

Project:
Location:
Contract:
Engineer:
Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 1
Date: 05-05-2010
SN: KLGCONSULT
Revision: Base
Config.: Normal

Electrical Transient Analyzer Program

ETAP PowerStation

Load Flow Analysis

Loading Category: Design

Load Diversity Factor: None

| | <u>Swing</u> | <u>Generator</u> | <u>Load</u> | <u>Total</u> |
|------------------|--------------|------------------|-------------|--------------|
| Number of Buses: | 1 | 0 | 60 | 61 |

| | <u>XFMR2</u> | <u>XFMR3</u> | <u>Reactor</u> | <u>Line/Cable</u> | <u>Impedance</u> | <u>Tie PD</u> | <u>Total</u> |
|---------------------|--------------|--------------|----------------|-------------------|------------------|---------------|--------------|
| Number of Branches: | 19 | 0 | 0 | 48 | 0 | 0 | 67 |

Method of Solution: Newton-Raphson Method

Maximum No. of Iteration: 9999

Precision of Solution: 0.000001

System Frequency: 50.00

Unit System: Metric

Project Filename: ramallah_max_taps

Output Filename: C:\ETAP 400\PowerStation\Ramallah\Untitled.lf1

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 2
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

BUS Input Data

| Bus | | Initial Voltage | | | Generator | | Motor Load | | Static Load | | Mvar Limits | |
|-----------------------|------|-----------------|--------|------|-----------|------|------------|-------|-------------|-------|-------------|------|
| ID | Type | kV | % Mag. | Ang. | MW | Mvar | MW | Mvar | MW | Mvar | Max. | Min. |
| Abu Qash | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| Abu Shukheidim | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| 'Ajjul | Load | 11.000 | 100.0 | 0.0 | | | 0.302 | 0.146 | 0.454 | 0.220 | | |
| Al Mazra'a El Qibleya | Load | 11.000 | 100.0 | 0.0 | | | 0.277 | 0.134 | 0.416 | 0.201 | | |
| Al Mazra'a El Qiblya | Load | 0.400 | 100.0 | 0.0 | | | 0.274 | 0.133 | 0.410 | 0.199 | | |
| al moalemen | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| al moalmen* | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| al tahona | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| al terah | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| A'tara | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| beiten central | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| beiten central* | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| beiten west | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| beiten west* | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| Bus1 | Load | 6.600 | 100.0 | 0.0 | | | 0.756 | 0.366 | 1.134 | 0.549 | | |
| Bus2 | Load | 11.000 | 100.0 | 0.0 | | | 2.412 | 1.168 | 3.618 | 1.752 | | |
| Bus3 | Load | 11.000 | 100.0 | 0.0 | | | 2.448 | 1.186 | 3.672 | 1.778 | | |
| Bus4 | Load | 11.000 | 100.0 | 0.0 | | | 4.248 | 2.057 | 6.372 | 3.086 | | |
| Bus5 | Load | 11.000 | 100.0 | 0.0 | | | 1.080 | 0.523 | 1.620 | 0.785 | | |
| Bus6 | Load | 11.000 | 100.0 | 0.0 | | | 1.080 | 0.523 | 1.620 | 0.785 | | |
| Bus7 | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| Bus8 | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| Bus9 | Load | 11.000 | 100.0 | 0.0 | | | 1.895 | 0.918 | 2.843 | 1.377 | | |
| Bus10 | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| Bus17 | Load | 0.400 | 100.0 | 0.0 | | | 0.158 | 0.077 | 0.238 | 0.115 | | |
| Bus18 | Load | 0.400 | 100.0 | 0.0 | | | 0.154 | 0.075 | 0.231 | 0.112 | | |
| Bus19 | Load | 0.400 | 100.0 | 0.0 | | | 0.101 | 0.049 | 0.151 | 0.073 | | |
| Bus24 | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| Bus25 | Load | 11.000 | 100.0 | 0.0 | | | 0.360 | 0.174 | 0.540 | 0.262 | | |
| Bus27 | Load | 0.400 | 100.0 | 0.0 | | | 0.162 | 0.078 | 0.243 | 0.118 | | |
| Bus28 | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| Bus31 | Load | 0.400 | 100.0 | 0.0 | | | 0.173 | 0.084 | 0.259 | 0.126 | | |
| Bus33 | Load | 0.400 | 100.0 | 0.0 | | | 0.104 | 0.051 | 0.157 | 0.076 | | |
| Bus35 | Load | 11.000 | 100.0 | 0.0 | | | 0.504 | 0.244 | 0.756 | 0.366 | | |
| Bus36 | Load | 0.400 | 100.0 | 0.0 | | | 0.096 | 0.046 | 0.144 | 0.070 | | |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 3
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

| Bus | | Initial Voltage | | | Generator | | Motor Load | | Static Load | | Mvar Limits | |
|---------------------------|-------|-----------------|--------|------|-----------|------|------------|-------|-------------|--------|-------------|--------|
| ID | Type | kV | % Mag. | Ang. | MW | Mvar | MW | Mvar | MW | Mvar | Max. | Min. |
| Bus37 | Load | 0.400 | 100.0 | 0.0 | | | 0.100 | 0.048 | 0.150 | 0.072 | | |
| connection bus al terah | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| connection bus for al ram | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| connection bus ramallah | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| Deir Abu Mash'al | Load | 11.000 | 100.0 | 0.0 | | | 0.310 | 0.150 | 0.465 | 0.225 | | |
| Deir Dibwan | Load | 11.000 | 100.0 | 0.0 | | | 1.321 | 0.640 | 1.982 | 0.960 | | |
| Deir Ibzi' | Load | 11.000 | 100.0 | 0.0 | | | 0.216 | 0.105 | 0.324 | 0.157 | | |
| Deir Nidham | Load | 11.000 | 100.0 | 0.0 | | | 0.237 | 0.115 | 0.356 | 0.172 | | |
| Deir Qaddis | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| 'Ein Arik | Load | 11.000 | 100.0 | 0.0 | | | 0.180 | 0.087 | 0.270 | 0.131 | | |
| El Mazra'a El Sharqeya | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| israel main bus | Swing | 33.000 | 100.0 | 0.0 | | | | | | | | |
| Jammala | Load | 11.000 | 100.0 | 0.0 | | | 0.209 | 0.101 | 0.313 | 0.152 | | |
| kafr 'Aqab | Load | 11.000 | 100.0 | 0.0 | | | 0.911 | 0.441 | 1.366 | 0.662 | | |
| Kafr Ni'ma | Load | 11.000 | 100.0 | 0.0 | | | 0.202 | 0.098 | 0.302 | 0.146 | | |
| Kfar Malik | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| Kharbat El Misbah | Load | 11.000 | 100.0 | 0.0 | | | 0.255 | 0.124 | 0.383 | 0.185 | | |
| Kober | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| ramallah north | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| ramallah north* | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| Ras Karkar | Load | 11.000 | 100.0 | 0.0 | | | 0.504 | 0.244 | 0.756 | 0.366 | | |
| silvana | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| silvana* | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| Sinjil | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| sivana** | Load | 33.000 | 100.0 | 0.0 | | | | | | | | |
| Umm Safah | Load | 11.000 | 100.0 | 0.0 | | | | | | | | |
| Total Number of Buses: 61 | | | | | | | 0.000 | 0.000 | 21.029 | 10.185 | 31.544 | 15.277 |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation
 4.0.0C
 Study Case: LF

Page: 4
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

LINE / CABLE Input Data

| Line/Cable | | Ohms or Mohs / 1000 m per Conductor (Cable) or per Phase (Line) | | | | | | |
|-------------------|---------|--|-----------|---------|--------|----------|----------|---|
| ID | Library | Size | Length(m) | #/Phase | T (°C) | R | X | Y |
| Cable1 | | | 2226.0 | 3 | 75 | 0.265000 | 0.352000 | |
| al ram | | | 2000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| al ram* | | | 1000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| al ram** | | | 1000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| beit eil | | | 2000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| en areek | | | 2000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line1 | | | 3000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line2 | | | 2700.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line3 | | | 10400.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line4 | | | 10400.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line6 | | | 8000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line7 | | | 2400.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line8 | | | 1200.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line9 | | | 1100.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line10 | | | 900.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line11 | | | 850.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line12 | | | 770.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line13 | | | 1650.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line14 | | | 1500.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line15 | | | 2230.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line16 | | | 1000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line17 | | | 920.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line18 | | | 1800.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line19 | | | 1220.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line20 | | | 1600.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line21 | | | 1250.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line22 | | | 1400.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line23 | | | 2100.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line24 | | | 3000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line25 | | | 2000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line26 | | | 1300.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line27 | | | 1200.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line52 | | | 1200.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line53 | | | 1400.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line54 | | | 1530.0 | 1 | 75 | 0.543000 | 0.352000 | |

Project:
Location:
Contract:
Engineer:
Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 5
Date: 05-05-2010
SN: KLGCONSULT
Revision: Base
Config.: Normal

| Line/Cable | Ohms or Mohs / 1000 m per Conductor (Cable) or per Phase (Line) | | | | | | | | |
|------------|---|---------|------|-----------|---------|--------|----------|----------|---|
| | ID | Library | Size | Length(m) | #/Phase | T (°C) | R | X | Y |
| Line55 | | | | 1120.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line56 | | | | 1223.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line57 | | | | 1230.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line58 | | | | 1430.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line59 | | | | 1420.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line61 | | | | 2223.0 | 1 | 75 | 0.543000 | 0.352000 | |
| Line62 | | | | 2765.0 | 1 | 75 | 0.543000 | 0.352000 | |
| offer | | | | 2000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| pereg | | | | 2000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| ramal | | | | 2000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| ramallah | | | | 2000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| ramallah* | | | | 1000.0 | 1 | 75 | 0.543000 | 0.352000 | |
| ramallah** | | | | 1000.0 | 1 | 75 | 0.543000 | 0.352000 | |

Line / Cable resistances are listed at the specified temperatures.

