Overview of Distribution Network

SHANKER RAHMAN
UNDERSTANDING WHAT IS A DISTRIBUTION SYSTEM

WHAT IS A DISTRIBUTION SYSTEM?

- DEFINITION
- LOCATION
- FUNCTION
- COMPONENTS
- BUSINESS MODEL
WHAT IS A DISTRIBUTION SYSTEM?  
- DEFINITION

Definition

Distribution system composed of all electrical parts that are required to distribute power from bulk power sources to customers.

Generally Distribution System is referred to the portion of the utility power system between Transmission network and Customer’s service entrance.
Location Within the Power System

Transmission:
Transmission line up to & inclusive of bulk power substation (main intake or PMU) that consist of transmission power transformer

Distribution:
Substations with distribution power transformer (PPU), primary feeders, distribution switching station (SSU), Substation with distribution transformer (PE), secondary feeders and services
POWER FLOW DIAGRAM

GENERATION
- Hidro
- Steam
- Diesel
- C/Cycle

TRANSMISSION
- O/head
- U/ground
- S/Marine

DISTRIBUTION

CONSUMER
- Domestic
- Commercial
- LPC

MV & LV SUB STATION

CABLE

OVER HEAD

METERING
CHAPTER 2

Distribution Network
By Function
Function of Distribution System

To deliver electrical energy from the transmission or small generating station (embedded generation) to customers while transforming to a suitable applications.
MAIN ACTIVITIES IN DISTRIBUTION

● DISTRIBUTION PLANNING
  - Reinforcement of MV system (MSVT)
  - New Supply

● DISTRIBUTION PROJECT
  Focus on new-supply projects
  - Cable (MV & LV) construction
  - Overhead (MV & LV) construction
  - Substation (MV & LV) construction

● DISTRIBUTION PROTECTION
  - Protection coordination within TNB network
  - Protection coordination between TNB and Customer
  - Protection relay testing & calibration
MAIN ACTIVITIES IN DISTRIBUTION

● DISTRIBUTION OPERATION & MAINTENANCE
  - Maintenance of Cable (MV & LV)
  - Maintenance of Overhead (MV & LV)
  - Maintenance of Substation (MV & LV)
  - MSVR & MSVT projects

● METERING
  - Installation of new meter (whole current meter, CT-meter)
  - Schedule replacement of meter (whole current)
  - Meter maintenance
  - Meter testing and calibration

● DISTRIBUTION SERVICE
  - LV Single phase (Overhead line, Five-foot-way)
  - LV Three phase (Overhead line, Five-foot-way, Underground cable)
MAIN ACTIVITIES IN DISTRIBUTION

● STREET LIGHTING
  - Installation
  - Maintenance

● CUSTOMER SERVICE
  - New supply application (individual, group)
  - Meter reading & Billing
  - Collection & banking
  - Change of tenancy
  - Change of tariff
  - Individual street light
  - Credit control & disconnection
  - Bank guarantee management
  - Revenue assurance & Back-billing
CHAPTER 3

Distribution Network
By Components
Distribution System Components

Distribution System can be divided into three major components:

**Bulk power substations**
It receives power from the transmission system and transform it to a subtransmission voltage by means of Transmission Power Transformer.
Distribution System Components

Primary Feeder
It is the system between subtransmission line and secondary feeder. **Distribution Power Transformer** \((33/11 \text{ kV})\) separates the primary feeder from subtransmission line and; **Distribution Transformer** \((11/0.415 \text{ kV})\) separates the primary feeder from secondary feeder.

Secondary Feeder
The secondary components of a distribution system ends at the customer’s meter.
THE DISTRIBUTION VOLTAGES ARE

- 33kV, 22kV, 11kV,
- 400V -3 phases
- 230V- single phase
DISTRIBUTION SUBSTATION

- Distribution Bulk Substations – PMU (132/33kV, 132/11kV)
  - Transformer capacity: 90MVA, 45MVA, 30MVA, 15MVA
  - GIS substation
  - AIS substation

- Distribution Primary Substations - PPU(33/11 kV, 33/22kV) & SSU
  - Transformer capacity: 7.5MVA, 15MVA, 30MVA,
  - GIS substation
  - AIS substation

- Distribution Secondary Substations - PE(11/0.415 kV, 22/0.415kV)
  - Transformer capacity: 100kVA, 300kVA, 500kVA, 750kVA, 1MVA,
  - Indoor substation
  - Outdoor substation
  - Pole mounted substation
  - Compact substation
  - Underground substation
DISTRIBUTION SUPPLY CATEGORY

