



# **GUIDELINES FOR RING-FENCING**

OF THE SYSTEM OPERATOR  
(PENINSULAR MALAYSIA) 2016



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[GP/ST/No.7/2016 (Pin. 2024)]

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**ELECTRICITY SUPPLY ACT 1990 [ACT 447]**

**GUIDELINES FOR RING-FENCING OF THE SYSTEM OPERATOR  
(PENINSULAR MALAYSIA) 2016**

**GP/ST/No.7/2016 (Pin. 2024)**

IN exercise of the power conferred by section 50C of the Electricity Supply Act 1990 [Act 447], the Commission issues the following guidelines:

**Citation and commencement**

1. These guidelines may be cited as the Guidelines for Ring-Fencing of the System Operator (Peninsular Malaysia) 2024.
2. These Guidelines come into operation on 19 July 2024.

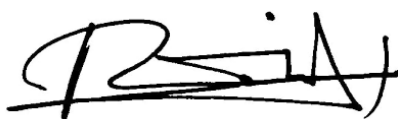
**Purposes**

3. These Guidelines set the principles, rules and mechanism for the implementation of ring-fencing arrangement of the System Operator for the purposes of performing its functions and duties in a fair and non-discriminatory manner.

**Application**

4. These Guidelines shall apply to any person or a unit, department or division which has been authorized to be the System Operator by the Order published in the Gazette.

Dated: 19 July 2024



**DATO' IR. TS. ABDUL RAZIB BIN DAWOOD**  
Chief Executive Officer  
for Energy Commission

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## Terms and Definitions

| Term                               | Definition   |
|------------------------------------|--|
| <b>Act 447</b>                     | means the Electricity Supply Act 1990 [Act 447] and any subsidiary legislation made under it.  |
| <b>Day Ahead Dispatch Schedule</b> | means the finalized schedule for each Generating Unit for each period for the next day.  |
| <b>Dispatch Schedule</b>           | means the Day Ahead Dispatch Schedule, the Week Ahead Dispatch Schedule and the Three Month Ahead Dispatch Schedule.   |
| <b>Dispatch Scheduling Model</b>   | means a dispatch model that is capable of optimizing and producing least cost Real-time Security Constrained Economic Dispatch Schedule, owned and operated by the Grid System Operator.   |
| <b>Commission</b>                  | means the Energy Commission established under the Energy Commission Act 2001 [Act 610].  |
| <b>Generation Schedule</b>         | means the generation output for each calendar quarter for the Generator prepared and finalized by the Single Buyer before the start of a calendar quarter pursuant to the Generator Contracts between the TNB and the Generator. |
| <b>Generator</b>                   | means an entity licensed by the Commission to generate electricity in Peninsular Malaysia.   |
| <b>GCC</b>                         | means the Grid Code Committee responsible for keeping the GCPM under review in accordance with the rules and procedures defined under GCPM.  |
| <b>GCPM</b>                        | means the Grid Code for Peninsular Malaysia.   |

|   |  |
|---|--|
| <b>Grid System</b>                                | means the system consisting (wholly or mainly) of high voltage electric lines (132kV and above) owned by the Grid Owner and used for the transmission of electricity from one Power Station to a sub-station or to another Power Station or between sub-stations or to or from any External Interconnection, and includes any Plant and Apparatus and meters owned by the Grid Owner and Energy Storage Units, which can be owned by the Grid Owner, in connection with the transmission of electricity. |
| <b>Grid Owner</b>                                 | means the party that owns the high voltage backbone Grid System and is responsible for maintaining adequate Grid capacity in accordance with the provisions of the Grid Code and Licence Standards.  |
| <b>ICT</b>  | means the information and communication technology, which refers to any information being processed digitally by information technology systems and transferred across communication networks.   |
| <b>Least Cost Dispatch Scheduling Methodology</b> | means a methodology for developing the Dispatch Schedules such that the lowest cost marginal Generating Unit is forecast to be dispatched first to meet demand followed by the next lowest cost marginal Generating Unit until all demand is met.  |
| <b>Operating Reserve</b>                          | means the additional output from Generating Module or the reduction in Demand, which must be realisable in real-time operation to respond in order to contribute to containing and correcting any System Frequency fall to an acceptable level in the event of a loss of generation or a loss of import from an External Interconnection or mismatch between generation and Demand.  |



