SINGLE BUYER OPERATIONS MANUAL
(PENINSULAR MALAYSIA)

SINGLE BUYER DEPARTMENT
Version 1.0
Effective Date: [■ 2017]

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1 INTRODUCTION

1.1 Background

1.1.1 The Energy Commission has pursuant to the Electricity Supply Act 1990 issued the Single Buyer Rules to govern the operation of the Single Buyer market as well as the role and functions of the Single Buyer. The roles of the Single Buyer are as follows:

(a) to procure electricity to meet demand at the least cost;

(b) to facilitate security of electricity supply;

(c) to monitor the adequacy of the supply of fuel to Generators;

(d) to promote transparency in the performance of its functions;

(e) to facilitate competition in the generation sector; and

(f) to promote confidence in the Electricity Industry.

1.2 Objectives of this Operations Manual

1.2.1 The objectives of this Operations Manual are:

(a) to detail the functions of the Single Buyer and the applicable standard operating policies and procedures;

(b) to provide Participants in the Single Buyer market insights into the operations of the Single Buyer;

(c) to promote transparency and market confidence in the operations of the Single Buyer; and

(d) to serve as a reference for the day-to-day operations for members of the Single Buyer.

1.2.2 This Operations Manual shall be read in conjunction with the Single Buyer Rules and shall apply without derogating from the general principles and requirements as detailed in the Single Buyer Rules.

1.2.3 Unless otherwise defined herein, all capitalised words appearing herein shall have the meanings ascribed in the Single Buyer Rules.

2 GENERAL OBLIGATIONS OF THE SINGLE BUYER

2.1 General Obligations of the Single Buyer

2.1.1 The Single Buyer Rules require the Single Buyer to purchase electricity and perform its functions as the Single Buyer in a fair and non-discriminatory manner while promoting competition in the energy generation sector and enhance public confidence in the Electricity Industry. In doing so, the Single Buyer shall:

(a) purchase electricity on a least cost basis in accordance with the terms and conditions of the Generator Contracts, Daily Heat Rate and Variable Operating Rate Bids and Daily Price Bids while taking into account any generation and transmission network constraints;

(b) facilitate the security of electricity supply by maintaining oversight of demand and supply issues in the performance of dispatch scheduling and assessing long term supply and demand conditions;

(c) monitor the adequacy of supply of gas, coal and hydro levels to meet the dispatch schedules and respond to any unplanned curtailments or disruptions;

(d) perform its functions in a transparent and consistent manner and, subject to any confidentiality obligations and requirements, publish information with regard to the performance of its functions in a clear, concise, understandable and readily accessible manner;

(e) deal with Participants in the Single Buyer market in a fair and balanced manner and not make decisions or act in a manner that is biased and/or unreasonably discriminates against any Participants;

(f) instill confidence in the Electricity Industry by avoiding conflicts of interests which may have an effect of reducing competition in the Single Buyer market or providing a competitive advantage to any Participant (including another division or unit of TNB); and

(g) at all times ensure it performs its functions in a manner that is consistent with the Malaysian Grid Code, Single Buyer Rules and other applicable laws, codes, rules, regulations and guidelines.

2.2 Functional Units

2.2.1 The Single Buyer is organised in the following functional units which are responsible for the following scope of work.

(a) System Planning Unit

The System Planning unit is responsible for maintaining oversight over demand and supply of electricity in Peninsular Malaysia through forecasting load demand over the long and short term and planning for new generation capacities to meet such demands.

(b) Market Operation and Assessment Unit

The Market Operation and Assessment unit is responsible for scheduling the day-to-day dispatch of Generators based on the Least Cost Dispatch Scheduling Methodology and forecasting dispatch over the medium term based on fuel supply and curtailments, scheduled Generator outages and relevant forecast data including assessment on expected participations from NEDA Participants.

(c) Technical Advisory and Industry Development Unit

The Technical Advisory and Industry Development unit is responsible for providing technical expertise, guidance and advice on generation, transmission and electricity industry related matters to the Single Buyer and other related agencies as necessary including the Energy Commission and the Ministry of Energy, Green Technology and Water ("KeTTHA") to advance development of the Malaysian Electricity Supply Industry.

(d) Contract & Resource Management Unit

The Contract & Resource Management unit is responsible for negotiating and managing Generators Contracts including contracting for new energy, monitoring contract performance and fuel planning for power sector consumption.