1. Penc. Masuk Utama (PMU)

2. Penc. Pemb. Utama (PPU)

3. Stesen Suis Utama (SSU)

4. Penc. Elektrik (PE)

Transmission Network:
- 500kV
- 275kV
- 132kV

- 275/33/11kV
- 132/33/11kV
- 132/11kV

- 33/11kV
- 22/11kV

- 33/.433kV
- 22/.433kV
- 11/.433kV
- 6.6/.433kV

LV Sys.
TNB DISTRIBUTION SUBSTATION CATEGORY

1. Main Intake Substation – PMU

a. Distribution Bulk Power Substation that provide interfacing between Transmission network and Distribution network where the Transmission voltage is step down to Distribution voltage. PMU serves as main supply source to:
   i. First level of Distribution primary network (33kV, 11kV)
   ii. Customer taking power supply at tariff-E3

b. Land size requirement - AIS 130.0 meter x 130.0 meter
   - GIS 70meter x 80meter (2TX)

c. Building size requirement - Depending on requirements

d. Transformer size - 15 MVA, 30 MVA, 45MVA, 90 MVA

e. Average cost range - More than RM30 million depending on Transformer
TNB DISTRIBUTION SUBSTATION CATEGORY

2. Main Distribution Substation – PPU

a. Distribution Primary Substation that distributes power by stepping down 33kV voltage to 11kV or 22kV voltage as a second level of Distribution primary-network.
   i. 33kV/11kV
   ii. 33kV/22kV

b. Land size requirement - 50.0 meter x 50.0 meter

c. Building size requirement -

d. Transformer size - 7.5 MVA, 15 MVA, 30MVA

e. Average cost range - RM7 Million – RM 10 Million depending on Transformer size
3. **Main Switching Station – SSU**

a. Distribution Substation that further distributes power without voltage transformation within the Distribution primary network (33kV, 22kV, 11kV). It provides interfacing between various PMU and/or various PPU within the Distribution primary network. PPU is established to facilitate:
   i. Power supply to Customer buying electricity at tariff C1, C2, E1, or E2
   ii. Reinforcement of Distribution supply network to ensure higher security level
   iii. Maintaining the scale of economic for power distribution at primary level through a larger area

b. **Land size requirement** - 31.0 meter x 31.0 meter

c. **Building size requirement** - Depending on requirements

d. **Transformer size** - No transformer

e. **Average cost range** - RM 500 K to RM1 Million depending on number of switchgear & voltage level
4. **Low Voltage Substation – PE**

   a. Low Voltage Substation provides interfacing between primary network and secondary network in Distribution system where the 11kV or 22kV voltage is step down to 415V. It is the main source of power supply to Customer buying electricity tariff A, B or D as well as for street lighting through LV network that comprises of:
   
   i. LV Board
   ii. LV Feeder pillar
   iii. LV Underground cable system
   iv. LV Overhead line system

   b. **Land size requirement**
   - single chamber
   - double chamber

   c. **Building size requirement**
   - Depending on requirements

   d. **Transformer size**
   - 100kVA, 300kVA, 500kVA, 750kVA, 1MVA

   e. **Average cost range**
   - RM 100K to RM 250K depending on Transformer size and size of building
Pencawang Masuk Utama – PMU
(Main Intake)
DISTRIBUTION INTAKE
INDOOR SUBSTATION – DOUBLE CHAMBER
INDOOR SUBSTATION – DOUBLE CHAMBER
INDOOR SUBSTATION – SINGLE CHAMBER
OUTDOOR SUBSTATION
POLE MOUNTED SUBSTATION
POLE MOUNTED SUBSTATION
UNDERGROUND SUBSTATION
POLE MOUNTED SUBSTATION
COMPACT SUBSTATION
COMPACT SUBSTATION - Switchgear
COMPACT SUBSTATION – Low Voltage Board
11KV SUBSTATION CONSTRUCTION

Three main sections of electrical substation

1. Switchgear
   - Ring Main Unit (RMU with fuse)
   - Circuit breaker

2. Distribution Transformer
   - Dyn11 11/0.415kV

3. Low Voltage Distribution Board

Single Line Diagram P/E
SUBSTATION COMPONENT

BASIC COMPONENTS:-

SUBSTATION ENCLOSURE
- Substation building (for indoor substation)
- Fencing (for ground substation)
- Metal enclosed kiosk (for compact substation)
- Pole (for pole mounted substation)

