**INPUT DATA FOR 33 BUS TEST SYSTEM**

**Line Data:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Frombus | Tobus | r(ohm) | x(ohm) | Status | Ratio | Rate A |
| 1 | 2 | 0.0922 | 0.047 | 1 | 0 | 9990 |
| 2 | 3 | 0.493 | 0.2511 | 1 | 0 | 9990 |
| 3 | 4 | 0.366 | 0.1864 | 1 | 0 | 9990 |
| 4 | 5 | 0.3811 | 0.1941 | 1 | 0 | 9990 |
| 5 | 6 | 0.819 | 0.707 | 1 | 0 | 9990 |
| 6 | 7 | 0.1872 | 0.6188 | 1 | 0 | 9990 |
| 7 | 8 | 0.7114 | 0.2351 | 1 | 0 | 9990 |
| 8 | 9 | 1.03 | 0.74 | 1 | 0 | 9990 |
| 9 | 10 | 1.044 | 0.74 | 1 | 0 | 9990 |
| 10 | 11 | 0.1966 | 0.065 | 1 | 0 | 9990 |
| 11 | 12 | 0.3744 | 0.1238 | 1 | 0 | 9990 |
| 12 | 13 | 1.468 | 1.155 | 1 | 0 | 9990 |
| 13 | 14 | 0.5416 | 0.7129 | 1 | 0 | 9990 |
| 14 | 15 | 0.591 | 0.526 | 1 | 0 | 9990 |
| 15 | 16 | 0.7463 | 0.545 | 1 | 0 | 9990 |
| 16 | 17 | 1.289 | 1.721 | 1 | 0 | 9990 |
| 17 | 18 | 0.732 | 0.574 | 1 | 0 | 9990 |
| 2 | 19 | 0.164 | 0.1565 | 1 | 0 | 9990 |
| 19 | 20 | 1.5042 | 1.3554 | 1 | 0 | 9990 |
| 20 | 21 | 0.4095 | 0.4784 | 1 | 0 | 9990 |
| 21 | 22 | 0.7089 | 0.9373 | 1 | 0 | 9990 |
| 3 | 23 | 0.4512 | 0.3083 | 1 | 0 | 9990 |
| 23 | 24 | 0.898 | 0.7091 | 1 | 0 | 9990 |
| 24 | 25 | 0.896 | 0.7011 | 1 | 0 | 9990 |
| 6 | 26 | 0.203 | 0.1034 | 1 | 0 | 9990 |
| 26 | 27 | 0.2842 | 0.1447 | 1 | 0 | 9990 |
| 27 | 28 | 1.059 | 0.9337 | 1 | 0 | 9990 |
| 28 | 29 | 0.8042 | 0.7006 | 1 | 0 | 9990 |
| 29 | 30 | 0.5075 | 0.2585 | 1 | 0 | 9990 |
| 30 | 31 | 0.9744 | 0.963 | 1 | 0 | 9990 |
| 31 | 32 | 0.3105 | 0.3619 | 1 | 0 | 9990 |
| 32 | 33 | 0.341 | 0.5302 | 1 | 0 | 9990 |
| 25 | 29 | 0.5 | 0.5 | 0 | 0 | 9990 |
| 8 | 21 | 2 | 2 | 0 | 0 | 9990 |
| 12 | 22 | 2 | 2 | 0 | 0 | 9990 |
| 9 | 15 | 2 | 2 | 0 | 0 | 9990 |
| 18 | 33 | 0.5 | 0.5 | 0 | 0 | 9990 |

**Bus Data:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus\_I | Pd | Qd | Bs | Type | Vm | Va | basekV | Vmax | Vmin |
|  |  |  |  |  |  |  |  |  |  |
| 1 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 2 | 100 | 60 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 3 | 90 | 40 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 4 | 120 | 80 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 5 | 60 | 30 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 6 | 60 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 7 | 200 | 100 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 8 | 200 | 100 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 9 | 60 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 10 | 60 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 11 | 45 | 30 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 12 | 60 | 35 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 13 | 60 | 35 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 14 | 120 | 80 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 15 | 60 | 10 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 16 | 60 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 17 | 60 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 18 | 90 | 40 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 19 | 90 | 40 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 20 | 90 | 40 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 21 | 90 | 40 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 22 | 90 | 40 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 23 | 90 | 50 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 24 | 420 | 200 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 25 | 420 | 200 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 26 | 60 | 25 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 27 | 60 | 25 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 28 | 60 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 29 | 120 | 70 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 30 | 200 | 600 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 31 | 150 | 70 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 32 | 210 | 100 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |
| 33 | 60 | 40 | 0 | 3 | 1 | 0 | 12.66 | 1.05 | 0.95 |