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 6
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

2-WINDING TRANSFORMER Input Data

| Transformer ID | Rating | | | % Z | X/R | Z Variation | | | % Tap Setting | | Adjusted | Phase Shift | |
|-------------------|--------|----------|---------|-------|------|-------------|------|--------|---------------|--------|----------|---------------|-------|
| | MVA | Prim. kV | Sec. kV | | | + 5% | - 5% | % Tol. | Prim. | Sec. | % Z | Type | Angle |
| T1 | 3.000 | 33.000 | 6.600 | 7.000 | 10.7 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T2 | 10.000 | 33.000 | 11.000 | 7.000 | 15.5 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T3 | 10.000 | 33.000 | 11.000 | 7.000 | 15.5 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T4 | 15.000 | 33.000 | 11.000 | 7.000 | 18.6 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T5 | 10.000 | 33.000 | 11.000 | 7.000 | 5.8 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T6 | 5.000 | 33.000 | 11.000 | 7.000 | 12.1 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T7 | 15.000 | 33.000 | 11.000 | 7.250 | 18.6 | 0 | 0 | 0 | 0 | 15.000 | 7.2500 | Std Pos. Seq. | 0.0 |
| T8 | 15.000 | 33.000 | 11.000 | 7.000 | 18.6 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T9 | 15.000 | 33.000 | 11.000 | 7.000 | 18.6 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T10 | 10.000 | 33.000 | 11.000 | 7.000 | 15.5 | 0 | 0 | 0 | 0 | 15.000 | 7.0000 | Std Pos. Seq. | 0.0 |
| T11 | 1.000 | 11.000 | 0.400 | 5.750 | 5.8 | 0 | 0 | 0 | 0 | 5.000 | 5.7500 | Std Pos. Seq. | 0.0 |
| T12 | 0.630 | 11.000 | 0.400 | 5.750 | 5.8 | 0 | 0 | 0 | 0 | 5.000 | 5.7500 | Std Pos. Seq. | 0.0 |
| T13 | 0.630 | 11.000 | 0.400 | 5.750 | 5.8 | 0 | 0 | 0 | 0 | 5.000 | 5.7500 | Std Pos. Seq. | 0.0 |
| T14 | 0.400 | 11.000 | 0.400 | 5.200 | 5.1 | 0 | 0 | 0 | 0 | 5.000 | 5.2000 | Std Pos. Seq. | 0.0 |
| T15 | 0.630 | 11.000 | 0.400 | 5.750 | 5.8 | 0 | 0 | 0 | 0 | 5.000 | 5.7500 | Std Pos. Seq. | 0.0 |
| T16 | 0.400 | 11.000 | 0.400 | 5.200 | 5.1 | 0 | 0 | 0 | 0 | 5.000 | 5.2000 | Std Pos. Seq. | 0.0 |
| T17 | 0.630 | 11.000 | 0.400 | 5.750 | 5.8 | 0 | 0 | 0 | 0 | 5.000 | 5.7500 | Std Pos. Seq. | 0.0 |
| T18 | 0.400 | 11.000 | 0.400 | 5.200 | 5.1 | 0 | 0 | 0 | 0 | 5.000 | 5.2000 | Std Pos. Seq. | 0.0 |
| T19 | 0.400 | 11.000 | 0.400 | 5.200 | 5.1 | 0 | 0 | 0 | 0 | 5.000 | 5.2000 | Std Pos. Seq. | 0.0 |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 7
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

BRANCH CONNECTIONS

| CKT/Branch | | Connected Bus ID | | % Impedance, Pos. Seq., 100 MVAb | | | |
|------------|---------|---------------------------|---------------------------|----------------------------------|---------|---------|---|
| ID | Type | From Bus | To Bus | R | X | Z | Y |
| T1 | 2W XFMR | beiten central | Bus1 | 25.04 | 267.16 | 268.33 | |
| T2 | 2W XFMR | beiten west* | Bus2 | 5.18 | 80.33 | 80.50 | |
| T3 | 2W XFMR | al tahona | Bus3 | 5.18 | 80.33 | 80.50 | |
| T4 | 2W XFMR | ramallah north* | Bus4 | 2.88 | 53.59 | 53.67 | |
| T5 | 2W XFMR | ramallah north | Bus5 | 13.70 | 79.33 | 80.50 | |
| T6 | 2W XFMR | al terah | Bus6 | 13.22 | 160.46 | 161.00 | |
| T7 | 2W XFMR | silvana | Bus7 | 2.98 | 55.50 | 55.58 | |
| T8 | 2W XFMR | silvana* | Bus8 | 2.88 | 53.59 | 53.67 | |
| T9 | 2W XFMR | al moalemen | Bus9 | 2.88 | 53.59 | 53.67 | |
| T10 | 2W XFMR | al moalmen* | Bus10 | 5.18 | 80.33 | 80.50 | |
| T11 | 2W XFMR | Abu Qash | Al Mazra'a El Qiblya | 102.75 | 594.94 | 603.75 | |
| T12 | 2W XFMR | Kober | Bus17 | 163.10 | 944.35 | 958.33 | |
| T13 | 2W XFMR | A'tara | Bus18 | 163.10 | 944.35 | 958.33 | |
| T14 | 2W XFMR | Umm Safah | Bus19 | 262.65 | 1339.49 | 1365.00 | |
| T15 | 2W XFMR | Kfar Malik | Bus27 | 163.10 | 944.35 | 958.33 | |
| T16 | 2W XFMR | Bus28 | Bus36 | 262.65 | 1339.49 | 1365.00 | |
| T17 | 2W XFMR | Ras Karkar | Bus31 | 163.10 | 944.35 | 958.33 | |
| T18 | 2W XFMR | El Mazra'a El Sharqeya | Bus33 | 262.65 | 1339.49 | 1365.00 | |
| T19 | 2W XFMR | Deir Qaddis | Bus37 | 262.65 | 1339.49 | 1365.00 | |
| Cable1 | Cable | ramallah north | al tahona | 1.81 | 2.40 | 3.00 | |
| al ram | Line | israel main bus | connection bus for al ram | 9.97 | 6.46 | 11.88 | |
| al ram* | Line | connection bus for al ram | al tahona | 4.99 | 3.23 | 5.94 | |
| al ram** | Line | connection bus for al ram | al moalmen* | 4.99 | 3.23 | 5.94 | |
| beit eil | Line | israel main bus | beiten west* | 9.97 | 6.46 | 11.88 | |
| en areek | Line | israel main bus | silvana* | 9.97 | 6.46 | 11.88 | |
| Line1 | Line | beiten west | beiten central | 14.96 | 9.70 | 17.83 | |
| Line2 | Line | ramallah north | beiten west | 13.46 | 8.73 | 16.04 | |
| Line3 | Line | ramallah north* | silvana | 51.86 | 33.62 | 61.80 | |
| Line4 | Line | ramallah north* | sivana** | 51.86 | 33.62 | 61.80 | |
| Line6 | Line | ramallah north* | connection bus al terah | 39.89 | 25.86 | 47.54 | |
| Line7 | Line | sivana** | connection bus al terah | 11.97 | 7.76 | 14.26 | |
| Line8 | Line | connection bus al terah | al terah | 5.98 | 3.88 | 7.13 | |
| Line9 | Line | Bus5 | Abu Qash | 49.36 | 32.00 | 58.83 | |
| Line10 | Line | Abu Qash | Abu Shukheidim | 40.39 | 26.18 | 48.13 | |
| Line11 | Line | Abu Shukheidim | Kober | 38.14 | 24.73 | 45.46 | |
| Line12 | Line | Abu Shukheidim | A'tara | 34.55 | 22.40 | 41.18 | |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 8
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