(e) Finance &Enterprise Management Unit

The Finance and Enterprise Management unit is responsible for settlement and clearance of invoices, performing the reporting obligations of the Single Buyer under the Single Buyer Rules and Incentive Based Regulations and monitoring compliance of the Single Buyer with the Single Buyer Rules and any applicable laws, codes, rules, regulations and guidelines.

2.3 Oversight of the Single Buyer Market

2.3.1 The Energy Commission and the Single Buyer Rules have established various panels, working groups and committees to oversee the operations of the Single Buyer market to facilitate the monitoring and improve the transparency of the Single Buyer market.

(a) Single Buyer Oversight Panel

(i) The Single Buyer Oversight Panel has the main functions of overseeing the compliance of the Single Buyer with the Single Buyer Rules and providing advice and guidance to the Single Buyer and Participants on achieving the objectives of the Single Buyer market.

(ii) The Single Buyer Oversight Panel is chaired by the Energy Commission and comprised of suitable members as selected by the Energy Commission.

(b) Dispatch Scheduling Working Group

(i) The Dispatch Scheduling Working Group is responsible for reviewing the efficiency and effectiveness of dispatch scheduling procedures performed by the Single Buyer to ensure the Single Buyer is minimizing the cost of electricity procurement while promoting transparency and facilitating competition in the Electricity Industry.

(ii) The Dispatch Scheduling Working Group meets at least quarterly and comprises (at a minimum) of representatives from the Energy Commission, the Single Buyer and the Grid System Operator.

(c) Long Term Demand and Supply Working Group

(i) The Long Term Demand and Supply Working Group is responsible for reviewing the development and content of the Five Year Ahead Load Forecast Report, Ten Year Ahead Load Forecast Report, Five Year Ahead Dispatch Schedule Report and Ten Year Ahead Generation Capacity Report to ensure security of electricity supply in Malaysia.

(ii) The Long Term Demand and Supply Working Group meets at least once every six months and comprises of representatives from the Energy Commission, the Ministry of Energy, Green Technology and Water, other relevant Government agencies or authorities, the Nominated Gas Supplier, the Single Buyer, the Grid System Operator and the Grid Owner.

(d) Single Buyer Website Working Group

(i) The Single Buyer Website Working Group is responsible for reviewing the content, format and accessibility of information published on the Single Buyer Website to ensure compliance with the Single Buyer Rules and applicable disclosure requirements.

(ii) The Single Buyer Website Working Group meets at least quarterly and comprises (at a minimum) of representatives from the Energy Commission, the Single Buyer, the appointed information communication and technology service provider and the Grid System Operator.

(e) Gas Supply Committee

(i) The Gas Supply Committee is responsible for ensuring the adequacy of gas supply for electricity generation in Peninsular Malaysia based on the relevant Three Month Ahead Dispatch Schedule, the relevant Five Year Ahead Dispatch Schedule Report and the Power Sector Gas Allocation.

(ii) The Gas Supply Committee will assess any risk to the availability and reliability of gas supply and put in place measures to mitigate the impact of any disruption, including the Urgent Gas Procedures for any urgent unplanned disruptions.

(iii) The Gas Supply Committee meets at least once every six months and comprises of representatives from the Economic Planning Unit of the Prime Minister's Department, Ministry of Energy, Green Technology and Water, the Energy Commission, the Nominated Gas Supplier, Grid Owner, Grid System Operator and the Single Buyer.

(f) Coal Supply Committee

(i) The Coal Supply Committee is responsible for monitoring and reporting on the supply of coal for the electricity generation sector.

(ii) The Coal Supply Committee will monitor and report on global coal supply and pricing trends and develop early warning systems to ensure no interruption to coal based electricity generation.

(iii) The Coal Supply Committee meets at least quarterly and comprises of representatives from the Economic Planning Unit of the Prime Minister's Department, Ministry of Energy, Green Technology and Water, the Energy Commission, the Nominated Coal Supplier, Grid Owner, Grid System Operator and the Single Buyer.

(g) Rule Change Panel

(i) The Rule Change Panel is responsible for assessing and recommending on proposed changes to the Single Buyer Rules which may better facilitate the objectives of the Single Buyer Rules.