HIGH VOLTAGE SWITCHGEAR
- Circuit breaker
- Main ring unit (c/w high voltage fuse)
- Isolator

LOW VOLTAGE SWITCHGEAR
- Low voltage distribution board
- Low voltage high current fuse

DISTRIBUTION TRANSFORMER
- 3 Phase oil-filled transformer

CABLE
- High voltage cable
- Low voltage cable

EARTHING SYSTEM
- Earthing rod
- Lightning arrester

DIRECT CURRENT (DC) SYSTEM
- DC 110v
- DC 30v
DISTRIBUTION TRANSFORMER
DISTRIBUTION SWITCHGEARS

Vacuum circuit breaker (VCB)

Air circuit breaker (ACB)

Ring Main Unit (RMU)
MEDIUM VOLTAGE CABLES

• Underground
  – Paper insulated cables (PILCDSTA)
  – Cross linked polyethylene (XLPE)
  – Oil filled

• Aerial Bundled Cable
  – Cross linked polyethylene (XLPE)
LOW VOLTAGE NETWORK

LV Board in 11/0.415kV Substation

Feeder Pillar 1

LV - UGC 300mmsq

LV Under ground cable (UGC) 300mmsq

250A

150A 150A

Feeder Pillar 2
LOW VOLTAGE NETWORK

Feeder Pillar 1

LV - UGC 185mm²

150A 150A

LV – Mains Overhead Line:
- ABC wire
- Bare wire

LV – Service Line:
- ABC wire
- PVC wire

LV – Five Foot Way
- ABC wire
- PVC wire

Terrace house

LV – Service Line:
- ABC wire
- PVC wire

200A 100A
MEDIUM VOLTAGE PAPER INSULATED CABLE (PILDSTA)
MEDIUM VOLTAGE XLPE UNDERGROUND CABLES
AERIAL XLPE
LV OVERHEAD LINES

• Bare aluminium conductors
• Aerial bundle cable
• PVC insulated conductors
OVERHEAD CONDUCTORS INSULATED / BARE

RED

YELLOW

BLUE

STREET LIGHTING

NEUTRAL

WOODEN/CONCRETE/SPUNPOLE

415V

240V

415V

240V

415V

240V

240V

240V

240V
LOW VOLTAGE LIVE LINE
Electrical Shock progression…

• Slight sensation (1mA)
• Feel a “shock” but not painful (5mA)
• Painful, may invoke reflexes (10mA)
• Muscle contraction, breathing difficulty – possible asphyxiation (50mA)
• Cardiac interference – possible fibrillation (100mA)
• Almost certain fibrillation, possible nerve damage (1A)
• Cardiac arrest, severe burns (internal/external) (5A) – (Note: 6A is operating parameters for Defibrillator)
CHAPTER 5
Distribution Network
By Business Model
DISTRIBUTION BUSINESS MODEL

Transmission
Supplier 1

Embedded Generation
Supplier 2

Distribution

Business activity 1
Distribution Network Operation

Business activity 2
Electricity Retail Operation
TNB Distribution plans, construct, operates, performs repair & maintenance as well as manage the assets of the 33kV, 22kV 11kV and 415/240 Volts in Peninsula Malaysia’s distribution network
TNB Distribution operates a network to purchase electricity from Transmission network and from embedded generators;

It markets and sell electricity by carrying out:
● connection of new supply
● providing customer services
● collection of revenue
● operating the call management centers
● providing supply restoration services
● cultivating strong customer and government relationships
DISTRIBUTION BUSINESS TERRITORY

High Voltage Customer (Tariff E3)

Medium Voltage Customer (Tariff C1, C2, E1, E2)

Low Voltage Customer (Tariff A, B, D)
Customer Segmentation
- based on meter category

Large Power Consumer (LPC):
All customers that take supply through CT-meter (normally tariff B, C, D, E)

Ordinary Power Consumer (OPC):
All customers that take supply through whole-current-meter (Tariff A & B)
Customer Segmentation
- based on activity

