.                                -1.      1.E3
14GPAA1B 0 13859.213       60.     -120.                      -1.      1.E3
14GPAA1C 0 13859.213       60.      120.                      -1.      1.E3
C Gerador PAF2A2 - 13,8 kV
14GPAA2A 0 13859.213       60.                                -1.      1.E3
14GPAA2B 0 13859.213       60.     -120.                      -1.      1.E3
14GPAA2C 0 13859.213       60.      120.                      -1.      1.E3
C Gerador PAF2B1 - 13,8 kV
14GPAB1A 0 13859.213       60.                                -1.      1.E3
14GPAB1B 0 13859.213       60.     -120.                      -1.      1.E3
14GPAB1C 0 13859.213       60.      120.                      -1.      1.E3
C Gerador PAF2B3 - 13,8 kV
14GPAB3A 0 13859.213       60.                                -1.      1.E3
14GPAB3B 0 13859.213       60.     -120.                      -1.      1.E3
14GPAB3C 0 13859.213       60.      120.                      -1.      1.E3
C Gerador PAF2B2 - 13,8 kV
14GPAB2A 0 13859.213       60.                                -1.      1.E3
14GPAB2B 0 13859.213       60.     -120.                      -1.      1.E3
14GPAB2C 0 13859.213       60.      120.                      -1.      1.E3
C Gerador PAF2A3 - 13,8 kV
14GPAA3A 0 13859.213       60.                                -1.      1.E3
14GPAA3B 0 13859.213       60.     -120.                      -1.      1.E3
14GPAA3C 0 13859.213       60.      120.                      -1.      1.E3
C Gerador ASAL E1 UHE - 13,8 kV
14GASE1A 0 13859.213       60.                                -1.      1.E3
14GASE1B 0 13859.213       60.     -120.                      -1.      1.E3
14GASE1C 0 13859.213       60.      120.                      -1.      1.E3
C Gerador P.AFONSO UHE 1 - 13,8 kV
14GPAF1A 0 11267.653       60.                                -1.      1.E3
14GPAF1B 0 11267.653       60.     -120.                      -1.      1.E3
14GPAF1C 0 11267.653       60.      120.                      -1.      1.E3
C Gerador CAMAÇARI D1 SIN - 13,8 kV
14GCAD1A 0  7887.357       60.                                -1.      1.E3
14GCAD1B 0  7887.357       60.     -120.                      -1.      1.E3
14GCAD1C 0  7887.357       60.      120.                      -1.      1.E3
C Gerador B.J.LAPA SIN - 13,8 kV
14GBJLAA 0 11267.653       60.                                -1.      1.E3
14GBJLAB 0 11267.653       60.     -120.                      -1.      1.E3
14GBJLAC 0 11267.653       60.      120.                      -1.      1.E3
C Gerador CAMAÇARI D2 SIN - 13,8 kV
14GCAD2A 0  7887.357       60.                                -1.      1.E3
14GCAD2B 0  7887.357       60.     -120.                      -1.      1.E3
14GCAD2C 0  7887.357       60.      120.                      -1.      1.E3