**BEFORE RECONFIGURATION:**

**"THE DISPLAYED LOAD-FLOW RESULTS ARE FOR 33-BUS RADIAL DISTRIBUTION NETWORK"**

**Voltage Solution in kV is displayed below...**

|  |  |
| --- | --- |
| Bus No. | Voltage(kV) |
| 1 | 12.66 |
| 2 | 12.6224 |
| 3 | 12.444 |
| 4 | 12.3493 |
| 5 | 12.2556 |
| 6 | 12.0227 |
| 7 | 11.9785 |
| 8 | 11.9172 |
| 9 | 11.8379 |
| 10 | 11.7642 |
| 11 | 11.7533 |
| 12 | 11.7344 |
| 13 | 11.657 |
| 14 | 11.6283 |
| 15 | 11.6104 |
| 16 | 11.5931 |
| 17 | 11.5674 |
| 18 | 11.5597 |
| 19 | 12.6157 |
| 20 | 12.5704 |
| 21 | 12.5615 |
| 22 | 12.5535 |
| 23 | 12.3986 |
| 24 | 12.3141 |
| 25 | 12.272 |
| 26 | 11.9982 |
| 27 | 11.9658 |
| 28 | 11.821 |
| 29 | 11.7169 |
| 30 | 11.6719 |
| 31 | 11.6192 |
| 32 | 11.6076 |
| 33 | 11.604 |

**Losses in each Line segment are displayed in kWs and kVAr...**

|  |  |  |
| --- | --- | --- |
| Line No. | Loss(kWs) | Loss(kVAr) |
| 1 | 12.2404 | 6.2397 |
| 2 | 51.7912 | 26.3789 |
| 3 | 19.9005 | 10.1351 |
| 4 | 18.6989 | 9.5237 |
| 5 | 38.2486 | 33.018 |
| 6 | 1.9145 | 6.3285 |
| 7 | 4.838 | 1.5988 |
| 8 | 4.1805 | 3.0035 |
| 9 | 3.5609 | 2.524 |
| 10 | 0.5537 | 0.1831 |
| 11 | 0.8811 | 0.2914 |
| 12 | 2.6662 | 2.0978 |
| 13 | 0.7292 | 0.9598 |
| 14 | 0.357 | 0.3177 |
| 15 | 0.2815 | 0.2055 |
| 16 | 0.2516 | 0.336 |
| 17 | 0.0531 | 0.0417 |
| 18 | 0.161 | 0.1536 |
| 19 | 0.8322 | 0.7499 |
| 20 | 0.1008 | 0.1177 |
| 21 | 0.0436 | 0.0577 |
| 22 | 3.1816 | 2.174 |
| 23 | 5.1437 | 4.0617 |
| 24 | 1.2875 | 1.0074 |
| 25 | 2.6009 | 1.3248 |
| 26 | 3.329 | 1.695 |
| 27 | 11.3009 | 9.9637 |
| 28 | 7.8333 | 6.8242 |
| 29 | 3.8957 | 1.9843 |
| 30 | 1.5936 | 1.575 |
| 31 | 0.2132 | 0.2485 |
| 32 | 0.0132 | 0.0205 |

 **Total Lines Losses in kW, kVAr, and in kVA are...**

 TotalkW TotalkVAr TotalkVA

 **202.6771 135.1410 243.6003**

**AFTER RECONFIGURATION:**

**"THE DISPLAYED LOAD-FLOW RESULTS ARE FOR 33-BUS RADIAL DISTRIBUTION NETWORK"**

**Voltage Solution in kV is displayed below...**

|  |  |
| --- | --- |
| Bus No. | Voltage(kV) |
| 1 | 12.66 |
| 2 | 12.631 |
| 3 | 12.4983 |
| 4 | 12.4374 |
| 5 | 12.3788 |
| 6 | 12.2417 |
| 7 | 12.1984 |
| 8 | 12.1382 |
| 9 | 12.0604 |
| 10 | 11.9882 |
| 11 | 11.9775 |
| 12 | 11.9589 |
| 13 | 11.883 |
| 14 | 11.8548 |
| 15 | 11.8373 |
| 16 | 11.8203 |
| 17 | 11.7951 |
| 18 | 11.7876 |
| 19 | 12.6243 |
| 20 | 12.579 |
| 21 | 12.5701 |
| 22 | 12.5621 |
| 23 | 12.4531 |
| 24 | 12.369 |
| 25 | 12.3271 |
| 26 | 12.2355 |
| 27 | 12.2286 |
| 28 | 12.2061 |
| 29 | 12.1941 |
| 30 | 12.5496 |
| 31 | 12.5331 |
| 32 | 12.5198 |
| 33 | 12.5038 |