**Domestic customer:**
Residential (Tariff A)

**Commercial customer:**
All business premises, Govt. offices, NGOs (Tariff B, C)

**Industrial customer:**
All industrial premise premises (Tariff D, E)

**Mining:**
All mining activity (Tariff F)

**Street lighting:**
All street lighting, Flood lighting, Neon Lighting

**Agriculture:**
Specific agricultural activity (Tariff H)
# SERVICES PROVIDED FOR CUSTOMER

<table>
<thead>
<tr>
<th>System Voltage</th>
<th>Fault Level</th>
<th>Maximum Demand</th>
<th>Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Voltage</strong></td>
<td>275kV</td>
<td>40kA</td>
<td>19,030MVA</td>
</tr>
<tr>
<td></td>
<td>132kV</td>
<td>31.5kA</td>
<td>7,193.3MVA</td>
</tr>
<tr>
<td><strong>Medium Voltage</strong></td>
<td>33kV</td>
<td>25kA</td>
<td>1,427.3MVA</td>
</tr>
<tr>
<td></td>
<td>22kV</td>
<td>20kA</td>
<td>761.2MVA</td>
</tr>
<tr>
<td></td>
<td>11kV</td>
<td>20kA</td>
<td>380.6MVA</td>
</tr>
<tr>
<td><strong>Low Voltage</strong></td>
<td>415V</td>
<td>31.5kA</td>
<td>22.6MVA</td>
</tr>
<tr>
<td></td>
<td>240V</td>
<td>31.5kA</td>
<td>13.1MVA</td>
</tr>
</tbody>
</table>
GUARANTEE TO CUSTOMER
- RELIABILITY OF SERVICE

Voltage Under Normal Condition

<table>
<thead>
<tr>
<th>Voltage Level</th>
<th>% Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>415V &amp; 240V</td>
<td>-10% to +5%</td>
</tr>
<tr>
<td>6.6kV, 11kV, 22kV, 33kV</td>
<td>±6%</td>
</tr>
<tr>
<td>132kV &amp; 275 kV</td>
<td>-5% to +10%</td>
</tr>
</tbody>
</table>

Voltage Under Contingency Condition

<table>
<thead>
<tr>
<th>Voltage Level</th>
<th>% Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>415V &amp; 240V</td>
<td>±10%</td>
</tr>
<tr>
<td>6.6kV, 11kV, 22kV, 33kV</td>
<td>±10%</td>
</tr>
<tr>
<td>132kV &amp; 275 kV</td>
<td>±10%</td>
</tr>
</tbody>
</table>
GUARANTEE TO CUSTOMER
-RESPONSE TIME TO SERVICE INTERRUPTION

Security Level for TNB Network

<table>
<thead>
<tr>
<th>Security Level</th>
<th>Average Restoration Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Less than 5 seconds</td>
</tr>
<tr>
<td>Level 2</td>
<td>Less than 15 minutes</td>
</tr>
<tr>
<td>Level 3</td>
<td>Less than 4 hours</td>
</tr>
<tr>
<td>Level 4</td>
<td>Less than 24 hours</td>
</tr>
</tbody>
</table>

~ 132kV, 275kV and 500kV generally are designed to facilitate an average supply restoration of less than 5 sec

~ 6.6kV, 11kV, 22kV, and 33kV generally are designed to facilitate an average supply restoration of less than 4 hours

~ 240V and 415V the restoration period may vary beyond 4 hours depending on the type of faults and/or traffic congestion level
BUSINESS CHALLENGES

Losses:
Non-technical losses

Revenue collection:
Average collection period
Bad debts collection
Revenue assurance & back-billing

Customer focus:
Customer complaints
Customer satisfaction
Retaining customer’s loyalty

Keeping the light on:
Reduce breakdown
Faster response to interruption

Cost per unit:
Managing CPU rise (2% - 3% annually)
Keeping CAPEX & OPEX reasonably low
POWER FLOW – IDEAL CONDITION
POWER FLOW – WITH LOSSES
CHAPTER 6

Electricity Billing
FUNDAMENTAL OF ELECTRICITY

Power Triangle

Apparent Power
Power withdrawn from the grid

Real Power
Actual power consumed to perform work at Customer’s premise

Reactive Power
Unused Power stored in inductive load at Customer’s premise

\[ kVA^2 = kW^2 + kVar^2 \]
FUNDAMENTAL OF ELECTRICITY

\[
\begin{align*}
\text{kVA}^2 &= \text{kW}^2 + \text{kVar}^2 \\
\text{kVAh}^2 &= \text{kWh}^2 + \text{kVarh}^2 \\
\text{Power factor} &= \frac{\text{kW}}{\text{kVA}} = \frac{\text{kWh}}{\text{kVAh}}
\end{align*}
\]
# ELECTRICITY BILLING COMPONENT

