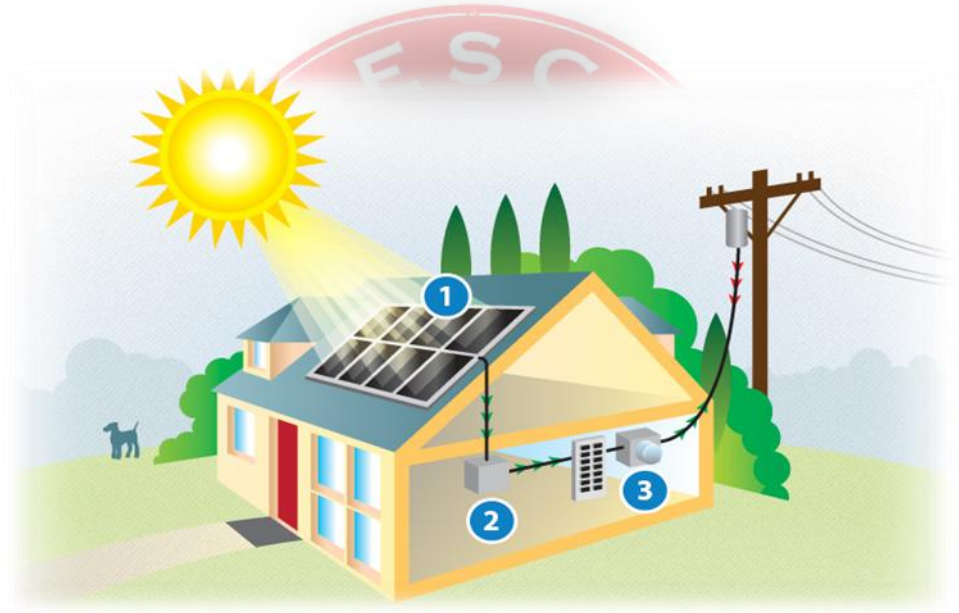
# QUETTA ELECTRIC SUPPLY COMPANY

# NET METERING

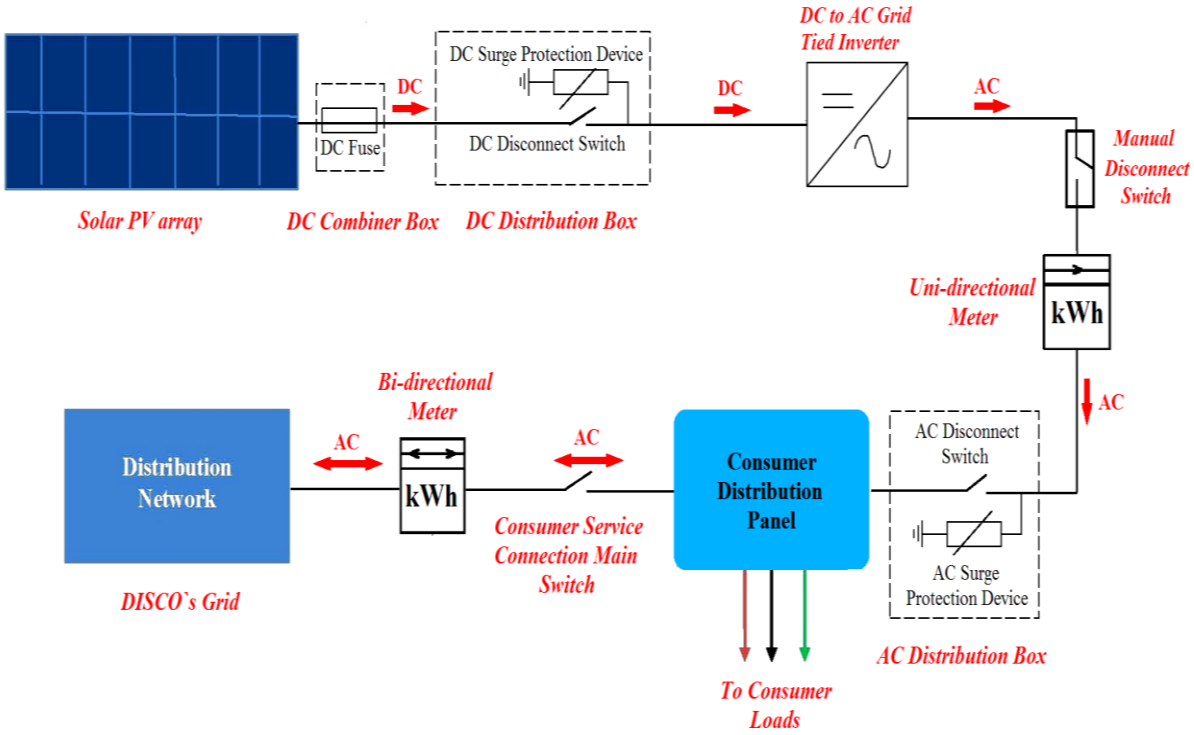



## STANDARD OPERATING PROCEDURE
## ON GRID SOLAR ROOF TOP NET