



**CAPÍTULO 6.  
NIVELES DE CORTO CIRCUITO DE LA TOPOLOGÍA DE LA RED DE  
DISTRIBUCIÓN SUBTERRANEA EN MEDIA TENSIÓN DE CIUDAD  
UNIVERSITARIA (23kV).**

Enseguida muestran los diagramas unifilares y las tablas con los resultados obtenidos por medio del software EDSA, que, como se mencionó en el Capítulo 5, el análisis se lleva a cabo en distintos escenarios; para los once Anillos que conforman la red. Al final de cada diagrama unifilar se muestra una tabla con los valores máximos y mínimos en cada uno de los puntos analizados.

**6.1. Niveles de corto circuito del Anillo A.**

Para el Anillo A, se llevará a cabo en dos escenarios distintos, que son:

- La Subestación General No. 2 fuera de servicio y la Subestación General No. 1 alimentando todo el Anillo.
- La Subestación General No. 1 fuera de servicio y la Subestación General No. 2 alimentando todo el Anillo.

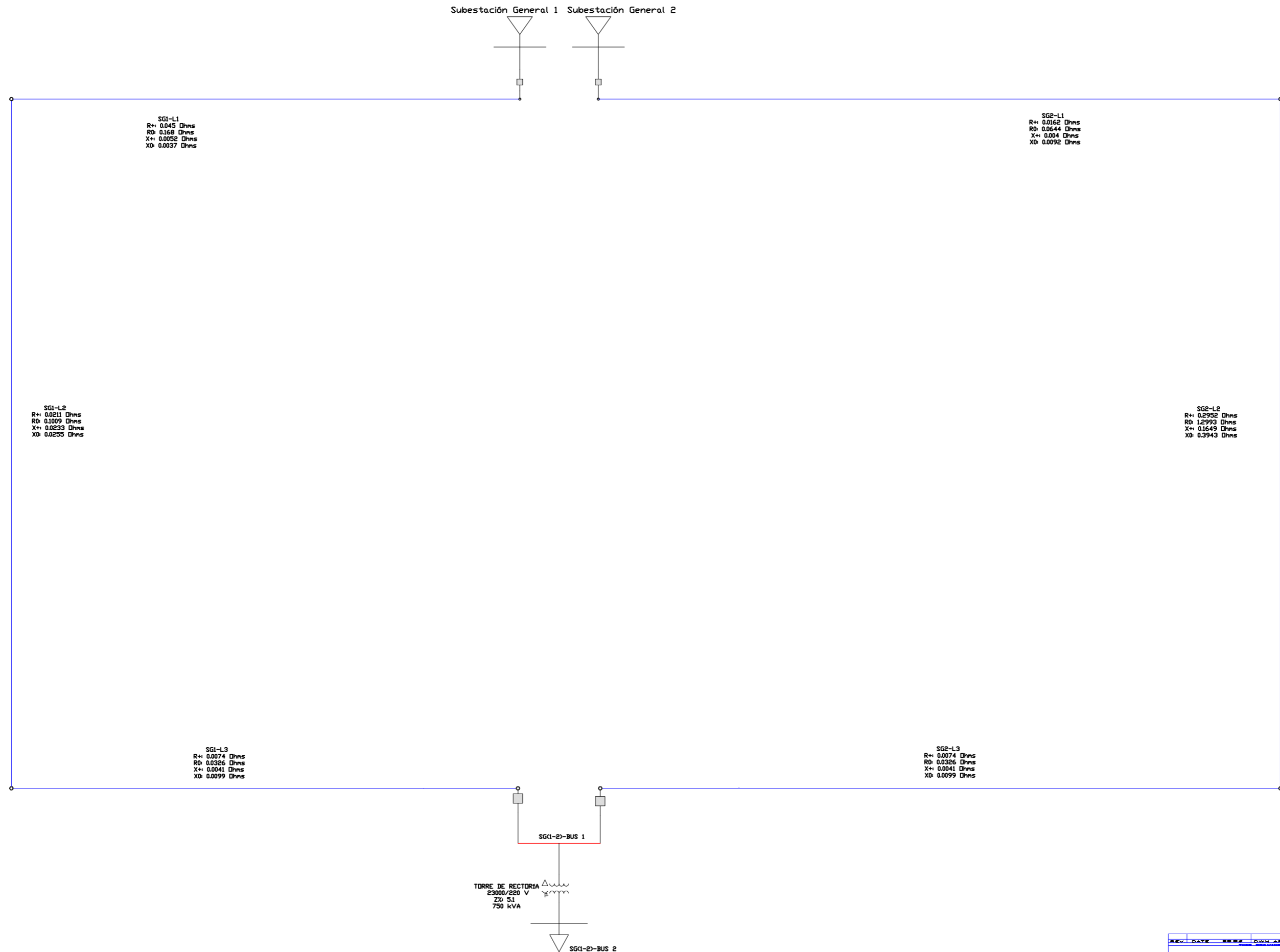


Figura No. 6.1. Diagrama unifilar del Anillo A.

| REV. | DATE | ESOP | OWN | APP. | DESCRIPTION |
|------|------|------|-----|------|-------------|
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## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS           | Corrientes de Corto Circuito [A] |          |            |                   |
|---------------|----------------------------------|----------|------------|-------------------|
|               | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG(1-2)-BUS 1 | 3664.23                          | 3173.54  | 2395.94    | 3304.41           |
| SG(1-2)-BUS 2 | 35067.90                         | 30369.90 | 36169.40   | 35715.10          |

**Tabla No. 6.1. Corrientes de corto circuito en el Anillo A para el Escenario 1.**

| BUS           | Corrientes de Corto Circuito [A] |          |            |                   |
|---------------|----------------------------------|----------|------------|-------------------|
|               | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG(1-2)-BUS 1 | 4136.70                          | 3582.48  | 2764.37    | 3790.86           |
| SG(1-2)-BUS 2 | 35459.10                         | 30708.50 | 36446.20   | 36099.70          |

**Tabla No. 6.2. Corrientes de corto circuito en el Anillo A para el Escenario 2.**

| BUS           | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|---------------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|               | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|               | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG(1-2)-BUS 1 | 4136.70                          | 3664.23  | 3582.48  | 3173.54  | 2764.37    | 2395.94  | 3790.86           | 3304.41  |
| SG(1-2)-BUS 2 | 35459.10                         | 35067.90 | 30708.50 | 30369.90 | 36446.20   | 36169.40 | 36099.70          | 35715.10 |

**Tabla No. 6.3. Corrientes de corto circuito máximas y mínimas del Anillo A.**

Para los Anillos B, C, D, E, F y G, se llevará a cabo en cuatro escenarios distintos, que son:

- La Subestación General No. 1 operando normalmente.
- La Subestación General No. 2 operando normalmente.
- La Subestación General No. 2 fuera de servicio y la Subestación General No. 1 alimentando todo el Anillo.
- La Subestación General No. 1 fuera de servicio y la Subestación General No. 2 alimentando todo el Anillo.

### 6.2. Niveles de corto circuito del Anillo B.

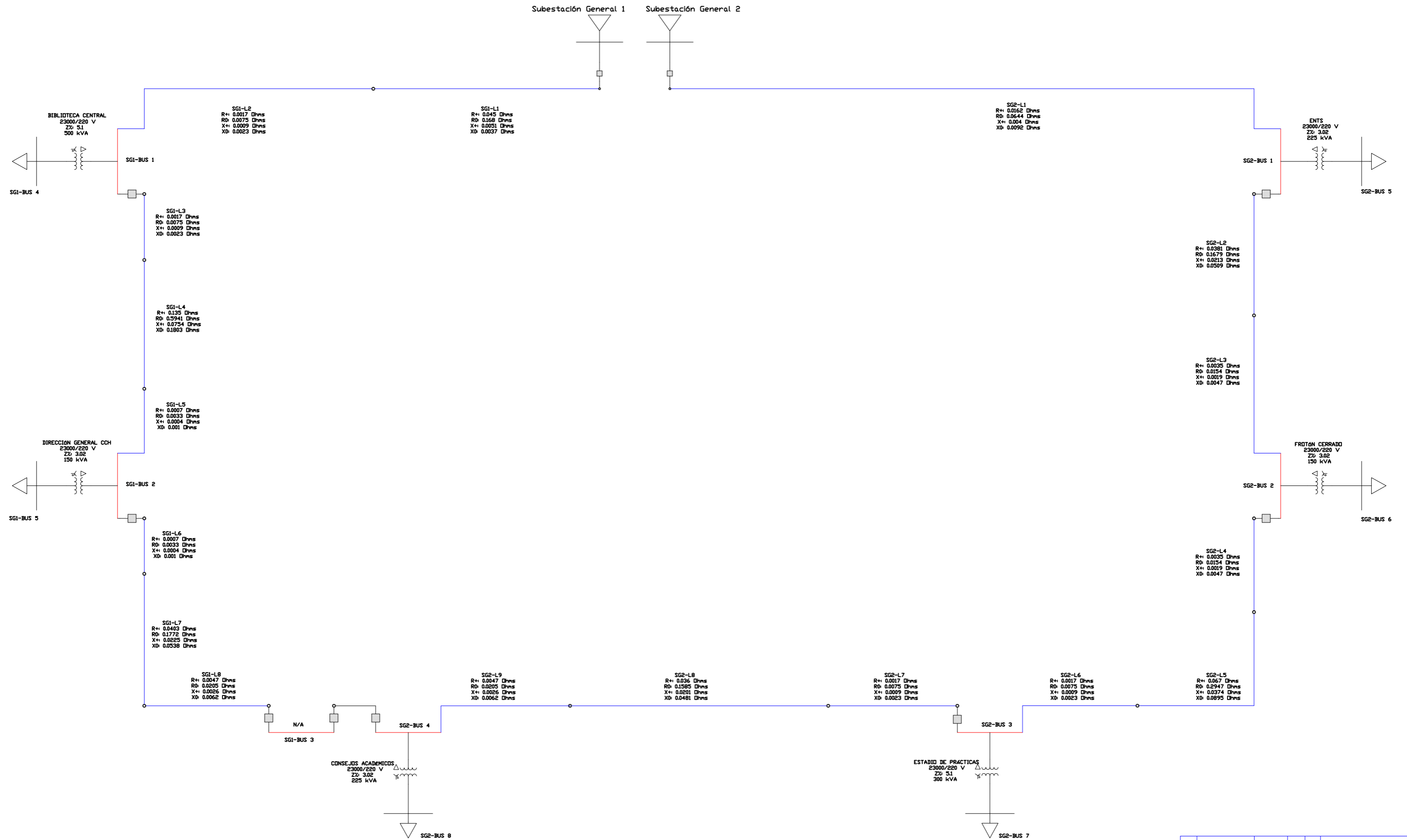


Figura No. 6.2. Diagrama unifilar del Anillo B.

| REV. | DATE | ESOP | OWN | APP | DESCRIPTION |
|------|------|------|-----|-----|-------------|
|      |      |      |     |     |             |
|      |      |      |     |     |             |
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**Electrical One-Line Diagram**

|              |        |           |           |
|--------------|--------|-----------|-----------|
| DESIGNED BY: | SCALE: | DWG. No.: | REV. No.: |
|              |        |           |           |



| Bus       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifasica                        | Bifasica | Monofasica | Bifasica a Tierra |
| SG1-BUS 1 | 3692.91                          | 3198.39  | 2410.20    | 3325.17           |
| SG1-BUS 2 | 3605.34                          | 3122.53  | 2351.31    | 3263.76           |
| SG1-BUS 3 | 3576.17                          | 3097.27  | 2331.14    | 3242.72           |
| SG1-BUS 4 | 24124.10                         | 20892.10 | 24636.30   | 24417.40          |
| SG1-BUS 5 | 12601.10                         | 10912.90 | 12742.40   | 12685.10          |

Tabla 6.4. Corrientes de corto circuito en el Anillo B para el Escenario 1.

| Bus       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifasica                        | Bifasica | Monofasica | Bifasica a Tierra |
| SG2-BUS 1 | 4408.68                          | 3818.03  | 2963.68    | 3980.67           |
| SG2-BUS 2 | 4371.32                          | 3785.68  | 2937.61    | 3956.05           |
| SG2-BUS 3 | 4306.42                          | 3729.46  | 2891.18    | 3912.14           |
| SG2-BUS 4 | 4268.26                          | 3696.42  | 2863.28    | 3885.66           |
| SG2-BUS 5 | 18757.60                         | 16244.60 | 19015.20   | 18901.80          |
| SG2-BUS 6 | 12674.20                         | 10976.10 | 12792.10   | 12741.10          |
| SG2-BUS 7 | 14927.50                         | 12927.60 | 15093.60   | 15025.20          |
| SG2-BUS 8 | 18735.40                         | 16225.40 | 19000.00   | 18894.50          |

Tabla No. 6.5. Corrientes de corto circuito en el Anillo B para el Escenario 2.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| Bus       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifasica                        | Bifasica | Monofasica | Bifasica a Tierra |
| SG1-BUS 1 | 3692.92                          | 3198.39  | 2410.20    | 3325.17           |
| SG1-BUS 2 | 3605.34                          | 3122.54  | 2351.31    | 3263.76           |
| SG1-BUS 4 | 24124.10                         | 20892.10 | 24636.30   | 24417.40          |
| SG1-BUS 5 | 12601.10                         | 10912.90 | 12742.40   | 12685.10          |
| SG2-BUS 1 | 3476.82                          | 3011.21  | 2260.71    | 3169.22           |
| SG2-BUS 2 | 3503.24                          | 3034.10  | 2279.68    | 3189.06           |
| SG2-BUS 3 | 3549.16                          | 3073.87  | 2312.24    | 3223.03           |
| SG2-BUS 4 | 3576.17                          | 3097.27  | 2331.14    | 3242.72           |
| SG2-BUS 5 | 18563.80                         | 16076.80 | 18882.10   | 18768.10          |
| SG2-BUS 6 | 12590.80                         | 10904.00 | 12735.40   | 12681.70          |
| SG2-BUS 7 | 14824.80                         | 12838.70 | 15023.50   | 14947.00          |
| SG2-BUS 8 | 18585.70                         | 16095.80 | 18897.20   | 18775.40          |

Tabla No. 6.6. Corrientes de corto circuito en el Anillo B para el Escenario 3.

| Bus       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifasica                        | Bifasica | Monofasica | Bifasica a Tierra |
| SG2-BUS 1 | 4408.69                          | 3818.03  | 2963.68    | 3980.68           |
| SG2-BUS 2 | 4371.33                          | 3785.68  | 2937.61    | 3956.06           |
| SG2-BUS 3 | 4306.42                          | 3729.47  | 2891.18    | 3912.15           |
| SG2-BUS 4 | 4268.26                          | 3696.42  | 2863.28    | 3885.66           |
| SG2-BUS 5 | 18757.60                         | 16244.60 | 19015.20   | 18901.80          |
| SG2-BUS 6 | 12674.20                         | 10976.10 | 12792.10   | 12741.10          |
| SG2-BUS 7 | 14927.50                         | 12927.60 | 15093.60   | 15025.20          |
| SG2-BUS 8 | 18735.40                         | 16225.40 | 19000.00   | 18894.50          |
| SG1-BUS 1 | 4103.88                          | 3554.06  | 2739.14    | 3766.27           |
| SG1-BUS 2 | 4227.10                          | 3660.77  | 2832.77    | 3856.52           |
| SG1-BUS 4 | 24288.70                         | 21034.60 | 24750.60   | 24589.20          |
| SG1-BUS 5 | 12663.80                         | 10967.10 | 12785.10   | 12737.70          |

Tabla No. 6.7. Corrientes de corto circuito en el Anillo B para el Escenario 4.

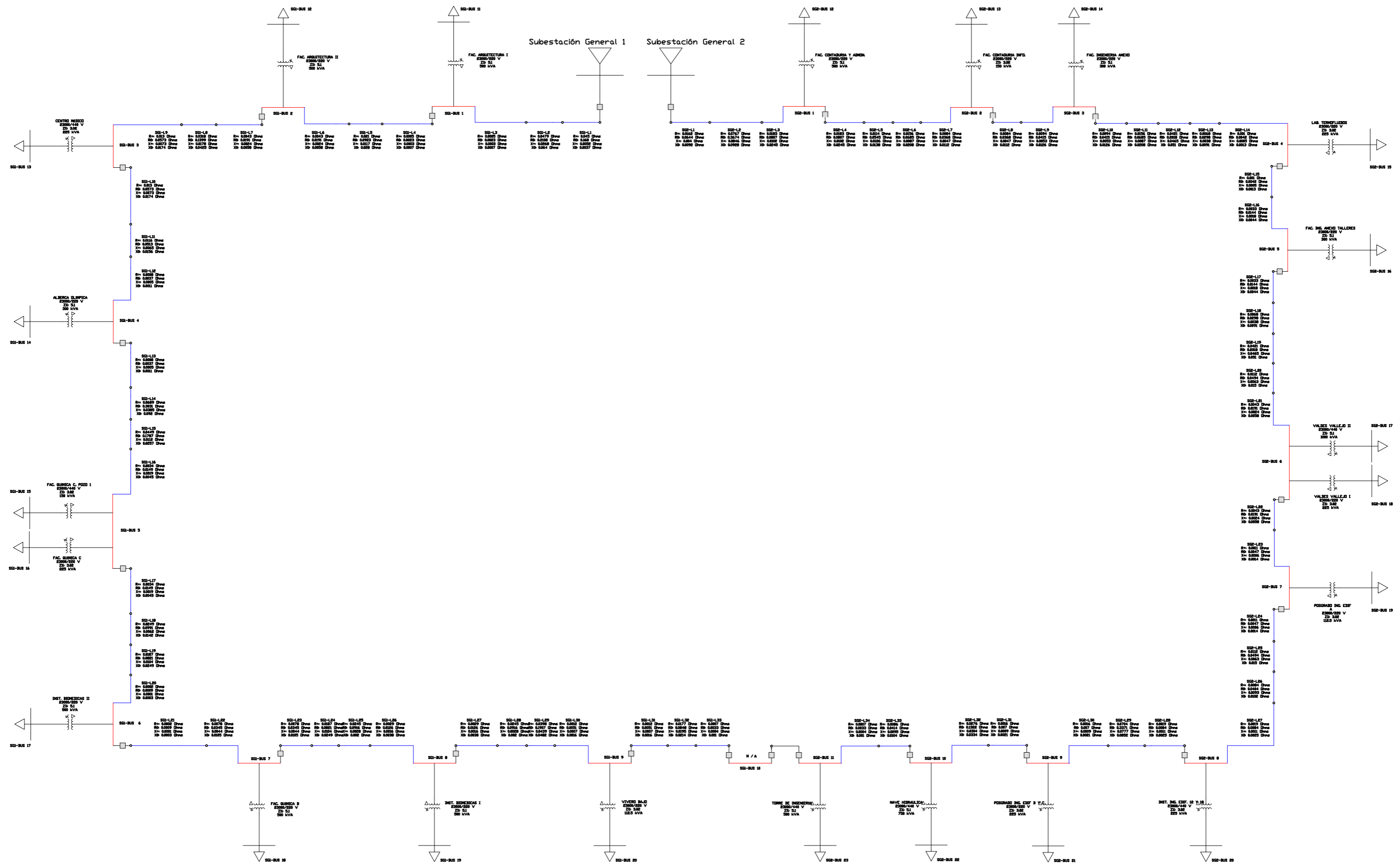


## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| Bus       | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|-----------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|           | Trifasica                        |          | Bifasica |          | Monofasica |          | Bifasica a Tierra |          |
|           | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG1-BUS 1 | 4103.88                          | 3692.92  | 3554.06  | 3198.39  | 2739.14    | 2410.20  | 3766.27           | 3325.17  |
| SG1-BUS 2 | 4227.10                          | 3605.34  | 3660.77  | 3122.54  | 2832.77    | 2351.31  | 3856.52           | 3263.76  |
| SG1-BUS 4 | 24288.70                         | 24124.10 | 21034.60 | 20892.10 | 24750.60   | 24636.30 | 24589.20          | 24417.40 |
| SG1-BUS 5 | 12663.80                         | 12601.10 | 10967.10 | 10912.90 | 12785.10   | 12742.40 | 12737.70          | 12685.10 |
| SG2-BUS 1 | 4408.69                          | 3476.82  | 3818.03  | 3011.21  | 2963.68    | 2260.71  | 3980.68           | 3169.22  |
| SG2-BUS 2 | 4371.33                          | 3503.24  | 3789.27  | 3034.10  | 2937.61    | 2279.68  | 3956.06           | 3189.06  |
| SG2-BUS 3 | 4306.42                          | 3549.16  | 3737.10  | 3073.87  | 2891.18    | 2312.24  | 3912.15           | 3223.03  |
| SG2-BUS 4 | 4268.26                          | 3576.17  | 3708.02  | 3097.27  | 2863.28    | 2331.14  | 3885.66           | 3242.72  |
| SG2-BUS 5 | 18757.60                         | 18563.80 | 16224.10 | 16076.80 | 19015.20   | 18882.10 | 18901.80          | 18768.10 |
| SG2-BUS 6 | 12674.20                         | 12590.80 | 10973.66 | 10904.00 | 12792.10   | 12735.40 | 12741.10          | 12681.70 |
| SG2-BUS 7 | 14927.50                         | 14824.80 | 12922.02 | 12838.70 | 15093.60   | 15023.50 | 15025.20          | 14947.00 |
| SG2-BUS 8 | 18735.40                         | 18585.70 | 16224.10 | 16095.80 | 19000.00   | 18897.20 | 18894.50          | 18775.40 |

Tabla No. 6.8. Corrientes de corto circuito máximas y mínimas del Anillo B.