|                        |  |
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| <b>Oversight Panel</b> | means the panel convened and chaired by the Commission to oversee the compliance of these Guidelines.  |
| <b>Participant</b>     | means an entity registered by the Commission as a market Participant with consequent obligations under the Guidelines for Single Buyer Market Peninsular Malaysia.   |
| <b>PPA</b>             | means Power Purchase Agreement, which refers to the agreement between the Single Buyer and a Generator or Network Operator relating to the financial and technical conditions relating to the purchase of the Power Station output and technical conditions relating to its connection to and performance on the Grid System |
| <b>RIG</b>             | means the electricity tariff regulatory implementation guidelines issued by the Commission.  |
| <b>SCADA/EMS</b>       | means Supervisory Control and Data Acquisition / Energy Management System.   |
| <b>Single Buyer</b>    | means any person or a unit, department or division forming part of a licensee who is authorized under subsection 22B(1) of Act 447.  |
| <b>SLA</b>             | means Service Level Agreement which refers to any document of commitment between a service provider and SO that identifies both the services required and the expected level of service.   |
| <b>SO</b>              | means the System Operator which refers to any person or a unit, department or division forming part of a licensee who is authorized under section 22A of the Act 447.  |
| <b>SO Website</b>      | means the website developed and maintained by the SO in accordance with these Guidelines.  |

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| <b>System Upgrade Plan</b> | means an investment plan to upgrade the Dispatch Scheduling Model.  |
| <b>TNB</b>                 | means Tenaga Nasional Berhad (Company Registration No.199001009294 (200866-W)), a public limited liability company with the registered address at No. 129, Jalan Bangsar, 59200 Kuala Lumpur, Malaysia. |
| <b>TNB Generation</b>      | means the generation division of TNB.   |
| <b>TNB Grid Division</b>   | means the TNB Transmission Division.  |
| <b>Unit Commitment</b>     | means turning on or turning off of a generating unit.   |

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## **CHAPTER 1: RING-FENCING OF SO WITHIN TNB**

### **1.1 Purpose**

1.1.1 This chapter sets out the requirements for SO to be able to perform its functions in a non-discriminatory manner and outlines the measures to be adopted to allow the SO to demonstrate that it is properly ring-fenced as it undertakes its daily activities.

### **1.2 Non-Discriminatory Conduct**

1.2.1 In performing its functions, the SO shall ensure that it operates in accordance with the GCPM and does not act in a manner that unreasonably discriminates against any other participant.

1.2.2 To provide transparency to the operation of the SO, the SO shall—

(a) develop a set of non-discriminatory processes; and

(b) published on its website together with enough information to allow an affected party to determine whether it is likely that discrimination may have taken place.

1.2.3 Any action specifically required of the SO under the Single Buyer Guidelines, the GCPM or any other agreement in existence more than twelve (12) months prior to the date of the ring fencing of the SO and previously registered with the Commission shall not be deemed to be discriminatory.

1.2.4 Subject to paragraph 3.2.2, the Commission shall determine, on a case-by-case basis, whether the behavior of the SO is unreasonably discriminatory. In doing so, the Commission shall have regard to:

(a) the laws of Malaysia;

- (b) the TNB Licence under which the SO is required to operate;
- (c) the GCPM;
- (d) the Guidelines for Single Buyer Market Peninsular Malaysia;
- (e) the Dispatch Schedule provided to the SO by the Single Buyer; and
- (f) any other matters it considers relevant.

### **1.3 Ring-Fencing of SO Activities**

- 1.3.1 For such period that the SO is a part of TNB, the SO shall identify circumstances where interaction with other divisions and units of TNB may give rise to a conflict of interest or have an impact on free competition within the electricity industry and implement appropriate operational ring-fencing procedures to address the potential conflict of interest, or impact on competition.
- 1.3.2 These ring-fencing procedures shall include but not limited to the following procedures:
  - (a) establishing separate work areas from the work areas of other divisions within TNB, with the SO operating from clearly separate areas to which only SO staff and others under the direct supervision of SO staff have access;
  - (b) restricting the access of the SO staff to the work areas of other parts of TNB such that they only have access to these work areas under the direct supervision of staff employed in the part of TNB responsible for these work areas;