**Losses in each Line segment are displayed in kWs and kVAr...**

|  |  |  |
| --- | --- | --- |
| Line No. | Loss(kWs) | Loss(kVAr) |
| 1 | 7.2462 | 3.6938 |
| 2 | 28.3629 | 14.4461 |
| 3 | 8.0583 | 4.104 |
| 4 | 7.1419 | 3.6375 |
| 5 | 14.1574 | 12.2213 |
| 6 | 1.8436 | 6.0943 |
| 7 | 4.6575 | 1.5392 |
| 8 | 4.0231 | 2.8904 |
| 9 | 3.4264 | 2.4287 |
| 10 | 0.5327 | 0.1761 |
| 11 | 0.8477 | 0.2803 |
| 12 | 2.5649 | 2.018 |
| 13 | 0.7014 | 0.9232 |
| 14 | 0.3434 | 0.3056 |
| 15 | 0.2707 | 0.1977 |
| 16 | 0.242 | 0.3231 |
| 17 | 0.0511 | 0.0401 |
| 18 | 0.1607 | 0.1534 |
| 19 | 0.831 | 0.7488 |
| 20 | 0.1006 | 0.1175 |
| 21 | 0.0436 | 0.0576 |
| 22 | 3.1534 | 2.1547 |
| 23 | 5.098 | 4.0256 |
| 24 | 1.276 | 0.9984 |
| 25 | 0.1492 | 0.076 |
| 26 | 0.1351 | 0.0688 |
| 27 | 0.2883 | 0.2541 |
| 28 | 0.1044 | 0.0909 |
| 29 | 0.166 | 0.1641 |
| 30 | 0.3204 | 0.3735 |
| 31 | 0.2283 | 0.355 |
| 32 | 13.0803 | 13.0803 |

**Total Lines Losses in kW, kVAr, and in kVA are...**

 TotalkW TotalkVAr TotalkVA

 **109.6065 78.0381 134.5494**

**Before and After reconfiguration bus voltages:**

|  |  |  |
| --- | --- | --- |
| Bus No. | Before Reconfiguration Bus Voltage(Kv) | After Reconfiguration Bus Voltage(Kv) |
| 1 | 12.66 | 12.66 |
| 2 | 12.6224 | 12.631 |
| 3 | 12.444 | 12.4983 |
| 4 | 12.3493 | 12.4374 |
| 5 | 12.2556 | 12.3788 |
| 6 | 12.0227 | 12.2417 |
| 7 | 11.9785 | 12.1984 |
| 8 | 11.9172 | 12.1382 |
| 9 | 11.8379 | 12.0604 |
| 10 | 11.7642 | 11.9882 |
| 11 | 11.7533 | 11.9775 |
| 12 | 11.7344 | 11.9589 |
| 13 | 11.657 | 11.883 |
| 14 | 11.6283 | 11.8548 |
| 15 | 11.6104 | 11.8373 |
| 16 | 11.5931 | 11.8203 |
| 17 | 11.5674 | 11.7951 |
| 18 | 11.5597 | 11.7876 |
| 19 | 12.6157 | 12.6243 |
| 20 | 12.5704 | 12.579 |
| 21 | 12.5615 | 12.5701 |
| 22 | 12.5535 | 12.5621 |
| 23 | 12.3986 | 12.4531 |
| 24 | 12.3141 | 12.369 |
| 25 | 12.272 | 12.3271 |
| 26 | 11.9982 | 12.2355 |
| 27 | 11.9658 | 12.2286 |
| 28 | 11.821 | 12.2061 |
| 29 | 11.7169 | 12.1941 |
| 30 | 11.6719 | 12.5496 |
| 31 | 11.6192 | 12.5331 |
| 32 | 11.6076 | 12.5198 |
| 33 | 11.604 | 12.5038 |