<table>
<thead>
<tr>
<th>Bill element</th>
<th>Tariff A</th>
<th>Tariff B</th>
<th>Tariff C</th>
<th>Tariff D</th>
<th>Tariff E</th>
<th>Tariff G</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Energy consumed</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>b Power (Max Demand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>√</td>
<td>√</td>
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<tr>
<td>c Power factor</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
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<tr>
<td>d Welding charge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>√</td>
</tr>
<tr>
<td>e Temporary supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>√</td>
</tr>
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</table>
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<th>Tariff B</th>
<th>Tariff C</th>
<th>Tariff D</th>
<th>Tariff E</th>
<th>Tariff G</th>
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<tbody>
<tr>
<td>Minimum monthly charge (RM)</td>
<td>3.00</td>
<td>7.20</td>
<td>600.00</td>
<td>7.20</td>
<td>600.00</td>
<td>7.20</td>
</tr>
<tr>
<td>Minimum rental of infra if no significant consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connected load charge (From second year onwards until 5th year)</td>
<td>√</td>
<td></td>
<td>√</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge for not meeting declared max-demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Free, 2nd 50%, 3rd 50%, 4th 75%, 5th 75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1% Renewable energy charge</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free, 50%, 50%, 75%, 75%</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tbody>
</table>
## SAMPLE DOMESTIC CONSUMPTION

<table>
<thead>
<tr>
<th></th>
<th>Qty</th>
<th>Power (Watt)</th>
<th>Daily usage rate (hour)</th>
<th>Daily Energy Consumed (kWh)</th>
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</thead>
<tbody>
<tr>
<td>Refrigerator</td>
<td>1</td>
<td>1200</td>
<td>24</td>
<td>28.8</td>
</tr>
<tr>
<td>Television</td>
<td>1</td>
<td>150</td>
<td>5</td>
<td>0.75</td>
</tr>
<tr>
<td>Air Conditioner</td>
<td>2</td>
<td>750</td>
<td>7</td>
<td>10.5</td>
</tr>
<tr>
<td>Iron</td>
<td>1</td>
<td>1000</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Rice Cooker</td>
<td>1</td>
<td>730</td>
<td>0.75</td>
<td>0.5475</td>
</tr>
<tr>
<td>Kettle</td>
<td>1</td>
<td>850</td>
<td>0.5</td>
<td>0.425</td>
</tr>
<tr>
<td>Washing machine</td>
<td>1</td>
<td>850</td>
<td>0.75</td>
<td>0.6375</td>
</tr>
<tr>
<td>Standing fan</td>
<td>2</td>
<td>75</td>
<td>7</td>
<td>1.05</td>
</tr>
<tr>
<td>Lighting</td>
<td>12</td>
<td>36</td>
<td>5</td>
<td>2.16</td>
</tr>
<tr>
<td><strong>Total daily kWh</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>45.37</strong></td>
</tr>
<tr>
<td><strong>Total monthly kWh</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>1361.1</strong></td>
</tr>
</tbody>
</table>
## SAMPLE DOMESTIC BILL

<table>
<thead>
<tr>
<th></th>
<th>kWh</th>
<th>Unit Rate (RM)</th>
<th>Energy Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
<td>200</td>
<td>0.2180</td>
<td>43.60</td>
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<tr>
<td>Block 2</td>
<td>100</td>
<td>0.3340</td>
<td>.33.40</td>
</tr>
<tr>
<td>Block 3</td>
<td>100</td>
<td>0.4000</td>
<td>40.00</td>
</tr>
<tr>
<td>Block 4</td>
<td>100</td>
<td>0.4020</td>
<td>40.20</td>
</tr>
<tr>
<td>Block 5</td>
<td>100</td>
<td>0.4160</td>
<td>41.60</td>
</tr>
<tr>
<td>Block 6</td>
<td>100</td>
<td>0.4260</td>
<td>42.60</td>
</tr>
<tr>
<td>Block 7</td>
<td>100</td>
<td>0.4370</td>
<td>43.70</td>
</tr>
<tr>
<td>Block 8</td>
<td>100</td>
<td>0.4530</td>
<td>45.30</td>
</tr>
<tr>
<td>Block 9</td>
<td>461.10</td>
<td>0.4540</td>
<td>209.34</td>
</tr>
<tr>
<td><strong>Total bill (RM)</strong></td>
<td></td>
<td></td>
<td><strong>539.74</strong></td>
</tr>
</tbody>
</table>
What happen if the total bill exceed RM 600.00?