- (c) establishing access controls for information systems used by the SO where—
  - (i) only the SO staff can access systems that are only used by the SO;
  - (ii) the shared systems are partitioned such that staff of all divisions have access only to the information that they require in the performance of their tasks and that staff of other divisions do not have access to SO information that may result in competitive advantage to TNB; and
  - (iii) a record is maintained of the date and time that each information item is accessed and/or changed by each individual user of the information systems used by the SO;
- (d) ensuring that no person responsible for the management of the SO shall participate in internal TNB meetings or discussions regarding the operation of any of the competitive businesses of TNB, except to the extent that they would normally attend such meetings with external parties;
- (e) restructuring staff meetings and internal communications mechanisms of TNB so that members of staff from the SO do not attend the same staff or communications meetings as staff from the businesses of TNB that are open to competition. With the explicit consent of the Commission, all staff of TNB may be summoned to a single meeting where it is considered essential that all TNB staff receive the same information at the same time. The Commission may issue a standing approval for whole company meetings where there is a visiting VIP or for the announcement of significant events (as defined by the Commission) affecting TNB; or

(f) establishing a mechanism for quarantining staff intending to leave the SO for any organization involved in the competitive sectors of the electricity industry including competitive businesses in TNB and any part of TNB where confidentiality arrangements similar to those in the SO have not been established. The quarantine period must be appropriate for the type of information to which the employee has had access.

1.3.3 Where corporate or other services are provided to the SO from elsewhere in the TNB organization, these services shall be provided under SLA negotiated between the SO and the appropriate other parts of TNB. Each SLA shall include cost transfer arrangements that comply with the RIG guidelines established by the Commission for the allocation of such costs and arrangements for the protection of information that are similar to those established for the protection and handling of information by the SO's own staff. These services include, but are not necessarily limited to the list of activities identified in Appendix A.

## **1.4 Confidentiality**

1.4.1 The SO shall not disclose any information that is confidential to TNB or to any other party, or any information, the disclosure of which may provide competitive advantage to any party except—

(a) to the extent required in the licence under which it operates or the GCPM for the performance of the SO functions under the licence and the GCPM;

(b) where the information can be proven to already be in the public domain; and

(c) as directed by the Commission or any court having appropriate jurisdiction.

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## **CHAPTER 2: RING FENCING OF OPERATIONS**

### **2.1 Purpose**

2.1.1 This Chapter establishes operational requirements for the SO in a ring-fenced environment and provides examples of procedures for ring-fenced SO operations.

2.1.2 As part of the drive towards greater transparency, it is expected that much of the information generated from many of these processes would become publicly available information on the ring-fenced SO website subject to Chapter 4.5 of the Guidelines.

### **2.2 Principles of Operational Ring Fencing of the SO**

2.2.1 Chapter 2 establishes the requirements for the ring fencing of the SO organization, the principle established being that, on a day-to-day basis, the ring-fenced SO shall operate as a separate organization from all other parts of TNB, treating TNB in the same manner as it treats those market participants that compete with TNB in the competitive industry sectors.

2.2.2 SO shall review all of its operational practices and procedures when it deems fit or when instructed by the Commission to ensure that they reflect the principles stated in section 2.2.1.

2.2.3 SO shall update its operational practices and procedures to ensure that it takes the primary management responsibility for all aspects of the customer interface for transmission activities in a manner that reflects the principles stated in section 2.2.1.



## 2.3 Detailed Operational Procedures

2.3.1 SO shall ensure the operational procedures are documented and comply with the requirements of the GCPM.

2.3.2 The key documented operational procedures include:

(a) **Processes Involved in the Operation Planning Phase**

(i) **Five (5) Years System Security Assessment**

SO shall prepare the Five (5) Year System Security Assessment (FYSSA) in accordance with specified quality system documentation. The objective of the FYSSA is to address issues and provide recommendations for achieving a reliable and economically efficient power system operation plan over the next five (5) years. This involves detailed studies for the first two (2) years and tentative studies for the subsequent three (3) years, with a focus on maximizing the utilization of generation, transmission resources and ancillary services.

(ii) **Daily Docket Meeting**

SO shall organize and chair the Daily Docket Meeting on every business day to discuss the post operation. In this meeting, the day ahead operation forecast and outage planning is carried out to ensure the safe and secure operations of the Grid System

(iii) **Weekly Coordination Meeting**

SO shall organize and chair the Weekly Coordination Meeting on every Thursday or the day before or after if Thursday is not a business day. This meeting coordinates the week ahead generator outages and transmission outages. SO also presents the weekly post generation

profile that captures for any least cost operation and constraint cost operation. Members of the meeting also discuss the week ahead Generation Schedule in conjunction with forecast gas availability and weekly hydro generation plan.