**INPUT DATA FOR 69 BUS TEST SYSTEM**

**Line Data:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Frombus | Tobus | r(ohm) | x(ohm) | Status | Ratio | Rate A |
| 1 | 2 | 0.0005 | 0.0012 | 1 | 0 | 9900 |
| 2 | 3 | 0.0005 | 0.0012 | 1 | 0 | 9900 |
| 3 | 4 | 0.0015 | 0.0036 | 1 | 0 | 9900 |
| 4 | 5 | 0.0251 | 0.0294 | 1 | 0 | 9900 |
| 5 | 6 | 0.366 | 0.1864 | 1 | 0 | 9900 |
| 6 | 7 | 0.3811 | 0.1941 | 1 | 0 | 9900 |
| 7 | 8 | 0.0922 | 0.047 | 1 | 0 | 9900 |
| 8 | 9 | 0.0493 | 0.0251 | 1 | 0 | 9900 |
| 9 | 10 | 0.819 | 0.2707 | 1 | 0 | 9900 |
| 10 | 11 | 0.1872 | 0.0619 | 1 | 0 | 9900 |
| 11 | 12 | 0.7114 | 0.2351 | 1 | 0 | 9900 |
| 12 | 13 | 1.03 | 0.34 | 1 | 0 | 9900 |
| 13 | 14 | 1.044 | 0.345 | 1 | 0 | 9900 |
| 14 | 15 | 1.058 | 0.3496 | 1 | 0 | 9900 |
| 15 | 16 | 0.1966 | 0.065 | 1 | 0 | 9900 |
| 16 | 17 | 0.3744 | 0.1238 | 1 | 0 | 9900 |
| 17 | 18 | 0.0047 | 0.0016 | 1 | 0 | 9900 |
| 18 | 19 | 0.3276 | 0.1083 | 1 | 0 | 9900 |
| 19 | 20 | 0.2106 | 0.0696 | 1 | 0 | 9900 |
| 20 | 21 | 0.3416 | 0.1129 | 1 | 0 | 9900 |
| 21 | 22 | 0.014 | 0.0046 | 1 | 0 | 9900 |
| 22 | 23 | 0.1591 | 0.0526 | 1 | 0 | 9900 |
| 23 | 24 | 0.3463 | 0.1145 | 1 | 0 | 9900 |
| 24 | 25 | 0.7488 | 0.2475 | 1 | 0 | 9900 |
| 25 | 26 | 0.3089 | 0.1021 | 1 | 0 | 9900 |
| 26 | 27 | 0.1732 | 0.0572 | 1 | 0 | 9900 |
| 3 | 28 | 0.0044 | 0.0108 | 1 | 0 | 9900 |
| 28 | 29 | 0.064 | 0.1565 | 1 | 0 | 9900 |
| 29 | 30 | 0.3978 | 0.1315 | 1 | 0 | 9900 |
| 30 | 31 | 0.0702 | 0.0232 | 1 | 0 | 9900 |
| 31 | 32 | 0.351 | 0.116 | 1 | 0 | 9900 |
| 32 | 33 | 0.839 | 0.2816 | 1 | 0 | 9900 |
| 33 | 34 | 1.708 | 0.5646 | 1 | 0 | 9900 |
| 34 | 35 | 1.474 | 0.4873 | 1 | 0 | 9900 |
| 4 | 36 | 0.0034 | 0.0084 | 1 | 0 | 9900 |
| 36 | 37 | 0.0851 | 0.2083 | 1 | 0 | 9900 |
| 37 | 38 | 0.2898 | 0.7091 | 1 | 0 | 9900 |
| 38 | 39 | 0.0822 | 0.2011 | 1 | 0 | 9900 |
| 8 | 40 | 0.0928 | 0.0473 | 1 | 0 | 9900 |
| 40 | 41 | 0.3319 | 0.1114 | 1 | 0 | 9900 |
| 9 | 42 | 0.174 | 0.0886 | 1 | 0 | 9900 |
| 42 | 43 | 0.203 | 0.1034 | 1 | 0 | 9900 |
| 43 | 44 | 0.2842 | 0.1447 | 1 | 0 | 9900 |
| 44 | 45 | 0.2813 | 0.1433 | 1 | 0 | 9900 |
| 45 | 46 | 1.59 | 0.5337 | 1 | 0 | 9900 |
| 46 | 47 | 0.7837 | 0.263 | 1 | 0 | 9900 |
| 47 | 48 | 0.3042 | 0.1006 | 1 | 0 | 9900 |
| 48 | 49 | 0.3861 | 0.1172 | 1 | 0 | 9900 |
| 49 | 50 | 0.5075 | 0.2585 | 1 | 0 | 9900 |
| 50 | 51 | 0.0974 | 0.0496 | 1 | 0 | 9900 |
| 51 | 52 | 0.145 | 0.0738 | 1 | 0 | 9900 |
| 52 | 53 | 0.7105 | 0.3619 | 1 | 0 | 9900 |
| 53 | 54 | 1.041 | 0.5302 | 1 | 0 | 9900 |
| 11 | 55 | 0.2012 | 0.0611 | 1 | 0 | 9900 |
| 55 | 56 | 0.0047 | 0.0014 | 1 | 0 | 9900 |
| 12 | 57 | 0.7394 | 0.2444 | 1 | 0 | 9900 |
| 57 | 58 | 0.0047 | 0.0016 | 1 | 0 | 9900 |
| 3 | 59 | 0.0044 | 0.0108 | 1 | 0 | 9900 |
| 59 | 60 | 0.064 | 0.1565 | 1 | 0 | 9900 |
| 60 | 61 | 0.1053 | 0.123 | 1 | 0 | 9900 |
| 61 | 62 | 0.0304 | 0.0355 | 1 | 0 | 9900 |
| 62 | 63 | 0.0018 | 0.0021 | 1 | 0 | 9900 |
| 63 | 64 | 0.7283 | 0.8509 | 1 | 0 | 9900 |
| 64 | 65 | 0.31 | 0.3623 | 1 | 0 | 9900 |
| 65 | 66 | 0.041 | 0.0478 | 1 | 0 | 9900 |
| 66 | 67 | 0.0092 | 0.0116 | 1 | 0 | 9900 |
| 67 | 68 | 0.1089 | 0.1373 | 1 | 0 | 9900 |
| 68 | 69 | 0.0009 | 0.0012 | 1 | 0 | 9900 |
| 11 | 43 | 0.5 | 0.5 | 0 | 0 | 9900 |
| 13 | 21 | 0.5 | 0.5 | 0 | 0 | 9900 |
| 46 | 15 | 1 | 1.5 | 0 | 0 | 9900 |
| 50 | 59 | 2 | 1 | 0 | 0 | 9900 |
| 27 | 65 | 1 | 1.5 | 0 | 0 | 9900 |