Possibilities:
- Increase in consumption
- Unauthorized connection
- Billing error
- Old appliances
CHAPTER 7

e - CUSTOMER INFORMATION BUSINESS SYSTEM (e-CIBS)
e-CIBS BUSINESS PROCESS

Customer → Supply Application → Estimation (Connection Charge) → Service Installation → Deposit → Install Meter (Work Order 11)

Refund

Closed Account

Reporting → Operational → Management

Financial

ePOS Collection/Agency → Debit/Credit → Transfer → Bank → Journal → Disconnection → Bounced Cheque → Reconcile → Installment Plan → Stub → LOA Posting → Backbilling

Billing → Spot Billing → Station Billing → RMR Reading → O Billing → IR/ER Extraction
e-CIBS SYSTEM & PROCESS OVERVIEW

- Basic SAP Navigation
- System & Process Overview
- Detail Transactions

- SAP001
  - Basic SAP Navigation

- ECIBS100
  - eCIBS Overview

- Customer Service (CS)
- Financial (FI)
- Meter and Billing (MB)
- Workflow (WF)
- Reporting (R)
DETAILS OF CUSTOMER SERVICE

Basic SAP Navigation
System & Process Overview
Detail Transactions

SAP001
Basic SAP Navigation

ECIBS100
eCIBS Overview

Customer Service (CS)
Financial (FI)
Meter and Billing (MB)
Workflow (WF)
Reporting (R)

CS001
Customer Enquiry For CS

CS100
New Connection

CS101
Change Of Tenancy

CS102
Work Order OPC

CS103
Work Order LPC

CS104
Group ID Contract & Complaint Log

CS105
Individual Street Lighting & COTA

CS106
E-Government & E-Services for CS
DETAILS OF METER & BILLING

- Basic SAP Navigation
- System & Process Overview
- Detail Transactions

SAP001
Basic SAP Navigation

ECIBS100
eCIBS Overview

Customer Service (CS)
Financial (FI)
Meter and Billing (MB)
Workflow (WF)
Reporting (R)

CS102 & CS103 Pre-requisite

MB001
Meter Information Form

MB100
LPC Schedule
MB101
Unscheduled Meter Inspection
MB102
Load Profile & Test Billable
MB103
Enhancement Sub Metering for MS 2&3

MB104
Landlords/Tenants & Group ID
MB105
Event & Carnival Discounts
MB106
Group Billing
MB107
Bill Cancellation & Ave Cons
MB108
Overall Reading Unit Processing
MB109
Remote Meter Reading
MB110
Station Billing & RMA Reporting
MB111
Substation Metering
MB112
Co-Gen
DETAILS OF METER & BILLING

- Basic SAP Navigation
- System & Process Overview
- Detail Transactions

**SAP001**
Basic SAP Navigation

**ECIBS100**
eCIBS Overview

- Customer Service (CS)
- Financial (FI)
- Meter and Billing (MB)
- Workflow (WF)
- Reporting (R)

**WF001**
Workflow Process

**WF002**
Setup, Configuration & Administration (Admin)

**WF003**
ABAP Query for Beginner
DETAILS OF REPORTING

- Basic SAP Navigation
- System & Process Overview
- Detail Transactions

SAP001
Basic SAP Navigation

ECIBS100
eCIBS Overview

Customer Service (CS)
Financial (FI)
Meter and Billing (MB)
Workflow (WF)
Reporting (R)

MR001
Operational Reporting
MR001
Management Reporting
Supply Application

Customer Service

1 day
Receive application

Check application forms
- Customer info
- Contractor info

Create New Connection (NC) number

Create work order for site visit

Print connection fee changes letter

Customer/Contractor to collect connection fee letter

Receive connection fee payment

Create work order 10 for service erection

Print deposit letter

Customer/Contractor to collect deposit letter

Receive deposit payment

Create work order 11 for meter installation

Service

7 days
Perform site visit and estimate connection fee changes

General: 14 days
Underground cable: 21 days
Service less than 3 poles: 7 days
*Service with lines pole: 2 days
*Service without pole: 1 day
*Site location within 20km radius from application office