METERING

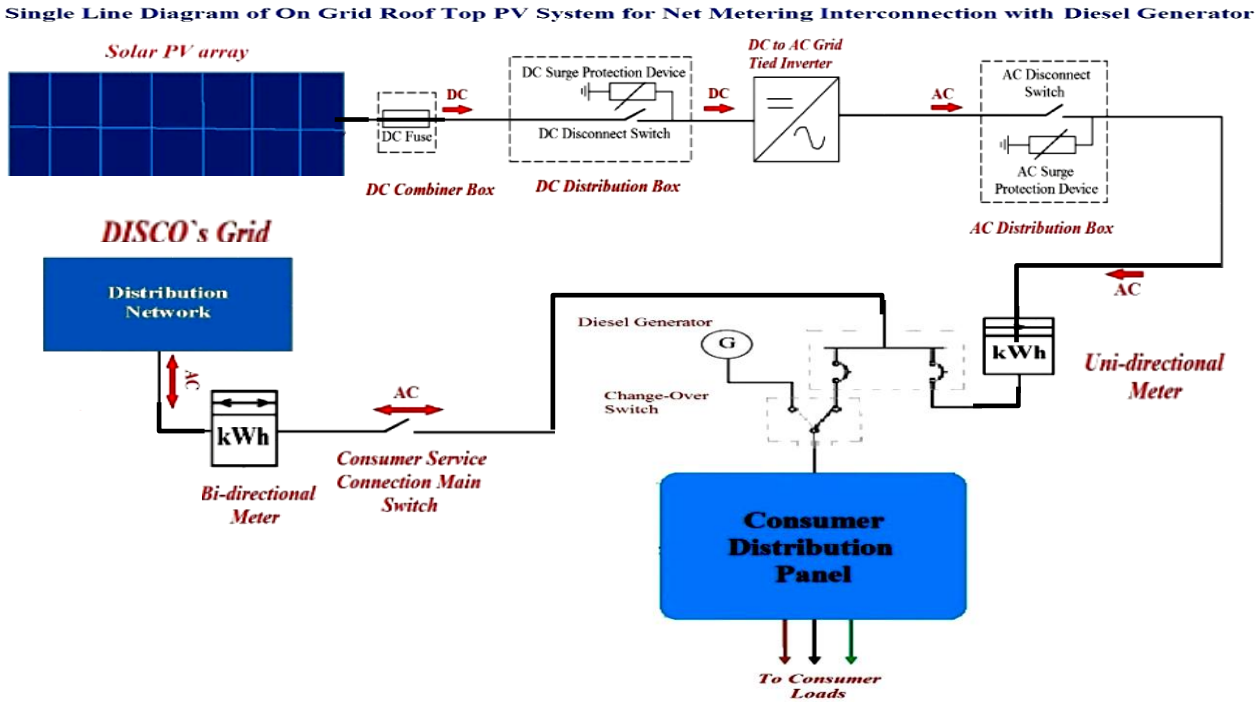
## PLANNING & ENGINEERING DEPARTMENT
## QESCO

# 1. NET METERING

a. Single Line Diagram Of On Grid Roof Top PV System for Net Metering Interconnection.