(ii) The Rule Change Panel meets as and when required by the Energy Commission and comprises of representatives from the Single Buyer, Generators, Grid System Operator, Grid Owner and other independent experts as deemed appropriate by the Energy Commission.

2.3.2 The Energy Commission and the Single Buyer may establish additional panels, working groups and committees from time to time and invite appropriate representatives from Participants and other stakeholder groups to the meetings to facilitate the development of the Electricity Industry in Malaysia.

3 LOAD FORECASTS

3.1 Load Forecasts

3.1.1 The Load Forecast section within the System Planning unit is responsible for carrying out long term and regional load forecasting studies.

3.1.2 The Short Term Scheduling section within the Market Operation and Assessment unit is responsible for carrying out short term load forecasting which covers the daily, weekly and monthly operational forecasts.

3.1.3 The studies are used to meet internal and external requirements as they are critical inputs to the capacity planning, scheduling and system operation processes.

3.1.4 The scope of load forecasting horizons includes the following:

(a) Day Ahead Load Forecast (including current day revision);

(b) Week Ahead Load Forecast;

(c) 3-Month Ahead Load Forecast;

(d) 5-Year Demand and Supply Forecast; and

(e) 20 Year Demand and Supply Forecast.

3.2 Long Term Load Forecast Data Collection and Model Update

3.2.1 The Load Forecast section shall collect all relevant data to update the forecasting models using the ForecastPro and ForecastX software. The data to be collected includes of the following:

(a) Annual and monthly aggregate and sectoral sales from TNB Distribution;

(b) Annual and monthly generation data from Grid System Operator;

(c) Annual and monthly peak demand data from the Grid System Operator;

(d) Annual system losses which is calculated based on historical sales and generation;

(e) Annual load factor which is calculated based on the historical peak demand and generation;

(f) Annual and quarterly Malaysian GDP from the Bank Negara Malaysia or Department of Statistics of Malaysia;

(g) Number of customers and electricity price from TNB Distribution;

(h) Peninsular Malaysia population and number of household from the Department of Statistics of Malaysia;

(i) Malaysian GDP forecasts from TNB Group Finance, the Ministry of Finance, Malaysia Institute of Economic Research, Economic Planning Unit and banks research houses; and

(j) Weather forecast updates from the Malaysian Meteorological Department.

3.3 Long Term Load Forecast Simulation Studies and Results Analysis

3.3.1 The Load Forecast section employs a multi-model approach in forecasting the baseline load forecast. The approach includes time series and regression analysis. Time series analysis attempts to forecast electricity load based on historical trends, through different types of statistical formulae. Regression analysis attempts to study the relationship of load and its various external drivers such as GDP and population.

3.3.2 Peak demand is derived from the load forecast, based on assumptions on losses and load factor. In addition, a separate regression model to forecast peak demand is used to determine the relationship of peak demand and its external drivers such as temperature, GDP and population.

3.3.3 The Load Forecast section shall then integrate the forecast results from the various forecasting models and perform a qualitative and quantitative analysis to verify the forecast results from the various models. An average of the selected forecast results shall be used as the overall forecast figures. A forecast error analysis is also conducted to evaluate the accuracy of past electricity demand forecast.

3.3.4 Findings from the Load Forecast section shall be presented to the Load Forecasting Work Group which comprises of various representatives such as representatives from the Energy Commission, the Single Buyer, the Grid System Operator and the Grid Owner. The Load Forecasting Working Group shall discuss the forecast results quantitatively and qualitatively to come up with a unified electricity demand forecast.

[*Cross Reference: SOP – Long Term Load Forecast Process, Work Instruction – Simulation Studies and Results Analysis, Work Instruction – Data Collection and Model Update, Work Instruction – Discussion of Results*]

3.4 Preparation of Short Term Load Forecasts

3.4.1 The Short Term Scheduling section shall prepare the:

(a) Day Ahead Load Forecast which is to be presented in the Daily Operational Review Meeting (weekdays); and

(b) Week Ahead Load Forecast which is to be presented in the Weekly Coordination Meeting held every Thursday.

3.4.2 Relevant data collected such as weather parameters and latest load data shall be used to renew the coefficients in the Itron Metrix forecast models. An analysis is then conducted on the results of the various forecast models to produce a preliminary forecast. The preliminary forecast shall be discussed, verified and approved internally before being presented in the Daily Operational Review Meeting

/ Weekly Coordination Meeting before dissemination to the Short Term Scheduling section and the Grid System Operator.