**Bus Data:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bus\_I | Pd | Qd | Bs | Type | Vm | Va | basekV | Vmax | Vmin |
| 1 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 2 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 3 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 4 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 5 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 6 | 2.6 | 2.2 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 7 | 40.4 | 30 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 8 | 75 | 54 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 9 | 30 | 22 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 10 | 28 | 19 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 11 | 145 | 104 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 12 | 145 | 104 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 13 | 8 | 5.5 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 14 | 8 | 5.5 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 15 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 16 | 45.5 | 30 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 17 | 60 | 35 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 18 | 60 | 35 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 19 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 20 | 1 | 0.6 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 21 | 114 | 81 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 22 | 5.3 | 3.5 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 23 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 24 | 28 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 25 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 26 | 14 | 10 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 27 | 14 | 10 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 28 | 26 | 18.6 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 29 | 26 | 18.6 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 30 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 31 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 32 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 33 | 14 | 10 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 34 | 19.5 | 14 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 35 | 6 | 4 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 36 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 37 | 79 | 56.4 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 38 | 384.7 | 274.5 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 39 | 384.7 | 274.5 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 40 | 40.5 | 28.3 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 41 | 3.6 | 2.7 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 42 | 4.35 | 3.5 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 43 | 26.4 | 19 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 44 | 24 | 17.2 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 45 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 46 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 47 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 48 | 100 | 72 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 49 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 50 | 1244 | 888 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 51 | 32 | 23 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 52 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 53 | 227 | 162 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 54 | 59 | 42 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 55 | 18 | 13 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 56 | 18 | 13 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 57 | 28 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 58 | 28 | 20 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 59 | 26 | 18.55 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 60 | 26 | 18.55 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 61 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 62 | 24 | 17 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 63 | 24 | 17 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 64 | 1.2 | 1 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 65 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 66 | 6 | 4.3 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 67 | 0 | 0 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 68 | 39.22 | 26.3 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |
| 69 | 39.22 | 26.3 | 0 | 3 | 1 | 0 | 12.66 | 1.1 | 0.9 |

**BEFORE RECONFIGURATION:**

**"THE DISPLAYED LOAD-FLOW RESULTS ARE FOR 69-BUS RADIAL DISTRIBUTION NETWORK"**

**Voltage Solution in kV is displayed below...**

|  |  |
| --- | --- |
| Bus No. | Voltage(kV) |
| 1 | 12.66 |
| 2 | 12.6596 |
| 3 | 12.6592 |
| 4 | 12.658 |
| 5 | 12.6476 |
| 6 | 12.5345 |
| 7 | 12.4168 |
| 8 | 12.3888 |
| 9 | 12.3744 |
| 10 | 12.3111 |
| 11 | 12.2972 |
| 12 | 12.2571 |
| 13 | 12.2201 |
| 14 | 12.1834 |
| 15 | 12.1471 |
| 16 | 12.1403 |
| 17 | 12.1292 |
| 18 | 12.129 |
| 19 | 12.1232 |
| 20 | 12.1194 |
| 21 | 12.1133 |
| 22 | 12.1132 |
| 23 | 12.1123 |
| 24 | 12.1103 |
| 25 | 12.1081 |
| 26 | 12.1073 |
| 27 | 12.107 |
| 28 | 12.6591 |
| 29 | 12.6582 |
| 30 | 12.6566 |
| 31 | 12.6564 |
| 32 | 12.655 |
| 33 | 12.6518 |
| 34 | 12.6475 |
| 35 | 12.6467 |
| 36 | 12.6573 |
| 37 | 12.6416 |
| 38 | 12.5929 |
| 39 | 12.586 |
| 40 | 12.3883 |
| 41 | 12.3882 |
| 42 | 12.3391 |
| 43 | 12.2981 |
| 44 | 12.2414 |
| 45 | 12.1861 |
| 46 | 11.9016 |
| 47 | 11.7616 |
| 48 | 11.7074 |
| 49 | 11.6438 |
| 50 | 11.5502 |
| 51 | 11.5465 |
| 52 | 11.5416 |
| 53 | 11.5176 |
| 54 | 11.5103 |
| 55 | 12.2964 |
| 56 | 12.2964 |
| 57 | 12.253 |
| 58 | 12.2529 |
| 59 | 12.659 |
| 60 | 12.6568 |
| 61 | 12.6548 |
| 62 | 12.6542 |
| 63 | 12.6542 |
| 64 | 12.6454 |
| 65 | 12.6417 |
| 66 | 12.6412 |
| 67 | 12.6411 |
| 68 | 12.6398 |