### 6.3. Niveles de corto circuito del Anillo C.



| REV. | DATE | EGOP | OWN APP. | DESCRIPTION |
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|      |      |      |          |             |

Figura No. 6.3. Diagrama unifilar del Anillo C.





## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1  | 3663.17                          | 3172.63  | 2390.51    | 3304.59           |
| SG1-BUS 2  | 3646.70                          | 3158.36  | 2379.46    | 3293.06           |
| SG1-BUS 3  | 3615.34                          | 3131.19  | 2358.17    | 3270.88           |
| SG1-BUS 4  | 3599.04                          | 3117.08  | 2346.98    | 3259.22           |
| SG1-BUS 5  | 3536.76                          | 3063.14  | 2302.85    | 3215.00           |
| SG1-BUS 6  | 3513.65                          | 3043.12  | 2286.01    | 3198.36           |
| SG1-BUS 7  | 3508.47                          | 3038.63  | 2282.31    | 3194.48           |
| SG1-BUS 8  | 3483.74                          | 3017.21  | 2264.44    | 3176.58           |
| SG1-BUS 9  | 3430.40                          | 2971.01  | 2234.25    | 3136.57           |
| SG1-BUS 10 | 3409.58                          | 2952.97  | 2222.78    | 3120.56           |
| SG1-BUS 11 | 24113.00                         | 20882.60 | 24628.70   | 24413.80          |
| SG1-BUS 12 | 24106.90                         | 20877.30 | 24624.50   | 24411.80          |
| SG1-BUS 13 | 9297.17                          | 8051.61  | 9451.54    | 9389.12           |
| SG1-BUS 14 | 14831.70                         | 12844.70 | 15028.30   | 14949.30          |
| SG1-BUS 15 | 6297.22                          | 5453.57  | 6368.95    | 6341.87           |
| SG1-BUS 16 | 18577.70                         | 16088.80 | 18891.60   | 18774.50          |
| SG1-BUS 17 | 24059.30                         | 20836.10 | 24591.40   | 24400.50          |
| SG1-BUS 18 | 24057.40                         | 20834.40 | 24590.10   | 24399.80          |
| SG1-BUS 19 | 24049.20                         | 20827.30 | 24584.40   | 24399.40          |
| SG1-BUS 20 | 9520.34                          | 8244.87  | 9604.11    | 9575.38           |

Tabla No. 6.9. Corrientes de corto circuito en el Anillo C para el Escenario 1.



**CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)**

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG2-BUS 1  | 4265.52                          | 3694.04  | 2887.31    | 3879.51           |
| SG2-BUS 2  | 4210.32                          | 3646.24  | 2850.12    | 3841.01           |
| SG2-BUS 3  | 4194.79                          | 3632.79  | 2838.42    | 3830.19           |
| SG2-BUS 4  | 4100.53                          | 3551.16  | 2780.29    | 3761.77           |
| SG2-BUS 5  | 4096.89                          | 3548.01  | 2777.45    | 3759.14           |
| SG2-BUS 6  | 4011.24                          | 3473.84  | 2723.86    | 3695.75           |
| SG2-BUS 7  | 4006.70                          | 3469.90  | 2720.22    | 3692.37           |
| SG2-BUS 8  | 3982.28                          | 3448.76  | 2703.40    | 3674.11           |
| SG2-BUS 9  | 3877.50                          | 3358.01  | 2640.82    | 3594.76           |
| SG2-BUS 10 | 3837.41                          | 3323.29  | 2616.35    | 3564.09           |
| SG2-BUS 11 | 3824.80                          | 3312.37  | 2608.55    | 3554.40           |
| SG2-BUS 12 | 24329.70                         | 21070.10 | 24778.80   | 24593.90          |
| SG2-BUS 13 | 12661.70                         | 10965.30 | 12783.60   | 12734.20          |
| SG2-BUS 14 | 14915.00                         | 12916.80 | 15085.10   | 15017.20          |
| SG2-BUS 15 | 18705.40                         | 16199.40 | 18979.40   | 18875.50          |
| SG2-BUS 16 | 14904.20                         | 12907.50 | 15077.80   | 15011.70          |
| SG2-BUS 17 | 22939.70                         | 19866.40 | 23800.30   | 23504.50          |
| SG2-BUS 18 | 18689.40                         | 16185.50 | 18968.40   | 18867.30          |
| SG2-BUS 19 | 9555.44                          | 8275.25  | 9627.87    | 9601.30           |
| SG2-BUS 20 | 9342.12                          | 8090.52  | 9482.46    | 9432.48           |
| SG2-BUS 21 | 18664.10                         | 16163.60 | 18951.10   | 18853.40          |
| SG2-BUS 22 | 17624.70                         | 15263.50 | 18149.30   | 17979.70          |
| SG2-BUS 23 | 12097.40                         | 10476.70 | 12342.90   | 12262.10          |

Tabla No. 6.10. Corrientes de corto circuito en el Anillo C para el Escenario 2.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS         | Corrientes de Corto Circuito [A] |          |            |                   |
|-------------|----------------------------------|----------|------------|-------------------|
|             | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG 1-BUS 1  | 3663.17                          | 3172.63  | 2390.51    | 3304.59           |
| SG 1-BUS 2  | 3646.70                          | 3158.36  | 2379.46    | 3293.06           |
| SG 1-BUS 3  | 3615.34                          | 3131.19  | 2358.17    | 3270.88           |
| SG 1-BUS 4  | 3599.04                          | 3117.08  | 2346.98    | 3259.22           |
| SG 1-BUS 5  | 3536.76                          | 3063.14  | 2302.85    | 3215.00           |
| SG 1-BUS 6  | 3513.65                          | 3043.12  | 2286.01    | 3198.36           |
| SG 1-BUS 7  | 3508.47                          | 3038.63  | 2282.31    | 3194.48           |
| SG 1-BUS 8  | 3483.74                          | 3017.21  | 2264.44    | 3176.58           |
| SG 1-BUS 9  | 3430.40                          | 2971.01  | 2234.25    | 3136.57           |
| SG 1-BUS 11 | 24113.00                         | 20882.60 | 24628.70   | 24413.80          |
| SG 1-BUS 12 | 24106.90                         | 20877.30 | 24624.50   | 24411.80          |
| SG 1-BUS 13 | 9297.17                          | 8051.61  | 9451.54    | 9389.12           |
| SG 1-BUS 14 | 14831.70                         | 12844.70 | 15028.30   | 14949.30          |
| SG 1-BUS 15 | 6297.22                          | 5453.57  | 6368.95    | 6341.87           |
| SG 1-BUS 16 | 18577.70                         | 16088.80 | 18891.60   | 18774.50          |
| SG 1-BUS 17 | 24059.30                         | 20836.10 | 24591.40   | 24400.50          |
| SG 1-BUS 18 | 24057.40                         | 20834.40 | 24590.10   | 24399.80          |
| SG 1-BUS 19 | 24049.20                         | 20827.30 | 24584.40   | 24399.40          |
| SG 1-BUS 20 | 9520.34                          | 8244.87  | 9604.11    | 9575.38           |
| SG 2-BUS 1  | 3105.14                          | 2689.29  | 2032.50    | 2880.52           |
| SG 2-BUS 2  | 3140.09                          | 2719.56  | 2057.97    | 2909.07           |
| SG 2-BUS 3  | 3150.30                          | 2728.40  | 2066.05    | 2917.46           |
| SG 2-BUS 4  | 3210.83                          | 2780.83  | 2105.01    | 2965.72           |
| SG 2-BUS 5  | 3213.33                          | 2782.99  | 2106.96    | 2967.74           |
| SG 2-BUS 6  | 3271.35                          | 2833.26  | 2143.15    | 3013.46           |
| SG 2-BUS 7  | 3274.61                          | 2836.07  | 2145.66    | 3016.05           |
| SG 2-BUS 8  | 3291.89                          | 2851.04  | 2157.15    | 3029.63           |
| SG 2-BUS 9  | 3368.60                          | 2917.48  | 2200.17    | 3089.02           |
| SG 2-BUS 10 | 3399.61                          | 2944.34  | 2217.29    | 3112.90           |
| SG 2-BUS 11 | 3409.58                          | 2952.97  | 2222.78    | 3120.56           |
| SG 2-BUS 12 | 23887.40                         | 20687.20 | 24472.10   | 24315.90          |
| SG 2-BUS 13 | 12549.60                         | 10868.30 | 12707.40   | 12662.40          |
| SG 2-BUS 14 | 14762.80                         | 12785.00 | 14981.10   | 14918.60          |
| SG 2-BUS 15 | 18498.50                         | 16020.20 | 18837.20   | 18736.90          |
| SG 2-BUS 16 | 14773.50                         | 12794.20 | 14988.40   | 14924.10          |
| SG 2-BUS 17 | 22416.10                         | 19413.10 | 23423.10   | 23134.20          |
| SG 2-BUS 18 | 18514.30                         | 16033.90 | 18848.00   | 18745.10          |
| SG 2-BUS 19 | 9509.94                          | 8235.87  | 9597.06    | 9569.55           |
| SG 2-BUS 20 | 9259.67                          | 8019.13  | 9425.76    | 9373.71           |
| SG 2-BUS 21 | 18539.20                         | 16055.50 | 18865.20   | 18758.90          |
| SG 2-BUS 22 | 17430.60                         | 15095.40 | 18011.80   | 17826.70          |
| SG 2-BUS 23 | 12009.90                         | 10400.90 | 12282.00   | 12192.60          |

Tabla No. 6.11. Corrientes de corto circuito en el Anillo C para el Escenario 3.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS         | Corrientes de Corto Circuito [A] |          |            |                   |
|-------------|----------------------------------|----------|------------|-------------------|
|             | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG 2-BUS 1  | 4265.52                          | 3694.04  | 2887.31    | 3879.51           |
| SG 2-BUS 2  | 4210.32                          | 3646.24  | 2850.12    | 3841.01           |
| SG 2-BUS 3  | 4194.79                          | 3632.79  | 2838.42    | 3830.19           |
| SG 2-BUS 4  | 4100.53                          | 3551.16  | 2780.29    | 3761.77           |
| SG 2-BUS 5  | 4096.89                          | 3548.01  | 2777.45    | 3759.14           |
| SG 2-BUS 6  | 4011.24                          | 3473.84  | 2723.86    | 3695.75           |
| SG 2-BUS 7  | 4006.70                          | 3469.90  | 2720.22    | 3692.37           |
| SG 2-BUS 8  | 3982.28                          | 3448.76  | 2703.40    | 3674.11           |
| SG 2-BUS 9  | 3877.50                          | 3358.01  | 2640.82    | 3594.76           |
| SG 2-BUS 10 | 3837.41                          | 3323.29  | 2616.35    | 3564.09           |
| SG 2-BUS 11 | 3824.80                          | 3312.37  | 2608.55    | 3554.40           |
| SG 2-BUS 12 | 24329.70                         | 21070.10 | 24778.80   | 24593.90          |
| SG 2-BUS 13 | 12661.70                         | 10965.30 | 12783.60   | 12734.20          |
| SG 2-BUS 14 | 14915.00                         | 12916.80 | 15085.10   | 15017.20          |
| SG 2-BUS 15 | 18705.40                         | 16199.40 | 18979.40   | 18875.50          |
| SG 2-BUS 16 | 14904.20                         | 12907.50 | 15077.80   | 15011.70          |
| SG 2-BUS 17 | 22939.70                         | 19866.40 | 23800.30   | 23504.50          |
| SG 2-BUS 18 | 18689.40                         | 16185.50 | 18968.40   | 18867.30          |
| SG 2-BUS 19 | 9555.44                          | 8275.25  | 9627.87    | 9601.30           |
| SG 2-BUS 20 | 9342.12                          | 8090.52  | 9482.46    | 9432.48           |
| SG 2-BUS 21 | 18664.10                         | 16163.60 | 18951.10   | 18853.40          |
| SG 2-BUS 22 | 17624.70                         | 15263.50 | 18149.30   | 17979.70          |
| SG 2-BUS 23 | 12097.40                         | 10476.70 | 12342.90   | 12262.10          |
| SG 1-BUS 1  | 3514.90                          | 3043.99  | 2357.09    | 3303.90           |
| SG 1-BUS 2  | 3534.27                          | 3060.77  | 2373.79    | 3320.60           |
| SG 1-BUS 3  | 3571.40                          | 3092.92  | 2405.81    | 3352.36           |
| SG 1-BUS 4  | 3590.84                          | 3109.76  | 2422.58    | 3368.86           |
| SG 1-BUS 5  | 3668.08                          | 3176.65  | 2490.92    | 3432.71           |
| SG 1-BUS 6  | 3696.90                          | 3201.61  | 2516.68    | 3455.84           |
| SG 1-BUS 7  | 3703.16                          | 3207.03  | 2522.05    | 3460.94           |
| SG 1-BUS 8  | 3733.91                          | 3233.66  | 2549.10    | 3484.83           |
| SG 1-BUS 9  | 3798.82                          | 3289.87  | 2592.35    | 3534.35           |
| SG 1-BUS 11 | 24100.00                         | 20871.20 | 24620.30   | 24494.20          |
| SG 1-BUS 12 | 24106.30                         | 20876.60 | 24624.60   | 24496.40          |
| SG 1-BUS 13 | 9304.14                          | 8057.62  | 9456.46    | 9416.77           |
| SG 1-BUS 14 | 14845.40                         | 12856.50 | 15037.70   | 14986.20          |
| SG 1-BUS 15 | 6308.20                          | 5463.06  | 6376.45    | 6356.37           |
| SG 1-BUS 16 | 18625.20                         | 16129.90 | 18924.50   | 18837.60          |
| SG 1-BUS 17 | 24154.90                         | 20918.70 | 24658.10   | 24508.60          |
| SG 1-BUS 18 | 24156.80                         | 20920.40 | 24659.40   | 24509.30          |
| SG 1-BUS 19 | 24165.20                         | 20927.60 | 24665.20   | 24509.80          |
| SG 1-BUS 20 | 9544.98                          | 8266.19  | 9620.79    | 9595.44           |

Tabla No. 6.12. Corrientes de corto circuito en el Anillo C para el Escenario 4.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS        | Corrientes de Corto Circuito [A] |         |          |         |            |         |                   |         |
|------------|----------------------------------|---------|----------|---------|------------|---------|-------------------|---------|
|            | Trifásica                        |         | Bifásica |         | Monofásica |         | Bifásica a Tierra |         |
|            | Max.                             | Min.    | Max.     | Min.    | Max.       | Min.    | Max.              | Min.    |
| SG1-BUS 1  | 3594.75                          | 3015.81 | 3113.37  | 2611.77 | 2239.43    | 1318.37 | 3234.62           | 2673.50 |
| SG1-BUS 2  | 3560.71                          | 3042.34 | 3083.88  | 2634.74 | 2186.78    | 1338.53 | 3203.88           | 2698.17 |
| SG1-BUS 3  | 3488.78                          | 3101.26 | 3021.58  | 2685.77 | 2080.23    | 1384.34 | 3138.10           | 2753.05 |
| SG1-BUS 4  | 3447.30                          | 3137.17 | 2985.65  | 2716.87 | 2021.54    | 1412.96 | 3099.75           | 2786.57 |
| SG1-BUS 5  | 3323.95                          | 3253.33 | 2878.81  | 2817.47 | 1857.98    | 1509.40 | 2984.59           | 2895.30 |
| SG1-BUS 6  | 3315.03                          | 3264.45 | 2870.90  | 2827.27 | 1784.50    | 1563.18 | 2953.27           | 2928.65 |
| SG1-BUS 7  | 3386.27                          | 3200.31 | 2932.60  | 2771.72 | 1708.93    | 1627.62 | 3020.37           | 2868.22 |
| SG1-BUS 8  | 3404.30                          | 3184.80 | 2948.21  | 2758.29 | 1691.19    | 1644.34 | 3037.38           | 2853.59 |
| SG1-BUS 9  | 3508.43                          | 3100.34 | 3038.39  | 2685.14 | 1744.47    | 1598.06 | 3135.83           | 2773.93 |
| SG1-BUS 11 | 3544.16                          | 3073.25 | 3069.33  | 2661.67 | 1780.21    | 1569.40 | 3169.71           | 2748.35 |
| SG1-BUS 12 | 3579.98                          | 3046.96 | 3100.35  | 2638.90 | 1816.87    | 1542.10 | 3203.69           | 2723.57 |
| SG1-BUS 13 | 3672.87                          | 2982.63 | 3180.79  | 2583.19 | 1915.76    | 1477.34 | 3291.93           | 2662.97 |
| SG1-BUS 14 | 3718.40                          | 2952.96 | 3220.23  | 2557.49 | 1966.35    | 1448.44 | 3335.25           | 2635.05 |
| SG1-BUS 15 | 3731.94                          | 2944.36 | 3231.96  | 2550.04 | 1981.67    | 1440.17 | 3348.14           | 2626.95 |
| SG1-BUS 16 | 3852.90                          | 2871.69 | 3336.71  | 2487.10 | 2124.62    | 1372.20 | 3463.25           | 2558.69 |
| SG1-BUS 17 | 3864.20                          | 2865.26 | 3346.49  | 2481.53 | 2138.53    | 1366.35 | 3474.00           | 2552.66 |
| SG1-BUS 18 | 4012.83                          | 2785.79 | 3475.21  | 2412.69 | 2331.89    | 1295.99 | 3615.03           | 2478.21 |
| SG1-BUS 19 | 4064.05                          | 2760.42 | 3519.57  | 2390.72 | 2403.12    | 1274.29 | 3663.36           | 2454.49 |
| SG1-BUS 20 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 1  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 2  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 3  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 4  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 5  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 6  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 7  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 8  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 9  | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 10 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 11 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 12 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 13 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 14 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 15 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 16 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 17 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 18 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 19 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 20 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 21 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 22 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |
| SG2-BUS 23 | 4207.70                          | 2694.07 | 3643.97  | 2333.25 | 2617.03    | 1219.16 | 3797.46           | 2392.58 |

Tabla No. 6.13. Corrientes de corto circuito máximas y mínimas del Anillo C.