| CKT/Branch | | Connected Bus ID | | % Impedance, Pos. Seq., 100 MVAb | | | |
|------------|------|-------------------------|-------------------------|----------------------------------|-------|--------|---|
| ID | Type | From Bus | To Bus | R | X | Z | Y |
| Line13 | Line | A'tara | Umm Safah | 74.05 | 48.00 | 88.24 | |
| Line14 | Line | Umm Safah | 'Ajjul | 67.31 | 43.64 | 80.22 | |
| Line15 | Line | Bus7 | kafr 'Aqab | 100.07 | 64.87 | 119.26 | |
| Line16 | Line | Bus8 | Deir Dibwan | 44.88 | 29.09 | 53.48 | |
| Line17 | Line | Deir Dibwan | Sinjil | 41.29 | 26.76 | 49.20 | |
| Line18 | Line | kafr 'Aqab | Bus25 | 80.78 | 52.36 | 96.26 | |
| Line19 | Line | kafr 'Aqab | Bus24 | 54.75 | 35.49 | 65.25 | |
| Line20 | Line | Bus24 | Kfar Malik | 71.80 | 46.55 | 85.57 | |
| Line21 | Line | A'tara | Bus24 | 56.10 | 36.36 | 66.85 | |
| Line22 | Line | Sinjil | Bus28 | 62.83 | 40.73 | 74.87 | |
| Line23 | Line | Ras Karkar | Sinjil | 94.24 | 61.09 | 112.31 | |
| Line24 | Line | Sinjil | 'Ajjul | 134.63 | 87.27 | 160.44 | |
| Line25 | Line | Sinjil | El Mazra'a El Sharqeya | 89.75 | 58.18 | 106.96 | |
| Line26 | Line | Sinjil | Bus35 | 58.34 | 37.82 | 69.52 | |
| Line27 | Line | Ras Karkar | Deir Qaddis | 53.85 | 34.91 | 64.18 | |
| Line52 | Line | Bus10 | 'Ein Arik | 53.85 | 34.91 | 64.18 | |
| Line53 | Line | 'Ein Arik | Deir Ibzi' | 62.83 | 40.73 | 74.87 | |
| Line54 | Line | Deir Ibzi' | Kharbat El Misbah | 68.66 | 44.51 | 81.82 | |
| Line55 | Line | Kharbat El Misbah | Deir Nidham | 50.26 | 32.58 | 59.90 | |
| Line56 | Line | Deir Nidham | Deir Abu Mash'al | 54.88 | 35.58 | 65.41 | |
| Line57 | Line | Deir Abu Mash'al | Jammala | 55.20 | 35.78 | 65.78 | |
| Line58 | Line | Al Mazra'a El Qibleya | Jammala | 64.17 | 41.60 | 76.48 | |
| Line59 | Line | Kafr Ni'ma | Al Mazra'a El Qibleya | 63.72 | 41.31 | 75.94 | |
| Line61 | Line | Bus10 | Ras Karkar | 99.76 | 64.67 | 118.89 | |
| Line62 | Line | Bus9 | Kafr Ni'ma | 124.08 | 80.44 | 147.87 | |
| offer | Line | israel main bus | silvana* | 9.97 | 6.46 | 11.88 | |
| pereg | Line | israel main bus | sivana** | 9.97 | 6.46 | 11.88 | |
| rama1 | Line | israel main bus | beiten central* | 9.97 | 6.46 | 11.88 | |
| ramallah | Line | israel main bus | connection bus ramallah | 9.97 | 6.46 | 11.88 | |
| ramallah* | Line | connection bus ramallah | silvana | 4.99 | 3.23 | 5.94 | |
| ramallah** | Line | connection bus ramallah | al moalemen | 4.99 | 3.23 | 5.94 | |

Project:
Location:
Contract:
Engineer:
Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 9
Date: 05-05-2010
SN: KLGCONSULT
Revision: Base
Config.: Normal

EQUIPMENT CABLE Input Data

| Equipment Cable | | Equipment | | ohms / 1000 m per Conductor | | | | | | | O/L |
|------------------------|----|------------------|---------|------------------------------------|------|------|--------|---|---|---|-------------------|
| ID | ID | Type | Library | Size | L(m) | #/ph | T (°C) | R | X | Y | Heater R (ohm) |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 10
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

LOAD FLOW REPORT

| Bus | | Voltage | | Generation | | Motor Load | | Static Load | | Load Flow | | | | XFMR | |
|-----------------------|--------|---------|------|------------|------|------------|------|-------------|------|---------------------------|--------|-------|------|-------|--------|
| ID | kV | %Mag. | Ang. | MW | Mvar | MW | Mvar | MW | Mvar | ID | MW | Mvar | Amp | %PF | % Tap |
| Abu Qash | 11.000 | 106.588 | -2.1 | 0 | 0 | 0 | 0 | 0 | 0 | Bus5 | -1.76 | -1.12 | 102 | 84.3 | |
| | | | | | | | | | | Abu Shukheidim | 0.99 | 0.72 | 60 | 81.1 | |
| | | | | | | | | | | Al Mazra'a El Qiblya | 0.77 | 0.41 | 42 | 88.4 | |
| Abu Shukheidim | 11.000 | 106.036 | -2.1 | 0 | 0 | 0 | 0 | 0 | 0 | Abu Qash | -0.99 | -0.71 | 60 | 81.0 | |
| | | | | | | | | | | Kober | 0.44 | 0.23 | 24 | 88.5 | |
| | | | | | | | | | | A'tara | 0.54 | 0.48 | 35 | 75.0 | |
| 'Ajjul | 11.000 | 105.625 | -2.2 | 0 | 0 | 0.30 | 0.15 | 0.51 | 0.25 | Umm Safah | 0.00 | 0.14 | 7 | 3.1 | |
| | | | | | | | | | | Sinjil | -0.81 | -0.53 | 48 | 83.5 | |
| Al Mazra'a El Qibleya | 11.000 | 104.597 | -2.6 | 0 | 0 | 0.28 | 0.13 | 0.45 | 0.22 | Jammala | 0.99 | 0.54 | 56 | 88.0 | |
| | | | | | | | | | | Kafr Ni'ma | -1.73 | -0.89 | 97 | 88.8 | |
| Al Mazra'a El Qiblya | 0.400 | 108.980 | -4.1 | 0 | 0 | 0.27 | 0.13 | 0.49 | 0.24 | Abu Qash | -0.76 | -0.37 | 1119 | 90.0 | 5.000 |
| al moalemen | 33.000 | 97.400 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | connection bus ramallah | -7.69 | -4.16 | 157 | 87.9 | |
| | | | | | | | | | | Bus9 | 7.69 | 4.16 | 157 | 87.9 | |
| al moalmen* | 33.000 | 97.083 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | connection bus for al ram | -4.80 | -2.62 | 98 | 87.8 | |
| | | | | | | | | | | Bus10 | 4.80 | 2.62 | 98 | 87.8 | |
| al tahona | 33.000 | 96.458 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | ramallah north | 6.85 | 3.95 | 143 | 86.7 | |
| | | | | | | | | | | connection bus for al ram | -13.58 | -7.64 | 282 | 87.2 | |
| | | | | | | | | | | Bus3 | 6.73 | 3.69 | 139 | 87.7 | |
| al terah | 33.000 | 97.004 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | connection bus al terah | -3.00 | -1.62 | 61 | 88.0 | |
| | | | | | | | | | | Bus6 | 3.00 | 1.62 | 61 | 88.0 | |
| A'tara | 11.000 | 105.758 | -2.0 | 0 | 0 | 0 | 0 | 0 | 0 | Abu Shukheidim | -0.54 | -0.48 | 35 | 74.9 | |
| | | | | | | | | | | Umm Safah | 0.28 | 0.00 | 13 | 100.0 | |
| | | | | | | | | | | Bus24 | -0.16 | 0.25 | 14 | -54.7 | |
| | | | | | | | | | | Bus18 | 0.43 | 0.23 | 24 | 88.6 | |
| beiten central | 33.000 | 95.405 | -0.2 | 0 | 0 | 0 | 0 | 0 | 0 | beiten west | -2.05 | -1.12 | 42 | 87.6 | |
| | | | | | | | | | | Bus1 | 2.05 | 1.12 | 42 | 87.6 | |
| beiten central* | 33.000 | 100.000 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | israel main bus | | | | | |
| beiten west | 33.000 | 95.840 | -0.2 | 0 | 0 | 0 | 0 | 0 | 0 | beiten central | 2.06 | 1.13 | 42 | 87.6 | |
| | | | | | | | | | | ramallah north | -2.06 | -1.13 | 42 | 87.6 | |
| beiten west* | 33.000 | 99.064 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | israel main bus | -6.87 | -3.75 | 138 | 87.8 | |
| | | | | | | | | | | Bus2 | 6.87 | 3.75 | 138 | 87.8 | |
| Bus1 | 6.600 | 106.169 | -3.2 | 0 | 0 | 0.76 | 0.37 | 1.28 | 0.62 | beiten central | -2.03 | -0.99 | 186 | 90.0 | 15.000 |
| Bus2 | 11.000 | 110.654 | -2.8 | 0 | 0 | 2.41 | 1.17 | 4.43 | 2.15 | beiten west* | -6.84 | -3.31 | 360 | 90.0 | 15.000 |
| Bus3 | 11.000 | 107.630 | -3.0 | 0 | 0 | 2.45 | 1.19 | 4.25 | 2.06 | al tahona | -6.70 | -3.25 | 363 | 90.0 | 15.000 |
| Bus4 | 11.000 | 105.596 | -3.6 | 0 | 0 | 4.25 | 2.06 | 7.11 | 3.44 | ramallah north* | -11.35 | -5.50 | 627 | 90.0 | 15.000 |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 11
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