**Losses in each Line segment are displayed in kWs and kVAr...**

|  |  |  |
| --- | --- | --- |
| Line No. | Loss(kWs) | Loss(kVAr) |
| 1 | 0.075 | 0.18 |
| 2 | 0.075 | 0.18 |
| 3 | 0.195 | 0.468 |
| 4 | 1.937 | 2.2688 |
| 5 | 28.2447 | 14.3847 |
| 6 | 29.3528 | 14.9498 |
| 7 | 6.8956 | 3.5151 |
| 8 | 3.3756 | 1.7186 |
| 9 | 4.7784 | 1.5794 |
| 10 | 1.015 | 0.3356 |
| 11 | 2.1927 | 0.7246 |
| 12 | 1.2875 | 0.425 |
| 13 | 1.247 | 0.4121 |
| 14 | 1.2061 | 0.3985 |
| 15 | 0.2241 | 0.0741 |
| 16 | 0.3209 | 0.1061 |
| 17 | 0.0026 | 0.0009 |
| 18 | 0.1044 | 0.0345 |
| 19 | 0.0671 | 0.0222 |
| 20 | 0.1077 | 0.0356 |
| 21 | 0.0005 | 0.0002 |
| 22 | 0.0051 | 0.0017 |
| 23 | 0.0112 | 0.0037 |
| 24 | 0.006 | 0.002 |
| 25 | 0.0025 | 0.0008 |
| 26 | 0.0003 | 0.0001 |
| 27 | 0.0003 | 0.0009 |
| 28 | 0.0026 | 0.0063 |
| 29 | 0.0058 | 0.0019 |
| 30 | 0.001 | 0.0003 |
| 31 | 0.0051 | 0.0017 |
| 32 | 0.0123 | 0.0041 |
| 33 | 0.0104 | 0.0034 |
| 34 | 0.0005 | 0.0002 |
| 35 | 0.0233 | 0.0575 |
| 36 | 0.5828 | 1.4266 |
| 37 | 1.6335 | 3.997 |
| 38 | 0.1159 | 0.2835 |
| 39 | 0.0018 | 0.0009 |
| 40 | 0 | 0 |
| 41 | 5.7813 | 2.9438 |
| 42 | 6.7115 | 3.4186 |
| 43 | 9.1248 | 4.6459 |
| 44 | 8.7902 | 4.4779 |
| 45 | 49.6849 | 16.6773 |
| 46 | 24.4894 | 8.2183 |
| 47 | 9.5058 | 3.1436 |
| 48 | 10.6711 | 3.2392 |
| 49 | 14.0263 | 7.1445 |
| 50 | 0.1121 | 0.0571 |
| 51 | 0.1349 | 0.0687 |
| 52 | 0.6612 | 0.3368 |
| 53 | 0.0412 | 0.021 |
| 54 | 0.0026 | 0.0008 |
| 55 | 0 | 0 |
| 56 | 0.0233 | 0.0077 |
| 57 | 0 | 0 |
| 58 | 0.0014 | 0.0034 |
| 59 | 0.0151 | 0.0369 |
| 60 | 0.0173 | 0.0202 |
| 61 | 0.005 | 0.0058 |
| 62 | 0.0002 | 0.0002 |
| 63 | 0.0487 | 0.0569 |
| 64 | 0.0201 | 0.0235 |
| 65 | 0.0027 | 0.0031 |
| 66 | 0.0005 | 0.0006 |
| 67 | 0.0061 | 0.0077 |
| 68 | 0 | 0 |