C Gerador P.CAVALO 1 UHE - 13,8 kV
14GPCA1A 0 11267.653       60.                                -1.      1.E3
14GPCA1B 0 11267.653       60.     -120.                      -1.      1.E3
14GPCA1C 0 11267.653       60.      120.                      -1.      1.E3
C Gerador FUNIL 1 UHE - 13,8 kV
14GFUN1A 0 11267.653       60.                                -1.      1.E3
14GFUN1B 0 11267.653       60.     -120.                      -1.      1.E3
14GFUN1C 0 11267.653       60.      120.                      -1.      1.E3
C Gerador ITAPEBI 1 UHE - 13,8 kV
14GITA1A 0 11267.653       60.                                -1.      1.E3
14GITA1B 0 11267.653       60.     -120.                      -1.      1.E3
14GITA1C 0 11267.653       60.      120.                      -1.      1.E3
C Gerador P.AFONSO 4-1 UHE - 13,8 kV
14GPA41A 0 11267.653       60.                                -1.      1.E3
14GPA41B 0 11267.653       60.     -120.                      -1.      1.E3
14GPA41C 0 11267.653       60.      120.                      -1.      1.E3
C Gerador XINGO 1 UHE - 13,8 kV
14GXIN1A 0 11267.653       60.                                -1.      1.E3
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14GXIN1B 0 11267.653       60.     -120.                    -1.      1.E3
14GXIN1C 0 11267.653       60.      120.                    -1.      1.E3
C Gerador P.SERGIPE 1V UTE - 24 kV
14GPS1VA 0 19595.918       60.       30.                    -1.      1.E3
14GPS1VB 0 19595.918       60.      -90.                    -1.      1.E3
14GPS1VC 0 19595.918       60.      150.                    -1.      1.E3
C Gerador P.SERGIPE 1G UTE - 25 kV
14GPS1GA 0 20412.415       60.       30.                    -1.      1.E3
14GPS1GB 0 20412.415       60.      -90.                    -1.      1.E3
14GPS1GC 0 20412.415       60.      150.                    -1.      1.E3
C Gerador T.CAMAÇARI 1 UTE - 13,8 kV
14GTCA1A 0 11493.006       60.                              -1.      1.E3
14GTCA1B 0 11493.006       60.     -120.                    -1.      1.E3
14GTCA1C 0 11493.006       60.      120.                    -1.      1.E3
C Gerador ASAL E2 UHE - 13,8 kV
14GASE2A 0 11267.653       60.                              -1.      1.E3
14GASE2B 0 11267.653       60.     -120.                    -1.      1.E3
14GASE2C 0 11267.653       60.      120.                    -1.      1.E3
C Gerador ASAL B2 UHE - 13,8 kV
14GASB2A 0 11267.653       60.                              -1.      1.E3
14GASB2B 0 11267.653       60.     -120.                    -1.      1.E3
14GASB2C 0 11267.653       60.      120.                    -1.      1.E3
C EQ - GERADOR - SOBRADINHO 230 kV
14ESOB2A 0 187794.21       60.                              -1.      1.E3