| Bus | Voltage | | Generation | | Motor Load | | Static Load | | Load Flow | | | | | | XFMR | |
|---------------------------|---------|--------|------------|------|------------|------|-------------|------|-----------|------|------------------------|--------|--------|-----|--------|--------|
| | ID | kV | %Mag. | Ang. | MW | Mvar | MW | Mvar | MW | Mvar | ID | MW | Mvar | Amp | %PF | % Tap |
| Bus5 | | 11.000 | 107.739 | -2.1 | 0 | 0 | 1.08 | 0.52 | 1.88 | 0.91 | Abu Qash | 1.78 | 1.13 | 102 | 84.3 | |
| | | | | | | | | | | | ramallah north | -4.74 | -2.57 | 262 | 87.9 | 15.000 |
| Bus6 | | 11.000 | 108.568 | -2.6 | 0 | 0 | 1.08 | 0.52 | 1.91 | 0.92 | al terah | -2.99 | -1.45 | 160 | 90.0 | 15.000 |
| Bus7 | | 11.000 | 110.882 | -1.4 | 0 | 0 | 0 | 0 | 0 | 0 | kafr 'Aqab | 4.20 | 1.75 | 215 | 92.3 | |
| | | | | | | | | | | | silvana | -4.20 | -1.75 | 215 | 92.3 | 15.000 |
| Bus8 | | 11.000 | 112.294 | -1.9 | 0 | 0 | 0 | 0 | 0 | 0 | Deir Dibwan | 6.90 | 3.47 | 361 | 89.4 | |
| | | | | | | | | | | | silvana* | -6.90 | -3.47 | 361 | 89.4 | 15.000 |
| Bus9 | | 11.000 | 109.570 | -2.3 | 0 | 0 | 1.90 | 0.92 | 3.41 | 1.65 | Kafr Ni'ma | 2.36 | 1.22 | 127 | 88.9 | |
| | | | | | | | | | | | al moalemen | -7.67 | -3.79 | 409 | 89.7 | 15.000 |
| Bus10 | | 11.000 | 109.287 | -2.1 | 0 | 0 | 0 | 0 | 0 | 0 | 'Ein Arik | 2.84 | 1.34 | 150 | 90.5 | |
| | | | | | | | | | | | Ras Karkar | 1.95 | 1.06 | 106 | 87.8 | |
| | | | | | | | | | | | al moalmen* | -4.78 | -2.40 | 256 | 89.4 | 15.000 |
| Bus17 | | 0.400 | 108.424 | -4.0 | 0 | 0 | 0.16 | 0.08 | 0.28 | 0.14 | Kober | -0.44 | -0.21 | 647 | 90.0 | 5.000 |
| Bus18 | | 0.400 | 108.430 | -3.9 | 0 | 0 | 0.15 | 0.07 | 0.27 | 0.13 | A'tara | -0.43 | -0.21 | 629 | 90.0 | 5.000 |
| Bus19 | | 0.400 | 108.335 | -3.8 | 0 | 0 | 0.10 | 0.05 | 0.18 | 0.09 | Umm Safah | -0.28 | -0.13 | 411 | 90.0 | 5.000 |
| Bus24 | | 11.000 | 105.759 | -1.9 | 0 | 0 | 0 | 0 | 0 | 0 | kafr 'Aqab | -0.61 | 0.01 | 30 | -100.0 | |
| | | | | | | | | | | | Kfar Malik | 0.45 | 0.24 | 25 | 88.5 | |
| | | | | | | | | | | | A'tara | 0.16 | -0.25 | 14 | -54.8 | |
| Bus25 | | 11.000 | 105.106 | -1.9 | 0 | 0 | 0.36 | 0.17 | 0.60 | 0.29 | kafr 'Aqab | -0.96 | -0.46 | 53 | 90.0 | |
| Bus27 | | 0.400 | 107.867 | -3.9 | 0 | 0 | 0.16 | 0.08 | 0.28 | 0.14 | Kfar Malik | -0.44 | -0.22 | 661 | 90.0 | 5.000 |
| Bus28 | | 11.000 | 106.889 | -2.2 | 0 | 0 | 0 | 0 | 0 | 0 | Sinjil | -0.27 | -0.14 | 14 | 88.8 | |
| | | | | | | | | | | | Bus36 | 0.27 | 0.14 | 14 | 88.8 | |
| Bus31 | | 0.400 | 109.279 | -4.3 | 0 | 0 | 0.17 | 0.08 | 0.31 | 0.15 | Ras Karkar | -0.48 | -0.23 | 707 | 90.0 | 5.000 |
| Bus33 | | 0.400 | 109.505 | -3.9 | 0 | 0 | 0.10 | 0.05 | 0.19 | 0.09 | El Mazra'a El Sharqeya | -0.29 | -0.14 | 427 | 90.0 | 5.000 |
| Bus35 | | 11.000 | 106.123 | -2.2 | 0 | 0 | 0.50 | 0.24 | 0.85 | 0.41 | Sinjil | -1.36 | -0.66 | 74 | 90.0 | |
| Bus36 | | 0.400 | 109.846 | -3.8 | 0 | 0 | 0.10 | 0.05 | 0.17 | 0.08 | Bus28 | -0.27 | -0.13 | 392 | 90.0 | 5.000 |
| Bus37 | | 0.400 | 109.540 | -3.9 | 0 | 0 | 0.10 | 0.05 | 0.18 | 0.09 | Deir Qaddis | -0.28 | -0.14 | 408 | 90.0 | 5.000 |
| connection bus al terah | | 33.000 | 97.254 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | ramallah north* | 3.89 | 2.15 | 79 | 87.5 | |
| | | | | | | | | | | | sivana** | -6.90 | -3.78 | 141 | 87.7 | |
| | | | | | | | | | | | al terah | 3.01 | 1.63 | 61 | 88.0 | |
| connection bus for al ram | | 33.000 | 97.416 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | israel main bus | -18.53 | -10.35 | 381 | 87.3 | |
| | | | | | | | | | | | al tabona | 13.71 | 7.72 | 282 | 87.1 | |
| | | | | | | | | | | | al moalmen* | 4.81 | 2.63 | 98 | 87.7 | |
| connection bus ramallah | | 33.000 | 97.932 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | israel main bus | -15.16 | -7.94 | 305 | 88.6 | |
| | | | | | | | | | | | silvana | 7.43 | 3.75 | 148 | 89.3 | |
| | | | | | | | | | | | al moalemen | 7.73 | 4.19 | 157 | 87.9 | |
| Deir Abu Mash'al | | 11.000 | 103.446 | -2.6 | 0 | 0 | 0.31 | 0.15 | 0.50 | 0.24 | Deir Nidham | -0.37 | -0.12 | 19 | 94.8 | |
| | | | | | | | | | | | Jammala | -0.44 | -0.27 | 26 | 85.4 | |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 12
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