### 6.4. Niveles de corto circuito del Anillo D.

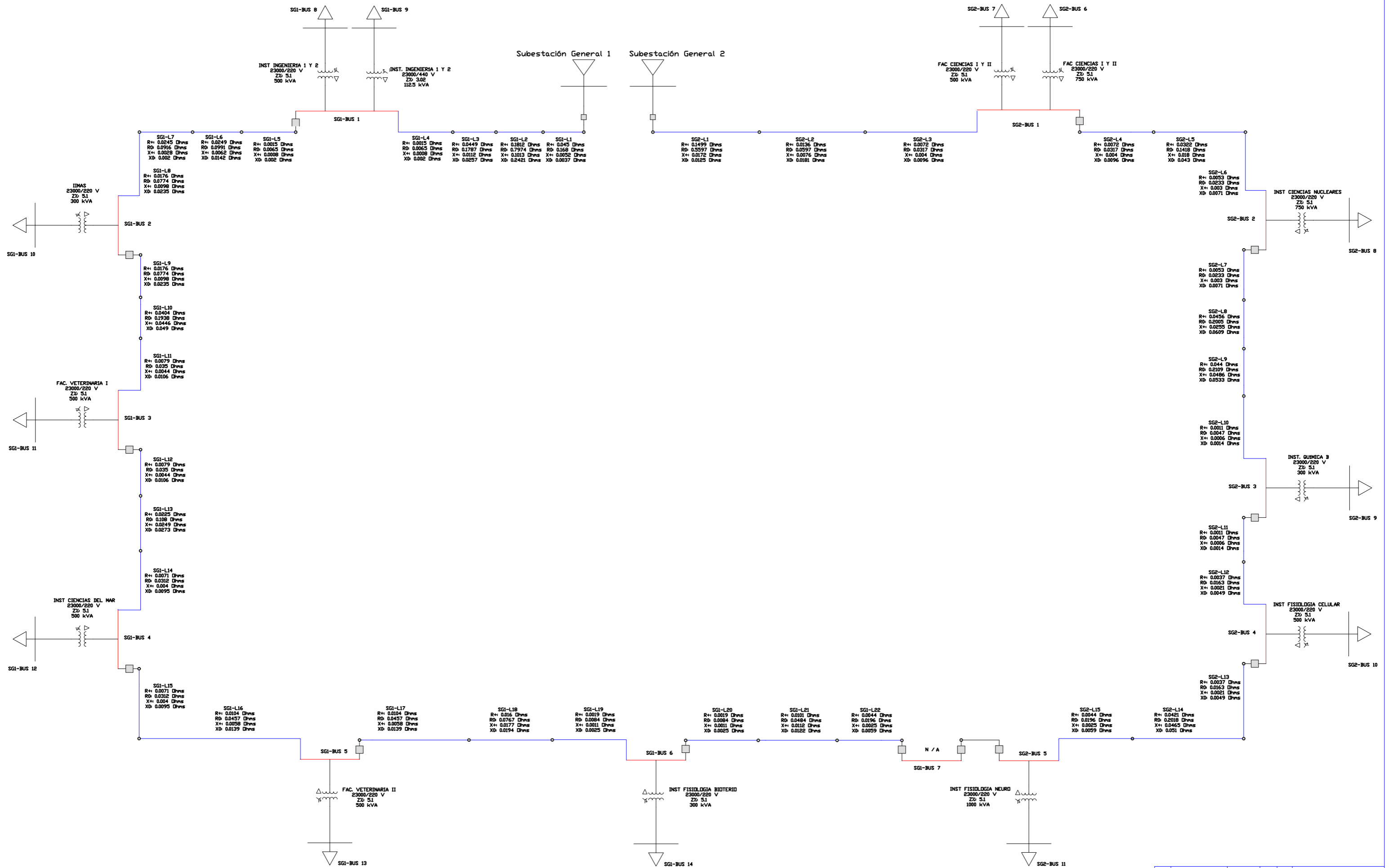


Figura No. 6.4. Diagrama unifilar del Anillo D.

| REV. | DATE | ESOP | OWN | APP | DESCRIPTION |
|------|------|------|-----|-----|-------------|
|      |      |      |     |     |             |
|      |      |      |     |     |             |
|      |      |      |     |     |             |
|      |      |      |     |     |             |

**Electrical One-Line Diagram**

|  |  |  |  |  |  |
|--|--|--|--|--|--|
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| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1  | 3562.05                          | 3085.04  | 2320.71    | 3233.64           |
| SG1-BUS 2  | 3535.39                          | 3061.95  | 2301.53    | 3215.43           |
| SG1-BUS 3  | 3472.86                          | 3007.79  | 2265.64    | 3168.26           |
| SG1-BUS 4  | 3438.14                          | 2977.72  | 2245.28    | 3141.87           |
| SG1-BUS 5  | 3427.13                          | 2968.18  | 2237.16    | 3133.46           |
| SG1-BUS 6  | 3401.83                          | 2946.26  | 2221.97    | 3114.08           |
| SG1-BUS 7  | 3386.82                          | 2933.26  | 2213.02    | 3102.52           |
| SG1-BUS 8  | 24076.50                         | 20851.00 | 24603.40   | 24404.60          |
| SG1-BUS 9  | 4763.90                          | 4125.66  | 4804.58    | 4788.79           |
| SG1-BUS 10 | 14823.80                         | 12837.80 | 15022.80   | 14949.30          |
| SG1-BUS 11 | 24043.30                         | 20822.20 | 24580.30   | 24392.70          |
| SG1-BUS 12 | 24029.30                         | 20810.10 | 24570.60   | 24385.40          |
| SG1-BUS 13 | 24025.10                         | 20806.50 | 24567.70   | 24384.00          |
| SG1-BUS 14 | 14803.60                         | 12820.40 | 15009.10   | 14939.20          |

Tabla No. 6.14. Corrientes de corto circuito en el Anillo D para el Escenario 1.



| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG2-BUS 1  | 4355.55                          | 3772.01  | 2929.17    | 3956.70           |
| SG2-BUS 2  | 4313.53                          | 3735.63  | 2898.19    | 3927.37           |
| SG2-BUS 3  | 4192.00                          | 3630.37  | 2821.51    | 3838.82           |
| SG2-BUS 4  | 4187.61                          | 3626.57  | 2818.13    | 3835.59           |
| SG2-BUS 5  | 4112.45                          | 3561.48  | 2774.02    | 3779.55           |
| SG2-BUS 6  | 35591.70                         | 30823.30 | 36539.10   | 36172.70          |
| SG2-BUS 7  | 24359.50                         | 21095.90 | 24799.50   | 24626.10          |
| SG2-BUS 8  | 35568.50                         | 30803.30 | 36522.90   | 36164.90          |
| SG2-BUS 9  | 14917.10                         | 12918.60 | 15086.60   | 15024.80          |
| SG2-BUS 10 | 24314.20                         | 21056.70 | 24768.20   | 24605.80          |
| SG2-BUS 11 | 46012.10                         | 39847.70 | 47695.90   | 47137.40          |

Tabla No. 6.15. Corrientes de corto circuito en el Anillo D para el Escenario 2.





**CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)**

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1  | 3562.05                          | 3085.04  | 2320.71    | 3233.64           |
| SG1-BUS 2  | 3535.39                          | 3061.95  | 2301.53    | 3215.43           |
| SG1-BUS 3  | 3472.86                          | 3007.79  | 2265.64    | 3168.26           |
| SG1-BUS 4  | 3438.14                          | 2977.72  | 2245.28    | 3141.87           |
| SG1-BUS 5  | 3427.13                          | 2968.18  | 2237.16    | 3133.46           |
| SG1-BUS 6  | 3401.83                          | 2946.26  | 2221.97    | 3114.08           |
| SG1-BUS 8  | 24076.50                         | 20851.00 | 24603.40   | 24404.60          |
| SG1-BUS 9  | 4763.90                          | 4125.66  | 4804.58    | 4788.79           |
| SG1-BUS 10 | 14823.80                         | 12837.80 | 15022.80   | 14949.30          |
| SG1-BUS 11 | 24043.30                         | 20822.20 | 24580.30   | 24392.70          |
| SG1-BUS 12 | 24029.30                         | 20810.10 | 24570.60   | 24385.40          |
| SG1-BUS 13 | 24025.10                         | 20806.50 | 24567.70   | 24384.00          |
| SG1-BUS 14 | 14803.60                         | 12820.40 | 15009.10   | 14939.20          |
| SG2-BUS 1  | 3230.00                          | 2797.44  | 2112.10    | 2979.93           |
| SG2-BUS 2  | 3256.56                          | 2820.44  | 2132.65    | 3001.22           |
| SG2-BUS 3  | 3333.67                          | 2887.23  | 2182.24    | 3061.53           |
| SG2-BUS 4  | 3336.59                          | 2889.76  | 2184.45    | 3063.82           |
| SG2-BUS 5  | 3386.82                          | 2933.26  | 2213.02    | 3102.52           |
| SG2-BUS 6  | 34707.00                         | 30057.40 | 35914.30   | 35568.80          |
| SG2-BUS 7  | 23942.90                         | 20735.20 | 24510.60   | 24343.20          |
| SG2-BUS 8  | 34729.50                         | 30076.90 | 35930.20   | 35576.70          |
| SG2-BUS 9  | 14792.80                         | 12810.90 | 15001.60   | 14933.30          |
| SG2-BUS 10 | 23987.20                         | 20773.60 | 24541.40   | 24363.40          |
| SG2-BUS 11 | 45003.00                         | 38974.10 | 46969.40   | 46354.00          |

Tabla No. 6.16. Corrientes de corto circuito en el Anillo D para el Escenario 3.



**CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)**

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG2-BUS 1  | 4355.55                          | 3772.01  | 2929.17    | 3956.70           |
| SG2-BUS 2  | 4313.53                          | 3735.63  | 2898.19    | 3927.37           |
| SG2-BUS 3  | 4192.00                          | 3630.37  | 2821.51    | 3838.82           |
| SG2-BUS 4  | 4187.61                          | 3626.57  | 2818.13    | 3835.59           |
| SG2-BUS 5  | 4112.45                          | 3561.48  | 2774.02    | 3779.55           |
| SG2-BUS 6  | 35591.70                         | 30823.30 | 36539.10   | 36172.70          |
| SG2-BUS 7  | 24359.50                         | 21095.90 | 24799.50   | 24626.10          |
| SG2-BUS 8  | 35568.50                         | 30803.30 | 36522.90   | 36164.90          |
| SG2-BUS 9  | 14917.10                         | 12918.60 | 15086.60   | 15024.80          |
| SG2-BUS 10 | 24314.20                         | 21056.70 | 24768.20   | 24605.80          |
| SG2-BUS 11 | 46012.10                         | 39847.70 | 47695.90   | 47137.40          |
| SG1-BUS 1  | 3871.27                          | 3352.61  | 2607.04    | 3595.76           |
| SG1-BUS 2  | 3909.03                          | 3385.32  | 2639.72    | 3624.29           |
| SG1-BUS 3  | 3991.49                          | 3456.73  | 2693.77    | 3687.89           |
| SG1-BUS 4  | 4039.24                          | 3498.08  | 2724.70    | 3724.31           |
| SG1-BUS 5  | 4054.74                          | 3511.51  | 2737.11    | 3736.09           |
| SG1-BUS 6  | 4090.72                          | 3542.67  | 2760.31    | 3763.21           |
| SG1-BUS 8  | 24223.00                         | 20977.80 | 24705.40   | 24563.70          |
| SG1-BUS 9  | 4775.39                          | 4135.60  | 4812.36    | 4801.18           |
| SG1-BUS 10 | 14885.80                         | 12891.40 | 15065.20   | 15008.60          |
| SG1-BUS 11 | 24256.90                         | 21007.10 | 24728.70   | 24576.00          |
| SG1-BUS 12 | 24271.20                         | 21019.50 | 24738.60   | 24583.40          |
| SG1-BUS 13 | 24275.40                         | 21023.10 | 24741.50   | 24584.80          |
| SG1-BUS 14 | 14906.10                         | 12909.10 | 15079.10   | 15018.80          |

Tabla No. 6.17. Corrientes de corto circuito en el Anillo D para el Escenario 4.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS        | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|------------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|            | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|            | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG1-BUS 1  | 3871.27                          | 3562.05  | 3352.61  | 3085.04  | 2607.04    | 2320.71  | 3595.76           | 3233.64  |
| SG1-BUS 2  | 3909.03                          | 3535.39  | 3385.32  | 3061.95  | 2639.72    | 2301.53  | 3624.29           | 3215.43  |
| SG1-BUS 3  | 3991.49                          | 3472.86  | 3456.73  | 3007.79  | 2693.77    | 2265.64  | 3687.89           | 3168.26  |
| SG1-BUS 4  | 4039.24                          | 3438.14  | 3498.08  | 2977.72  | 2724.70    | 2245.28  | 3724.31           | 3141.87  |
| SG1-BUS 5  | 4054.74                          | 3427.13  | 3511.51  | 2968.18  | 2737.11    | 2237.16  | 3736.09           | 3133.46  |
| SG1-BUS 6  | 4090.72                          | 3401.83  | 3542.67  | 2946.26  | 2760.31    | 2221.97  | 3763.21           | 3114.08  |
| SG1-BUS 8  | 24223.00                         | 24076.50 | 20977.80 | 20851.00 | 24705.40   | 24603.40 | 24563.70          | 24404.60 |
| SG1-BUS 9  | 4775.39                          | 4763.90  | 4135.60  | 4125.66  | 4812.36    | 4804.58  | 4801.18           | 4788.79  |
| SG1-BUS 10 | 14885.80                         | 14823.80 | 12891.40 | 12837.80 | 15065.20   | 15022.80 | 15008.60          | 14949.30 |
| SG1-BUS 11 | 24256.90                         | 24043.30 | 21007.10 | 20822.20 | 24728.70   | 24580.30 | 24576.00          | 24392.70 |
| SG1-BUS 12 | 24271.20                         | 24029.30 | 21019.50 | 20810.10 | 24738.60   | 24570.60 | 24583.40          | 24385.40 |
| SG1-BUS 13 | 24275.40                         | 24025.10 | 21023.10 | 20806.50 | 24741.50   | 24567.70 | 24584.80          | 24384.00 |
| SG1-BUS 14 | 14906.10                         | 14803.60 | 12909.10 | 12820.40 | 15079.10   | 15009.10 | 15018.80          | 14939.20 |
| SG2-BUS 1  | 4355.55                          | 3230.00  | 3772.01  | 2797.44  | 2929.17    | 2112.10  | 3956.70           | 2979.93  |
| SG2-BUS 2  | 4313.53                          | 3256.56  | 3735.63  | 2820.44  | 2898.19    | 2132.65  | 3927.37           | 3001.22  |
| SG2-BUS 3  | 4192.00                          | 3333.67  | 3630.37  | 2887.23  | 2821.51    | 2182.24  | 3838.82           | 3061.53  |
| SG2-BUS 4  | 4187.61                          | 3336.59  | 3626.57  | 2889.76  | 2818.13    | 2184.45  | 3835.59           | 3063.82  |
| SG2-BUS 5  | 4112.45                          | 3386.82  | 3561.48  | 2933.26  | 2774.02    | 2213.02  | 3779.55           | 3102.52  |
| SG2-BUS 6  | 35591.70                         | 34707.00 | 30823.30 | 30057.40 | 36539.10   | 35914.30 | 36172.70          | 35568.80 |
| SG2-BUS 7  | 24359.50                         | 23942.90 | 21095.90 | 20735.20 | 24799.50   | 24510.60 | 24626.10          | 24343.20 |
| SG2-BUS 8  | 35568.50                         | 34729.50 | 30803.30 | 30076.90 | 36522.90   | 35930.20 | 36164.90          | 35576.70 |
| SG2-BUS 9  | 14917.10                         | 14792.80 | 12918.60 | 12810.90 | 15086.60   | 15001.60 | 15024.80          | 14933.30 |
| SG2-BUS 10 | 24314.20                         | 23987.20 | 21056.70 | 20773.60 | 24768.20   | 24541.40 | 24605.80          | 24363.40 |
| SG2-BUS 11 | 46012.10                         | 45003.00 | 39847.70 | 38974.10 | 47695.90   | 46969.40 | 47137.40          | 46354.00 |

Tabla No. 6.18. Corrientes de corto circuito máximas y mínimas del Anillo D.

### 6.5. Niveles de corto circuito del Anillo E.

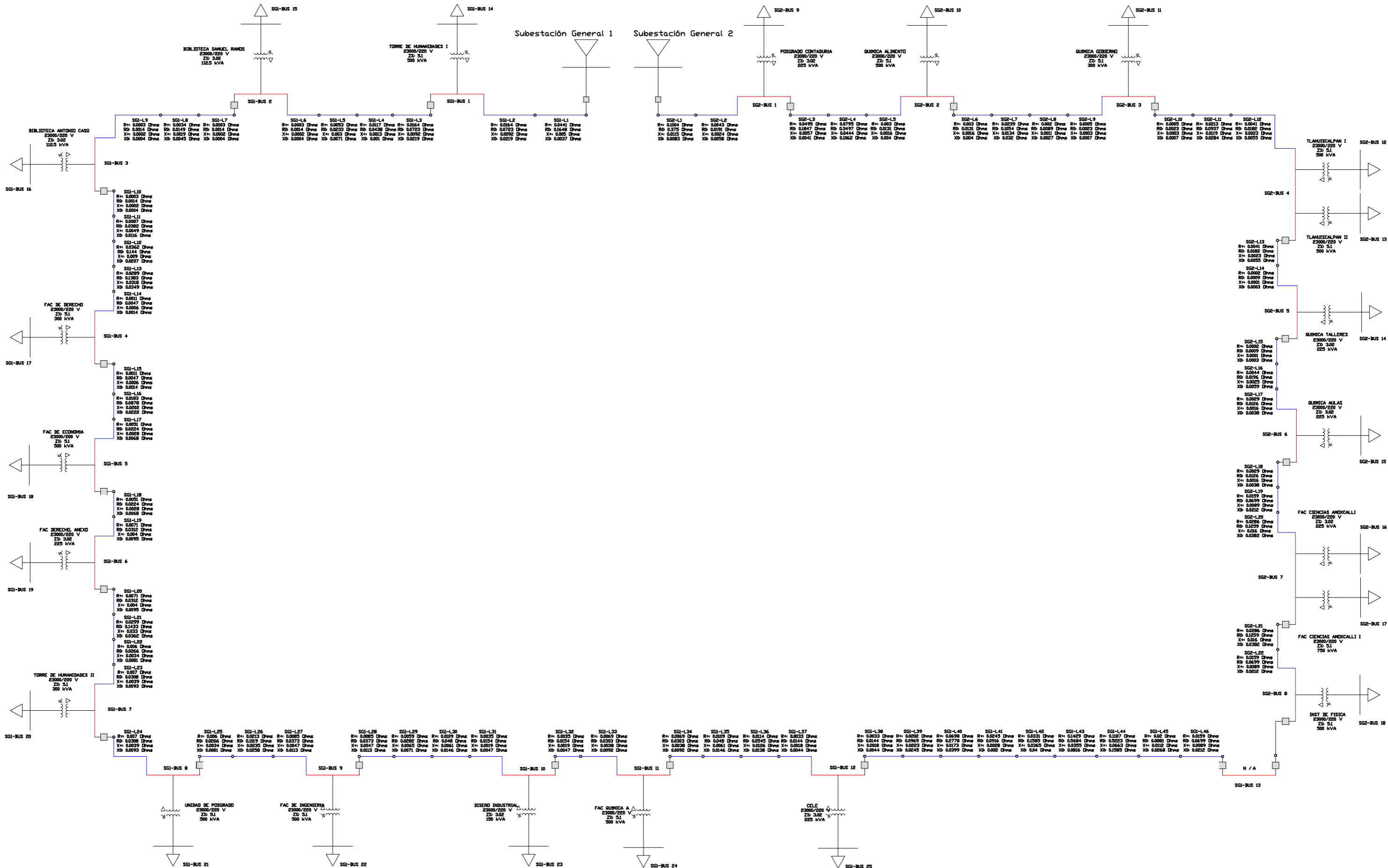


Figura No. 6.5. Diagrama unifilar del Anillo E.

| REV. | DATE | ESOP | OWN | APP. | DESCRIPTION |
|------|------|------|-----|------|-------------|
|      |      |      |     |      |             |
|      |      |      |     |      |             |
|      |      |      |     |      |             |
|      |      |      |     |      |             |
|      |      |      |     |      |             |



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1  | 3683.71                          | 3190.42  | 2404.13    | 3318.79           |
| SG1-BUS 2  | 3667.48                          | 3176.36  | 2393.55    | 3308.11           |
| SG1-BUS 3  | 3664.92                          | 3174.14  | 2391.83    | 3306.32           |
| SG1-BUS 4  | 3612.48                          | 3128.72  | 2362.48    | 3269.49           |
| SG1-BUS 5  | 3587.20                          | 3106.83  | 2349.14    | 3250.92           |
| SG1-BUS 6  | 3579.47                          | 3100.13  | 2343.75    | 3245.37           |
| SG1-BUS 7  | 3532.45                          | 3059.40  | 2317.36    | 3210.71           |
| SG1-BUS 8  | 3528.05                          | 3055.59  | 2314.23    | 3207.50           |
| SG1-BUS 9  | 3494.98                          | 3026.94  | 2295.28    | 3182.93           |
| SG1-BUS 10 | 3474.16                          | 3008.91  | 2281.50    | 3167.49           |
| SG1-BUS 11 | 3467.71                          | 3003.33  | 2276.80    | 3162.70           |
| SG1-BUS 12 | 3442.10                          | 2981.15  | 2260.58    | 3143.50           |
| SG1-BUS 13 | 3206.80                          | 2777.34  | 2088.42    | 2962.90           |
| SG1-BUS 14 | 24120.60                         | 20889.20 | 24633.90   | 24416.20          |
| SG1-BUS 15 | 9533.75                          | 8256.48  | 9613.18    | 9581.02           |
| SG1-BUS 16 | 9533.60                          | 8256.35  | 9613.08    | 9581.00           |
| SG1-BUS 17 | 14833.60                         | 12846.30 | 15029.60   | 14950.00          |
| SG1-BUS 18 | 26492.80                         | 22943.50 | 27069.60   | 26842.50          |
| SG1-BUS 19 | 18586.10                         | 16096.10 | 18897.40   | 18774.30          |
| SG1-BUS 20 | 14821.70                         | 12836.00 | 15021.40   | 14944.00          |
| SG1-BUS 21 | 24061.20                         | 20837.70 | 24592.70   | 24391.10          |
| SG1-BUS 22 | 24047.90                         | 20826.20 | 24583.50   | 24384.30          |
| SG1-BUS 23 | 12586.90                         | 10900.60 | 12732.80   | 12678.10          |
| SG1-BUS 24 | 24037.40                         | 20817.00 | 24576.10   | 24380.00          |
| SG1-BUS 25 | 18553.80                         | 16068.10 | 18875.20   | 18758.90          |