(iv) **Daily Security Assessment Report**

SO shall prepare the Daily Security Assessment Report which looks into the security and reliability of the Grid System under all n - 1 contingencies and selected n - 2 contingencies.

(v) **Defense Plan and Mechanism**

SO shall review, formulate, approve and implement the defense plan and mechanism to be installed to mitigate and reduce possible risk to the Grid System.

(vi) **Five (5) Year Generator Outage Plan**

By virtue of the GCPM, SO shall prepare the Five (5) Years Generator Outage Plan to ensure for a safe, secured, reliable and economic operation of the Grid System. The coordination of Generation outages and the preparation of the Generation Outage Plan from year 1 to year 5 whereby year 1 will be the provisional outage plan while year 2 to year 5 will be an indicative outage plan.

(vii) **Generation Units Outage Scheduling**

SO shall plan the month ahead, week ahead, day ahead and actual granting of generator outages.

(viii) **Transmission Operation System Study**

On a case-to-case basis, SO may be required to prepare a Grid Operation System Study report(s). This request may come from TNB Grid. In some circumstances, the system

studies may require the appointment of a specialist consultant to advise SO.

(ix) **Transmission Outage Management**

SO shall manage the outages of transmission lines and equipment in the Grid System. The outages shall be planned and coordinated in conjunction with generator outage plan so that the Grid System remains safe and secure. SO uses the Integrated Commissioning and Outage Management System (ICOMS) or any other outage management systems to schedule outages and manage the database. ICOMS or any other outage management systems are used to plan for day ahead, week ahead, month ahead and year ahead outage planning.

(b) **Processes Involved in the Real-time Control Phase**

(i) **Real-Time Scheduling and Dispatch Procedure**

SO has the Real-Time Scheduling and Dispatch Procedure in place to guide the shift personnel to economically dispatch generating units to meet the system demand while ensuring the safe and secure operations of the Grid System.

(ii) **Procedure on Issuance of Non-Compliance**

SO shall have a procedure on issuance of Non-Compliance. Basically, penalties are imposed on generators if they do not comply with the dispatch instructions. When shift personnel issue a dispatch instruction, the instruction given must strictly follow the guidelines given in this procedure. When a generator fails to comply with the dispatch instruction, the shift personnel shall follow strictly the guidance given in issuing the notice to the generator concerned and also informing the Single Buyer of such failure.

(iii) **Guide to Manage Gas Curtailment**

SO shall have a guide that provides the assistance to the shift personnel in minimizing the cost of generation and maintaining fuel security during gas curtailment period.

(iv) **Spinning Reserve Operation Guide**

SO shall have a guide that provides the assistance to the shift personnel in keeping sufficient spinning reserve to cater for load regulation, forecast errors and that the loss of the largest generating unit does not result in automatic under-frequency load shedding.

(v) **Guide for Voltage Management**

SO shall have a guide that provides the assistance to the shift personnel to follow in ensuring voltages in the Grid System meet the Transmission System Reliability Standards (TSRS) and GCPM.

2.3.3 Based on the above, all routine operational procedures shall place the ring-fenced SO in overall managerial control of the Grid System, responsible for the customer interface and undertaking system operation based on the least cost dispatch principal while recognizing the ring-fenced SO's responsibility for real time system management.

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## **CHAPTER 3: RING FENCING OF INFRASTRUCTURE AND ICT**

### **3.1 Purpose**

- 3.1.1 To ensure that the ring-fenced SO is able to continue in operation, arrangements must be established for it to have continued access to ICT infrastructure and services and to be able to develop its ICT infrastructure to ensure compliance with the requirements of the GCPM. This chapter outlines appropriate arrangements that should be put in place to ensure that both the ring-fenced SO and the other TNB businesses are capable of operating successfully.
- 3.1.2 In identifying appropriate arrangements, it is recognized that the ICT infrastructure currently supporting the SO operations is highly integrated with that of other TNB departments and that the legal entity owning this infrastructure before and after ring fencing of the SO will be TNB. The management and Board of TNB retain an obligation to ensure the cost-effective operation of the company in compliance with all the company's obligations.