**Total Lines Losses in kW, kVAr, and in kVA are...**

 TotalkW TotalkVAr TotalkVA

 **225.0028 102.1659 247.1116**

**AFTER RECONFIGURATION:**

**"THE DISPLAYED LOAD-FLOW RESULTS ARE FOR 69-BUS RADIAL DISTRIBUTION NETWORK"**

**Voltage Solution in kV is displayed below...**

|  |  |
| --- | --- |
| Bus No. | Voltage(kV) |
| 1 | 12.66 |
| 2 | 12.6598 |
| 3 | 12.6595 |
| 4 | 12.6589 |
| 5 | 12.6544 |
| 6 | 12.6064 |
| 7 | 12.5565 |
| 8 | 12.5448 |
| 9 | 12.5392 |
| 10 | 12.4696 |
| 11 | 12.4543 |
| 12 | 12.4086 |
| 13 | 12.3632 |
| 14 | 12.318 |
| 15 | 12.273 |
| 16 | 12.2647 |
| 17 | 12.2505 |
| 18 | 12.2503 |
| 19 | 12.2417 |
| 20 | 12.2362 |
| 21 | 12.2272 |
| 22 | 12.227 |
| 23 | 12.2248 |
| 24 | 12.2199 |
| 25 | 12.2114 |
| 26 | 12.2079 |
| 27 | 12.2062 |
| 28 | 12.6594 |
| 29 | 12.6585 |
| 30 | 12.657 |
| 31 | 12.6567 |
| 32 | 12.6554 |
| 33 | 12.6521 |
| 34 | 12.6479 |
| 35 | 12.647 |
| 36 | 12.6582 |
| 37 | 12.6424 |
| 38 | 12.5938 |
| 39 | 12.5869 |
| 40 | 12.5444 |
| 41 | 12.5442 |
| 42 | 12.5363 |
| 43 | 12.5329 |
| 44 | 12.5291 |
| 45 | 12.526 |
| 46 | 12.5102 |
| 47 | 12.5024 |
| 48 | 12.4994 |
| 49 | 12.4994 |
| 50 | 12.6425 |
| 51 | 12.6375 |
| 52 | 12.6155 |
| 53 | 12.5832 |
| 54 | 12.5821 |
| 55 | 12.4543 |
| 56 | 12.4529 |
| 57 | 12.4086 |
| 58 | 12.4086 |
| 59 | 12.6406 |
| 60 | 12.6395 |
| 61 | 12.6393 |
| 62 | 12.6392 |
| 63 | 12.6366 |
| 64 | 12.6366 |
| 65 | 12.2061 |
| 66 | 12.2047 |
| 67 | 12.2047 |
| 68 | 12.1875 |

**Losses in each Line segment are displayed in kWs and kVAr...**

|  |  |  |
| --- | --- | --- |
| Line No. | Loss(kWs) | Loss(kVAr) |
| 1 | 0.0241 | 0.0578 |
| 2 | 0.0241 | 0.0578 |
| 3 | 0.0605 | 0.1451 |
| 4 | 0.3497 | 0.4096 |
| 5 | 5.0997 | 2.5972 |
| 6 | 5.2859 | 2.6922 |
| 7 | 1.1933 | 0.6083 |
| 8 | 0.514 | 0.2617 |
| 9 | 5.7635 | 1.905 |
| 10 | 1.2335 | 0.4079 |
| 11 | 2.8493 | 0.9416 |
| 12 | 1.9375 | 0.6396 |
| 13 | 1.8934 | 0.6257 |
| 14 | 1.8485 | 0.6108 |
| 15 | 0.3435 | 0.1136 |
| 16 | 0.5224 | 0.1728 |
| 17 | 0.0047 | 0.0016 |
| 18 | 0.2221 | 0.0734 |
| 19 | 0.1428 | 0.0472 |
| 20 | 0.2299 | 0.076 |
| 21 | 0.0029 | 0.001 |
| 22 | 0.0311 | 0.0103 |
| 23 | 0.0678 | 0.0224 |
| 24 | 0.0935 | 0.0309 |
| 25 | 0.0386 | 0.0127 |
| 26 | 0.0165 | 0.0055 |
| 27 | 0.0003 | 0.0009 |
| 28 | 0.0026 | 0.0063 |
| 29 | 0.0058 | 0.0019 |
| 30 | 0.001 | 0.0003 |
| 31 | 0.0051 | 0.0017 |
| 32 | 0.0123 | 0.0041 |
| 33 | 0.0104 | 0.0034 |
| 34 | 0.0005 | 0.0002 |
| 35 | 0.0233 | 0.0575 |
| 36 | 0.5827 | 1.4264 |
| 37 | 1.6333 | 3.9964 |
| 38 | 0.1159 | 0.2835 |
| 39 | 0.0017 | 0.0009 |
| 40 | 0 | 0 |
| 41 | 0.0405 | 0.0206 |
| 42 | 0.0445 | 0.0227 |
| 43 | 0.0424 | 0.0216 |
| 44 | 0.0273 | 0.0139 |
| 45 | 0.1545 | 0.0519 |
| 46 | 0.0762 | 0.0256 |
| 47 | 0.0296 | 0.0098 |
| 48 | 0 | 0 |
| 49 | 0.2079 | 0.1059 |
| 50 | 2.7145 | 1.3816 |
| 51 | 1.1888 | 0.6055 |
| 52 | 0.0011 | 0.0006 |
| 53 | 0 | 0 |
| 54 | 0.3768 | 0.1122 |
| 55 | 0 | 0 |
| 56 | 0.0002 | 0.0001 |
| 57 | 11.6431 | 28.5785 |
| 58 | 0.0031 | 0.0077 |
| 59 | 0.0002 | 0.0002 |
| 60 | 0 | 0 |
| 61 | 1.7727 | 2.0682 |
| 62 | 0 | 0 |
| 63 | 0.0222 | 0.0258 |
| 64 | 0 | 0 |
| 65 | 1.0653 | 1.3431 |
| 66 | 19.5372 | 26.0496 |
| 67 | 0.002 | 0.001 |
| 68 | 0 | 0 |