Tabla No. 6.19. Corrientes de corto circuito en el Anillo E para el Escenario 1.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG2-BUS 1  | 4385.52                          | 3797.97  | 2950.06    | 3973.18           |
| SG2-BUS 2  | 4293.54                          | 3718.31  | 2883.29    | 3913.21           |
| SG2-BUS 3  | 4265.93                          | 3694.40  | 2862.55    | 3893.47           |
| SG2-BUS 4  | 4241.64                          | 3673.37  | 2844.17    | 3875.90           |
| SG2-BUS 5  | 4237.58                          | 3669.85  | 2841.09    | 3872.94           |
| SG2-BUS 6  | 4230.56                          | 3663.77  | 2835.74    | 3867.81           |
| SG2-BUS 7  | 4186.40                          | 3625.53  | 2801.93    | 3835.28           |
| SG2-BUS 8  | 4145.07                          | 3589.73  | 2769.99    | 3804.32           |
| SG2-BUS 9  | 18755.10                         | 16242.40 | 19013.40   | 18906.10          |
| SG2-BUS 10 | 24343.60                         | 21082.10 | 24788.50   | 24620.80          |
| SG2-BUS 11 | 14925.10                         | 12925.50 | 15092.00   | 15029.40          |
| SG2-BUS 12 | 24330.20                         | 21070.60 | 24779.30   | 24616.30          |
| SG2-BUS 13 | 24330.20                         | 21070.60 | 24779.30   | 24616.30          |
| SG2-BUS 14 | 18733.30                         | 16223.50 | 18998.60   | 18901.70          |
| SG2-BUS 15 | 18732.20                         | 16222.60 | 18997.80   | 18901.30          |
| SG2-BUS 16 | 35498.20                         | 30742.30 | 36473.70   | 36141.20          |
| SG2-BUS 17 | 18725.50                         | 16216.70 | 18993.20   | 18899.10          |
| SG2-BUS 18 | 24305.10                         | 21048.90 | 24762.00   | 24607.90          |

Tabla No. 6.20. Corrientes de corto circuito en el Anillo E para el Escenario 2.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS         | Corrientes de Corto Circuito [A] |          |            |                   |
|-------------|----------------------------------|----------|------------|-------------------|
|             | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG 1-BUS 1  | 3683.71                          | 3190.42  | 2404.13    | 3318.79           |
| SG 1-BUS 2  | 3667.48                          | 3176.36  | 2393.55    | 3308.11           |
| SG 1-BUS 3  | 3664.92                          | 3174.14  | 2391.83    | 3306.32           |
| SG 1-BUS 4  | 3612.48                          | 3128.72  | 2362.48    | 3269.49           |
| SG 1-BUS 5  | 3587.20                          | 3106.83  | 2349.14    | 3250.92           |
| SG 1-BUS 6  | 3579.47                          | 3100.13  | 2343.75    | 3245.37           |
| SG 1-BUS 7  | 3532.45                          | 3059.40  | 2317.36    | 3210.71           |
| SG 1-BUS 8  | 3528.05                          | 3055.59  | 2314.23    | 3207.50           |
| SG 1-BUS 9  | 3494.98                          | 3026.94  | 2295.28    | 3182.93           |
| SG 1-BUS 10 | 3474.16                          | 3008.91  | 2281.50    | 3167.49           |
| SG 1-BUS 11 | 3467.71                          | 3003.33  | 2276.80    | 3162.70           |
| SG 1-BUS 12 | 3442.10                          | 2981.15  | 2260.58    | 3143.50           |
| SG 1-BUS 14 | 24120.60                         | 20889.20 | 24633.90   | 24416.20          |
| SG 1-BUS 15 | 9533.75                          | 8256.48  | 9613.18    | 9581.02           |
| SG 1-BUS 16 | 9533.60                          | 8256.35  | 9613.08    | 9581.00           |
| SG 1-BUS 17 | 14833.60                         | 12846.30 | 15029.60   | 14950.00          |
| SG 1-BUS 18 | 26492.80                         | 22943.50 | 27069.60   | 26842.50          |
| SG 1-BUS 19 | 18586.10                         | 16096.10 | 18897.40   | 18774.30          |
| SG 1-BUS 20 | 14821.70                         | 12836.00 | 15021.40   | 14944.00          |
| SG 1-BUS 21 | 24061.20                         | 20837.70 | 24592.70   | 24391.10          |
| SG 1-BUS 22 | 24047.90                         | 20826.20 | 24583.50   | 24384.30          |
| SG 1-BUS 23 | 12586.90                         | 10900.60 | 12732.80   | 12678.10          |
| SG 1-BUS 24 | 24037.40                         | 20817.00 | 24576.10   | 24380.00          |
| SG 1-BUS 25 | 18553.80                         | 16068.10 | 18875.20   | 18758.90          |
| SG 2-BUS 1  | 3050.94                          | 2642.34  | 1965.69    | 2832.75           |
| SG 2-BUS 2  | 3112.39                          | 2695.57  | 2014.69    | 2884.42           |
| SG 2-BUS 3  | 3129.66                          | 2710.52  | 2028.20    | 2898.92           |
| SG 2-BUS 4  | 3144.95                          | 2723.77  | 2040.17    | 2911.71           |
| SG 2-BUS 5  | 3147.52                          | 2726.00  | 2042.18    | 2913.86           |
| SG 2-BUS 6  | 3151.97                          | 2729.85  | 2045.66    | 2917.58           |
| SG 2-BUS 7  | 3180.13                          | 2754.24  | 2067.64    | 2940.94           |
| SG 2-BUS 8  | 3206.80                          | 2777.34  | 2088.42    | 2962.90           |
| SG 2-BUS 9  | 18466.90                         | 15992.90 | 18815.60   | 18737.90          |
| SG 2-BUS 10 | 23902.90                         | 20700.60 | 24483.10   | 24342.40          |
| SG 2-BUS 11 | 14764.10                         | 12786.10 | 14982.10   | 14926.70          |
| SG 2-BUS 12 | 23916.10                         | 20712.00 | 24492.20   | 24347.00          |
| SG 2-BUS 13 | 23916.10                         | 20712.00 | 24492.20   | 24347.00          |
| SG 2-BUS 14 | 18488.50                         | 16011.60 | 18830.40   | 18742.70          |
| SG 2-BUS 15 | 18489.60                         | 16012.50 | 18831.20   | 18743.00          |
| SG 2-BUS 16 | 34679.30                         | 30033.40 | 35895.30   | 35586.30          |
| SG 2-BUS 17 | 18496.30                         | 16018.30 | 18835.70   | 18745.30          |
| SG 2-BUS 18 | 23940.70                         | 20733.40 | 24509.30   | 24355.60          |

Tabla No. 6.21. Corrientes de corto circuito en el Anillo E para el Escenario 3.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS         | Corrientes de Corto Circuito [A] |          |            |                   |
|-------------|----------------------------------|----------|------------|-------------------|
|             | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG 2-BUS 1  | 4385.52                          | 3797.97  | 2950.06    | 3973.18           |
| SG 2-BUS 2  | 4293.54                          | 3718.31  | 2883.29    | 3913.21           |
| SG 2-BUS 3  | 4265.93                          | 3694.40  | 2862.55    | 3893.47           |
| SG 2-BUS 4  | 4241.64                          | 3673.37  | 2844.17    | 3875.90           |
| SG 2-BUS 5  | 4237.58                          | 3669.85  | 2841.09    | 3872.94           |
| SG 2-BUS 6  | 4230.56                          | 3663.77  | 2835.74    | 3867.81           |
| SG 2-BUS 7  | 4186.40                          | 3625.53  | 2801.93    | 3835.28           |
| SG 2-BUS 8  | 4145.07                          | 3589.73  | 2769.99    | 3804.32           |
| SG 2-BUS 9  | 18755.10                         | 16242.40 | 19013.40   | 18906.10          |
| SG 2-BUS 10 | 24343.60                         | 21082.10 | 24788.50   | 24620.80          |
| SG 2-BUS 11 | 14925.10                         | 12925.50 | 15092.00   | 15029.40          |
| SG 2-BUS 12 | 24330.20                         | 21070.60 | 24779.30   | 24616.30          |
| SG 2-BUS 13 | 24330.20                         | 21070.60 | 24779.30   | 24616.30          |
| SG 2-BUS 14 | 18733.30                         | 16223.50 | 18998.60   | 18901.70          |
| SG 2-BUS 15 | 18732.20                         | 16222.60 | 18997.80   | 18901.30          |
| SG 2-BUS 16 | 35498.20                         | 30742.30 | 36473.70   | 36141.20          |
| SG 2-BUS 17 | 18725.50                         | 16216.70 | 18993.20   | 18899.10          |
| SG 2-BUS 18 | 24305.10                         | 21048.90 | 24762.00   | 24607.90          |
| SG 1-BUS 1  | 3488.17                          | 3020.84  | 2277.51    | 3271.74           |
| SG 1-BUS 2  | 3510.26                          | 3039.97  | 2296.15    | 3291.26           |
| SG 1-BUS 3  | 3513.45                          | 3042.74  | 2298.79    | 3294.09           |
| SG 1-BUS 4  | 3577.66                          | 3098.35  | 2345.63    | 3348.63           |
| SG 1-BUS 5  | 3606.85                          | 3123.62  | 2364.76    | 3372.95           |
| SG 1-BUS 6  | 3616.88                          | 3132.31  | 2373.02    | 3381.70           |
| SG 1-BUS 7  | 3674.10                          | 3181.86  | 2411.76    | 3429.39           |
| SG 1-BUS 8  | 3680.02                          | 3186.99  | 2416.61    | 3434.50           |
| SG 1-BUS 9  | 3721.91                          | 3223.26  | 2444.83    | 3469.17           |
| SG 1-BUS 10 | 3749.96                          | 3247.56  | 2466.03    | 3492.76           |
| SG 1-BUS 11 | 3758.97                          | 3255.36  | 2473.39    | 3500.43           |
| SG 1-BUS 12 | 3793.70                          | 3285.44  | 2498.33    | 3529.19           |
| SG 1-BUS 14 | 24120.80                         | 20889.20 | 24635.30   | 24544.40          |
| SG 1-BUS 15 | 9536.14                          | 8258.54  | 9614.86    | 9599.87           |
| SG 1-BUS 16 | 9536.28                          | 8258.66  | 9614.96    | 9599.92           |
| SG 1-BUS 17 | 14854.60                         | 12864.50 | 15044.10   | 15005.70          |
| SG 1-BUS 18 | 26573.90                         | 23013.70 | 27127.00   | 27015.40          |
| SG 1-BUS 19 | 18634.10                         | 16137.60 | 18930.80   | 18869.30          |
| SG 1-BUS 20 | 14866.70                         | 12874.90 | 15052.30   | 15011.90          |
| SG 1-BUS 21 | 24181.80                         | 20942.00 | 24677.30   | 24571.20          |
| SG 1-BUS 22 | 24195.40                         | 20953.80 | 24686.60   | 24578.30          |
| SG 1-BUS 23 | 12632.10                         | 10939.70 | 12763.60   | 12733.10          |
| SG 1-BUS 24 | 24206.20                         | 20963.20 | 24694.10   | 24582.80          |
| SG 1-BUS 25 | 18667.00                         | 16166.10 | 18953.30   | 18885.30          |

Tabla No. 6.22. Corrientes de corto circuito en el Anillo E para el Escenario 4.





## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS        | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|------------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|            | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|            | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG1-BUS 1  | 3683.71                          | 3488.17  | 3190.42  | 3020.84  | 2404.13    | 2277.51  | 3318.79           | 3271.74  |
| SG1-BUS 2  | 3667.48                          | 3510.26  | 3176.36  | 3039.97  | 2393.55    | 2296.15  | 3308.11           | 3291.26  |
| SG1-BUS 3  | 3664.92                          | 3513.45  | 3174.14  | 3042.74  | 2391.83    | 2298.79  | 3306.32           | 3294.09  |
| SG1-BUS 4  | 3612.48                          | 3577.66  | 3128.72  | 3098.35  | 2362.48    | 2345.63  | 3348.63           | 3269.49  |
| SG1-BUS 5  | 3606.85                          | 3587.20  | 3123.62  | 3106.83  | 2364.76    | 2349.14  | 3372.95           | 3250.92  |
| SG1-BUS 6  | 3616.88                          | 3579.47  | 3132.31  | 3100.13  | 2373.02    | 2343.75  | 3381.70           | 3245.37  |
| SG1-BUS 7  | 3674.10                          | 3532.45  | 3181.86  | 3059.40  | 2411.76    | 2317.36  | 3429.39           | 3210.71  |
| SG1-BUS 8  | 3680.02                          | 3528.05  | 3186.99  | 3055.59  | 2416.61    | 2314.23  | 3434.50           | 3207.50  |
| SG1-BUS 9  | 3721.91                          | 3494.98  | 3223.26  | 3026.94  | 2444.83    | 2295.28  | 3469.17           | 3182.93  |
| SG1-BUS 10 | 3749.96                          | 3474.16  | 3247.56  | 3008.91  | 2466.03    | 2281.50  | 3492.76           | 3167.49  |
| SG1-BUS 11 | 3758.97                          | 3467.71  | 3255.36  | 3003.33  | 2473.39    | 2276.80  | 3500.43           | 3162.70  |
| SG1-BUS 12 | 3793.70                          | 3442.10  | 3285.44  | 2981.15  | 2498.33    | 2260.58  | 3529.19           | 3143.50  |
| SG1-BUS 14 | 24120.80                         | 24120.60 | 20889.20 | 20889.20 | 24635.30   | 24633.90 | 24544.40          | 24416.20 |
| SG1-BUS 15 | 9536.14                          | 9533.75  | 8258.54  | 8256.48  | 9614.86    | 9613.18  | 9599.87           | 9581.02  |
| SG1-BUS 16 | 9536.28                          | 9533.60  | 8258.66  | 8256.35  | 9614.96    | 9613.08  | 9599.92           | 9581.00  |
| SG1-BUS 17 | 14854.60                         | 14833.60 | 12864.50 | 12846.30 | 15044.10   | 15029.60 | 15005.70          | 14950.00 |
| SG1-BUS 18 | 26573.90                         | 26492.80 | 23013.70 | 22943.50 | 27127.00   | 27069.60 | 27015.40          | 26842.50 |
| SG1-BUS 19 | 18634.10                         | 18586.10 | 16137.60 | 16096.10 | 18930.80   | 18897.40 | 18869.30          | 18774.30 |
| SG1-BUS 20 | 14866.70                         | 14821.70 | 12874.90 | 12836.00 | 15052.30   | 15021.40 | 15011.90          | 14944.00 |
| SG1-BUS 21 | 24181.80                         | 24061.20 | 20942.00 | 20837.70 | 24677.30   | 24592.70 | 24571.20          | 24391.10 |
| SG1-BUS 22 | 24195.40                         | 24047.90 | 20953.80 | 20826.20 | 24686.60   | 24583.50 | 24578.30          | 24384.30 |
| SG1-BUS 23 | 12632.10                         | 12586.90 | 10939.70 | 10900.60 | 12763.60   | 12732.80 | 12733.10          | 12678.10 |
| SG1-BUS 24 | 24206.20                         | 24037.40 | 20963.20 | 20817.00 | 24694.10   | 24576.10 | 24582.80          | 24380.00 |
| SG1-BUS 25 | 18667.00                         | 18553.80 | 16166.10 | 16068.10 | 18953.30   | 18875.20 | 18885.30          | 18758.90 |
| SG2-BUS 1  | 4385.52                          | 3050.94  | 3797.97  | 2642.34  | 2950.06    | 1965.69  | 3973.18           | 2832.75  |
| SG2-BUS 2  | 4293.54                          | 3112.39  | 3718.31  | 2695.57  | 2883.29    | 2014.69  | 3913.21           | 2884.42  |
| SG2-BUS 3  | 4265.93                          | 3129.66  | 3694.40  | 2710.52  | 2862.55    | 2028.20  | 3893.47           | 2898.92  |
| SG2-BUS 4  | 4241.64                          | 3144.95  | 3673.37  | 2723.77  | 2844.17    | 2040.17  | 3875.90           | 2911.71  |
| SG2-BUS 5  | 4237.58                          | 3147.52  | 3669.85  | 2726.00  | 2841.09    | 2726.00  | 3872.94           | 2913.86  |
| SG2-BUS 6  | 4230.56                          | 3151.97  | 3663.77  | 2729.85  | 2835.74    | 2045.66  | 3867.81           | 2917.58  |
| SG2-BUS 7  | 4186.40                          | 3180.13  | 3625.53  | 2754.24  | 2801.93    | 2067.64  | 3835.28           | 2940.94  |
| SG2-BUS 8  | 4145.07                          | 3206.80  | 3589.73  | 2777.34  | 2769.99    | 2088.42  | 3804.32           | 2962.90  |
| SG2-BUS 9  | 18755.10                         | 18466.90 | 16242.40 | 15992.90 | 19013.40   | 18815.60 | 18906.10          | 18737.90 |
| SG2-BUS 10 | 24343.60                         | 23902.90 | 21082.10 | 20700.60 | 24788.50   | 24483.10 | 24620.80          | 24342.40 |
| SG2-BUS 11 | 14925.10                         | 14764.10 | 12925.50 | 12786.10 | 15092.00   | 14982.10 | 15029.40          | 14926.70 |
| SG2-BUS 12 | 24330.20                         | 23916.10 | 21070.60 | 20712.00 | 24779.30   | 24492.20 | 24616.30          | 24347.00 |
| SG2-BUS 13 | 24330.20                         | 23916.10 | 21070.60 | 20712.00 | 24779.30   | 24492.20 | 24616.30          | 24347.00 |
| SG2-BUS 14 | 18733.30                         | 18488.50 | 16223.50 | 16011.60 | 18998.60   | 18830.40 | 18901.70          | 18742.70 |
| SG2-BUS 15 | 18732.20                         | 18489.60 | 16222.60 | 16012.50 | 18997.80   | 18831.20 | 18901.30          | 18743.00 |
| SG2-BUS 16 | 35498.20                         | 34679.30 | 30742.30 | 30033.40 | 36473.70   | 35895.30 | 36141.20          | 35586.30 |
| SG2-BUS 17 | 18725.50                         | 18496.30 | 16216.70 | 16018.30 | 18993.20   | 18835.70 | 18899.10          | 18745.30 |
| SG2-BUS 18 | 24305.10                         | 23940.70 | 21048.90 | 20733.40 | 24762.00   | 24509.30 | 24607.90          | 24355.60 |

Tabla No. 6.23. Corrientes de corto circuito máximas y mínimas del Anillo E.