| Bus ID | kV | Voltage | | Generation | | Motor Load | | Static Load | | Load Flow | | | | XFMR | |
|------------------------|--------|---------|------|------------|-------|------------|------|-------------|------|---------------------------|-------|-------|-----|--------|-------|
| | | %Mag. | Ang. | MW | Mvar | MW | Mvar | MW | Mvar | ID | MW | Mvar | Amp | %PF | % Tap |
| Deir Dibwan | 11.000 | 108.638 | -2.1 | 0 | 0 | 1.32 | 0.64 | 2.34 | 1.13 | Bus8 | -6.69 | -3.33 | 361 | 89.5 | |
| | | | | | | | | | | Sinjil | 3.03 | 1.56 | 164 | 88.9 | |
| Deir Ibzi' | 11.000 | 105.714 | -2.4 | 0 | 0 | 0.22 | 0.10 | 0.36 | 0.18 | 'Ein Arik | -2.26 | -1.05 | 123 | 90.8 | |
| | | | | | | | | | | Kharbat El Misbah | 1.69 | 0.77 | 91 | 91.0 | |
| Deir Nidham | 11.000 | 103.683 | -2.6 | 0 | 0 | 0.24 | 0.11 | 0.38 | 0.19 | Kharbat El Misbah | -0.99 | -0.42 | 54 | 91.9 | |
| | | | | | | | | | | Deir Abu Mash'al | 0.37 | 0.12 | 19 | 94.8 | |
| Deir Qaddis | 11.000 | 106.692 | -2.2 | 0 | 0 | 0 | 0 | 0 | 0 | Ras Karkar | -0.28 | -0.15 | 15 | 88.7 | |
| | | | | | | | | | | Bus37 | 0.28 | 0.15 | 15 | 88.7 | |
| 'Ein Arik | 11.000 | 107.464 | -2.3 | 0 | 0 | 0.18 | 0.09 | 0.31 | 0.15 | Bus10 | -2.79 | -1.31 | 150 | 90.6 | |
| | | | | | | | | | | Deir Ibzi' | 2.30 | 1.07 | 123 | 90.7 | |
| El Mazra'a El Sharqeya | 11.000 | 106.771 | -2.2 | 0 | 0 | 0 | 0 | 0 | 0 | Sinjil | -0.29 | -0.15 | 16 | 88.6 | |
| | | | | | | | | | | Bus33 | 0.29 | 0.15 | 16 | 88.6 | |
| * israel main bus | 33.000 | 100.000 | 0.0 | 60.13 | 32.87 | 0 | 0 | 0 | 0 | connection bus for al ram | 19.00 | 10.66 | 381 | 87.2 | |
| | | | | | | | | | | beiten west* | 6.93 | 3.79 | 138 | 87.7 | |
| | | | | | | | | | | silvana* | 3.47 | 1.89 | 69 | 87.8 | |
| | | | | | | | | | | silvana* | 3.47 | 1.89 | 69 | 87.8 | |
| | | | | | | | | | | sivana** | 11.79 | 6.50 | 235 | 87.6 | |
| | | | | | | | | | | beiten central* | | | | | |
| Jammala | 11.000 | 103.773 | -2.6 | 0 | 0 | 0.21 | 0.10 | 0.34 | 0.16 | Deir Abu Mash'al | 0.44 | 0.27 | 26 | 85.4 | |
| | | | | | | | | | | Al Mazra'a El Qibleya | -0.99 | -0.53 | 56 | 88.0 | |
| Kafr 'Aqab | 11.000 | 106.072 | -1.8 | 0 | 0 | 0.91 | 0.44 | 1.54 | 0.74 | Bus7 | -4.03 | -1.64 | 215 | 92.6 | |
| | | | | | | | | | | Bus25 | 0.96 | 0.47 | 53 | 90.0 | |
| | | | | | | | | | | Bus24 | 0.62 | -0.01 | 30 | -100.0 | |
| Kafr Ni'ma | 11.000 | 106.001 | -2.5 | 0 | 0 | 0.20 | 0.10 | 0.34 | 0.16 | Al Mazra'a El Qibleya | 1.75 | 0.91 | 97 | 88.8 | |
| | | | | | | | | | | Bus9 | -2.29 | -1.17 | 127 | 89.1 | |
| Kfar Malik | 11.000 | 105.349 | -2.0 | 0 | 0 | 0 | 0 | 0 | 0 | Bus24 | -0.45 | -0.24 | 25 | 88.5 | |
| | | | | | | | | | | Bus27 | 0.45 | 0.24 | 25 | 88.5 | |
| Kharbat El Misbah | 11.000 | 104.296 | -2.5 | 0 | 0 | 0.26 | 0.12 | 0.42 | 0.20 | Deir Ibzi' | -1.67 | -0.75 | 91 | 91.1 | |
| | | | | | | | | | | Deir Nidham | 0.99 | 0.43 | 54 | 91.9 | |
| Kober | 11.000 | 105.823 | -2.1 | 0 | 0 | 0 | 0 | 0 | 0 | Abu Shukheidim | -0.44 | -0.23 | 24 | 88.5 | |
| | | | | | | | | | | Bus17 | 0.44 | 0.23 | 24 | 88.5 | |
| ramallah north | 33.000 | 96.232 | -0.2 | 0 | 0 | 0 | 0 | 0 | 0 | al tahona | -6.84 | -3.93 | 143 | 86.7 | |
| | | | | | | | | | | beiten west | 2.06 | 1.14 | 42 | 87.6 | |
| | | | | | | | | | | Bus5 | 4.78 | 2.80 | 100 | 86.3 | |
| ramallah north* | 33.000 | 95.088 | -0.2 | 0 | 0 | 0 | 0 | 0 | 0 | silvana | -3.12 | -1.82 | 66 | 86.4 | |
| | | | | | | | | | | sivana** | -4.48 | -2.46 | 94 | 87.6 | |
| | | | | | | | | | | connection bus al terah | -3.80 | -2.10 | 79 | 87.6 | |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 13
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

| Bus | | Voltage | | Generation | | Motor Load | | Static Load | | Load Flow | | | | XFMR | |
|------------|--------|---------|------|------------|------|------------|------|-------------|------|-------------------------|--------|-------|-----|-------|-------|
| ID | kV | %Mag. | Ang. | MW | Mvar | MW | Mvar | MW | Mvar | ID | MW | Mvar | Amp | %PF | % Tap |
| Ras Karkar | 11.000 | 106.882 | -2.2 | 0 | 0 | 0.50 | 0.24 | 0.86 | 0.42 | Bus4 | 11.40 | 6.38 | 240 | 87.3 | |
| | | | | | | | | | | Sinjil | -0.23 | -0.03 | 11 | 99.2 | |
| | | | | | | | | | | Deir Qaddis | 0.28 | 0.15 | 15 | 88.7 | |
| | | | | | | | | | | Bus10 | -1.91 | -1.04 | 106 | 87.8 | |
| silvana | 33.000 | 97.430 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | ramallah north* | 3.19 | 1.87 | 66 | 86.3 | |
| | | | | | | | | | | connection bus ramallah | -7.39 | -3.73 | 148 | 89.3 | |
| | | | | | | | | | | Bus7 | 4.20 | 1.86 | 82 | 91.5 | |
| silvana* | 33.000 | 99.531 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | israel main bus | -3.46 | -1.88 | 69 | 87.9 | |
| | | | | | | | | | | israel main bus | -3.46 | -1.88 | 69 | 87.9 | |
| Sinjil | 11.000 | 107.102 | -2.2 | 0 | 0 | 0 | 0 | 0 | 0 | Bus8 | 6.92 | 3.76 | 138 | 87.9 | |
| | | | | | | | | | | Deir Dibwan | -2.99 | -1.53 | 164 | 89.0 | |
| | | | | | | | | | | Bus28 | 0.27 | 0.14 | 14 | 88.7 | |
| | | | | | | | | | | Ras Karkar | 0.23 | 0.03 | 11 | 99.1 | |
| | | | | | | | | | | 'Ajjul | 0.82 | 0.54 | 48 | 83.5 | |
| | | | | | | | | | | El Mazra'a El Sharqeya | 0.30 | 0.15 | 16 | 88.6 | |
| sivana** | 33.000 | 98.404 | -0.1 | 0 | 0 | 0 | 0 | 0 | 0 | ramallah north* | 4.63 | 2.56 | 94 | 87.5 | |
| | | | | | | | | | | connection bus al terah | 6.98 | 3.83 | 141 | 87.7 | |
| | | | | | | | | | | israel main bus | -11.61 | -6.39 | 235 | 87.6 | |
| Umm Safah | 11.000 | 105.563 | -2.1 | 0 | 0 | 0 | 0 | 0 | 0 | A'tara | -0.28 | 0.00 | 13 | 100.0 | |
| | | | | | | | | | | 'Ajjul | 0.00 | -0.14 | 7 | 3.0 | |
| | | | | | | | | | | Bus19 | 0.28 | 0.15 | 15 | 88.7 | |

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

Indicates a bus with a load mismatch of more than 0.1 MVA

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 14
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

BUS LOADING Summary Report

| Bus | | | Bus Total Load | | | | | |
|-----------------------|--------|-----------|-----------------------|-------|--------|------|---------|-----------|
| ID | kV | Rated Amp | MW | Mvar | MVA | % PF | Amp | % Loading |
| Abu Qash | 11.000 | | 1.759 | 1.122 | 2.086 | 84.3 | 102.73 | |
| Abu Shukheidim | 11.000 | | 0.986 | 0.713 | 1.216 | 81.0 | 60.21 | |
| 'Ajjul | 11.000 | | 0.813 | 0.535 | 0.973 | 83.5 | 48.35 | |
| Al Mazra'a El Qibleya | 11.000 | | 1.727 | 0.892 | 1.944 | 88.8 | 97.53 | |
| Al Mazra'a El Qiblya | 0.400 | | 0.761 | 0.369 | 0.846 | 90.0 | 1119.91 | |
| al moalemen | 33.000 | | 7.691 | 4.162 | 8.745 | 87.9 | 157.08 | |
| al moalmen* | 33.000 | | 4.797 | 2.621 | 5.466 | 87.8 | 98.50 | |
| al tahona | 33.000 | | 13.584 | 7.636 | 15.583 | 87.2 | 282.65 | |
| al terah | 33.000 | | 3.004 | 1.621 | 3.413 | 88.0 | 61.56 | |
| A'tara | 11.000 | | 0.706 | 0.479 | 0.853 | 82.7 | 42.34 | |
| beiten central | 33.000 | | 2.047 | 1.124 | 2.336 | 87.6 | 42.83 | |
| beiten central* | 33.000 | | | | | 0.0 | | |
| beiten west | 33.000 | | 2.056 | 1.130 | 2.346 | 87.6 | 42.83 | |
| beiten west* | 33.000 | | 6.870 | 3.750 | 7.827 | 87.8 | 138.23 | |
| Bus1 | 6.600 | | 2.034 | 0.985 | 2.260 | 90.0 | 186.23 | |
| Bus2 | 11.000 | | 6.842 | 3.314 | 7.602 | 90.0 | 360.59 | |
| Bus3 | 11.000 | | 6.702 | 3.246 | 7.446 | 90.0 | 363.13 | |
| Bus4 | 11.000 | | 11.353 | 5.499 | 12.615 | 90.0 | 627.01 | |
| Bus5 | 11.000 | | 4.738 | 2.568 | 5.389 | 87.9 | 262.55 | |
| Bus6 | 11.000 | | 2.990 | 1.448 | 3.322 | 90.0 | 160.58 | |
| Bus7 | 11.000 | | 4.197 | 1.752 | 4.548 | 92.3 | 215.28 | |
| Bus8 | 11.000 | | 6.903 | 3.469 | 7.725 | 89.4 | 361.08 | |
| Bus9 | 11.000 | | 7.671 | 3.787 | 8.555 | 89.7 | 409.78 | |
| Bus10 | 11.000 | | 4.782 | 2.399 | 5.350 | 89.4 | 256.96 | |
| Bus17 | 0.400 | | 0.438 | 0.212 | 0.486 | 90.0 | 647.45 | |
| Bus18 | 0.400 | | 0.426 | 0.206 | 0.473 | 90.0 | 629.80 | |
| Bus19 | 0.400 | | 0.278 | 0.135 | 0.309 | 90.0 | 411.92 | |
| Bus24 | 11.000 | | 0.614 | 0.250 | 0.663 | 92.6 | 32.91 | |
| Bus25 | 11.000 | | 0.957 | 0.463 | 1.063 | 90.0 | 53.07 | |
| Bus27 | 0.400 | | 0.445 | 0.215 | 0.494 | 90.0 | 661.23 | |
| Bus28 | 11.000 | | 0.271 | 0.141 | 0.305 | 88.8 | 15.00 | |
| Bus31 | 0.400 | | 0.482 | 0.234 | 0.536 | 90.0 | 707.86 | |
| Bus33 | 0.400 | | 0.292 | 0.142 | 0.325 | 90.0 | 427.92 | |
| Bus35 | 11.000 | | 1.355 | 0.656 | 1.506 | 90.0 | 74.48 | |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 15
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