### **3.2 Existing Operational Systems**

- 3.2.1 To avoid unnecessary changes to supplier relationships, the continuing ownership of the SCADA/EMS, load forecasting software, power flow software and unit commitment and Dispatch Schedule software and supporting architecture should remain within the current TNB arrangements.
- 3.2.2 Appropriate SLA shall be developed between the SO and other TNB departments to ensure that operational systems are developed and maintained, with the opportunity for them to be renewed when necessary, as required by the ring-fenced SO. At the time of system replacement, the ownership decision can be revisited.

- 3.2.3 Where software is used by both the Single Buyer and the SO, procedures shall be established to ensure changes to, or any upgrades to the existing systems, or the adoption of new software are coordinated between both parties such that the same version and parameters used are kept in step. In the event it is determined that new software should be acquired to replace such shared operational systems, this shall be evaluated by a cross functional team consisting of representatives of SO and Single Buyer to ensure that the replacement software is appropriate for use by both parties.
- 3.2.4 The SLA established to support existing operational systems shall include provision for the SO accounts to bear the cost of software licensing and support and a realistic hardware and firmware lease charge. A realistic proportion of the corporate LAN and WAN costs shall also be charged to the SO accounts under the SLA, taking due account of the data volumes transmitted and the high security requirements of the SO operational systems.

### **3.3 Administrative Systems**

- 3.3.1 As is the case with all organizations, SO requires access to administrative systems which are, and will continue to be delivered by shared systems providing service to all of TNB. Provision of these services shall be subject to the terms of an SLA negotiated between the SO and TNB's ICT department. Costs for these services shall be established in accordance with the provisions of RIG guidelines relating to shared service provision.

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## **CHAPTER 4: RING FENCING OF INFORMATION AND DATA FLOW**

### **4.1 Purpose**

4.1.1 As SO uses shared ICT systems to support its operations, it is necessary to establish arrangements for the management and protection of data used by SO. For the successful operation of the wider electricity market, certain high-level rules are required to govern the transfer of data between those parties that have a legitimate interest in that data. This chapter outlines appropriate arrangements that should be put in place to ensure that SO, the other TNB businesses and the wider electricity market are all capable of operating successfully.

4.1.2 The ICT infrastructure currently supporting the SO operations is highly integrated with that of other TNB departments and the legal entity owning this infrastructure will always be TNB. The management and Board of TNB retain an obligation to ensure the cost-effective operation of the company in compliance with all the company's obligations. However, within this framework, the data held by TNB is used to support the operation of different businesses and the effective business ownership of data elements is considered here.

### **4.2 Data Ownership**

4.2.1 The ownership of all data in the principal operational systems used by SO shall be established to rest with SO.

4.2.2 The ownership of all data in the operational systems used jointly by the SO and the Single Buyer shall rest with the Single Buyer where their principal use is to support the development of the Day Ahead Schedule and/or the operation of market settlement. The ownership of all other data in operational systems used jointly by the SO and the Single Buyer shall rest with the SO.

4.2.3 The data held in corporate or shared administrative systems relating to the operation of the SO or to staff employed by the SO shall rest with the SO.

### **4.3 Access to SO Data**

4.3.1 Access to all SO owned data shall be subject to controls that ensure that it is only accessible by those individuals who have a legitimate interest in that data.

4.3.2 Access to SO data shall be controlled, at minimum, by only permitting access to it after the entry of an individual username and password pair that meets the requirements of good industry practice. Where screens may be left open while the individual is not using them, data access shall close after a reasonable inactivity period.

4.3.3 Systems shall record access to data by individuals together with a date and time stamp. Similarly, the change of any data element shall be monitored by the storage of username, date and time of the change action.

4.3.4 All individuals having access to SO owned data shall be subject to the compliance code of conduct. This requirement shall be included in all SLA concluded by the SO with other parts of the TNB organization.

4.3.5 No individual shall be provided with access to any data that is not essential for the completion of tasks normally allocated to them.

### **4.4 Transfer of Market Data**

4.4.1 The Commission shall ensure that the general rules established for the transfer on market related data shall apply to all market participants.

4.4.2 Where any party active or previously active in the electricity market



holds data or other information and another party has a legitimate need of that data or other information for purposes in connection with the operation of the electricity market or for system operation reasons then the party holding the data or other information is required to provide it to the other party.