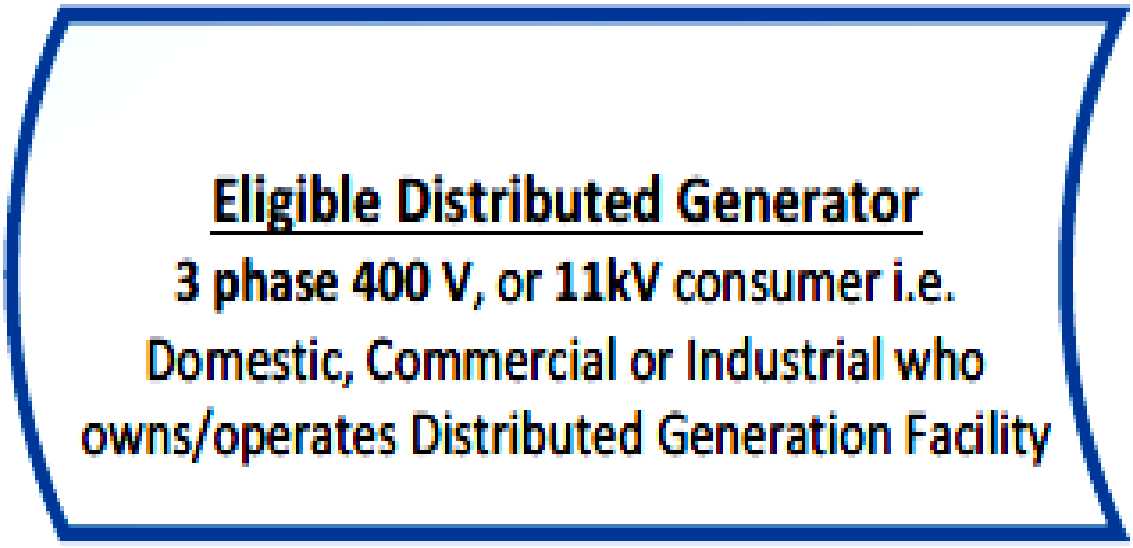

b. Single Line Diagram Of On Grid Roof Top PV System For Net Metering Interconnection Diesel Generator.



## 2. REGISTERATION OF APPLICATIONS

a. Application can be down loaded from NEPRA's website www.nepra.org.pk & QESCO's website www.qesco.gov.pk

b. Eligible Distributed Generator can submit application for net metering in the concerned QESCO office.




c. CAPACITY OF DIESEL GENERATOR FILICITY

| | | REGISTERING OFFICE |
|---|---|---|
| i. | UPTO 70 kW | **Dy: MANAGER OPER**: |
| ii. | UPTO 500 kW | **MANAGER OPERATION** |
| iii. | ABOVE 500 kW | **CHIEF ENGINEER (P&E)** |

d. QESCO shall accord solar net metering approvals on a first come first served basis until the grid connected Solar PV installed capacity reaches 30% of the closest upstream Distribution Transformer rated capacity.

e. The priority for such applications shall be maintained for which a separate register shall be prepared for solar roof top applications.

## 3. REQUIRED DOCUMENTS

a. Distributed Generation Interconnection Agreement (Schedule-I).

b. Standard Distributed Generation Application Form (Schedule-II).

c. Application for grant of License (Schedule-III).

d. Application for Exemption from section 24 of the Act (Schedule-IV).

e. Fee Schedule (Schedule-V).

f. Affidavit on non-judicial paper (Schedule-VI).

g. Generation License Template (Schedule-VII).

h. Attested copy of CNIC.

i. Copy of last paid electricity bill.

j. Certificate from Electric Inspector, Govt. of Balochistan.

k. Technical Data of components including solar modules, Invertors, etc.

l. Schematic drawings, Single line diagram of the system.

m. Site plan showing location of external disconnect switch.

## 4. APPLICATION PROCESING

a. Within five (5) working days of receiving an application QESCO shall acknowledge its receipt and inform the applicant whether the application is complete in all respects.

b. In case of any missing information or documents, the applicant shall provide the same to the QESCO office within seven (7) working days of being informed.

c. The QESCO office shall perform an initial review / technical feasibility to determine whether the applicant qualifies for interconnection facility, or may qualify subject to additional

requirements provided that the initial review shall be completed within twenty (20) working days.

d. Checks before issuing the technical feasibility report of proposed interconnection:

   i. ***The transformer shall be loaded (including proposed SRTPV system load) up to 80% of its capacity.***

   ii. ***Whether the proposed interconnection will require upgrading the capacity of existing distribution network.***

   iii. ***Phase balancing to avoid unbalancing of load in secondary circuit of distribution line.***

e. In case the initial review reveals that the proposed facility is not technically feasible, QESCO office shall return the application and communicate reason (s) to the applicant within three (3) working days after the completion of initial review / technical feasibility study.