3.4.3 KPIs shall apply for the accuracy of the current day revision of the day ahead load forecast.

[*Cross Reference: SOP – Day Ahead Load Forecast, SOP – Week Ahead Load Forecast and SOP – Long Term Load Forecast, Work Instruction – Data Collection and Model Update, Work Instruction – Actual Load Data & Weather Forecast (Day), Work Instruction – Actual Load Data and Weather Forecast (Week)*]

4 CAPACITY PLANNING

4.1 Capacity Planning

4.1.1 The Capacity Planning section within the System Planning unit is responsible for carrying out medium to long term capacity planning (from 5 years up to 20 years) to ensure adequate generation capacity to meet forecast future demand. This planning role supports the Energy Commission in relation to contracting for new capacity.

4.1.2 The capacity planning activities include demand-supply analysis, site study and determination of maximum capacity for each of the identified sites, and other technical and economic studies related to generation capacity issues.

4.1.3 The generation development plan shall be presented and discussed in the Long Term Demand and Supply Working Group which shall consist of representatives from the Capacity Planning section, other members of the System Planning unit together with representatives of the Energy Commission and KeTTHA via the Planning and Implementation Committee for Electricity and Supply Tariff of Malaysia (JPPPET).

4.2 20-Year Generation Development Plan

4.2.1 The Capacity Planning section is shall prepare the 20-Year Generation Development Plan once every 6 to 12 months.

4.2.2 The Capacity Planning section shall initiate the process by establishing a work plan with the other units of the Single Buyer, the Energy Commission, KeTTHA and such other persons with data relevant for the 20-Year Generation Development Plan for delivery of the requisite input data.

4.2.3 The Capacity Planning section shall compile, review and verify the requisite input data which includes the following:

(a) Electricity Demand Forecast from the Load Forecast section;

(b) Generation Plants Data from TNB, IPPs or the Contract and Resource Management unit;

(c) New Options Plant Data from TNB Generation, Malaysia Nuclear Power Corporation and THERMOFLOW (a power plant design and cost estimation software);

(d) Fuel price projections from TNB Fuel and other publicly available resources;

(e) Renewable Energy Data from the Sustainable Energy Development Authority of Malaysia and the Energy Commission; and

(f) Economic parameters from the TNB Group Finance;

4.2.4 The data shall then be updated and processed using the PLEXOS Software and used to prepare the 20-Year Generation Development Plan including new capacity expansion, generation mix, fuel requirement projection and emission projection.

4.2.5 The Long Term Supply and Demand Working Group shall discuss, verify and approve the key assumptions used for simulation of the base case and other scenarios.

4.2.6 The proposed 20-Year Generation Development Plan shall then be submitted for the necessary verifications and approvals by the General Manager of the System Planning unit and the Head of Single Buyer before dissemination to the Energy Commission and KeTTHA.

[*Cross Reference: SOP – 20-Year Generation Development Plan (Pre-JPPPET)*]

5 SCHEDULING

5.1 Scheduling

5.1.1 The Short Term Scheduling and Medium Term Scheduling sections within the Market Operation and Assessment unit are responsible for the short to medium term scheduling and planning for dispatch of Generators. Its related functions include fuel requirement nomination for gas and coal, coordination with the GSO for generator outages and analysis for Incentive Based Regulation documentation and submission.

5.1.2 The scope of dispatch scheduling includes the following:

(a) Day Ahead Dispatch Schedule;

(b) Week Ahead Dispatch Schedule;

(c) 3-Month Ahead Dispatch Schedule;

(d) 1-Year Ahead Dispatch Schedule; and

(e) 5-Year Ahead Dispatch Schedule

Note: The dispatch schedules refer to the planned dispatch of all generating units to meet the load profiles for the corresponding time horizon.

5.1.3 The Scheduling sections shall use the Least Cost Dispatch Scheduling Methodology to prepare the dispatch schedules to minimize the cost of electricity procurement in accordance with the Single Buyer Rules.