14ESOB2B 0 187794.21       60.     -120.                    -1.      1.E3
14ESOB2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - ANGELIM 500 kV
14EANG5A 0 408248.29       60.                              -1.      1.E3
14EANG5B 0 408248.29       60.     -120.                    -1.      1.E3
14EANG5C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - MESSIAS 500 kV
14EMES5A 0 408248.29       60.                              -1.      1.E3
14EMES5B 0 408248.29       60.     -120.                    -1.      1.E3
14EMES5C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - GARANHUNS 2 500 kV
14EGA25A 0 408248.29       60.                              -1.      1.E3
14EGA25B 0 408248.29       60.     -120.                    -1.      1.E3
14EGA25C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - G.OURO 2 500 kV
14EGO25A 0 408248.29       60.                              -1.      1.E3
14EGO25B 0 408248.29       60.     -120.                    -1.      1.E3
14EGO25C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - MILAGRES 2 500 kV
14EMI25A 0 408248.29       60.                              -1.      1.E3
14EMI25B 0 408248.29       60.     -120.                    -1.      1.E3
14EMI25C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - IGAPORÃ 3 500 kV
14EIG35A 0 408248.29       60.                              -1.      1.E3
14EIG35B 0 408248.29       60.     -120.                    -1.      1.E3
14EIG35C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - P.PARAISO 2 500 kV
14EPP25A 0 408248.29       60.                              -1.      1.E3
14EPP25B 0 408248.29       60.     -120.                    -1.      1.E3
14EPP25C 0 408248.29       60.      120.                    -1.      1.E3
C EQ - GERADOR - P.AFONSO 3 A 230 kV
14EP3A2A 0 187794.21       60.                              -1.      1.E3
14EP3A2B 0 187794.21       60.     -120.                    -1.      1.E3
14EP3A2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - ANGELIM 230 kV
14EANG2A 0 187794.21       60.                              -1.      1.E3
14EANG2B 0 187794.21       60.     -120.                    -1.      1.E3
14EANG2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - ITAPEBI 230 kV
14EITA2A 0 187794.21       60.                              -1.      1.E3
14EITA2B 0 187794.21       60.     -120.                    -1.      1.E3
14EITA2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - B.J.LAPA 230 kV
14EBJL2A 0 187794.21       60.                              -1.      1.E3
14EBJL2B 0 187794.21       60.     -120.                    -1.      1.E3
14EBJL2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - P.AFONSO 3 B 230 kV