Material request for service erection

Perform service erection

2 days
Material request for meter installation

Meter appointment with Contractor/Customer

Perform meter installation
Supply Application

Types of supply application

A. Supply applications – by load category

• Low Voltage Supply application for load up to 100 kVA without substation (maximum processing period = 3 weeks provided way leave is acquired)

• Low Voltage Supply application for load exceeding 100 kVA requiring substation (maximum processing period = 3 month, provided way leave is acquired)

• Medium Voltage Supply (11kV & 33kV) application for load 1MVA – 25MVA (maximum processing period = 3 years, provided way leave is acquired)

• High Voltage Supply (132kV) application for load exceeding 25MVA (processing period = 3 - 5 years, provided way leave is acquired)
Supply Application

Types of supply application

B  Mode of supply application – by nature of supply

•  New supply
  i.  Customers that require new service line from the existing supply mains.
  ii. Developers that require new supply mains and services in a development area.

•  Additional supply
Customer that require additional load from the existing supply mains to cater for any extension.

•  Change of tenancy
Termination of old supply contract and registration of new supply contract at a particular premise with existing supply mains available.
Supply Application

Types of supply application

B Mode of supply application – by nature of supply

- Temporary supply
  Customer that require electricity supply for a period less than 6 months only and intended for purposes of electricity supply for temporary work site, festival and celebrations.

- Standby supply
  Customer that generate electricity supply by themselves and require synchronization with TNB for additional supply security.

- Co-Generation
  Industrial consumers whose processes require electricity and heat or steam, may plan cogeneration of such energies from suitable plant, and request synchronization with TNB supply system.
Supply Application

Special features of new supply project

• Alternative source of supply
  Customer that require an alternative source of supply for added security.

• Additional feeder
  Customer that require additional service feeder for added security.

• HDD technique to lay underground cable

• Installation of compact substation

• Underground service cable design for housing project
- Can be done thru **TNB Kedai Tenaga** or **internet**

Register

- eCIBS
- Internet Application

or

- e-Application

Moving To The Next Dimension
New Connection Process

Menu Path

SAP Easy Access  e-CIBS Tenaga Nasional Berhad

- SAP menu
  - SAP Business Workplace
  - Customer Search
  - Customer Enquiry
- Customer Services
  - Customer Information
  - New Connection
    - New Application
    - Status Overview
      - Maintain
      - Display
  - Approval/Rejection
    - Maintain
    - Display
- Change of Tenancy
- Work Order
- Complaint Log
- Change of Tariff
- Substation Metering
- Group ID
- Individual Streetlight (ISL)
## New Connection Process

### Individual Application Stages

<table>
<thead>
<tr>
<th>Application Stage</th>
<th>Compl Date</th>
<th>User Id</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Application Form</td>
<td>31.07.2009</td>
<td>10025577</td>
</tr>
<tr>
<td>Site Visit/Connection Charge</td>
<td>10.08.2009</td>
<td>10025577</td>
</tr>
<tr>
<td>Prepare Installation</td>
<td>15.08.2009</td>
<td>16581790</td>
</tr>
<tr>
<td>Process Initial Deposit</td>
<td>18.08.2009</td>
<td>16971922</td>
</tr>
<tr>
<td>Data Confirmation</td>
<td>18.08.2009</td>
<td>16971922</td>
</tr>
<tr>
<td>Install/Test Meter</td>
<td>19.08.2009</td>
<td>16971922</td>
</tr>
<tr>
<td>Finalise Application</td>
<td>20.08.2009</td>
<td>10365639</td>
</tr>
</tbody>
</table>

### Group Application Stages

<table>
<thead>
<tr>
<th>Application Stage</th>
<th>Compl Date</th>
<th>User Id</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Application Form</td>
<td>20.05.2008</td>
<td>10032263</td>
</tr>
<tr>
<td>Site Visit/Connection Charge</td>
<td>20.05.2008</td>
<td>10032263</td>
</tr>
<tr>
<td>Prepare Installation</td>
<td>20.05.2008</td>
<td>10071822</td>
</tr>
<tr>
<td>Data Confirmation</td>
<td>25.05.2008</td>
<td>10071822</td>
</tr>
</tbody>
</table>
New Connection Process

Process Application Form – Stage 1

Application Type

Choose the correct type of NC:

Individual Application:

Application Type:
01 – Individual
07 – Rewiring
(for upgrading ie. 1Ø to 3Ø)

Project:
02 – Group
04 – Metered Street Light/ Tel Booth light Group

Project Individual:
03 – Group Individual
05 - Metered Street Light/ Tel Booth light Group Individual
How to create NC?