| Bus | | | Bus Total Load | | | | | |
|---------------------------|--------|-----------|----------------|--------|--------|------|---------|-----------|
| ID | kV | Rated Amp | MW | Mvar | MVA | % PF | Amp | % Loading |
| Bus36 | 0.400 | | 0.269 | 0.130 | 0.299 | 90.0 | 392.85 | |
| Bus37 | 0.400 | | 0.279 | 0.135 | 0.310 | 90.0 | 408.77 | |
| connection bus al terah | 33.000 | | 6.897 | 3.776 | 7.863 | 87.7 | 141.45 | |
| connection bus for al ram | 33.000 | | 18.527 | 10.352 | 21.222 | 87.3 | 381.14 | |
| connection bus ramallah | 33.000 | | 15.160 | 7.937 | 17.112 | 88.6 | 305.70 | |
| Deir Abu Mash'al | 11.000 | | 0.807 | 0.391 | 0.897 | 90.0 | 45.52 | |
| Deir Dibwan | 11.000 | | 6.690 | 3.331 | 7.474 | 89.5 | 361.08 | |
| Deir Ibzi' | 11.000 | | 2.265 | 1.047 | 2.495 | 90.8 | 123.87 | |
| Deir Nidham | 11.000 | | 0.988 | 0.424 | 1.076 | 91.9 | 54.45 | |
| Deir Qaddis | 11.000 | | 0.281 | 0.147 | 0.317 | 88.7 | 15.61 | |
| 'Ein Arik | 11.000 | | 2.792 | 1.308 | 3.083 | 90.6 | 150.56 | |
| El Mazra'a El Sharqeya | 11.000 | | 0.295 | 0.154 | 0.332 | 88.6 | 16.34 | |
| israel main bus | 33.000 | | 60.135 | 32.868 | 68.531 | 87.7 | 1198.98 | |
| Jammala | 11.000 | | 0.987 | 0.533 | 1.122 | 88.0 | 56.74 | |
| kafr 'Aqab | 11.000 | | 4.029 | 1.654 | 4.355 | 92.5 | 215.50 | |
| Kafr Ni'ma | 11.000 | | 2.290 | 1.169 | 2.571 | 89.1 | 127.31 | |
| Kfar Malik | 11.000 | | 0.448 | 0.236 | 0.507 | 88.5 | 25.25 | |
| Kharbat El Misbah | 11.000 | | 1.666 | 0.753 | 1.828 | 91.1 | 91.99 | |
| Kober | 11.000 | | 0.441 | 0.232 | 0.498 | 88.5 | 24.72 | |
| ramallah north | 33.000 | | 6.842 | 3.932 | 7.891 | 86.7 | 143.47 | |
| ramallah north* | 33.000 | | 11.400 | 6.378 | 13.063 | 87.3 | 240.35 | |
| Ras Karkar | 11.000 | | 2.136 | 1.067 | 2.387 | 89.5 | 117.24 | |
| silvana | 33.000 | | 7.393 | 3.726 | 8.278 | 89.3 | 148.65 | |
| silvana* | 33.000 | | 6.918 | 3.760 | 7.874 | 87.9 | 138.42 | |
| Sinjil | 11.000 | | 2.990 | 1.532 | 3.359 | 89.0 | 164.63 | |
| sivana** | 33.000 | | 11.608 | 6.387 | 13.249 | 87.6 | 235.56 | |
| Umm Safah | 11.000 | | 0.281 | 0.146 | 0.316 | 88.7 | 15.73 | |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 16
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

BRANCH LOADING Summary Report

| CKT / Branch | | Cable & Reactor | | | Transformer | | | | |
|--------------|-------------|-----------------|-------------|---|----------------|-----------------|------|------------------|------|
| ID | Type | Ampacity (Amp) | Loading Amp | % | Capacity (MVA) | Loading (input) | | Loading (output) | |
| | | | | | | MVA | % | MVA | % |
| T1 | Transformer | | | | 3.000 | 2.336 | 77.9 | 2.260 | 75.3 |
| T2 | Transformer | | | | 10.000 | 7.827 | 78.3 | 7.602 | 76.0 |
| T3 | Transformer | | | | 10.000 | 7.674 | 76.7 | 7.446 | 74.5 |
| T4 | Transformer | | | | 15.000 | 13.063 | 87.1 | 12.615 | 84.1 |
| T5 | Transformer | | | | 10.000 | 5.536 | 55.4 | 5.389 | 53.9 |
| T6 | Transformer | | | | 5.000 | 3.413 | 68.3 | 3.322 | 66.4 |
| T7 | Transformer | | | | 15.000 | 4.596 | 30.6 | 4.548 | 30.3 |
| T8 | Transformer | | | | 15.000 | 7.874 | 52.5 | 7.725 | 51.5 |
| T9 | Transformer | | | | 15.000 | 8.745 | 58.3 | 8.555 | 57.0 |
| T10 | Transformer | | | | 10.000 | 5.466 | 54.7 | 5.350 | 53.5 |
| T11 | Transformer | | | | 1.000 | 0.868 | 86.8 | 0.846 | 84.6 |
| T12 | Transformer | | | | 0.630 | 0.498 | 79.1 | 0.486 | 77.2 |
| T13 | Transformer | | | | 0.630 | 0.485 | 76.9 | 0.473 | 75.1 |
| T14 | Transformer | | | | 0.400 | 0.316 | 79.1 | 0.309 | 77.3 |
| T15 | Transformer | | | | 0.630 | 0.507 | 80.4 | 0.494 | 78.4 |
| T16 | Transformer | | | | 0.400 | 0.305 | 76.4 | 0.299 | 74.7 |
| T17 | Transformer | | | | 0.630 | 0.550 | 87.4 | 0.536 | 85.1 |
| T18 | Transformer | | | | 0.400 | 0.332 | 83.1 | 0.325 | 81.2 |
| T19 | Transformer | | | | 0.400 | 0.317 | 79.3 | 0.310 | 77.6 |

* Indicates a branch with operating load exceeding the branch capability

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 17
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