f. If DG facility is technically feasible, QESCO shall enter into an agreement with the applicant within ten (10) working days**.**

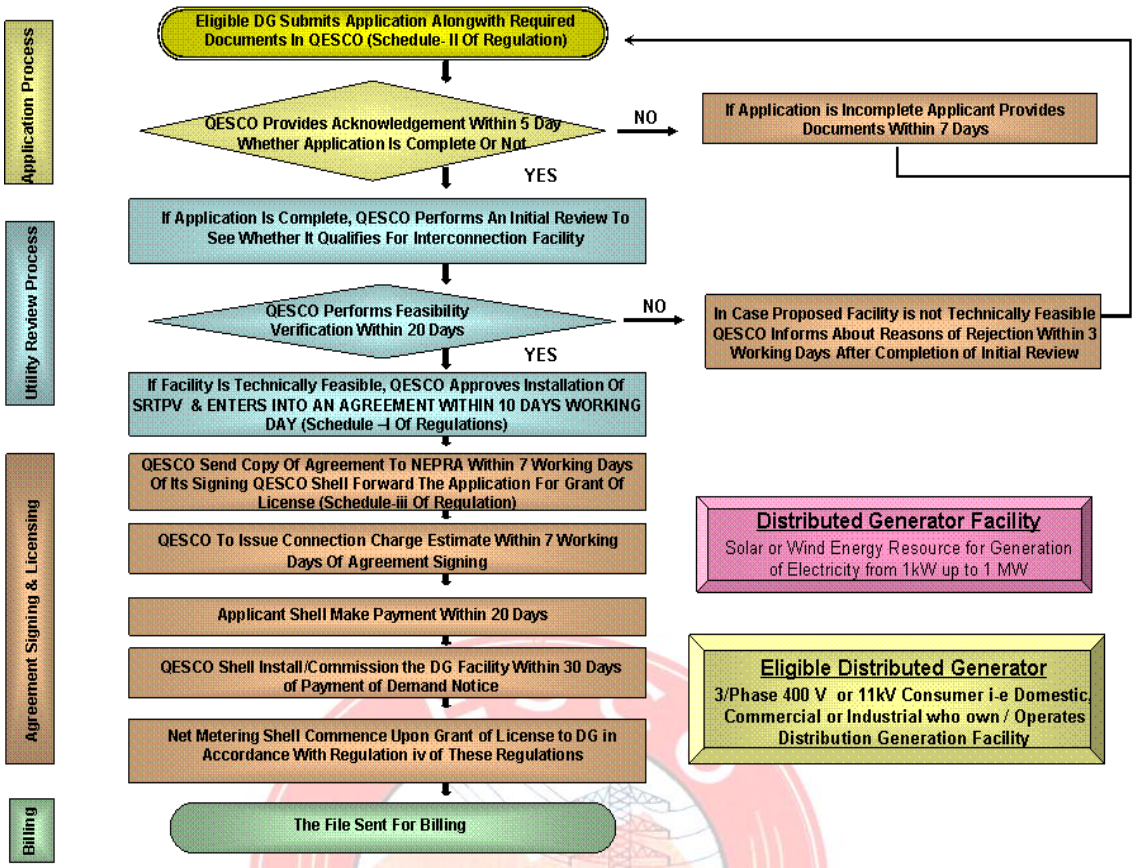
g. Within seven (7) working days, QESCO Office shall forward the application along with agreement and enclosures to NEPRA for issuance of generation license. Simultaneously, QESCO office shall issue the demand notice to the applicant for the proposed interconnection facility.

h. The applicant shall make the payment of demand notice within twenty (20) days of its issuance.

i. QESCO office shall install and commission the proposed interconnection facility within thirty (30) days of the payment of demand notice by the applicant.

j. Net Metering arrangement / billing shall commence upon grant of license to the Distributed Generator by NEPRA.