14EP3B2A 0 187794.21       60.                              -1.      1.E3
14EP3B2B 0 187794.21       60.     -120.                    -1.      1.E3
14EP3B2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - FUNIL 138 kV
14EFUN1A 0 112676.53       60.                              -1.      1.E3
14EFUN1B 0 112676.53       60.     -120.                    -1.      1.E3
14EFUN1C 0 112676.53       60.      120.                    -1.      1.E3
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C EQ - GERADOR - S.BONFIM 230 kV
14ESBO2A 0 187794.21       60.                              -1.      1.E3
14ESBO2B 0 187794.21       60.     -120.                    -1.      1.E3
14ESBO2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - POÇÕES 2 230 kV
14EPOC2A 0 187794.21       60.                              -1.      1.E3
14EPOC2B 0 187794.21       60.     -120.                    -1.      1.E3
14EPOC2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - CATU 230 kV
14ECAT2A 0 187794.21       60.                              -1.      1.E3
14ECAT2B 0 187794.21       60.     -120.                    -1.      1.E3
14ECAT2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - CAMAÇARI B1 230 kV
14ECB12A 0 93897.107       60.                              -1.      1.E3
14ECB12B 0 93897.107       60.     -120.                    -1.      1.E3
14ECB12C 0 93897.107       60.      120.                    -1.      1.E3
C EQ - GERADOR - CAMAÇARI 4 230 kV
14ECA42A 0 187794.21       60.                              -1.      1.E3
14ECA42B 0 187794.21       60.     -120.                    -1.      1.E3
14ECA42C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - IBICOARA 230 kV
14EIBI2A 0 187794.21       60.                              -1.      1.E3
14EIBI2B 0 187794.21       60.     -120.                    -1.      1.E3
14EIBI2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - CAMAÇARI B2 230 kV
14ECB22A 0 93897.107       60.                              -1.      1.E3
14ECB22B 0 93897.107       60.     -120.                    -1.      1.E3
14ECB22C 0 93897.107       60.      120.                    -1.      1.E3
C EQ - GERADOR - GARANHUNS 230 kV
14EGAR2A 0 187794.21       60.                              -1.      1.E3
14EGAR2B 0 187794.21       60.     -120.                    -1.      1.E3
14EGAR2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - JUAZEIRO 3 230 kV
14EJUA2A 0 187794.21       60.                              -1.      1.E3
14EJUA2B 0 187794.21       60.     -120.                    -1.      1.E3
14EJUA2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - SE01 230 kV
14EQSE2A 0 187794.21       60.                              -1.      1.E3
14EQSE2B 0 187794.21       60.     -120.                    -1.      1.E3