BRANCH LOSSES Summary Report

| CKT / Branch ID | From-To Bus Flow | | To-From Bus Flow | | Losses | | % Bus Voltage | | Vd % Drop in Vmag |
|--------------------|------------------|--------|------------------|--------|--------|-------|---------------|-------|-------------------------|
| | MW | Mvar | MW | Mvar | kW | Kvar | From | To | |
| Line9 | -1.759 | -1.122 | 1.778 | 1.135 | 18.9 | 12.3 | 106.6 | 107.7 | 1.15 |
| Line10 | 0.991 | 0.716 | -0.986 | -0.713 | 5.3 | 3.4 | 106.6 | 106.0 | 0.55 |
| T11 | 0.768 | 0.406 | -0.761 | -0.369 | 6.5 | 37.6 | 106.6 | 109.0 | 2.39 |
| Line11 | 0.442 | 0.232 | -0.441 | -0.232 | 0.8 | 0.5 | 106.0 | 105.8 | 0.21 |
| Line12 | 0.544 | 0.480 | -0.542 | -0.479 | 1.6 | 1.0 | 106.0 | 105.8 | 0.28 |
| Line14 | 0.004 | 0.143 | -0.004 | -0.143 | 0.1 | 0.1 | 105.6 | 105.6 | 0.06 |
| Line24 | -0.813 | -0.535 | 0.824 | 0.542 | 11.4 | 7.4 | 105.6 | 107.1 | 1.48 |
| Line58 | 0.995 | 0.538 | -0.987 | -0.533 | 7.5 | 4.9 | 104.6 | 103.8 | 0.82 |
| Line59 | -1.727 | -0.892 | 1.749 | 0.907 | 22.0 | 14.3 | 104.6 | 106.0 | 1.40 |
| ramallah** | -7.691 | -4.162 | 7.731 | 4.188 | 40.2 | 26.1 | 97.4 | 97.9 | 0.53 |
| T9 | 7.691 | 4.162 | -7.671 | -3.787 | 20.2 | 375.7 | 97.4 | 109.6 | 12.17 |
| al ram** | -4.797 | -2.621 | 4.812 | 2.631 | 15.8 | 10.2 | 97.1 | 97.4 | 0.33 |
| T10 | 4.797 | 2.621 | -4.782 | -2.399 | 14.3 | 221.4 | 97.1 | 109.3 | 12.20 |
| Cable1 | 6.854 | 3.948 | -6.842 | -3.932 | 12.1 | 16.1 | 96.5 | 96.2 | 0.23 |
| al ram* | -13.584 | -7.636 | 13.714 | 7.721 | 130.1 | 84.4 | 96.5 | 97.4 | 0.96 |
| T3 | 6.730 | 3.688 | -6.702 | -3.246 | 28.5 | 442.2 | 96.5 | 107.6 | 11.17 |
| Line8 | -3.004 | -1.621 | 3.011 | 1.625 | 7.4 | 4.8 | 97.0 | 97.3 | 0.25 |
| T6 | 3.004 | 1.621 | -2.990 | -1.448 | 14.2 | 172.7 | 97.0 | 108.6 | 11.56 |
| Line13 | 0.277 | 0.003 | -0.276 | -0.003 | 0.5 | 0.3 | 105.8 | 105.6 | 0.20 |
| Line21 | -0.164 | 0.251 | 0.164 | -0.250 | 0.4 | 0.3 | 105.8 | 105.8 | 0.00 |
| T13 | 0.429 | 0.225 | -0.426 | -0.206 | 3.3 | 18.9 | 105.8 | 108.4 | 2.67 |
| Line1 | -2.047 | -1.124 | 2.056 | 1.130 | 9.0 | 5.8 | 95.4 | 95.8 | 0.44 |
| T1 | 2.047 | 1.124 | -2.034 | -0.985 | 13.1 | 139.2 | 95.4 | 106.2 | 10.76 |
| rama1 | | | | | | | 100.0 | 100.0 | |
| Line2 | -2.056 | -1.130 | 2.064 | 1.136 | 8.1 | 5.2 | 95.8 | 96.2 | 0.39 |
| beit eil | -6.870 | -3.750 | 6.932 | 3.790 | 62.3 | 40.4 | 99.1 | 100.0 | 0.94 |
| T2 | 6.870 | 3.750 | -6.842 | -3.314 | 28.1 | 436.1 | 99.1 | 110.7 | 11.59 |
| T4 | -11.353 | -5.499 | 11.400 | 6.378 | 47.3 | 879.5 | 105.6 | 95.1 | 10.51 |
| T5 | -4.738 | -2.568 | 4.777 | 2.797 | 39.4 | 228.3 | 107.7 | 96.2 | 11.51 |
| Line15 | 4.197 | 1.752 | -4.029 | -1.642 | 168.4 | 109.1 | 110.9 | 106.1 | 4.81 |
| T7 | -4.197 | -1.752 | 4.203 | 1.859 | 5.8 | 107.4 | 110.9 | 97.4 | 13.45 |
| Line16 | 6.903 | 3.469 | -6.690 | -3.331 | 212.4 | 137.7 | 112.3 | 108.6 | 3.66 |
| T8 | -6.903 | -3.469 | 6.918 | 3.760 | 15.7 | 291.7 | 112.3 | 99.5 | 12.76 |
| Line62 | 2.363 | 1.216 | -2.290 | -1.169 | 73.0 | 47.3 | 109.6 | 106.0 | 3.57 |
| Line52 | 2.836 | 1.336 | -2.792 | -1.308 | 44.3 | 28.7 | 109.3 | 107.5 | 1.82 |
| Line61 | 1.946 | 1.063 | -1.905 | -1.037 | 41.1 | 26.6 | 109.3 | 106.9 | 2.41 |
| T12 | -0.438 | -0.212 | 0.441 | 0.232 | 3.4 | 20.0 | 108.4 | 105.8 | 2.60 |
| T14 | -0.278 | -0.135 | 0.281 | 0.146 | 2.2 | 11.5 | 108.3 | 105.6 | 2.77 |
| Line19 | -0.614 | 0.013 | 0.616 | -0.012 | 1.8 | 1.2 | 105.8 | 106.1 | 0.31 |
| Line20 | 0.450 | 0.237 | -0.448 | -0.236 | 1.7 | 1.1 | 105.8 | 105.3 | 0.41 |
| Line18 | -0.957 | -0.463 | 0.965 | 0.469 | 8.3 | 5.4 | 105.1 | 106.1 | 0.97 |
| T15 | -0.445 | -0.215 | 0.448 | 0.236 | 3.6 | 20.8 | 107.9 | 105.3 | 2.52 |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 18
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

| CKT / Branch ID | From-To Bus Flow | | To-From Bus Flow | | Losses | | % Bus Voltage | | Vd % Drop in Vmag |
|--------------------|------------------|---------|------------------|--------|--------|--------|---------------|-------|-------------------------|
| | MW | Mvar | MW | Mvar | kW | Kvar | From | To | |
| Line22 | -0.271 | -0.141 | 0.272 | 0.141 | 0.5 | 0.3 | 106.9 | 107.1 | 0.21 |
| T16 | 0.271 | 0.141 | -0.269 | -0.130 | 2.0 | 10.4 | 106.9 | 109.8 | 2.96 |
| T17 | -0.482 | -0.234 | 0.486 | 0.257 | 4.1 | 23.8 | 109.3 | 106.9 | 2.40 |
| T18 | -0.292 | -0.142 | 0.295 | 0.154 | 2.4 | 12.4 | 109.5 | 106.8 | 2.73 |
| Line26 | -1.355 | -0.656 | 1.367 | 0.664 | 11.7 | 7.6 | 106.1 | 107.1 | 0.98 |
| T19 | -0.279 | -0.135 | 0.281 | 0.147 | 2.2 | 11.3 | 109.5 | 106.7 | 2.85 |
| Line6 | 3.886 | 2.151 | -3.803 | -2.097 | 83.2 | 53.9 | 97.3 | 95.1 | 2.17 |
| Line7 | -6.897 | -3.776 | 6.975 | 3.827 | 78.2 | 50.7 | 97.3 | 98.4 | 1.15 |
| al ram | -18.527 | -10.352 | 19.000 | 10.659 | 473.3 | 306.8 | 97.4 | 100.0 | 2.58 |
| ramallah | -15.160 | -7.937 | 15.464 | 8.135 | 304.5 | 197.4 | 97.9 | 100.0 | 2.07 |
| ramallah* | 7.429 | 3.749 | -7.393 | -3.726 | 36.0 | 23.3 | 97.9 | 97.4 | 0.50 |
| Line56 | -0.368 | -0.124 | 0.369 | 0.124 | 0.8 | 0.5 | 103.4 | 103.7 | 0.24 |
| Line57 | -0.440 | -0.268 | 0.441 | 0.268 | 1.4 | 0.9 | 103.4 | 103.8 | 0.33 |
| Line17 | 3.030 | 1.558 | -2.990 | -1.532 | 40.6 | 26.3 | 108.6 | 107.1 | 1.54 |
| Line53 | -2.265 | -1.047 | 2.300 | 1.069 | 35.0 | 22.7 | 105.7 | 107.5 | 1.75 |
| Line54 | 1.687 | 0.767 | -1.666 | -0.753 | 21.1 | 13.7 | 105.7 | 104.3 | 1.42 |
| Line55 | -0.988 | -0.424 | 0.994 | 0.428 | 5.4 | 3.5 | 103.7 | 104.3 | 0.61 |
| Line27 | -0.281 | -0.147 | 0.282 | 0.147 | 0.5 | 0.3 | 106.7 | 106.9 | 0.19 |
| Line25 | -0.295 | -0.154 | 0.295 | 0.154 | 0.9 | 0.6 | 106.8 | 107.1 | 0.33 |
| en areek | 3.475 | 1.890 | -3.459 | -1.880 | 15.6 | 10.1 | 100.0 | 99.5 | 0.47 |
| offer | 3.475 | 1.890 | -3.459 | -1.880 | 15.6 | 10.1 | 100.0 | 99.5 | 0.47 |
| pereg | 11.789 | 6.504 | -11.608 | -6.387 | 180.8 | 117.2 | 100.0 | 98.4 | 1.60 |
| Line3 | -3.115 | -1.818 | 3.190 | 1.867 | 74.6 | 48.4 | 95.1 | 97.4 | 2.34 |
| Line4 | -4.483 | -2.463 | 4.633 | 2.560 | 150.0 | 97.3 | 95.1 | 98.4 | 3.32 |
| Line23 | -0.231 | -0.030 | 0.231 | 0.030 | 0.4 | 0.3 | 106.9 | 107.1 | 0.22 |
| | | | | | 2691.1 | 5047.3 | | | |

Project:
Location:
Contract:
Engineer:
Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 19
Date: 05-05-2010
SN: KLGCONSULT
Revision: Base
Config.: Normal