k. **Flow Chart of Interconnection Process**




# 5. TECHNICAL COMMITTEES FOR CHECKING / COMMISSIONING INTERCONNECTION FACILITY

a. When application is entertained by Deputy Manager Operation

i. Deputy Manager (Operation) **Convener**

ii. Deputy Manager (M&T) **Member**

iii. Assistant Manager (Operation) **Member**

b. When application is entertained by Manager Operation Div:

i. Manager (Operation) **Convener**

ii. Deputy Manager (M&T) **Member**

iii. Deputy Manager (Operation) **Member**

c. When application is entertained by Chief Engineer (P&E) QESCO HQ:

| | | |
|---|---|---|
| i. | Chief Engineer (P&E) | **Convener** |
| ii. | Manager (GSO) | **Member** |
| iii. | Regional Manager (M&T) | **Member** |
| iv. | Manager (Operation) | **Member** |

## 6. AUTHORIZED OFFICERS TO SIGN / WITNESS AGREEMENT COMMITTEES FOR CHECKING COMMISSIONING INTERCONNECTION FACILITY

a. When application is entertained by **Deputy Manager Operation**

| | | |
|---|---|---|
| i. | Agreement signed by | Load sanctioning authority, i.e. D.M Op: / A.M Op: |
| ii. | Agreement witnessed by | Any two of the staff members of concerned office, i.e. LS / TA / HDM / SDC |

b. When application is entertained by **Manager Operation**

| | | |
|---|---|---|
| i. | Agreement signed by | **Manager Operation** |
| ii. | Agreement witnessed by | Any two staff members of circle office, i.e. DDT/DCM/TA/HDM |

c. When application is entertained by Chief Engineer (P&E) QESCO HQ:

| | | |
|---|---|---|
| i. | Agreement signed by | **Chief Engineer (P&E)** |
| ii. | Agreement witnessed by | **Any two officers of P&E Section** |

## 7. SOME IMPORTANT PRE-REQUISTES

a. Submission of Load flow study (on PSSE software) will be compulsory for all distributed generators having installed capacity of more than 500 kW.

b. Distributed generator having capacity above 70-kW but less than 500 kW may submit load flow study on FDRANA.

c. The solar PV capacity shall not exceed the sanctioned load. If a consumer proposes to install a solar PV system with the capacity that exceeds the service connection sanctioned load, an application for EOL shall be submitted by the consumer prior to the solar net metering application. EOL application (s) shall be processed as per existing standard procedure.

d. Safety inspection certificate for Solar PV installation shall be obtained from Electric Inspector, Government of Balochistan by the applicant.

e. Mandatory safety features of the grid connected solar PV system installations are:

   i. An inbuilt Inverter relay which trips on grid failure and thus prevents any solar power injection to the grid when there is no power in grid (***Anti-islanding protection***)

   ii. **Anti-islanding protection** shall be tested by the respective officers at the time of commissioning and routine service connection inspections.

   iii. Necessary protection arrangements shall be made when there is no grid supply on single/two/three phases.

iv. The applicant's installation shall be disconnected in the event of such exigencies to prevent accident or damage to men and material.

v. The Solar PV system should be **separately grounded / earthed.**

vi. **Manual Disconnect Switch** shall also be provided for physical isolation of DG facility from the grid.

f. Bi-directional service connection meter shall be installed to measure import and export (kWh) separately**.**

g. For existing service connections, the Uni-directional energy meter shall be replaced with a Bi-directional energy meter.

h. Bi-directional service connection meter's accuracy and features shall be the same as applicable to the standard Uni-directional meters for the relevant type of service connection and tariff.

i. The consumer shall be present at the time of synchronization of the installation.

j. The applicant is required to install the SRTPV system through system installer who has experience in design, supply and installation of SRTPV system.

l. The SRTPV system should comply with the relevant IEC standards.

k. In case the installed or proposed capacity of the SRTPV system is higher than the sanctioned load of the consumer, which consequently requires an up-gradation in the infrastructure, i.e.

service cables, CTs, transformer augmentation, etc. cost of the up gradation will be borne by the consumer.