### 6.6. Niveles de corto circuito del Anillo F.



Figura No. 6.6. Diagrama unifilar del Anillo F.

| REV. | DATE | EGOP | OWN | APP | DESCRIPTION |
|------|------|------|-----|-----|-------------|
|      |      |      |     |     |             |
|      |      |      |     |     |             |
|      |      |      |     |     |             |

|                             |  |  |  |
|-----------------------------|--|--|--|
| ELECTRICAL ONE-LINE DIAGRAM |  |  |  |
| DRAWN BY/DATE:              |  |  |  |
| CHECKED BY/DATE:            |  |  |  |
| SCALE:                      |  |  |  |
|                             |  |  |  |

|          |  |  |  |  |
|----------|--|--|--|--|
|          |  |  |  |  |
|          |  |  |  |  |
| DWG. No. |  |  |  |  |



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1  | 3561.75                          | 3084.78  | 2320.65    | 3233.61           |
| SG1-BUS 2  | 3561.25                          | 3084.35  | 2320.39    | 3233.23           |
| SG1-BUS 3  | 3551.04                          | 3075.50  | 2313.19    | 3225.72           |
| SG1-BUS 4  | 3426.38                          | 2967.53  | 2224.86    | 3131.77           |
| SG1-BUS 5  | 3399.14                          | 2943.94  | 2209.92    | 3110.84           |
| SG1-BUS 6  | 3394.43                          | 2939.85  | 2206.43    | 3107.17           |
| SG1-BUS 7  | 3393.96                          | 2939.44  | 2206.17    | 3106.80           |
| SG1-BUS 8  | 3355.20                          | 2905.88  | 2181.81    | 3076.75           |
| SG1-BUS 9  | 3330.44                          | 2884.43  | 2165.85    | 3057.39           |
| SG1-BUS 10 | 24076.60                         | 20851.00 | 24603.40   | 24405.10          |
| SG1-BUS 11 | 34990.20                         | 30302.60 | 36114.60   | 35701.30          |
| SG1-BUS 12 | 24072.60                         | 20847.60 | 24600.70   | 24403.70          |
| SG1-BUS 13 | 18580.90                         | 16091.60 | 18893.80   | 18775.80          |
| SG1-BUS 14 | 24026.10                         | 20807.30 | 24568.40   | 24387.30          |
| SG1-BUS 15 | 14803.60                         | 12820.30 | 15009.10   | 14940.00          |
| SG1-BUS 16 | 4758.96                          | 4121.38  | 4801.23    | 4786.92           |
| SG1-BUS 17 | 24012.80                         | 20795.80 | 24559.20   | 24380.10          |
| SG1-BUS 18 | 34821.60                         | 30156.60 | 35995.50   | 35631.20          |

Tabla No. 6.24. Corrientes de corto circuito en el Anillo F para el Escenario 1.



| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG2-BUS 1  | 4401.20                          | 3811.54  | 2959.28    | 3977.02           |
| SG2-BUS 2  | 4366.07                          | 3781.13  | 2935.39    | 3956.93           |
| SG2-BUS 3  | 4357.83                          | 3773.99  | 2929.48    | 3951.34           |
| SG2-BUS 4  | 4166.55                          | 3608.33  | 2789.20    | 3815.69           |
| SG2-BUS 5  | 4120.86                          | 3568.77  | 2760.52    | 3781.58           |
| SG2-BUS 6  | 4101.32                          | 3551.84  | 2746.97    | 3766.91           |
| SG2-BUS 7  | 4044.10                          | 3502.29  | 2713.31    | 3723.64           |
| SG2-BUS 8  | 18756.60                         | 16243.70 | 19014.50   | 18902.30          |
| SG2-BUS 9  | 14933.90                         | 12933.10 | 15098.00   | 15029.10          |
| SG2-BUS 10 | 46250.30                         | 40054.00 | 47865.20   | 47225.10          |
| SG2-BUS 11 | 24307.10                         | 21050.60 | 24763.40   | 24599.60          |
| SG2-BUS 12 | 46018.80                         | 39853.40 | 47700.60   | 47135.70          |
| SG2-BUS 13 | 14907.10                         | 12909.90 | 15079.80   | 15019.00          |
| SG2-BUS 14 | 18699.10                         | 16193.90 | 18975.10   | 18881.00          |

Tabla No. 6.25. Corrientes de corto circuito en el Anillo F para el Escenario 2.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS         | Corrientes de Corto Circuito [A] |          |            |                   |
|-------------|----------------------------------|----------|------------|-------------------|
|             | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG 1-BUS 1  | 3561.75                          | 3084.78  | 2320.65    | 3233.61           |
| SG 1-BUS 2  | 3561.25                          | 3084.35  | 2320.39    | 3233.23           |
| SG 1-BUS 3  | 3551.04                          | 3075.50  | 2313.19    | 3225.72           |
| SG 1-BUS 4  | 3426.38                          | 2967.53  | 2224.86    | 3131.77           |
| SG 1-BUS 5  | 3399.14                          | 2943.94  | 2209.92    | 3110.84           |
| SG 1-BUS 6  | 3394.43                          | 2939.85  | 2206.43    | 3107.17           |
| SG 1-BUS 7  | 3393.96                          | 2939.44  | 2206.17    | 3106.80           |
| SG 1-BUS 8  | 3355.20                          | 2905.88  | 2181.81    | 3076.75           |
| SG 1-BUS 10 | 24076.60                         | 20851.00 | 24603.40   | 24405.10          |
| SG 1-BUS 11 | 34990.20                         | 30302.60 | 36114.60   | 35701.30          |
| SG 1-BUS 12 | 24072.60                         | 20847.60 | 24600.70   | 24403.70          |
| SG 1-BUS 13 | 18580.90                         | 16091.60 | 18893.80   | 18775.80          |
| SG 1-BUS 14 | 24026.10                         | 20807.30 | 24568.40   | 24387.30          |
| SG 1-BUS 15 | 14803.60                         | 12820.30 | 15009.10   | 14940.00          |
| SG 1-BUS 16 | 4758.96                          | 4121.38  | 4801.23    | 4786.92           |
| SG 1-BUS 17 | 24012.80                         | 20795.80 | 24559.20   | 24380.10          |
| SG 1-BUS 18 | 34821.60                         | 30156.60 | 35995.50   | 35631.20          |
| SG 2-BUS 1  | 3095.08                          | 2680.58  | 1997.73    | 2867.47           |
| SG 2-BUS 2  | 3120.97                          | 2703.00  | 2018.47    | 2888.71           |
| SG 2-BUS 3  | 3126.18                          | 2707.51  | 2022.52    | 2893.06           |
| SG 2-BUS 4  | 3249.02                          | 2813.91  | 2116.21    | 2993.48           |
| SG 2-BUS 5  | 3278.73                          | 2839.64  | 2134.89    | 3016.93           |
| SG 2-BUS 6  | 3291.78                          | 2850.95  | 2143.79    | 3027.25           |
| SG 2-BUS 7  | 3330.44                          | 2884.43  | 2165.85    | 3057.39           |
| SG 2-BUS 8  | 18473.10                         | 15998.20 | 18819.80   | 18732.80          |
| SG 2-BUS 9  | 14760.20                         | 12782.80 | 14979.40   | 14921.20          |
| SG 2-BUS 10 | 44622.80                         | 38644.80 | 46695.80   | 46190.20          |
| SG 2-BUS 11 | 23951.90                         | 20743.00 | 24516.90   | 24349.10          |
| SG 2-BUS 12 | 44846.40                         | 38838.50 | 46856.60   | 46281.60          |
| SG 2-BUS 13 | 14786.70                         | 12805.70 | 14997.50   | 14931.40          |
| SG 2-BUS 14 | 18529.90                         | 16047.40 | 18858.80   | 18754.40          |

Tabla No. 6.26. Corrientes de corto circuito en el Anillo F para el Escenario 3.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS         | Corrientes de Corto Circuito [A] |          |            |                   |
|-------------|----------------------------------|----------|------------|-------------------|
|             | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG 2-BUS 1  | 4401.20                          | 3811.54  | 2959.28    | 3977.02           |
| SG 2-BUS 2  | 4366.07                          | 3781.13  | 2935.39    | 3956.93           |
| SG 2-BUS 3  | 4357.83                          | 3773.99  | 2929.48    | 3951.34           |
| SG 2-BUS 4  | 4166.55                          | 3608.33  | 2789.20    | 3815.69           |
| SG 2-BUS 5  | 4120.86                          | 3568.77  | 2760.52    | 3781.58           |
| SG 2-BUS 6  | 4101.32                          | 3551.84  | 2746.97    | 3766.91           |
| SG 2-BUS 7  | 4044.10                          | 3502.29  | 2713.31    | 3723.64           |
| SG 2-BUS 8  | 18756.60                         | 16243.70 | 19014.50   | 18902.30          |
| SG 2-BUS 9  | 14933.90                         | 12933.10 | 15098.00   | 15029.10          |
| SG 2-BUS 10 | 46250.30                         | 40054.00 | 47865.20   | 47225.10          |
| SG 2-BUS 11 | 24307.10                         | 21050.60 | 24763.40   | 24599.60          |
| SG 2-BUS 12 | 46018.80                         | 39853.40 | 47700.60   | 47135.70          |
| SG 2-BUS 13 | 14907.10                         | 12909.90 | 15079.80   | 15019.00          |
| SG 2-BUS 14 | 18699.10                         | 16193.90 | 18975.10   | 18881.00          |
| SG 1-BUS 1  | 3734.28                          | 3233.98  | 2482.24    | 3478.18           |
| SG 1-BUS 2  | 3734.88                          | 3234.49  | 2482.61    | 3478.67           |
| SG 1-BUS 3  | 3747.93                          | 3245.80  | 2493.37    | 3489.51           |
| SG 1-BUS 4  | 3911.01                          | 3387.03  | 2624.99    | 3621.19           |
| SG 1-BUS 5  | 3947.61                          | 3418.72  | 2647.12    | 3649.48           |
| SG 1-BUS 6  | 3954.09                          | 3424.34  | 2652.34    | 3654.55           |
| SG 1-BUS 7  | 3954.74                          | 3424.90  | 2652.72    | 3655.06           |
| SG 1-BUS 8  | 4008.73                          | 3471.66  | 2689.25    | 3696.62           |
| SG 1-BUS 10 | 24180.00                         | 20940.50 | 24675.70   | 24542.50          |
| SG 1-BUS 11 | 35207.90                         | 30491.00 | 36270.20   | 35992.30          |
| SG 1-BUS 12 | 24184.00                         | 20944.00 | 24678.40   | 24543.90          |
| SG 1-BUS 13 | 18647.40                         | 16149.10 | 18939.80   | 18859.20          |
| SG 1-BUS 14 | 24231.40                         | 20985.00 | 24711.10   | 24560.90          |
| SG 1-BUS 15 | 14890.00                         | 12895.10 | 15068.10   | 15010.40          |
| SG 1-BUS 16 | 4777.05                          | 4137.05  | 4813.49    | 4801.50           |
| SG 1-BUS 17 | 24245.00                         | 20996.80 | 24720.50   | 24568.20          |
| SG 1-BUS 18 | 35381.20                         | 30641.00 | 36391.50   | 36065.00          |

Tabla No. 6.27. Corrientes de corto circuito en el Anillo F para el Escenario 4.

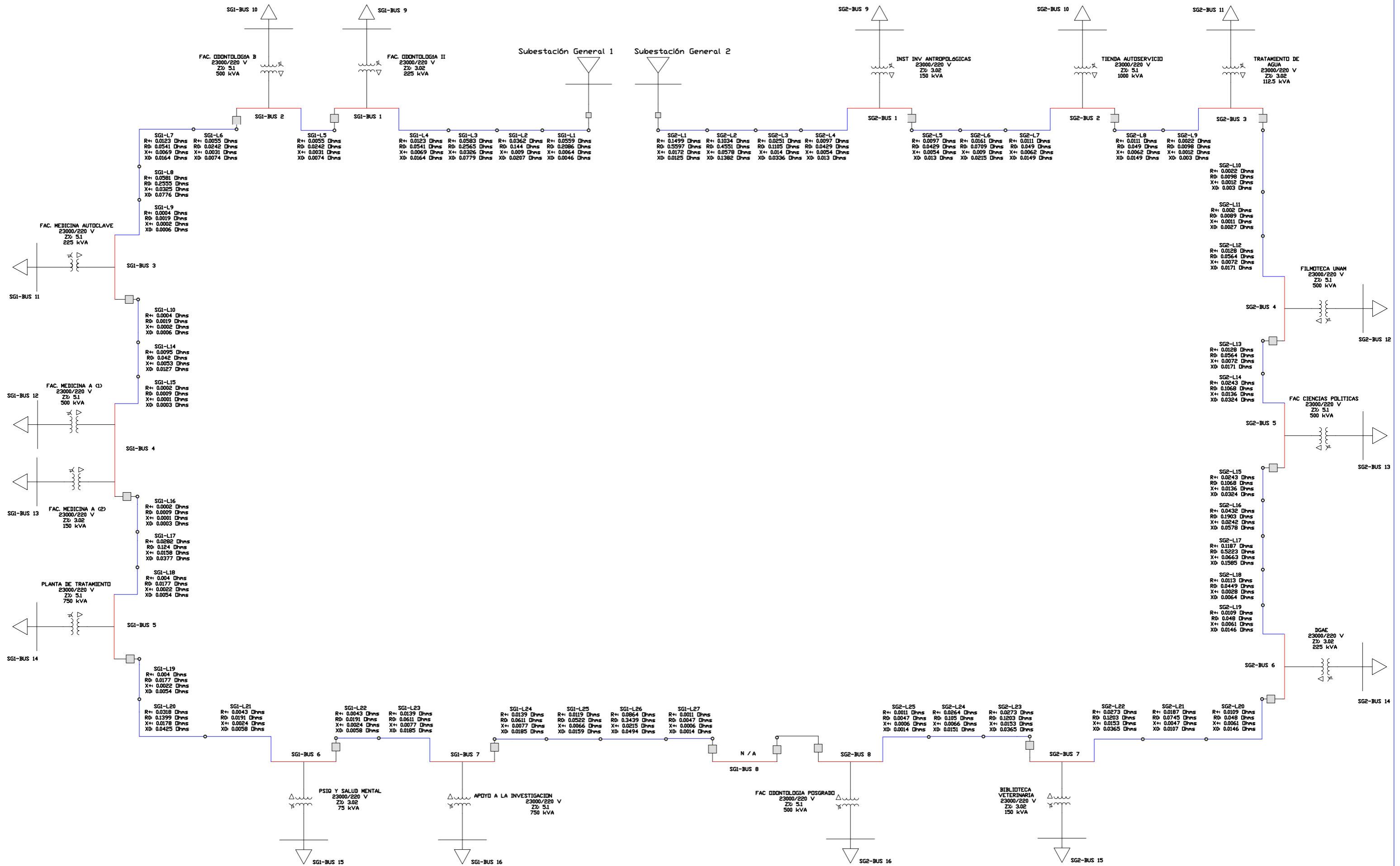


## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS        | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|------------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|            | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|            | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG1-BUS 1  | 3734.28                          | 3561.75  | 3233.98  | 3084.78  | 2482.24    | 2320.65  | 3478.18           | 3233.61  |
| SG1-BUS 2  | 3734.88                          | 3561.25  | 3234.49  | 3084.35  | 2482.61    | 2320.39  | 3478.67           | 3233.23  |
| SG1-BUS 3  | 3747.93                          | 3551.04  | 3245.80  | 3075.50  | 2493.37    | 2313.19  | 3489.51           | 3225.72  |
| SG1-BUS 4  | 3911.01                          | 3426.38  | 3387.03  | 2967.53  | 2624.99    | 2224.86  | 3621.19           | 3131.77  |
| SG1-BUS 5  | 3947.61                          | 3399.14  | 3418.72  | 2943.94  | 2647.12    | 2209.92  | 3649.48           | 3110.84  |
| SG1-BUS 6  | 3954.09                          | 3394.43  | 3424.34  | 2939.85  | 2652.34    | 2206.43  | 3654.55           | 3107.17  |
| SG1-BUS 7  | 3954.74                          | 3393.96  | 3424.90  | 2939.44  | 2652.72    | 2206.17  | 3655.06           | 3106.80  |
| SG1-BUS 8  | 4008.73                          | 3355.20  | 3471.66  | 2905.88  | 2689.25    | 2181.81  | 3696.62           | 3076.75  |
| SG1-BUS 10 | 24180.00                         | 24076.60 | 20940.50 | 20851.00 | 24675.70   | 24603.40 | 24542.50          | 24405.10 |
| SG1-BUS 11 | 35207.90                         | 34990.20 | 30491.00 | 30302.60 | 36270.20   | 36114.60 | 35992.30          | 35701.30 |
| SG1-BUS 12 | 24184.00                         | 24072.60 | 20944.00 | 20847.60 | 24678.40   | 24600.70 | 24543.90          | 24403.70 |
| SG1-BUS 13 | 18647.40                         | 18580.90 | 16149.10 | 16091.60 | 18939.80   | 18893.80 | 18859.20          | 18775.80 |
| SG1-BUS 14 | 24231.40                         | 24026.10 | 20985.00 | 20807.30 | 24711.10   | 24568.40 | 24560.90          | 24387.30 |
| SG1-BUS 15 | 14890.00                         | 14803.60 | 12895.10 | 12820.30 | 15068.10   | 15009.10 | 15010.40          | 14940.00 |
| SG1-BUS 16 | 4777.05                          | 4758.96  | 4137.05  | 4121.38  | 4813.49    | 4801.23  | 4801.50           | 4786.92  |
| SG1-BUS 17 | 24245.00                         | 24012.80 | 20996.80 | 20795.80 | 24720.50   | 24559.20 | 24568.20          | 24380.10 |
| SG1-BUS 18 | 35381.20                         | 34821.60 | 30641.00 | 30156.60 | 36391.50   | 35995.50 | 36065.00          | 35631.20 |
| SG2-BUS 1  | 4401.20                          | 3095.08  | 3811.54  | 2680.58  | 2959.28    | 1997.73  | 3977.02           | 2867.47  |
| SG2-BUS 2  | 4366.07                          | 3120.97  | 3781.13  | 2703.00  | 2935.39    | 2018.47  | 3956.93           | 2888.71  |
| SG2-BUS 3  | 4357.83                          | 3126.18  | 3773.99  | 2707.51  | 2929.48    | 2022.52  | 3951.34           | 2893.06  |
| SG2-BUS 4  | 4166.55                          | 3249.02  | 3608.33  | 2813.91  | 2789.20    | 2116.21  | 3815.69           | 2993.48  |
| SG2-BUS 5  | 4120.86                          | 3278.73  | 3568.77  | 2839.64  | 2760.52    | 2134.89  | 3781.58           | 3016.93  |
| SG2-BUS 6  | 4101.32                          | 3291.78  | 3551.84  | 2850.95  | 2746.97    | 2143.79  | 3766.91           | 3027.25  |
| SG2-BUS 7  | 4044.10                          | 3330.44  | 3502.29  | 2884.43  | 2713.31    | 2165.85  | 3723.64           | 3057.39  |
| SG2-BUS 8  | 18756.60                         | 18473.10 | 16243.70 | 15998.20 | 19014.50   | 18819.80 | 18902.30          | 18732.80 |
| SG2-BUS 9  | 14933.90                         | 14760.20 | 12933.10 | 12782.80 | 15098.00   | 14979.40 | 15029.10          | 14921.20 |
| SG2-BUS 10 | 46250.30                         | 44622.80 | 40054.00 | 38644.80 | 47865.20   | 46695.80 | 47225.10          | 46190.20 |
| SG2-BUS 11 | 24307.10                         | 23951.90 | 21050.60 | 20743.00 | 24763.40   | 24516.90 | 24599.60          | 24349.10 |
| SG2-BUS 12 | 46018.80                         | 44846.40 | 39853.40 | 38838.50 | 47700.60   | 46856.60 | 47135.70          | 46281.60 |
| SG2-BUS 13 | 14907.10                         | 14786.70 | 12909.90 | 12805.70 | 15079.80   | 14997.50 | 15019.00          | 14931.40 |
| SG2-BUS 14 | 18699.10                         | 18529.90 | 16193.90 | 16047.40 | 18975.10   | 18858.80 | 18881.00          | 18754.40 |

Tabla No. 6.28. Corrientes de corto circuito máximas y mínimas del Anillo F.

### 6.7. Niveles de corto circuito del Anillo G.



| REV. | DATE | ESOP | OWN | APP. | DESCRIPTION |
|------|------|------|-----|------|-------------|
|      |      |      |     |      |             |
|      |      |      |     |      |             |
|      |      |      |     |      |             |
|      |      |      |     |      |             |

Figura No. 6.7. Diagrama unifilar del Anillo G.





## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1  | 3634.88                          | 3148.12  | 2371.29    | 3286.35           |
| SG1-BUS 2  | 3631.33                          | 3145.04  | 2368.87    | 3283.82           |
| SG1-BUS 3  | 3582.21                          | 3102.50  | 2334.96    | 3248.51           |
| SG1-BUS 4  | 3575.66                          | 3096.83  | 2330.39    | 3243.74           |
| SG1-BUS 5  | 3554.80                          | 3078.76  | 2315.75    | 3228.48           |
| SG1-BUS 6  | 3529.00                          | 3056.42  | 2297.48    | 3209.42           |
| SG1-BUS 7  | 3517.31                          | 3046.29  | 2289.15    | 3200.71           |
| SG1-BUS 8  | 3468.76                          | 3004.24  | 2252.70    | 3165.74           |
| SG1-BUS 9  | 18599.20                         | 16107.40 | 18906.40   | 18781.90          |
| SG1-BUS 10 | 24102.10                         | 20873.10 | 24621.10   | 24413.60          |
| SG1-BUS 11 | 11232.90                         | 9728.00  | 11345.60   | 11301.30          |
| SG1-BUS 12 | 24081.70                         | 20855.50 | 24607.00   | 24406.80          |
| SG1-BUS 13 | 12598.40                         | 10910.50 | 12740.60   | 12685.20          |
| SG1-BUS 14 | 34985.20                         | 30298.30 | 36111.10   | 35699.70          |
| SG1-BUS 15 | 6405.32                          | 5547.18  | 6442.25    | 6429.76           |
| SG1-BUS 16 | 34955.80                         | 30272.80 | 36090.40   | 35689.80          |

Tabla No. 6.29. Corrientes de corto circuito en el Anillo G para el Escenario 1.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG2-BUS 1  | 4245.32                          | 3676.55  | 2846.96    | 3878.60           |
| SG2-BUS 2  | 4210.78                          | 3646.64  | 2820.65    | 3853.36           |
| SG2-BUS 3  | 4198.33                          | 3635.86  | 2811.11    | 3844.17           |
| SG2-BUS 4  | 4182.45                          | 3622.10  | 2798.89    | 3832.38           |
| SG2-BUS 5  | 4148.01                          | 3592.28  | 2772.27    | 3806.57           |
| SG2-BUS 6  | 3961.73                          | 3430.96  | 2625.19    | 3661.83           |
| SG2-BUS 7  | 3917.23                          | 3392.42  | 2588.98    | 3626.22           |
| SG2-BUS 8  | 3877.48                          | 3357.99  | 2556.18    | 3594.08           |
| SG2-BUS 9  | 12666.30                         | 10969.40 | 12786.80   | 12742.10          |
| SG2-BUS 10 | 46120.10                         | 39941.20 | 47773.00   | 47210.60          |
| SG2-BUS 11 | 9565.54                          | 8284.00  | 9634.70    | 9609.80           |
| SG2-BUS 12 | 24314.90                         | 21057.30 | 24768.70   | 24611.20          |
| SG2-BUS 13 | 24305.90                         | 21049.50 | 24762.60   | 24608.20          |
| SG2-BUS 14 | 18690.70                         | 16186.60 | 18969.40   | 18887.80          |
| SG2-BUS 15 | 12643.30                         | 10949.40 | 12771.20   | 12735.00          |
| SG2-BUS 16 | 24235.80                         | 20988.80 | 24714.40   | 24587.90          |

Tabla No. 6.30. Corrientes de corto circuito en el Anillo G para el Escenario 2.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1  | 3634.88                          | 3148.12  | 2371.29    | 3286.35           |
| SG1-BUS 2  | 3631.33                          | 3145.04  | 2368.87    | 3283.82           |
| SG1-BUS 3  | 3582.21                          | 3102.50  | 2334.96    | 3248.51           |
| SG1-BUS 4  | 3575.66                          | 3096.83  | 2330.39    | 3243.74           |
| SG1-BUS 5  | 3554.80                          | 3078.76  | 2315.75    | 3228.48           |
| SG1-BUS 6  | 3529.00                          | 3056.42  | 2297.48    | 3209.42           |
| SG1-BUS 7  | 3517.31                          | 3046.29  | 2289.15    | 3200.71           |
| SG1-BUS 9  | 18599.20                         | 16107.40 | 18906.40   | 18781.90          |
| SG1-BUS 10 | 24102.10                         | 20873.10 | 24621.10   | 24413.60          |
| SG1-BUS 11 | 11232.90                         | 9728.00  | 11345.60   | 11301.30          |
| SG1-BUS 12 | 24081.70                         | 20855.50 | 24607.00   | 24406.80          |
| SG1-BUS 13 | 12598.40                         | 10910.50 | 12740.60   | 12685.20          |
| SG1-BUS 14 | 34985.20                         | 30298.30 | 36111.10   | 35699.70          |
| SG1-BUS 15 | 6405.32                          | 5547.18  | 6442.25    | 6429.76           |
| SG1-BUS 16 | 34955.80                         | 30272.80 | 36090.40   | 35689.80          |
| SG2-BUS 1  | 3214.84                          | 2784.30  | 2062.31    | 2963.75           |
| SG2-BUS 2  | 3237.62                          | 2804.04  | 2079.56    | 2982.57           |
| SG2-BUS 3  | 3245.89                          | 2811.20  | 2085.80    | 2989.38           |
| SG2-BUS 4  | 3256.49                          | 2820.38  | 2093.80    | 2998.08           |
| SG2-BUS 5  | 3279.62                          | 2840.41  | 2111.24    | 3016.98           |
| SG2-BUS 6  | 3408.99                          | 2952.46  | 2208.01    | 3120.21           |
| SG2-BUS 7  | 3440.64                          | 2979.88  | 2231.67    | 3144.56           |
| SG2-BUS 8  | 3468.76                          | 3004.24  | 2252.70    | 3165.74           |
| SG2-BUS 9  | 12562.90                         | 10879.80 | 12716.50   | 12675.90          |
| SG2-BUS 10 | 44825.40                         | 38820.20 | 46843.10   | 46344.50          |
| SG2-BUS 11 | 9510.22                          | 8236.10  | 9597.26    | 9573.28           |
| SG2-BUS 12 | 23967.00                         | 20756.10 | 24527.60   | 24376.90          |
| SG2-BUS 13 | 23975.80                         | 20763.70 | 24533.70   | 24380.00          |
| SG2-BUS 14 | 18552.00                         | 16066.50 | 18874.00   | 18771.20          |
| SG2-BUS 15 | 12585.70                         | 10899.60 | 12732.00   | 12683.00          |
| SG2-BUS 16 | 24044.60                         | 20823.30 | 24581.30   | 24400.00          |

Tabla No. 6.31. Corrientes de corto circuito en el Anillo G para el Escenario 3.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG2-BUS 1  | 4245.32                          | 3676.55  | 2846.96    | 3878.60           |
| SG2-BUS 2  | 4210.78                          | 3646.64  | 2820.65    | 3853.36           |
| SG2-BUS 3  | 4198.33                          | 3635.86  | 2811.11    | 3844.17           |
| SG2-BUS 4  | 4182.45                          | 3622.10  | 2798.89    | 3832.38           |
| SG2-BUS 5  | 4148.01                          | 3592.28  | 2772.27    | 3806.57           |
| SG2-BUS 6  | 3961.73                          | 3430.96  | 2625.19    | 3661.83           |
| SG2-BUS 7  | 3917.23                          | 3392.42  | 2588.98    | 3626.22           |
| SG2-BUS 8  | 3877.48                          | 3357.99  | 2556.18    | 3594.08           |
| SG2-BUS 9  | 12666.30                         | 10969.40 | 12786.80   | 12742.10          |
| SG2-BUS 10 | 46120.10                         | 39941.20 | 47773.00   | 47210.60          |
| SG2-BUS 11 | 9565.54                          | 8284.00  | 9634.70    | 9609.80           |
| SG2-BUS 12 | 24314.90                         | 21057.30 | 24768.70   | 24611.20          |
| SG2-BUS 13 | 24305.90                         | 21049.50 | 24762.60   | 24608.20          |
| SG2-BUS 14 | 18690.70                         | 16186.60 | 18969.40   | 18887.80          |
| SG2-BUS 15 | 12643.30                         | 10949.40 | 12771.20   | 12735.00          |
| SG2-BUS 16 | 24235.80                         | 20988.80 | 24714.40   | 24587.90          |
| SG1-BUS 1  | 3648.60                          | 3159.78  | 2368.88    | 3400.95           |
| SG1-BUS 2  | 3653.25                          | 3163.80  | 2372.62    | 3404.99           |
| SG1-BUS 3  | 3718.10                          | 3219.97  | 2424.83    | 3460.89           |
| SG1-BUS 4  | 3726.86                          | 3227.55  | 2431.88    | 3468.39           |
| SG1-BUS 5  | 3754.90                          | 3251.84  | 2454.46    | 3492.30           |
| SG1-BUS 6  | 3789.95                          | 3282.19  | 2482.68    | 3522.00           |
| SG1-BUS 7  | 3805.97                          | 3296.07  | 2495.58    | 3535.52           |
| SG1-BUS 9  | 18642.50                         | 16144.80 | 18936.60   | 18876.40          |
| SG1-BUS 10 | 24176.60                         | 20937.50 | 24673.70   | 24573.00          |
| SG1-BUS 11 | 11257.40                         | 9749.19  | 11362.30   | 11338.80          |
| SG1-BUS 12 | 24197.60                         | 20955.70 | 24688.20   | 24580.30          |
| SG1-BUS 13 | 12630.50                         | 10938.30 | 12762.50   | 12732.70          |
| SG1-BUS 14 | 35260.50                         | 30536.50 | 36308.10   | 36077.60          |
| SG1-BUS 15 | 6416.08                          | 5556.49  | 6449.51    | 6441.37           |
| SG1-BUS 16 | 35291.00                         | 30562.90 | 36329.40   | 36088.50          |

Tabla No. 6.32. Corrientes de corto circuito en el Anillo G para el Escenario 4.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS        | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|------------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|            | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|            | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG1-BUS 1  | 3648.60                          | 3634.88  | 3159.78  | 3148.12  | 2371.29    | 2368.88  | 3400.95           | 3286.35  |
| SG1-BUS 2  | 3653.25                          | 3631.33  | 3163.80  | 3145.04  | 2372.62    | 2368.87  | 3404.99           | 3283.82  |
| SG1-BUS 3  | 3718.10                          | 3582.21  | 3219.97  | 3102.50  | 2424.83    | 2334.96  | 3460.89           | 3248.51  |
| SG1-BUS 4  | 3726.86                          | 3575.66  | 3227.55  | 3096.83  | 2431.88    | 2330.39  | 3468.39           | 3243.74  |
| SG1-BUS 5  | 3754.90                          | 3554.80  | 3251.84  | 3078.76  | 2454.46    | 2315.75  | 3492.30           | 3228.48  |
| SG1-BUS 6  | 3789.95                          | 3529.00  | 3282.19  | 3056.42  | 2482.68    | 2297.48  | 3522.00           | 3209.42  |
| SG1-BUS 7  | 3805.97                          | 3517.31  | 3296.07  | 3046.29  | 2495.58    | 2289.15  | 3535.52           | 3200.71  |
| SG1-BUS 9  | 18642.50                         | 18599.20 | 16144.80 | 16107.40 | 18936.60   | 18906.40 | 18876.40          | 18781.90 |
| SG1-BUS 10 | 24176.60                         | 24102.10 | 20937.50 | 20873.10 | 24673.70   | 24621.10 | 24573.00          | 24413.60 |
| SG1-BUS 11 | 11257.40                         | 11232.90 | 9749.19  | 9728.00  | 11362.30   | 11345.60 | 11338.80          | 11301.30 |
| SG1-BUS 12 | 24197.60                         | 24081.70 | 20955.70 | 20855.50 | 24688.20   | 24607.00 | 24580.30          | 24406.80 |
| SG1-BUS 13 | 12630.50                         | 12598.40 | 10938.30 | 10910.50 | 12762.50   | 12740.60 | 12732.70          | 12685.20 |
| SG1-BUS 14 | 35260.50                         | 34985.20 | 30536.50 | 30298.30 | 36308.10   | 36111.10 | 36077.60          | 35699.70 |
| SG1-BUS 15 | 6416.08                          | 6405.32  | 5556.49  | 5547.18  | 6449.51    | 6442.25  | 6441.37           | 6429.76  |
| SG1-BUS 16 | 35291.00                         | 34955.80 | 30562.90 | 30272.80 | 36329.40   | 36090.40 | 36088.50          | 35689.80 |
| SG2-BUS 1  | 4245.32                          | 3214.84  | 3676.55  | 2784.30  | 2846.96    | 2062.31  | 3878.60           | 2963.75  |
| SG2-BUS 2  | 4210.78                          | 3237.62  | 3646.64  | 2804.04  | 2820.65    | 2079.56  | 3853.36           | 2982.57  |
| SG2-BUS 3  | 4198.33                          | 3245.89  | 3635.86  | 2811.20  | 2811.11    | 2085.80  | 3844.17           | 2989.38  |
| SG2-BUS 4  | 4182.45                          | 3256.49  | 3622.10  | 2820.38  | 2798.89    | 2093.80  | 3832.38           | 2998.08  |
| SG2-BUS 5  | 4148.01                          | 3279.62  | 3592.28  | 2840.41  | 2772.27    | 2111.24  | 3806.57           | 3016.98  |
| SG2-BUS 6  | 3961.73                          | 3408.99  | 3430.96  | 2952.46  | 2625.19    | 2208.01  | 3661.83           | 3120.21  |
| SG2-BUS 7  | 3917.23                          | 3440.64  | 3392.42  | 2979.88  | 2588.98    | 2231.67  | 3626.22           | 3144.56  |
| SG2-BUS 8  | 3877.48                          | 3468.76  | 3357.99  | 3004.24  | 2556.18    | 2252.70  | 3594.08           | 3165.74  |
| SG2-BUS 9  | 12666.30                         | 12562.90 | 10969.40 | 10879.80 | 12786.80   | 12716.50 | 12742.10          | 12675.90 |
| SG2-BUS 10 | 46120.10                         | 44825.40 | 39941.20 | 38820.20 | 47773.00   | 46843.10 | 47210.60          | 46344.50 |
| SG2-BUS 11 | 9565.54                          | 9510.22  | 8284.00  | 8236.10  | 9634.70    | 9597.26  | 9609.80           | 9573.28  |
| SG2-BUS 12 | 24314.90                         | 23967.00 | 21057.30 | 20756.10 | 24768.70   | 24527.60 | 24611.20          | 24376.90 |
| SG2-BUS 13 | 24305.90                         | 23975.80 | 21049.50 | 20763.70 | 24762.60   | 24533.70 | 24608.20          | 24380.00 |
| SG2-BUS 14 | 18690.70                         | 18552.00 | 16186.60 | 16066.50 | 18969.40   | 18874.00 | 18887.80          | 18771.20 |
| SG2-BUS 15 | 12643.30                         | 12585.70 | 10949.40 | 10899.60 | 12771.20   | 12732.00 | 12735.00          | 12683.00 |
| SG2-BUS 16 | 24235.80                         | 24044.60 | 20988.80 | 20823.30 | 24714.40   | 24581.30 | 24587.90          | 24400.00 |

Tabla No. 6.33. Corrientes de corto circuito máximas y mínimas del Anillo G.

### 6.8. Niveles de corto circuito del Anillo H.

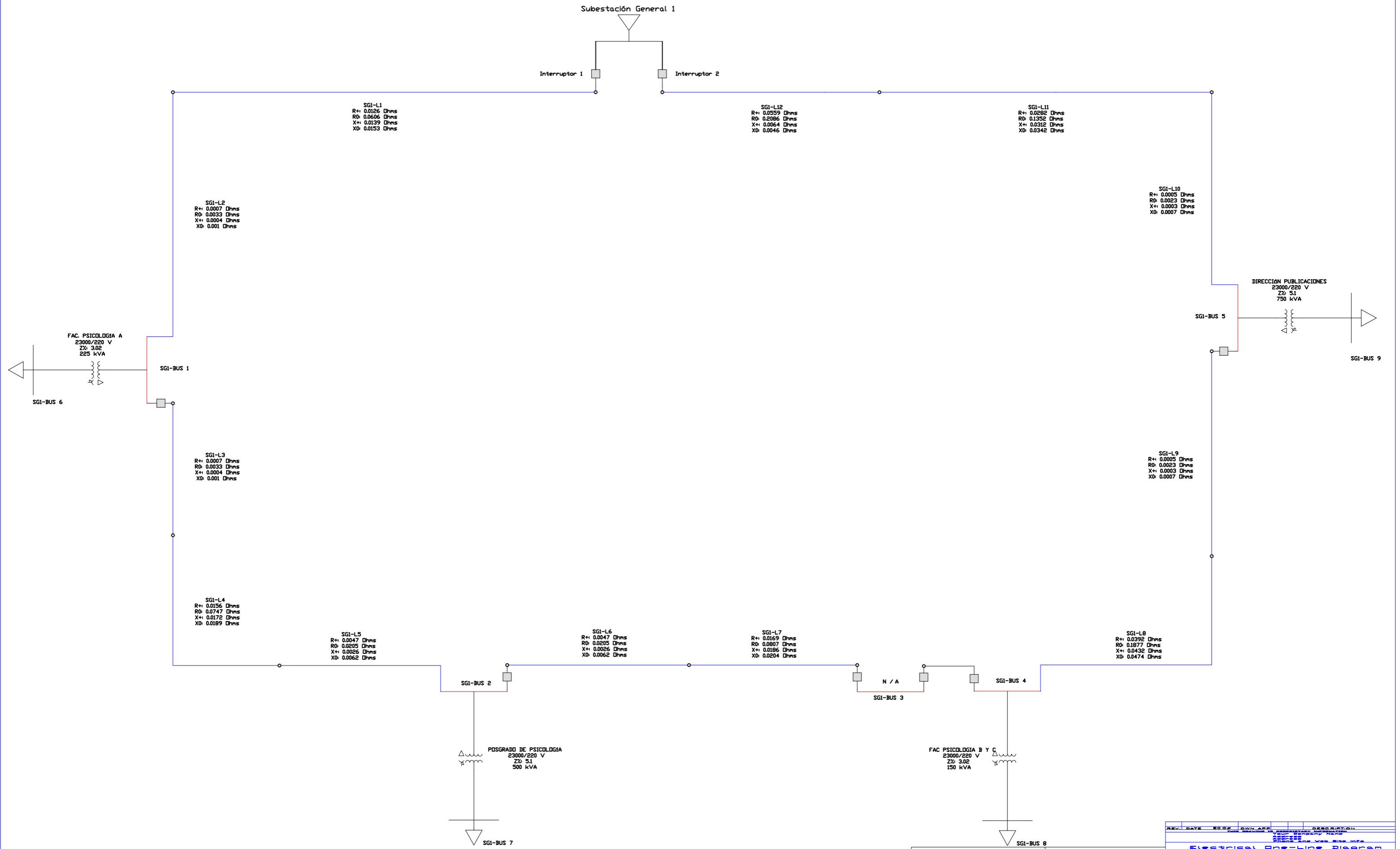


Figura No. 6.8. Diagrama unifilar del Anillo H.



Se tienen tres escenarios distintos:

- La Subestación General No. 1 operando normalmente, (Interruptor 1 cerrado e Interruptor 2 cerrado)
- La Subestación General No. 1 operando normalmente, (Interruptor 1 cerrado e Interruptor 2 abierto)
- La Subestación General No. 1 operando normalmente, (Interruptor 1 abierto e Interruptor 2 cerrado)

| BUS       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1 | 3686.38                          | 3192.73  | 2407.84    | 3317.72           |
| SG1-BUS 2 | 3664.67                          | 3173.92  | 2397.03    | 3302.08           |
| SG1-BUS 3 | 3642.06                          | 3154.34  | 2385.76    | 3285.71           |
| SG1-BUS 4 | 3611.95                          | 3128.26  | 2371.16    | 3266.64           |
| SG1-BUS 5 | 3658.14                          | 3168.26  | 2393.64    | 3300.40           |
| SG1-BUS 6 | 18609.40                         | 16116.20 | 18913.40   | 18779.80          |
| SG1-BUS 7 | 24112.10                         | 20881.80 | 24628.00   | 24406.00          |
| SG1-BUS 8 | 12601.30                         | 10913.00 | 12742.50   | 12683.30          |
| SG1-BUS 9 | 35063.20                         | 30365.80 | 36166.10   | 35714.00          |

Tabla No. 6.34. Corrientes de corto circuito en el Anillo H para el Escenario 1.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1 | 3686.38                          | 3192.73  | 2407.84    | 3317.72           |
| SG1-BUS 2 | 3664.67                          | 3173.92  | 2397.03    | 3302.08           |
| SG1-BUS 4 | 3642.06                          | 3154.34  | 2385.76    | 3285.71           |
| SG1-BUS 5 | 3596.55                          | 3114.93  | 2363.73    | 3252.51           |
| SG1-BUS 6 | 18609.40                         | 16116.20 | 18913.40   | 18779.80          |
| SG1-BUS 7 | 24112.10                         | 20881.80 | 24628.00   | 24406.00          |
| SG1-BUS 8 | 12604.20                         | 10915.60 | 12744.50   | 12683.60          |
| SG1-BUS 9 | 35008.70                         | 30318.60 | 36127.50   | 35671.20          |

Tabla No. 6.35. Corrientes de corto circuito en el Anillo H para el Escenario 2.

| BUS       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG1-BUS 1 | 3568.33                          | 3090.48  | 2348.28    | 3234.77           |
| SG1-BUS 2 | 3589.54                          | 3108.85  | 2359.52    | 3250.26           |
| SG1-BUS 4 | 3611.95                          | 3128.26  | 2371.16    | 3266.64           |
| SG1-BUS 5 | 3658.14                          | 3168.26  | 2393.64    | 3300.40           |
| SG1-BUS 6 | 18582.20                         | 16092.70 | 18894.70   | 18768.00          |
| SG1-BUS 7 | 24083.50                         | 20857.00 | 24608.10   | 24395.30          |
| SG1-BUS 8 | 12601.30                         | 10913.00 | 12742.50   | 12683.30          |
| SG1-BUS 9 | 35063.20                         | 30365.80 | 36166.10   | 35714.00          |

Tabla No. 6.36. Corrientes de corto circuito en el Anillo H para el Escenario 3.





## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| Bus       | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|-----------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|           | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|           | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG1-BUS 1 | 3686.38                          | 3568.33  | 3192.73  | 3090.48  | 2407.84    | 2348.28  | 3317.72           | 3234.77  |
| SG1-BUS 2 | 3664.67                          | 3589.54  | 3173.92  | 3108.85  | 2397.03    | 2359.52  | 3302.08           | 3250.26  |
| SG1-BUS 4 | 3642.06                          | 3611.95  | 3154.34  | 3128.26  | 2385.76    | 2371.16  | 3285.71           | 3266.64  |
| SG1-BUS 5 | 3658.14                          | 3596.55  | 3168.26  | 3114.93  | 2393.64    | 2363.73  | 3300.40           | 3252.51  |
| SG1-BUS 6 | 18609.40                         | 18582.20 | 16116.20 | 16092.70 | 18913.40   | 18894.70 | 18779.80          | 18768.00 |
| SG1-BUS 7 | 24112.10                         | 24083.50 | 20881.80 | 20857.00 | 24628.00   | 24608.10 | 24406.00          | 24395.30 |
| SG1-BUS 8 | 12604.20                         | 12601.30 | 10915.60 | 10913.00 | 12744.50   | 12742.50 | 12683.60          | 12683.30 |
| SG1-BUS 9 | 35063.20                         | 35008.70 | 30365.80 | 30318.60 | 36166.10   | 36127.50 | 35714.00          | 35671.20 |

Tabla No. 6.37. Corrientes de corto circuito máximas y mínimas del Anillo H.

### 6.9. Niveles de corto circuito del Anillo I.

Se tienen tres escenarios distintos:

- La Subestación General No. 5 operando normalmente, (Interruptor 1 cerrado e Interruptor 2 cerrado)
- La Subestación General No. 5 operando normalmente, (Interruptor 1 cerrado e Interruptor 2 abierto)
- La Subestación General No. 5 operando normalmente, (Interruptor 1 abierto e Interruptor 2 cerrado)

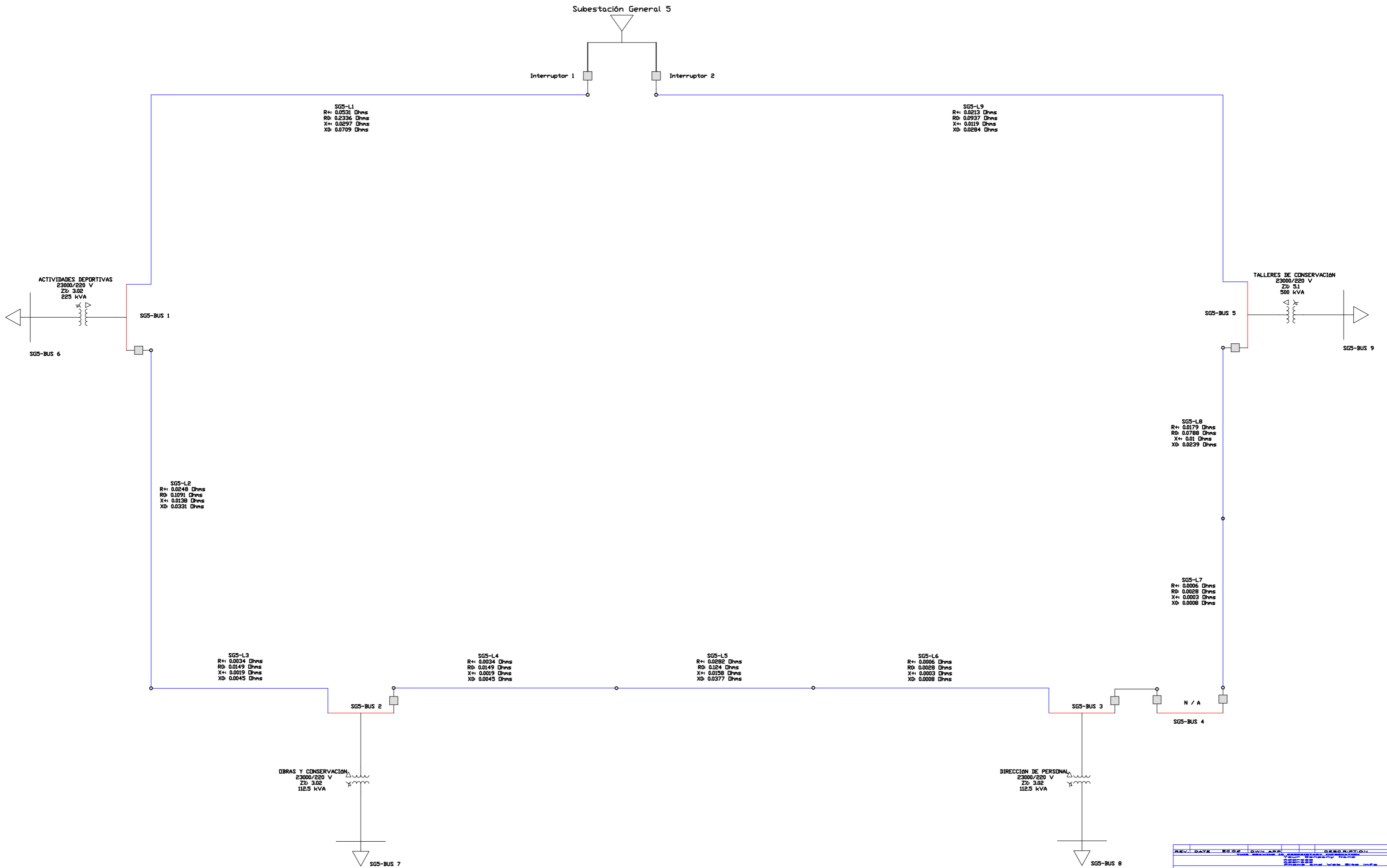


Figura No. 6.9. Diagrama unifilar del Anillo I.

| REV. | DATE | EGOP | OWN | APP. | DESCRIPTION |
|------|------|------|-----|------|-------------|
|      |      |      |     |      |             |
|      |      |      |     |      |             |
|      |      |      |     |      |             |

**Electrical One-Line Diagram**

|  |  |  |  |  |  |
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|  |  |  |  |  |  |
|  |  |  |  |  |  |

DWG. No.      SCALE      DATE



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG5-BUS 1 | 3668.50                          | 3177.24  | 2393.33    | 3306.09           |
| SG5-BUS 2 | 3650.77                          | 3161.88  | 2381.57    | 3293.79           |
| SG5-BUS 3 | 3630.48                          | 3144.31  | 2367.97    | 3279.59           |
| SG5-BUS 4 | 3676.80                          | 3184.43  | 2398.79    | 3311.77           |
| SG5-BUS 5 | 3688.46                          | 3194.53  | 2406.42    | 3319.80           |
| SG5-BUS 6 | 18605.50                         | 16112.90 | 18910.80   | 18779.40          |
| SG5-BUS 7 | 9532.60                          | 8255.49  | 9612.40    | 9579.74           |
| SG5-BUS 8 | 9531.42                          | 8254.46  | 9611.60    | 9579.55           |
| SG5-BUS 9 | 24121.70                         | 20890.10 | 24634.60   | 24412.40          |

Tabla No. 6.38. Corrientes de corto circuito en el Anillo I para el Escenario 1.

| BUS       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG5-BUS 1 | 3668.50                          | 3177.24  | 2393.33    | 3306.09           |
| SG5-BUS 2 | 3650.77                          | 3161.88  | 2381.57    | 3293.79           |
| SG5-BUS 3 | 3630.48                          | 3144.31  | 2367.97    | 3279.59           |
| SG5-BUS 5 | 3618.76                          | 3134.16  | 2360.06    | 3271.30           |
| SG5-BUS 6 | 18605.50                         | 16112.90 | 18910.80   | 18779.40          |
| SG5-BUS 7 | 9532.60                          | 8255.49  | 9612.40    | 9579.74           |
| SG5-BUS 8 | 9531.42                          | 8254.46  | 9611.60    | 9579.55           |
| SG5-BUS 9 | 24095.60                         | 20867.50 | 24616.50   | 24403.80          |

Tabla No. 6.39. Corrientes de corto circuito en el Anillo I para el Escenario 2.



| BUS       | Corrientes de Corto Circuito [A] |          |            |                   |
|-----------|----------------------------------|----------|------------|-------------------|
|           | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG5-BUS 1 | 3638.79                          | 3151.51  | 2373.57    | 3285.39           |
| SG5-BUS 2 | 3656.54                          | 3166.88  | 2385.42    | 3297.77           |
| SG5-BUS 3 | 3676.80                          | 3184.43  | 2398.79    | 3311.77           |
| SG5-BUS 5 | 3688.46                          | 3194.53  | 2406.42    | 3319.80           |
| SG5-BUS 6 | 18598.90                         | 16107.20 | 18906.20   | 18777.20          |
| SG5-BUS 7 | 9532.94                          | 8255.78  | 9612.63    | 9579.79           |
| SG5-BUS 8 | 9534.12                          | 8256.80  | 9613.43    | 9579.98           |
| SG5-BUS 9 | 24121.70                         | 20890.10 | 24634.60   | 24412.40          |

Tabla No. 6.40. Corrientes de corto circuito en el Anillo I para el Escenario 3.

| Bus       | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|-----------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|           | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|           | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG5-BUS 1 | 3668.50                          | 3638.79  | 3177.24  | 3151.51  | 2393.33    | 2373.57  | 3306.09           | 3285.39  |
| SG5-BUS 2 | 3656.54                          | 3650.77  | 3166.88  | 3161.88  | 2385.42    | 2381.57  | 3297.77           | 3293.79  |
| SG5-BUS 4 | 3676.80                          | 3630.48  | 3184.43  | 3144.31  | 2398.79    | 2367.97  | 3311.77           | 3279.59  |
| SG5-BUS 5 | 3688.46                          | 3618.76  | 3194.53  | 3134.16  | 2406.42    | 2360.06  | 3319.80           | 3271.30  |
| SG5-BUS 6 | 18605.50                         | 18598.90 | 16112.90 | 16107.20 | 18910.80   | 18906.20 | 18779.40          | 18777.20 |
| SG5-BUS 7 | 9532.94                          | 9532.60  | 8255.78  | 8255.49  | 9612.63    | 9612.40  | 9579.79           | 9579.74  |
| SG5-BUS 8 | 9534.12                          | 9531.42  | 8256.80  | 8254.46  | 9613.43    | 9611.60  | 9579.98           | 9579.55  |
| SG5-BUS 9 | 24121.70                         | 24095.60 | 20890.10 | 20867.50 | 24634.60   | 24616.50 | 24412.40          | 24403.80 |

Tabla No. 6.41. Corrientes de corto circuito máximas y mínimas del Anillo I.

## 6.10. Niveles de corto circuito del Anillo J.

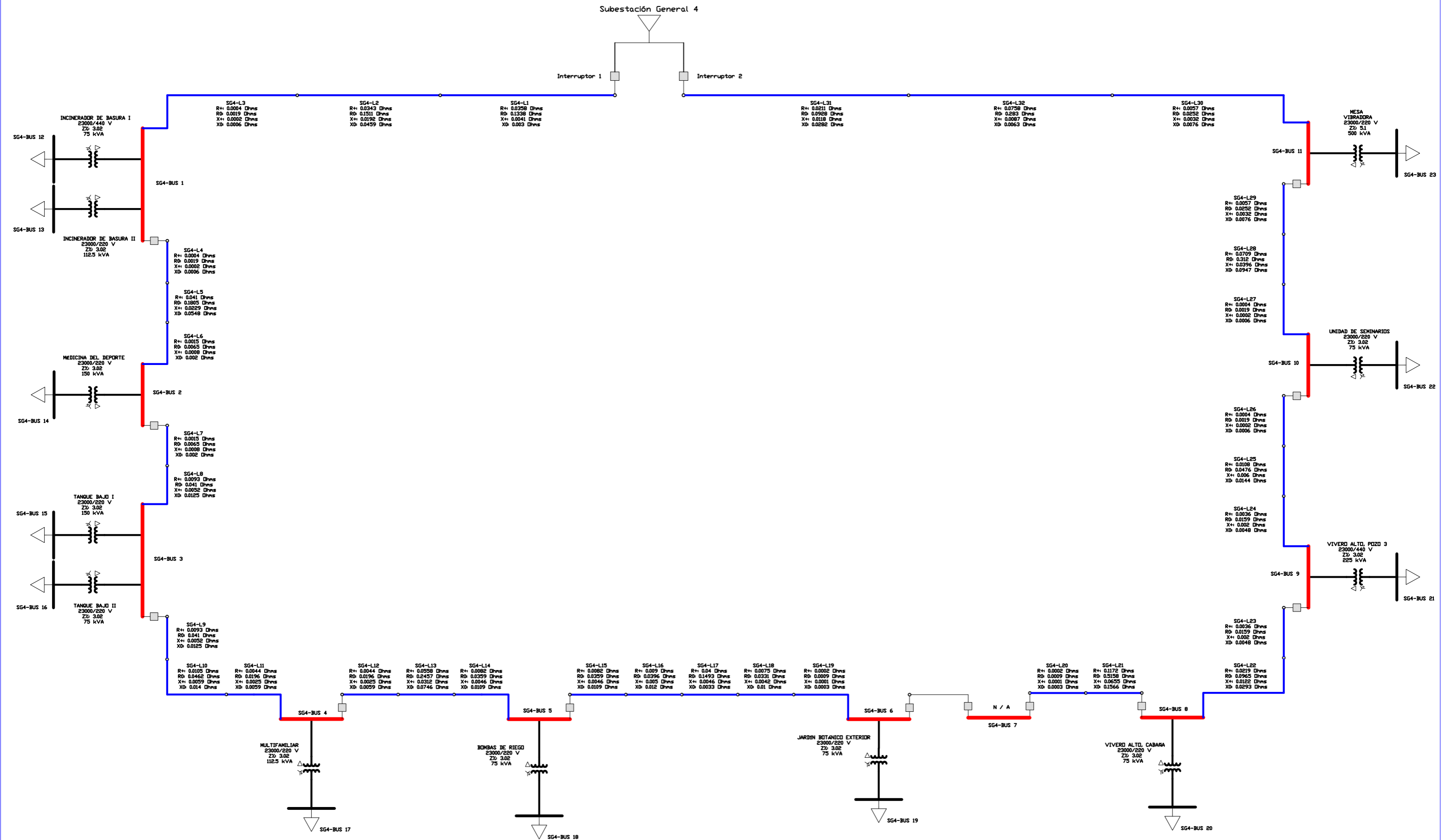


Figura No. 6.10. Diagrama unifilar del Anillo J.

| REV. | DATE | EGOP | OWN | APP. | DESCRIPTION |
|------|------|------|-----|------|-------------|
|      |      |      |     |      |             |
|      |      |      |     |      |             |

|                     |  |                   |  |
|---------------------|--|-------------------|--|
| DRAWN BY: [Name]    |  | SCALE: [Scale]    |  |
| CHECKED BY: [Name]  |  | DATE: [Date]      |  |
| APPROVED BY: [Name] |  | DWG. No. [Number] |  |



Se tienen tres escenarios distintos:

- La Subestación General No. 4 operando normalmente, (Interruptor 1 cerrado e Interruptor 2 cerrado)
- La Subestación General No. 4 operando normalmente, (Interruptor 1 cerrado e Interruptor 2 abierto)
- La Subestación General No. 4 operando normalmente, (Interruptor 1 abierto e Interruptor 2 cerrado)



**CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)**

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG4-BUS 1  | 4375.50                          | 3789.29  | 2941.52    | 3960.97           |
| SG4-BUS 2  | 4336.61                          | 3755.61  | 2913.75    | 3934.75           |
| SG4-BUS 3  | 4326.80                          | 3747.12  | 2906.67    | 3928.04           |
| SG4-BUS 4  | 4304.78                          | 3728.05  | 2890.67    | 3912.88           |
| SG4-BUS 5  | 4242.67                          | 3674.26  | 2844.83    | 3869.30           |
| SG4-BUS 6  | 4207.27                          | 3643.60  | 2818.22    | 3846.36           |
| SG4-BUS 7  | 4156.53                          | 3599.66  | 2779.49    | 3809.04           |
| SG4-BUS 8  | 4263.96                          | 3692.70  | 2860.86    | 3887.14           |
| SG4-BUS 9  | 4287.41                          | 3713.00  | 2878.28    | 3903.72           |
| SG4-BUS 10 | 4301.04                          | 3724.81  | 2888.34    | 3913.27           |
| SG4-BUS 11 | 4371.79                          | 3786.08  | 2939.73    | 3961.87           |
| SG4-BUS 12 | 3213.08                          | 2782.61  | 3228.14    | 3221.96           |
| SG4-BUS 13 | 9572.11                          | 8289.69  | 9639.14    | 9611.72           |
| SG4-BUS 14 | 12671.80                         | 10974.10 | 12790.50   | 12741.00          |
| SG4-BUS 15 | 12671.10                         | 10973.50 | 12790.00   | 12740.70          |
| SG4-BUS 16 | 6425.27                          | 5564.45  | 6455.67    | 6443.79           |
| SG4-BUS 17 | 9569.23                          | 8287.20  | 9637.19    | 9611.28           |
| SG4-BUS 18 | 6423.72                          | 5563.11  | 6454.63    | 6443.55           |
| SG4-BUS 19 | 6423.17                          | 5562.63  | 6454.27    | 6443.82           |
| SG4-BUS 20 | 6424.20                          | 5563.52  | 6454.96    | 6443.98           |
| SG4-BUS 21 | 9369.76                          | 8114.45  | 9501.40    | 9449.77           |
| SG4-BUS 22 | 6424.87                          | 5564.10  | 6455.41    | 6444.08           |
| SG4-BUS 23 | 24361.80                         | 21097.90 | 24801.00   | 24619.70          |

Tabla No. 6.42. Corrientes de corto circuito en el Anillo J para el Escenario 1.



**CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)**

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG4-BUS 1  | 4375.50                          | 3789.29  | 2941.52    | 3960.97           |
| SG4-BUS 2  | 4336.61                          | 3755.61  | 2913.75    | 3934.75           |
| SG4-BUS 3  | 4326.80                          | 3747.12  | 2906.67    | 3928.04           |
| SG4-BUS 4  | 4304.78                          | 3728.05  | 2890.67    | 3912.88           |
| SG4-BUS 5  | 4242.67                          | 3674.26  | 2844.83    | 3869.30           |
| SG4-BUS 6  | 4207.27                          | 3643.60  | 2818.22    | 3846.36           |
| SG4-BUS 8  | 4100.29                          | 3550.95  | 2736.03    | 3766.77           |
| SG4-BUS 9  | 4077.20                          | 3530.95  | 2718.04    | 3749.16           |
| SG4-BUS 10 | 4063.81                          | 3519.36  | 2707.58    | 3738.88           |
| SG4-BUS 11 | 3994.75                          | 3459.55  | 2653.26    | 3685.15           |
| SG4-BUS 12 | 3213.08                          | 2782.61  | 3228.14    | 3221.96           |
| SG4-BUS 13 | 9572.11                          | 8289.69  | 9639.14    | 9611.72           |
| SG4-BUS 14 | 12671.80                         | 10974.10 | 12790.50   | 12741.00          |
| SG4-BUS 15 | 12671.10                         | 10973.50 | 12790.00   | 12740.70          |
| SG4-BUS 16 | 6425.27                          | 5564.45  | 6455.67    | 6443.79           |
| SG4-BUS 17 | 9569.23                          | 8287.20  | 9637.19    | 9611.28           |
| SG4-BUS 18 | 6423.72                          | 5563.11  | 6454.63    | 6443.55           |
| SG4-BUS 19 | 6423.17                          | 5562.63  | 6454.27    | 6443.82           |
| SG4-BUS 20 | 6421.22                          | 5560.94  | 6452.95    | 6443.51           |
| SG4-BUS 21 | 9353.34                          | 8100.23  | 9490.17    | 9444.31           |
| SG4-BUS 22 | 6420.54                          | 5560.35  | 6452.50    | 6443.41           |
| SG4-BUS 23 | 24261.90                         | 21011.50 | 24732.30   | 24586.30          |

Tabla No. 6.43. Corrientes de corto circuito en el Anillo J para el Escenario 2.





**CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)**

| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG4-BUS 1  | 3986.96                          | 3452.81  | 2646.34    | 3680.48           |
| SG4-BUS 2  | 4025.60                          | 3486.27  | 2676.92    | 3710.91           |
| SG4-BUS 3  | 4035.38                          | 3494.74  | 2684.64    | 3718.57           |
| SG4-BUS 4  | 4057.39                          | 3515.80  | 2701.95    | 3735.69           |
| SG4-BUS 5  | 4119.83                          | 3567.88  | 2750.77    | 3783.54           |
| SG4-BUS 6  | 4156.49                          | 3599.62  | 2779.47    | 3808.99           |
| SG4-BUS 8  | 4263.97                          | 3692.70  | 2860.86    | 3887.14           |
| SG4-BUS 9  | 4287.41                          | 3713.01  | 2878.28    | 3903.72           |
| SG4-BUS 10 | 4301.04                          | 3724.81  | 2888.34    | 3913.27           |
| SG4-BUS 11 | 4371.79                          | 3786.08  | 2939.73    | 3961.87           |
| SG4-BUS 12 | 3209.63                          | 2779.62  | 3225.82    | 3221.78           |
| SG4-BUS 13 | 9556.76                          | 8276.39  | 9628.77    | 9606.40           |
| SG4-BUS 14 | 12650.40                         | 10955.60 | 12776.00   | 12736.00          |
| SG4-BUS 15 | 12651.10                         | 10956.20 | 12776.50   | 12736.20          |
| SG4-BUS 16 | 6420.15                          | 5560.01  | 6452.23    | 6443.70           |
| SG4-BUS 17 | 9559.65                          | 8278.90  | 9630.72    | 9607.35           |
| SG4-BUS 18 | 6421.69                          | 5561.35  | 6453.27    | 6443.94           |
| SG4-BUS 19 | 6422.25                          | 5561.83  | 6453.65    | 6443.67           |
| SG4-BUS 20 | 6424.20                          | 5563.52  | 6454.96    | 6443.98           |
| SG4-BUS 21 | 9369.76                          | 8114.45  | 9501.40    | 9449.77           |
| SG4-BUS 22 | 6424.87                          | 5564.10  | 6455.41    | 6444.08           |
| SG4-BUS 23 | 24361.80                         | 21097.90 | 24801.00   | 24619.70          |

Tabla No. 6.44. Corrientes de corto circuito en el Anillo J para el Escenario 3.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 KV)

| BUS        | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|------------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|            | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|            | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG4-BUS 1  | 4375.50                          | 3986.96  | 3789.29  | 3452.81  | 2941.52    | 2646.34  | 3960.97           | 3680.48  |
| SG4-BUS 2  | 4336.61                          | 4025.60  | 3755.61  | 3486.27  | 2913.75    | 2676.92  | 3934.75           | 3710.91  |
| SG4-BUS 3  | 4326.80                          | 4035.38  | 3747.12  | 3494.74  | 2906.67    | 2684.64  | 3928.04           | 3718.57  |
| SG4-BUS 4  | 4304.78                          | 4057.39  | 3728.05  | 3515.80  | 2890.67    | 2701.95  | 3912.88           | 3735.69  |
| SG4-BUS 5  | 4242.67                          | 4119.83  | 3674.26  | 3567.88  | 2844.83    | 2750.77  | 3869.30           | 3783.54  |
| SG4-BUS 6  | 4207.27                          | 4156.49  | 3643.60  | 3599.62  | 2818.22    | 2779.47  | 3846.36           | 3808.99  |
| SG4-BUS 8  | 4263.97                          | 4100.29  | 3692.70  | 3550.95  | 2860.86    | 2736.03  | 3887.14           | 3766.77  |
| SG4-BUS 9  | 4287.41                          | 4077.20  | 3713.01  | 3530.95  | 2878.28    | 2718.04  | 3903.72           | 3749.16  |
| SG4-BUS 10 | 4301.04                          | 4063.81  | 3724.81  | 3519.36  | 2888.34    | 2707.58  | 3913.27           | 3738.88  |
| SG4-BUS 11 | 4371.79                          | 3994.75  | 3786.08  | 3459.55  | 2939.73    | 2653.26  | 3961.87           | 3685.15  |
| SG4-BUS 12 | 3213.08                          | 3209.63  | 2782.61  | 2779.62  | 3228.14    | 3225.82  | 3221.96           | 3221.78  |
| SG4-BUS 13 | 9572.11                          | 9556.76  | 8289.69  | 8276.39  | 9639.14    | 9628.77  | 9611.72           | 9606.40  |
| SG4-BUS 14 | 12671.80                         | 12650.40 | 10974.10 | 10955.60 | 12790.50   | 12776.00 | 12741.00          | 12736.00 |
| SG4-BUS 15 | 12671.10                         | 12651.10 | 10973.50 | 10956.20 | 12790.00   | 12776.50 | 12740.70          | 12736.20 |
| SG4-BUS 16 | 6425.27                          | 6420.15  | 5564.45  | 5560.01  | 6455.67    | 6452.23  | 6443.79           | 6443.70  |
| SG4-BUS 17 | 9569.23                          | 9559.65  | 887.20   | 8278.90  | 9637.19    | 9630.72  | 9611.28           | 9607.35  |
| SG4-BUS 18 | 6423.72                          | 6421.69  | 5563.11  | 5561.35  | 6454.63    | 6453.27  | 6443.94           | 6443.55  |
| SG4-BUS 19 | 6423.17                          | 6422.25  | 5562.63  | 5561.83  | 6454.27    | 6453.65  | 6443.82           | 6443.67  |
| SG4-BUS 20 | 6424.20                          | 6421.22  | 5563.52  | 5560.94  | 6454.96    | 6452.95  | 6443.98           | 6443.51  |
| SG4-BUS 21 | 9369.76                          | 9353.34  | 8114.45  | 8100.23  | 9501.40    | 9490.17  | 9449.77           | 9444.31  |
| SG4-BUS 22 | 6424.87                          | 6420.54  | 5564.10  | 5560.35  | 6455.41    | 6452.50  | 6444.08           | 6443.41  |
| SG4-BUS 23 | 24361.80                         | 34261.90 | 21097.90 | 21011.50 | 24801.00   | 24732.30 | 24619.70          | 24586.30 |

Tabla No. 6.45. Corrientes de corto circuito máximas y mínimas del Anillo J.

### 6.11. Niveles de corto circuito del Anillo K.

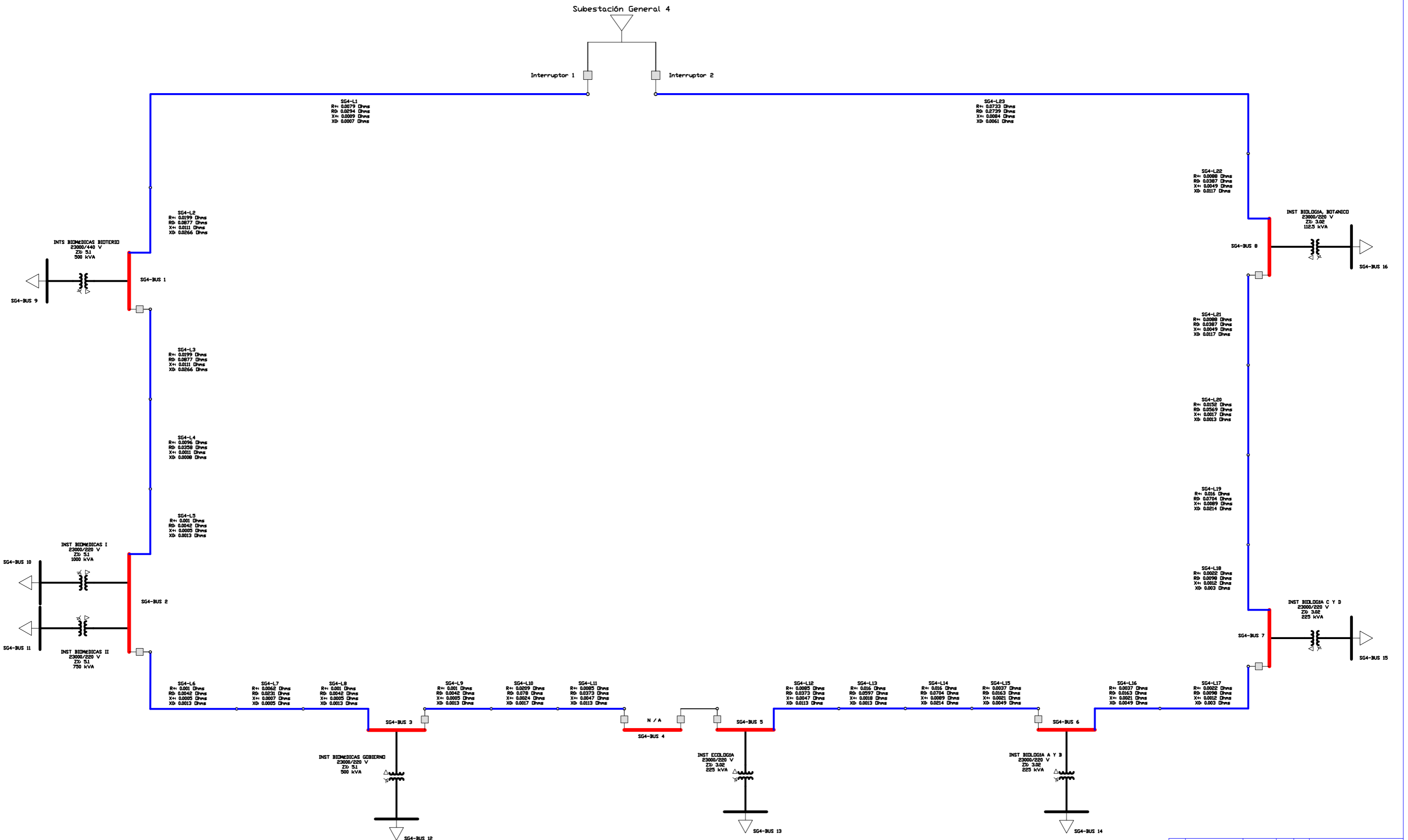


Figura No. 6.11. Diagrama unifilar del Anillo K.

| REV. | DATE | ESOP | OWN | APP | DESCRIPTION |
|------|------|------|-----|-----|-------------|
|      |      |      |     |     |             |
|      |      |      |     |     |             |
|      |      |      |     |     |             |
|      |      |      |     |     |             |

|                  |  |                |  |
|------------------|--|----------------|--|
| DRAWN BY: [ ]    |  | SCALE: [ ]     |  |
| CHECKED BY: [ ]  |  | DATE: [ ]      |  |
| APPROVED BY: [ ] |  | JOB No.: [ ]   |  |
| DWG. No.: [ ]    |  | SHEET No.: [ ] |  |



Se tienen tres escenarios distintos:

- La Subestación General No. 4 operando normalmente, (Interruptor 1 cerrado e Interruptor 2 cerrado)
- La Subestación General No. 4 operando normalmente, (Interruptor 1 cerrado e Interruptor 2 abierto)
- La Subestación General No. 4 operando normalmente, (Interruptor 1 abierto e Interruptor 2 cerrado)



| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG4-BUS 1  | 4396.07                          | 3807.11  | 2955.23    | 3972.11           |
| SG4-BUS 2  | 4374.88                          | 3788.75  | 2940.65    | 3958.96           |
| SG4-BUS 3  | 4371.54                          | 3785.86  | 2938.44    | 3957.26           |
| SG4-BUS 4  | 4357.34                          | 3773.56  | 2928.79    | 3949.47           |
| SG4-BUS 5  | 4323.55                          | 3744.30  | 2905.18    | 3931.06           |
| SG4-BUS 6  | 4354.38                          | 3771.00  | 2927.43    | 3951.07           |
| SG4-BUS 7  | 4359.85                          | 3775.74  | 2931.39    | 3954.82           |
| SG4-BUS 8  | 4388.99                          | 3800.97  | 2951.94    | 3973.21           |
| SG4-BUS 9  | 12183.40                         | 10551.20 | 12402.30   | 12307.40          |
| SG4-BUS 10 | 46263.40                         | 40065.30 | 47874.40   | 47213.70          |
| SG4-BUS 11 | 35596.00                         | 30827.00 | 36542.00   | 36147.00          |
| SG4-BUS 12 | 24360.60                         | 21096.90 | 24800.20   | 24614.30          |
| SG4-BUS 13 | 18745.60                         | 16234.20 | 19007.00   | 18903.20          |
| SG4-BUS 14 | 18750.10                         | 16238.10 | 19010.00   | 18903.80          |
| SG4-BUS 15 | 18750.90                         | 16238.80 | 19010.60   | 18904.00          |
| SG4-BUS 16 | 9572.79                          | 8290.28  | 9639.59    | 9612.57           |

Tabla No. 6.46. Corrientes de corto circuito en el Anillo K para el Escenario 1.



| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG4-BUS 1  | 4396.07                          | 3807.11  | 2955.23    | 3972.11           |
| SG4-BUS 2  | 4374.88                          | 3788.75  | 2940.65    | 3958.96           |
| SG4-BUS 3  | 4371.54                          | 3785.86  | 2938.44    | 3957.26           |
| SG4-BUS 5  | 4357.31                          | 3773.54  | 2928.77    | 3949.42           |
| SG4-BUS 6  | 4327.07                          | 3747.35  | 2907.23    | 3930.09           |
| SG4-BUS 7  | 4321.63                          | 3742.64  | 2903.28    | 3926.34           |
| SG4-BUS 8  | 4292.31                          | 3717.25  | 2881.92    | 3907.07           |
| SG4-BUS 9  | 12183.40                         | 10551.20 | 12402.30   | 12307.40          |
| SG4-BUS 10 | 46263.40                         | 40065.30 | 47874.40   | 47213.70          |
| SG4-BUS 11 | 35596.00                         | 30827.00 | 36542.00   | 36147.00          |
| SG4-BUS 12 | 24360.60                         | 21096.90 | 24800.20   | 24614.30          |
| SG4-BUS 13 | 18749.90                         | 16237.90 | 19009.90   | 18901.20          |
| SG4-BUS 14 | 18745.40                         | 16234.00 | 19006.80   | 18900.60          |
| SG4-BUS 15 | 18744.60                         | 16233.30 | 19006.30   | 18900.40          |
| SG4-BUS 16 | 9568.90                          | 8286.91  | 9636.97    | 9612.03           |

Tabla No. 6.47. Corrientes de corto circuito en el Anillo K para el Escenario 2.



| BUS        | Corrientes de Corto Circuito [A] |          |            |                   |
|------------|----------------------------------|----------|------------|-------------------|
|            | Trifásica                        | Bifásica | Monofásica | Bifásica a Tierra |
| SG4-BUS 1  | 4281.91                          | 3708.24  | 2874.55    | 3904.26           |
| SG4-BUS 2  | 4304.42                          | 3727.82  | 2891.37    | 3919.64           |
| SG4-BUS 3  | 4308.25                          | 3731.05  | 2894.10    | 3921.84           |
| SG4-BUS 5  | 4323.55                          | 3744.30  | 2905.19    | 3931.07           |
| SG4-BUS 6  | 4354.38                          | 3771.00  | 2927.43    | 3951.07           |
| SG4-BUS 7  | 4359.85                          | 3775.74  | 2931.39    | 3954.82           |
| SG4-BUS 8  | 4388.99                          | 3800.97  | 2951.94    | 3973.21           |
| SG4-BUS 9  | 12170.10                         | 10539.70 | 12393.10   | 12309.50          |
| SG4-BUS 10 | 46206.30                         | 40015.80 | 47834.10   | 47234.10          |
| SG4-BUS 11 | 35562.40                         | 30798.00 | 36518.60   | 36159.30          |
| SG4-BUS 12 | 24346.60                         | 21084.80 | 24790.60   | 24619.50          |
| SG4-BUS 13 | 18745.60                         | 16234.20 | 19007.00   | 18903.20          |
| SG4-BUS 14 | 18750.10                         | 16238.10 | 19010.00   | 18903.80          |
| SG4-BUS 15 | 18750.90                         | 16238.80 | 19010.60   | 18904.00          |
| SG4-BUS 16 | 9572.79                          | 8290.28  | 9639.59    | 9612.57           |

Tabla No. 6.48. Corrientes de corto circuito en el Anillo K para el Escenario 3.



## CAPÍTULO 6. NIVELES DE C.C. DE LA RED DE DISTRIBUCIÓN DE CU (23 kV)

| BUS        | Corrientes de Corto Circuito [A] |          |          |          |            |          |                   |          |
|------------|----------------------------------|----------|----------|----------|------------|----------|-------------------|----------|
|            | Trifásica                        |          | Bifásica |          | Monofásica |          | Bifásica a Tierra |          |
|            | Max.                             | Min.     | Max.     | Min.     | Max.       | Min.     | Max.              | Min.     |
| SG4-BUS 1  | 4396.07                          | 4281.91  | 3807.11  | 3708.24  | 2955.23    | 2874.55  | 3972.11           | 3904.26  |
| SG4-BUS 2  | 4374.88                          | 4304.42  | 3788.75  | 3727.82  | 2940.65    | 2891.37  | 3958.96           | 3919.64  |
| SG4-BUS 3  | 4371.54                          | 4308.25  | 3785.86  | 3731.05  | 2938.44    | 2894.10  | 3957.26           | 3921.84  |
| SG4-BUS 5  | 4357.31                          | 4323.55  | 3773.54  | 3744.30  | 2928.77    | 2905.19  | 3949.42           | 3931.07  |
| SG4-BUS 6  | 4354.38                          | 4327.07  | 3771.00  | 3747.35  | 2927.43    | 2907.23  | 3951.07           | 3930.09  |
| SG4-BUS 7  | 4359.85                          | 4321.63  | 3775.74  | 3742.64  | 2931.39    | 2903.28  | 3954.82           | 3926.34  |
| SG4-BUS 8  | 4388.99                          | 4292.31  | 3800.97  | 3717.25  | 2951.94    | 2881.92  | 3973.21           | 3907.07  |
| SG4-BUS 9  | 12183.40                         | 12170.10 | 10551.20 | 10539.70 | 12402.30   | 12393.10 | 12309.50          | 12307.40 |
| SG4-BUS 10 | 46263.40                         | 46206.30 | 40065.30 | 40015.80 | 47874.40   | 47834.10 | 47234.10          | 47213.70 |
| SG4-BUS 11 | 35596.00                         | 35562.40 | 30827.00 | 30798.00 | 36542.00   | 36518.60 | 36159.30          | 36147.00 |
| SG4-BUS 12 | 24360.60                         | 24346.60 | 21096.90 | 21084.80 | 24800.20   | 24790.60 | 24619.50          | 24614.30 |
| SG4-BUS 13 | 18749.90                         | 18745.60 | 16237.90 | 16234.20 | 19009.90   | 19007.00 | 18903.20          | 18901.20 |
| SG4-BUS 14 | 18750.10                         | 18745.40 | 16238.10 | 16234.00 | 19010.00   | 19006.80 | 18903.80          | 18900.60 |
| SG4-BUS 15 | 18750.90                         | 18744.60 | 16238.80 | 16233.30 | 19010.60   | 19006.30 | 18904.00          | 18900.40 |
| SG4-BUS 16 | 9572.79                          | 9568.90  | 8290.28  | 8286.91  | 9639.59    | 9636.97  | 9612.57           | 9612.03  |

**Tabla No. 6.49. Corrientes de corto circuito máximas y mínimas del Anillo K.**