 **Total Lines Losses in kW, kVAr, and in kVA are...**

 TotalkW TotalkVAr TotalkVA

 **71.1381 78.7572 106.1288**

**Before and After reconfiguration bus voltages:**

|  |  |  |
| --- | --- | --- |
| Bus No. | Before Reconfiguration Voltage(kv) | After Reconfiguration Voltage (Kv) |
| 1 | 12.66 | 12.66 |
| 2 | 12.6596 | 12.6598 |
| 3 | 12.6592 | 12.6595 |
| 4 | 12.658 | 12.6589 |
| 5 | 12.6476 | 12.6544 |
| 6 | 12.5345 | 12.6064 |
| 7 | 12.4168 | 12.5565 |
| 8 | 12.3888 | 12.5448 |
| 9 | 12.3744 | 12.5392 |
| 10 | 12.3111 | 12.4696 |
| 11 | 12.2972 | 12.4543 |
| 12 | 12.2571 | 12.4086 |
| 13 | 12.2201 | 12.3632 |
| 14 | 12.1834 | 12.318 |
| 15 | 12.1471 | 12.273 |
| 16 | 12.1403 | 12.2647 |
| 17 | 12.1292 | 12.2505 |
| 18 | 12.129 | 12.2503 |
| 19 | 12.1232 | 12.2417 |
| 20 | 12.1194 | 12.2362 |
| 21 | 12.1133 | 12.2272 |
| 22 | 12.1132 | 12.227 |
| 23 | 12.1123 | 12.2248 |
| 24 | 12.1103 | 12.2199 |
| 25 | 12.1081 | 12.2114 |
| 26 | 12.1073 | 12.2079 |
| 27 | 12.107 | 12.2062 |
| 28 | 12.6591 | 12.6594 |
| 29 | 12.6582 | 12.6585 |
| 30 | 12.6566 | 12.657 |
| 31 | 12.6564 | 12.6567 |
| 32 | 12.655 | 12.6554 |
| 33 | 12.6518 | 12.6521 |
| 34 | 12.6475 | 12.6479 |
| 35 | 12.6467 | 12.647 |
| 36 | 12.6573 | 12.6582 |
| 37 | 12.6416 | 12.6424 |
| 38 | 12.5929 | 12.5938 |
| 39 | 12.586 | 12.5869 |
| 40 | 12.3883 | 12.5444 |
| 41 | 12.3882 | 12.5442 |
| 42 | 12.3391 | 12.5363 |
| 43 | 12.2981 | 12.5329 |
| 44 | 12.2414 | 12.5291 |
| 45 | 12.1861 | 12.526 |
| 46 | 11.9016 | 12.5102 |
| 47 | 11.7616 | 12.5024 |
| 48 | 11.7074 | 12.4994 |
| 49 | 11.6438 | 12.4994 |
| 50 | 11.5502 | 12.6425 |
| 51 | 11.5465 | 12.6375 |
| 52 | 11.5416 | 12.6155 |
| 53 | 11.5176 | 12.5832 |
| 54 | 11.5103 | 12.5821 |
| 55 | 12.2964 | 12.4543 |
| 56 | 12.2964 | 12.4529 |
| 57 | 12.253 | 12.4086 |
| 58 | 12.2529 | 12.4086 |
| 59 | 12.659 | 12.6406 |
| 60 | 12.6568 | 12.6395 |
| 61 | 12.6548 | 12.6393 |
| 62 | 12.6542 | 12.6392 |
| 63 | 12.6542 | 12.6366 |
| 64 | 12.6454 | 12.6366 |
| 65 | 12.6417 | 12.2061 |
| 66 | 12.6412 | 12.2047 |
| 67 | 12.6411 | 12.2047 |
| 68 | 12.6398 | 12.1875 |
| 69 | 12.6398 | 12.181 |