## 8. PERIODICAL INSPECTION

a. Bi-directional energy meters should be tested by the standing committee once in 6 months.

b. The inverter functionality of every installation may also be checked by the standing committee once in 6 months.

c. Periodical test reports/inspection certificates shall be maintained by the concerned division and sub divisional offices**.**

## 9. BILLING PROCEDURE

a. The consumer shall receive a monthly net import/export bill indicating either net export to the grid or net import from the grid.

b. The meter reader has to capture import & export energy and other billing parameters recorded by the bi-directional meter.

c. In case of net import bill, the Distributed Generator shall be billed for the net kWh in accordance with the applicable tariff.

d. In case, the export kWh is more than the import, the net kWh shall be credited against Distributed Generator's next billing cycle for future consumption, or shall be paid by QESCO to the Distributed Generator quarterly. Provided that where the Distributed Generator is to be paid, the kWh in a month will be charged at the tariff of that respective month.

f. The tariff payable by QESCO shall only be the off-peak rate of the respective consumer category of the respective month and other rates such as variable charges for peak time, fixed charges, fuel price adjustment, duties / levies will not be payable by the QESCO.

# 10. WAY FORWARD

a. Public awareness through print, electronic and social media to increase acceptance of solar based solutions.

b. Government institutions should take initiatives to install solar system on rooftop of their offices on top priority.

c. Tax exemption, zero rated custom duty, sales tax, income tax and others on all renewable energy equipments for a period of at least five years.

d. Banks and other financial institutions should start financing solar industry at lowest markup.

e. Local manufacturing of solar systems allied facilities.

f. Capacity building in DISCOs for raising awareness and facilitating the use of Net Metering.

g. Legislation for compulsory installation of solar system on newly constructed buildings and housing societies.

# 11. INSPECTION AND TEST CHECK PROFORMA

a. **Service Connection Details**:

i. Name of the Consumer:

ii. Address:

iii. Telephone No/Mobile No:

iv. Email address:

v. Reference No. of existing connection

vi. Applicable tariff:

vii. Details of already existing (removed energy meter)

1.) Make and type
2.) Meter Readings
3.) Serial number
4.) Month / year of manufacture

b. **Details of the Newly Installed Bidirectional Meter**

i. Make and type
ii. Serial number
iii. Month / year of manufacture
iv. Capacity:
v. Meter constant (for CT-operated meters):
vi. Import register reading (kWh):
vii. Export register reading (kWh):
viii. Accuracy …….

c. **Solar Generation Check**

i. Make and type
ii. Serial number
iii. Month / year of manufacture
iv. KWH Reading
v. Meter constant (for CT-operated meters):
vi. Accuracy…….

d. **Solar Grid Inverter**

i. Make:
ii. Serial number:
iii. Capacity:
iv. Input DC voltage range:
v. Output AC voltage range:
vi. Anti-Islanding Protection Check - if the grid fails the status of the contactor (on or off)

e. **Solar PV modules**

Total capacity of solar modules (kW):

**Deputy Manager Operation**_____ **Deputy Manager M&T**_____

# 12. CHECKLIST FOR SOLAR ROOFTOP PV GRID SAFETY QUALIFICATION

a. Solar RTPV – Customer and Location Data

| | | |
|---|---|---|
| i. | Customer Name | |
| ii. | Address | |
| iii. | Customer Contact - Email | |
| iv. | Customer Contact – Mobile No. | |
| v. | SRTPV Installer – Name & Address | |
| vi. | QESCO Officer in Charge | |

b. Component Inspection Checklist

| Sr. No | Item Type | YES | NO |
|---|---|---|---|
| i. | Installation layout – is it as per drawing? | | |
| ii. | Inverter IEC standards qualified | | |
| iii. | PV panel IEC standards qualified | | |
| iv. | PV isolators / PV cables IEC standards qualified | | |
| v. | AC disconnect manual switch provided | | |
| vi. | Meters checked by M&T | | |
| vii. | Any other critical component IEC standards certified | | |

c. Grid Functional Safety Checklist

| Sr. No | Item Type | YES | NO |
|---|---|---|---|
| i. | Check-PV Inverter and islanding (utility side) Disconnect grid and check whether PV generator seizes generation immediately | | |
| ii. | Check reconnect time by reconnecting the grid: PV Generator reconnects minimum 60 seconds later (Single Phase) or minimum 300 seconds later (three phase connectivity) | | |
| iii. | Bi directional flow recorded on QESCO Meter | | |
| iv. | Consumption (import) only mode OK? | | |
| v. | PV inverter anti islanding tested at array side | | |
| vi. | Solar generation meter OK? | | |
| vii. | Check all earthings provided at ACDB/DCDB/LA | | |

It is certified that the PV installation is qualified to be connected to QESCO Grid.

**Deputy Manager Operation _____ Division QESCO**