• Goto this Area Menu.
• Double click
Step 1

- Enter <Station Code>
- Choose the correct <Application Type>

Note:
1. Group Reference Number is referring to NC type 2 or NC Type 4.
2. Customer number is referring to customer number created thru NC Type 2 or NC Type 4.
New Connection Process

• Step 2
• Choose the correct Account Type.

Note:
• 01 – Customer with New IC.
• 02 – Customer with Old IC/Police ID/Army ID/Passport
• Step 2

• Customer Request Date
  – Defaulted to 23 working days. Why?
  • Estimation – 7 days
  • Service Installation after connection charge paid – 14 days
  • Meter Installation after deposit paid – 2 days
New Connection Process

Step 2

- For temporary supply:
  1. Tick temporary supply check box.
  2. Enter Contract End Date

- Submit Date
  - Date customer submitted supply application form.
Choose a valid contactor number.

Note: Only active contractors appear on the selection list.
symbol is a mandatory field.
Enter:
1. <Customer Name>
2. <IC Number New>
3. <Premis Status>
4. <Premis Number>
5. <Street Number>

Note:
Please enter other information for reference.
- Tab Concept

- Bill can be sent by Post. To send check Bill By Post.

- Enter postal address
New Connection Process

- Tab Concept
- Bill can be sent by Post.
- Enter postal address
- Enter info in Ref Contacts tab Director Info tab.

Note: At least 1 director info must be keyed in.
Site Visit/Connection Charge—Stage 2

- Site Visit is the stage where all physical estimation is captured.

- Estimation value must be entered correctly either thru LKKK or BKKM.

- Connection charge must be printed and served upon completion of data entry for customer to make payment.
New Connection Process

Site Visit/Connection Charge—Stage 2

- At this stage the correct info must be entered:
  - Type of work
  - Customer category
  - Business Code
  - Tariff Code
  - Supply Voltage Code
  - Average Consumption
After connection charge paid by customer, service installation must be made.

- Work Order 10 for service installation must be created and updated.

- Allow user to maintain Work Order without exiting NC.

- Double click Work Order number in blue color to maintain Work Order.
### New Connection Process

**Process Initial Deposit – Stage 4**

<table>
<thead>
<tr>
<th>(Station Code)</th>
<th>2610</th>
<th>Creation Date</th>
<th>31-03-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Connection</td>
<td>68936</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Type</td>
<td>Individual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Number</td>
<td>943164</td>
<td>KU AHMAD ROSIDI BIN KU</td>
<td></td>
</tr>
</tbody>
</table>

#### General Classification

- **Deposit:** [Cash](#), [Bank Guarantee](#), [Cash & Bank Guarantee](#), [Exempted](#)

- **Deposit Exempted Category:**
  - [Exempted Category](#)

#### Deposit Details

- **Average Bill Amount:** 0.00
- **Required Deposit:** 0.00
- **Cash Deposit Value:** 0.00
- **Unpaid Cash Deposit:** 0.00
- **Credit Worthiness:** [Rating: 0.006] [Evaluation Date: 29-04-2010]

#### Exempted Category

<table>
<thead>
<tr>
<th>Exempted Category</th>
<th>Exempted Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>TNB Staff</td>
</tr>
<tr>
<td>02</td>
<td>Government Agency</td>
</tr>
<tr>
<td>03</td>
<td>Free Unit</td>
</tr>
<tr>
<td>04</td>
<td>Others</td>
</tr>
</tbody>
</table>
**New Connection Process**

**Process Initial Deposit – Stage 4**

- **Exempted Category**
  - 01: TNB Staff
  - 02: Government Agency
  - 03: Free Unit
  - 04: Others

- **Corporate Cust Class**
  - 9991: AKAUN KAKITANGAN TNB
  - 9992: Unit percuma
  - 9995: INDAH WATER KONSORTIUM
  - 9999: Temporary class for conversion

- **Exempted Category**
  - Staff – 8 digit Staff Number and Corporate Cust Class 9991 must be entered.
  - Free Unit – Corporate Cust Class 9992 must be entered.
Install Test Meter – Stage 6

Klik Save – Work Order 11 diwujudkan

Klik Yes untuk kemaskini pesanan kerja