5.2 Preparation of Forecast Dispatch Schedules

5.2.1 The Scheduling sections shall prepare the Day Ahead Dispatch Schedule / Week Ahead Dispatch Schedule / Three Month Ahead Dispatch Schedules in accordance with the Single Buyer Rules. In addition, the Scheduling sections shall prepare 1-Year Ahead Dispatch Forecast for Financial Year budgeting purposes as well as a the 5-Year Ahead Dispatch Schedule for the purposes of the 5-Year and 10-Year Demand and Supply Forecast Report.

5.2.2 The Scheduling sections shall collect the relevant input data, including:

(a) Daily Availability Declarations from TNB Generation and IPPs;

(b) Load forecast from the Load Forecast section;

(c) Day-Ahead Dispatch Schedule: Daily Availability Declaration from Generator(s);

(d) Beyond the horizon of the Day Ahead Dispatch Schedule: Outage plan from the Generator Coordination Section;

(e) Gas Curtailment Schedule from Petronas Gas Berhad;

(f) System Constraint (if any) from the Grid System Operator; and

(g) Generator Testing Pattern (if any) from the Generator(s).

5.2.3 Using the PLEXOS Model with the updated input data, the Scheduling sections shall conduct the production simulation to prepare and submit the relevant dispatch schedules for approval at the relevant working group and/or coordination meetings.

5.2.4 The Dispatch Schedules once finalized shall be submitted to the National Load Dispatch Centre, Petronas Gas Berhad, Fuel Management section, Grid System Operator, TNB Group Finance, individually to Generators and the Energy Commission as relevant.

5.2.5 KPIs apply for the dissemination of the relevant Dispatch Schedules on a timely basis.

[*Cross Reference: SOP – Day Ahead Generation and Unit Commitment Schedule, SOP – Preparation of Weekly Production Plan, SOP – 3-Month and 1 Year Ahead Dispatch Forecast, SOP – 5 Years Ahead Dispatch Forecast*]

6 PLEXOS MODEL

6.1 PLEXOS Model

6.1.1 PLEXOS Integrated Energy Model Software is a simulation software that uses mathematical optimization to provide simulation integrating energy production, transportation and demand over simulated timeframes. PLEXOS is predominantly used by the System Planning and Market Operation and Assessment units for simulation of forecasts and scheduling dispatch based on verified input data.

6.2 Simulation Model Review and Updates

6.2.1 The System Planning and Market Operation and Assessment units are responsible for updating and reviewing the data for the PLEXOS database. The data which are necessary for the simulation model includes:

(a) Demand forecast;

(b) Forced outages;

(c) Fuel availability;

(d) Fuel conversion factors;

(e) Fuel prices;

(f) Gas curtailment;

(g) Generator availabilities;

(h) Heat rates;

(i) Hydro energy production;

(j) Interconnection availabilities;

(k) Major public holidays;

(l) Minimum down times for generators;

(m) Minimum up times for generators;

(n) Planned outages;

(o) Plants ups and retirements;

(p) Solar profiles;

(q) Start up costs;

(r) System constraints;

(s) Test energy and testing patterns;

(t) Tested annual available capacities;

(u) Transmission line constraints; and

(v) Variable operating rates.

6.2.2 Data is collected from other units of the Single Buyer, Grid System Operator, Generators and other relevant Participants via emails, official letters, minute of meetings, websites and information in SLAs and PPAs. All information shall be reviewed, verified and approved before updating the simulation model.

6.2.3 Data revisions shall be approved by the Senior Managers of the System Planning and Market Operation and Assessment units before the Database Controllers updates the models. Only Database Controllers who are authorised can do amendments on the PLEXOS Database. Database Controllers must record all the changes and details of the changes made in a log.

[*Cross Reference: SOP – Simulation Model Review and Updates, SOP – PLEXOS Database Version Control Work Instruction – PLEXOS Model update for Day-Ahead Generation and Unit Commitment Schedules and Work Instruction – PLEXOS Model Update for Weekly Production Plan*]

7 FUEL MANAGEMENT

7.1 Fuel Management

7.1.1 The Fuel Management section is responsible for activities related to fuel billing, planning and monitoring. It also conducts risk assessment of fuel supply. Other roles of this section include:

(a) Develop and manage Gas Framework Agreement for the power sector;

(b) Verify Applicable Coal Price;

(c) Review and assist the Energy Commission in gas sector reforms;

(d) Assist relevant stakeholders in the process of fuel procurement for gas, coal and liquefied natural gas;

(e) Coordinate coal and gas committees under the Single Buyer Rules; and

(f) Provide commercial, technical and legal advisory on fuel matters.