EQUIPMENT CABLE LOSSES Summary Report

| <u>Equipment Cable</u> | <u>Connected</u> | <u>Losses</u> | | <u>% Voltage</u> | | <u>Vd</u> | <u>Vst</u> |
|------------------------|------------------|---------------|-------------|------------------|-------------|---------------------------------|------------------------------|
| <u>ID</u> | <u>Load Type</u> | <u>kW</u> | <u>kvar</u> | <u>Bus</u> | <u>Load</u> | <u>% Drop</u> <u>in Vmag</u> | <u>% for</u> <u>Motor</u> |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation
 4.0.0C
 Study Case: LF

Page: 20
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

Alert Summary Report

% Alert Settings

| | <u>Critical</u> | <u>Marginal</u> |
|------------------------------------|------------------------|------------------------|
| <u>Loading</u> | | |
| Bus | | |
| Cable | | |
| Reactor | | |
| Generator | | |
| Transformer | | |
| Protective Device | | |
| <u>Bus Voltage</u> | | |
| OverVoltage | 105.0 | 102.0 |
| UnderVoltage | 95.0 | 98.0 |
| <u>Generator Excitation</u> | | |
| OverExcited (Q Max.) | | |
| UnderExcited (Q Min.) | | |

Critical Report

| ID | Device Type | Rating | Unit | Calculated | %Mag. | Condition |
|----------------------|--------------------|---------------|-------------|-------------------|--------------|------------------|
| Abu Qash | Bus | 11.000 | kV | 11.725 | 106.6 | OverVoltage |
| Abu Shukheidim | Bus | 11.000 | kV | 11.664 | 106.0 | OverVoltage |
| 'Ajjul | Bus | 11.000 | kV | 11.619 | 105.6 | OverVoltage |
| Al Mazra'a El Qiblya | Bus | 0.400 | kV | 0.436 | 109.0 | OverVoltage |
| A'tara | Bus | 11.000 | kV | 11.633 | 105.8 | OverVoltage |
| Bus1 | Bus | 6.600 | kV | 7.007 | 106.2 | OverVoltage |
| Bus10 | Bus | 11.000 | kV | 12.022 | 109.3 | OverVoltage |
| Bus17 | Bus | 0.400 | kV | 0.434 | 108.4 | OverVoltage |
| Bus18 | Bus | 0.400 | kV | 0.434 | 108.4 | OverVoltage |
| Bus19 | Bus | 0.400 | kV | 0.433 | 108.3 | OverVoltage |
| Bus2 | Bus | 11.000 | kV | 12.172 | 110.7 | OverVoltage |
| Bus24 | Bus | 11.000 | kV | 11.633 | 105.8 | OverVoltage |
| Bus25 | Bus | 11.000 | kV | 11.562 | 105.1 | OverVoltage |
| Bus27 | Bus | 0.400 | kV | 0.431 | 107.9 | OverVoltage |
| Bus28 | Bus | 11.000 | kV | 11.758 | 106.9 | OverVoltage |
| Bus3 | Bus | 11.000 | kV | 11.839 | 107.6 | OverVoltage |
| Bus31 | Bus | 0.400 | kV | 0.437 | 109.3 | OverVoltage |
| Bus33 | Bus | 0.400 | kV | 0.438 | 109.5 | OverVoltage |
| Bus35 | Bus | 11.000 | kV | 11.674 | 106.1 | OverVoltage |

Project:
 Location:
 Contract:
 Engineer:
 Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 21
 Date: 05-05-2010
 SN: KLGCONSULT
 Revision: Base
 Config.: Normal

Critical Report

| ID | Device Type | Rating | Unit | Calculated | %Mag. | Condition |
|------------------------|-------------|--------|------|------------|-------|-------------|
| Bus36 | Bus | 0.400 | kV | 0.439 | 109.8 | OverVoltage |
| Bus37 | Bus | 0.400 | kV | 0.438 | 109.5 | OverVoltage |
| Bus4 | Bus | 11.000 | kV | 11.616 | 105.6 | OverVoltage |
| Bus5 | Bus | 11.000 | kV | 11.851 | 107.7 | OverVoltage |
| Bus6 | Bus | 11.000 | kV | 11.943 | 108.6 | OverVoltage |
| Bus7 | Bus | 11.000 | kV | 12.197 | 110.9 | OverVoltage |
| Bus8 | Bus | 11.000 | kV | 12.352 | 112.3 | OverVoltage |
| Bus9 | Bus | 11.000 | kV | 12.053 | 109.6 | OverVoltage |
| Deir Dibwan | Bus | 11.000 | kV | 11.950 | 108.6 | OverVoltage |
| Deir Ibbi' | Bus | 11.000 | kV | 11.629 | 105.7 | OverVoltage |
| Deir Qaddis | Bus | 11.000 | kV | 11.736 | 106.7 | OverVoltage |
| 'Ein Arik | Bus | 11.000 | kV | 11.821 | 107.5 | OverVoltage |
| El Mazra'a El Sharqeya | Bus | 11.000 | kV | 11.745 | 106.8 | OverVoltage |
| kafr 'Aqab | Bus | 11.000 | kV | 11.668 | 106.1 | OverVoltage |
| Kafr Ni'ma | Bus | 11.000 | kV | 11.660 | 106.0 | OverVoltage |
| Kfar Malik | Bus | 11.000 | kV | 11.588 | 105.3 | OverVoltage |
| Kober | Bus | 11.000 | kV | 11.641 | 105.8 | OverVoltage |
| Ras Karkar | Bus | 11.000 | kV | 11.757 | 106.9 | OverVoltage |
| Sinjil | Bus | 11.000 | kV | 11.781 | 107.1 | OverVoltage |
| Umm Safah | Bus | 11.000 | kV | 11.612 | 105.6 | OverVoltage |

Marginal Report

| ID | Device Type | Rating | Unit | Calculated | %Mag. | Condition |
|---------------------------|-------------|--------|------|------------|-------|--------------|
| Al Mazra'a El Qibleya | Bus | 11.000 | kV | 11.506 | 104.6 | OverVoltage |
| al moalemen | Bus | 33.000 | kV | 32.142 | 97.4 | UnderVoltage |
| al moalmen* | Bus | 33.000 | kV | 32.037 | 97.1 | UnderVoltage |
| al tahona | Bus | 33.000 | kV | 31.831 | 96.5 | UnderVoltage |
| al terah | Bus | 33.000 | kV | 32.011 | 97.0 | UnderVoltage |
| beiten central | Bus | 33.000 | kV | 31.484 | 95.4 | UnderVoltage |
| beiten west | Bus | 33.000 | kV | 31.627 | 95.8 | UnderVoltage |
| connection bus al terah | Bus | 33.000 | kV | 32.094 | 97.3 | UnderVoltage |
| connection bus for al ram | Bus | 33.000 | kV | 32.147 | 97.4 | UnderVoltage |
| connection bus ramallah | Bus | 33.000 | kV | 32.318 | 97.9 | UnderVoltage |
| Deir Abu Mash'al | Bus | 11.000 | kV | 11.379 | 103.4 | OverVoltage |
| Deir Nidham | Bus | 11.000 | kV | 11.405 | 103.7 | OverVoltage |
| Jammala | Bus | 11.000 | kV | 11.415 | 103.8 | OverVoltage |
| Kharbat El Misbah | Bus | 11.000 | kV | 11.473 | 104.3 | OverVoltage |

Project:
Location:
Contract:
Engineer:
Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 22
Date: 05-05-2010
SN: KLGCONSULT
Revision: Base
Config.: Normal

Marginal Report

| <u>ID</u> | <u>Device Type</u> | <u>Rating</u> | <u>Unit</u> | <u>Calculated</u> | <u>%Mag.</u> | <u>Condition</u> |
|-----------------|--------------------|---------------|-------------|-------------------|--------------|------------------|
| ramallah north | Bus | 33.000 | kV | 31.757 | 96.2 | UnderVoltage |
| ramallah north* | Bus | 33.000 | kV | 31.379 | 95.1 | UnderVoltage |
| silvana | Bus | 33.000 | kV | 32.152 | 97.4 | UnderVoltage |

Project:
Location:
Contract:
Engineer:
Filename: ramallah_max_taps

ETAP PowerStation

4.0.0C

Study Case: LF

Page: 23
Date: 05-05-2010
SN: KLGCONSULT
Revision: Base
Config.: Normal

SUMMARY OF TOTAL GENERATION, LOADING & DEMAND

| | <u>MW</u> | <u>Mvar</u> | <u>MVA</u> | <u>% PF</u> |
|--------------------|-----------|-------------|------------|----------------|
| Swing Bus(es): | 60.135 | 32.868 | 68.531 | 87.75 Lagging |
| Generators: | 0.000 | 0.000 | 0.000 | 100.00 Lagging |
| Total Demand: | 60.135 | 32.868 | 68.531 | 87.75 Lagging |
| Total Motor Load: | 21.029 | 10.185 | 23.366 | 90.00 Lagging |
| Total Static Load: | 36.415 | 17.636 | | |
| Apparent Losses: | 2.691 | 5.047 | | |
| System Mismatch: | 0.000 | 0.000 | | |

Number of Iterations: 3