14EQSE2C 0 187794.21       60.      120.                    -1.      1.E3
C EQ - GERADOR - IRECE 138 kV
14EIRE1A 0 112676.53       60.                              -1.      1.E3
14EIRE1B 0 112676.53       60.     -120.                    -1.      1.E3
14EIRE1C 0 112676.53       60.      120.                    -1.      1.E3
C EQ - GERADOR - G.OURO 1 138 kV
14EGOU1A 0 112676.53       60.                              -1.      1.E3
14EGOU1B 0 112676.53       60.     -120.                    -1.      1.E3
14EGOU1C 0 112676.53       60.      120.                    -1.      1.E3
C EQ - GERADOR - JARDIM 69 kV
14EJAR6A 0 56338.264       60.                              -1.      1.E3
14EJAR6B 0 56338.264       60.     -120.                    -1.      1.E3
14EJAR6C 0 56338.264       60.      120.                    -1.      1.E3
C EQ - GERADOR - CAMAÇARI 69 kV
14ECAM6A 0 56338.264       60.                              -1.      1.E3
14ECAM6B 0 56338.264       60.     -120.                    -1.      1.E3
14ECAM6C 0 56338.264       60.      120.                    -1.      1.E3
C EQ - GERADOR - BROTAS 34.5 kV
14EBRO6A 0 28169.132       60.                              -1.      1.E3
14EBRO6B 0 28169.132       60.     -120.                    -1.      1.E3
14EBRO6C 0 28169.132       60.      120.                    -1.      1.E3
C EQ - GERADOR - UMBURANAS 34.5 kV
14EUMU3A 0 28169.132       60.                              -1.      1.E3
14EUMU3B 0 28169.132       60.     -120.                    -1.      1.E3
14EUMU3C 0 28169.132       60.      120.                    -1.      1.E3
C EQ - GERADOR - C.LARGO 34.5 kV
14ECLA3A 0 28169.132       60.                              -1.      1.E3
14ECLA3B 0 28169.132       60.     -120.                    -1.      1.E3
14ECLA3C 0 28169.132       60.      120.                    -1.      1.E3
C EQ - GERADOR - G.OURO 1B 34.5 kV
14EGOU3A 0 28169.132       60.                              -1.      1.E3
14EGOU3B 0 28169.132       60.     -120.                    -1.      1.E3
14EGOU3C 0 28169.132       60.      120.                    -1.      1.E3
C EQ - GERADOR - SOBRADINHO 500 kV
14ESOB5A 0 408248.29       60.                              -1.      1.E3
14ESOB5B 0 408248.29       60.     -120.                    -1.      1.E3
14ESOB5C 0 408248.29       60.      120.                    -1.      1.E3
BLANK SOURCE
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## ANEXO III– DIAGRAMA DO SISTEMA EQUIVALENTE REPRESENTADO NO ATP

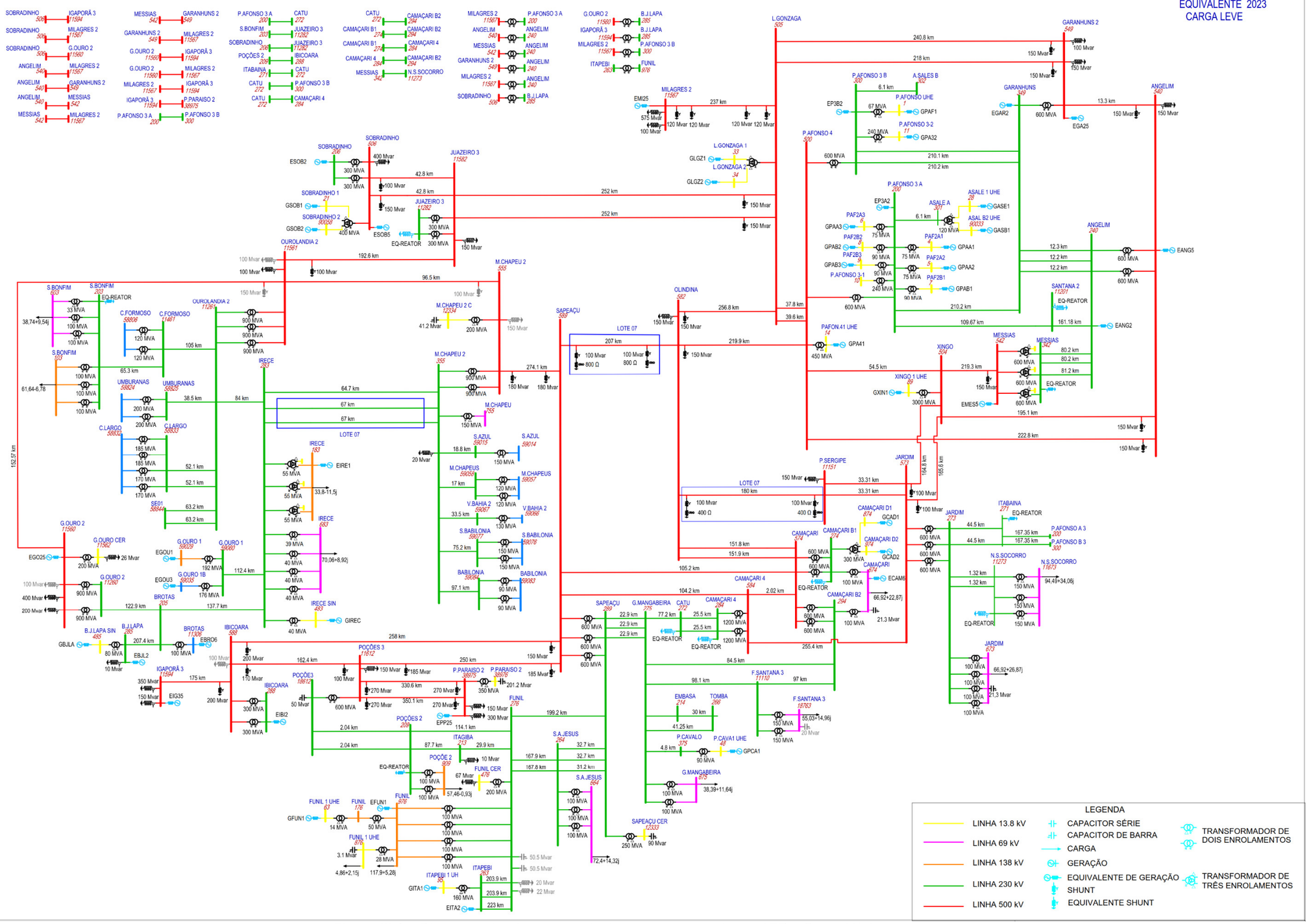


**Figura III.1 – Diagrama do sistema equivalente representado no ATP – Curto Mínimo**

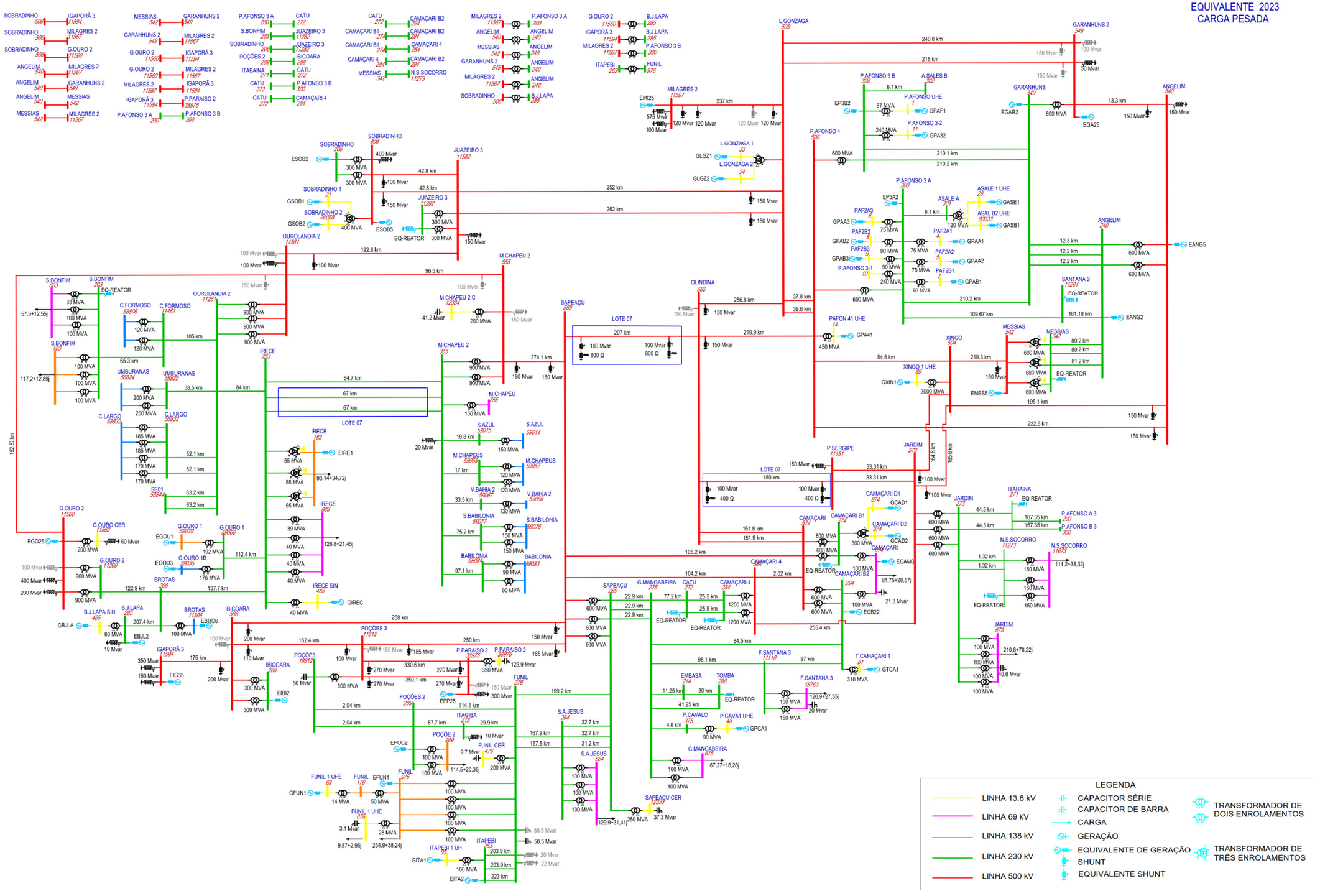


**Figura III.2 – Diagrama do sistema equivalente representado no ATP – Curto Mínimo**