7.2 Coal Stock Monitoring

7.2.1 The Fuel Management section will monitor coal stock at all coal fired plants in Peninsular Malaysia. The Fuel Management section will monitor the cola stock through the following:

(a) Coal Dispatch Forecast;

(b) Daily Availability Declarations submitted by Generators ;

(c) Generators Outage Update;

(d) Meter reading from TNB Transmission Metering Portal; and

(e) Weekly Coal Delivery Schedule submitted by TNB Fuel Services.

7.2.2 The Fuel Management section then monitors the coal stock level for each Generator on a daily basis and compares it with the minimum level of coal stock as per the PPA. If any of the Generators does not meet the minimum level of coal stock as per PPA, the Fuel Management section shall, if necessary, prepare a non-compliance letter and submit it to the respective generator in a timely manner.

7.2.3 The Fuel Management section will also produce the Monthly Coal Stock Monitoring Reports. A KPI is set for 100% completion and timely preparation of the Monthly Coal Stock Monitoring Report.

[*Cross Reference: SOP – Coal Stock Monitoring*]

7.3 Gas Billing

7.3.1 The Fuel Management section will process gas invoices from Petronas for power sector gas consumption. The process begins with receipt of Petronas's invoice which will be checked and verified the invoice data including the volume (SM), Energy (GJ), Gross Heating Value (GHV), Pressure (kPag), Gas Price and Gas Differential Price.

7.3.2 Upon the necessary checks, verifications and approvals, the invoice will be submitted to the TNB Group Finance team for payment.

[*Cross Reference: SOP – Gas Billing*]

8 GENERATION COST SUBMISSION

8.1 In accordance with the Single Buyer Rules, the generation costs incurred by the Single Buyer in procuring electricity in accordance with the Generators Contracts and other sale and purchase agreements for electricity shall be recovered from the Distributors via the Single Buyer Generation Tariff.

8.2 Generation costs incurred shall be reported in accordance with the requirements of the Incentive Based Regulations ("IBR") and Imbalance Cost Pass-Through ("ICPT") mechanism.

8.3 Generation cost data can be categorised into 3 types: (i) forecast (ii) estimates and (iii) actual. For the IBR submission, the regulatory period covers a 3-year look-ahead horizon. All data used are forecast data. For the ICPT submission, it covers a 6-month period straddling across actual data for the first 2 months, estimate for month 3 and forecast data for months 4-6.

8.4 The Scheduling sections begin the process with compilation of inputs and assumptions for updating the PLEXOS Model. Once agreed, the Scheduling sections shall finalise the PLEXOS model based on the agreed input list and proceed with simulation of the generation forecast.

8.5 Based on the verified PLEXOS model, the simulations will produce the monthly figures of:

(a) GWh forecast by plant/generating facility;

(b) Heat rate by plant/generating facility;

(c) Fuel price by fuel type; and

(d) Fuel volume by fuel type.

8.6 Based on the forecasts, the Finance & Enterprise Management unit can calculate the forecasted energy and capacity costs for each generator. The aggregate forecast Generation Costs will be submitted to Regulatory Economics Department for further analysis and determination of the Single Buyer Generation Tariff.

8.7 Actual monthly invoices from Generators will be process by the Finance & Enterprise Management unit verified against actual generation data and fuel prices. Once verified, the invoices will be submitted to TNB Group Finance for settlement.

8.8 A KPI is set for 100% completion and timely submission of the Generation Cost reports by the deadline specified in each ICPT cycle and IBR Regulatory Period submission.

[*Cross Reference: SOP – SB Generation Cost Submission*]

9 MONTHLY PRICE QUOTATION FOR THAILAND

9.1 A Monthly Price Quotation ("MPQ") is required to be submitted to the Contract & Resource Management unit as a price indicator of selling electricity to Electricity Generating Authority of Thailand ("EGAT").

9.2 The Scheduling sections are responsible for data collection and it includes the LNG price from the Fuel Management unit, the Transmission Use of System price from the Incentive Based Regulations ("IBR") Unit and the Merit Order List from the Scheduling sections.

[*Cross Reference: SOP – Monthly Price Quotation*]

10 CENTRALISED FILE SHARING

10.1 Centralised File Sharing

10.1.1 TNB's centralised file sharing server ("TNB Centralised File Sharing") is the preferred storage medium for work related documents and files for the Single Buyer. The TNB Centralised File Sharing is maintained and supported by the Information Communications Technology ("ICT") Division of TNB and has the following features:

(a) Resilient service;

(b) Data are backed up regularly;

(c) Controlled access to read and write the data to provide security of the folders and files;

(d) Central support via the TNB ICT Service Desk; and

(e) Departmental and localised security.

10.2 Access to Secure Data on the TNB Centralised File Sharing

10.2.1 The access rights to read, write or modify data contained within the secure files or folders on the TNB Centralised File Sharing can be specified so that only certain users have such access.

10.2.2 A data owner refers to a member of the Single Buyer who has ownership or control over the secure files or folders on the TNB Centralised File Sharing. To set up a secure file or folder or to modify its access rights, the data owner needs to submit a request to the TNB ICT Service Desk using the relevant form.

10.2.3 A member of staff who wishes to access a secure file of folder on the TNB Centralised File Sharing must obtain permission from the data owner of the relevant file or folder. The data owner must then obtain the approval from the Supervisor or the Head of the Department for the requested access. If approval is obtained, the data owner then sends a request to the TNB ICT Service Desk in the relevant form for the TNB ICT Administrator to set up the access after verifying the request and approval.

10.2.4 Any maintenance of the Centralised File Sharing by the designated technical personnel of TNB ICT Division will also require permission to access the secure file or folder from the data owner.

[*Cross Reference: SOP – TNB Centralised File Sharing for Single Buyer and SOP – Maintenance of TNB Centralised File Sharing for Single Buyer*]

11 SUBMISSION FOR INCENTIVE BASED REGULATION

11.1 The Enterprise Management section within the Finance & Enterprise Management unit is responsible for the submission of the Single Buyer's performance indicators in accordance with the Incentive Based Regulation ("IBR").

11.2 The Single Buyer is measured on the following four categories of performance indicators:

No.	Performance Indicator	Measure
1.	System Average Cost	% difference between daily planned system average cost vs. daily actual system average cost
2.	Compliance to Timely Settlement of Generators' Invoices	% compliance to timely payment of generator invoices
3.	Compliance to the Malaysian Grid Code	No. of non-compliance occurrences
4.	Compliance to the Single Buyer Rules	No. of non-compliance occurrences

11.3 Regulatory targets apply for each of the performance indicators in accordance with the IBR as approved by the Energy Commission. A KPI is set for 100% completion and timely submission of the performance indicators as required under the IBR.

[*Cross Reference: SOP for SB Performance Indicators' Submission for Incentive Based Regulation*]

LIST OF STANDARD OPERATING PROCEDURES ("SOP") AND WORK INSTRUCTIONS ("WI")

Load Forecasts

1. SOP – Preparation of Day Ahead Load Forecast
2. SOP – Preparation of Week Ahead Load Forecast
3. SOP – Long Term Load Forecast Process
4. WI – Data Collection and Model Update
5. WI – Actual Load Data and Weather Forecast Update (Day)
6. WI – Actual Load Data and Weather Forecast Update (Week)
7. WI – Simulation Studies and Results Analysis
8. WI – Discussion of Results

Scheduling

9. SOP – Day Ahead Generation and Unit Commitment Schedules
10. SOP – Preparation of Weekly Production Plan
11. SOP – 3-Month and 1-Year Ahead Dispatch Forecast
12. SOP – 5-Year Ahead Dispatch Forecast
13. WI – Day Ahead Dispatch Forecast
14. WI – Week Ahead Dispatch Forecast

Capacity Planning

15. SOP – 20-Year Generation Development Plan (Pre-JPPPET)

Fuel Management

16. SOP – Gas Billing
17. SOP – Coal Stock Monitoring

PLEXOS

18. SOP – Simulation Model Review and Updates
19. SOP – PLEXOS Database Version Control

Information and Communication Technology

20. SOP – TNB Centralised File Sharing
21. SOP – Maintenance of TNB Centralized File

Single Buyer Generation Tariff

22. Single Buyer Generation Cost Submission
23. Monthly Price Quotation

Enterprise Management

24. SOP – Management of Incentive Based Regulations Submission
25. SOP - Single Buyer Performance Indicators' Submission for Incentive Based Regulation