- 4.4.3 Where data is transferred as part of the routine processes necessary for purposes in connection with the operation of the electricity market or for system operation purposes then the data will be transferred free of all charges to the recipient.
- 4.4.4 Where any party requests a non-routine transfer of data (for example a resend of properly receipted data as a result of a failure in the recipient's IT systems) then the party holding that data shall be permitted to charge the recipient such reasonable costs as are incurred in preparing the data for transfer and for effecting the transfer of data.
- 4.4.5 All parties shall be free to agree on the mechanism to be used for data transfer. This may be in written form (which may include letter, fax or email) provided it will be received within twenty-four (24) hours of it being sent or by other means of electronic data transfer which can be used to automatically update the recipient's electronic systems.
- 4.4.6 Where data is transferred electronically using a public communication system or a private system to which other parties have access, it shall, at minimum, to allow the receiving party to confirm the authenticity of the data received.
- 4.4.7 The choice of data transfer mechanism shall facilitate smooth operation of the electricity market while ensuring that there are no barriers to entry by small players. In this context, it is expected that persons or entities sending or receiving a small number of data messages may use a transfer in written form, while persons or entities sending or receiving a large number of data messages will agree the use of electronic data transfer systems.

- 4.4.8 Where parties, who do not have a contractual relationship, are unable to agree a means of data transfer for market related data, they will refer the issue to the Commission for resolution.
- 4.4.9 On each occasion that data is sent and received, a receipt shall be returned and retained by the party sending the data. Only once the receipt has been obtained, the sender of the data has discharged its obligations to provide data.
- 4.4.10 If the parties by whom data or other information is shared use automated systems for the transfer of the data or other information, then the obligations of the parties in respect of section 4.4.9 shall be discharged when the recipient sends an acknowledgement generated by its automated systems or (as appropriate) the sender receives an acknowledgement generated by the recipient's automated systems.

#### **4.5 SO Website Working Group**

- 4.5.1 The SO shall establish a working group known as SO Website Working Group comprising members as detailed in the Terms of Reference (TOR) of the SO Website Working Group.
- 4.5.2 The objectives of this SO Website Working Group including but not limited to—
- (a) discuss, review, and recommend the information that is required to be published on the SO's website, with certain consideration on the details and particulars of such information that is to be published on SO's website; and
  - (b) the format, classification, and accessibility of the information published on the SO's website.

4.5.3 The SO Website Working Group may invite other related participants to participate in such meetings as and when it deems necessary.

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## **CHAPTER 5: GOVERNANCE AND OVERSIGHT**

### **5.1 Purpose**

5.1.1 To ensure that the SO complies with the requirements of a ring-fenced organization it is necessary to put in place the necessary governance arrangements, such as ensuring sufficient independence of the SO in terms of management decisions, finance and accounting, and the confidentiality of information within the TNB organization. This chapter outlines the governance arrangements for the ring-fenced SO including its independence from the competitive businesses of TNB, the independent oversight of the SO and requirements for compliance with the GCPM.

### **5.2 Appointment of the Head of the SO**

5.2.1 The appointment of the Head of SO, who shall report directly to the Chief Executive Officer of TNB, shall be undertaken in accordance with TNB's documented employment policies. The appointment or dismissal of the Head of SO shall require the endorsement of the Commission.

5.2.2 In the event that the position of the Head of SO is left vacant due to the departure of the incumbent at short notice, or the processes for appointment of the Head of SO have not been completed for any reason, the Chief Executive Officer of TNB, with the endorsement of the Commission, shall appoint a person to act in the position of Head of SO until the appointment process is completed. The acting Head of SO shall enjoy the same level of independence and be subject to the same operational regime as would the Head of SO.

5.2.3 TNB shall establish appropriate reporting arrangements for the Head of the ring-fenced SO which ensures that:

(a) the Head of SO is responsible to the CEO of TNB for the

operation of the SO in accordance with TNB's Corporate Governance arrangements;

- (b) the Head of SO has sole responsibility for the day-to-day operation of the SO;
- (c) unless they also have responsibility for approving all business plans and all financial plans which impact on the overall corporate operation of TNB, no person who has control of any part of the generation or retail supply businesses of TNB shall also have any control over any part of the operation of the SO;
- (d) for any person who has control of any part of the generation or retail supply businesses of TNB, the extent of the control over any part of the operation of the SO that is permitted under paragraph (c) above shall be limited to the approval of business plans and overall financial plans; and
- (e) the Head of SO shall not have any control over, or receive any direct benefit from, the operation of any part of the generation or retail supply businesses of TNB.

5.2.4 The terms of employment for the Head of SO and the staff of the SO shall be consistent with TNB's employment policy and shall include requirements to comply with the requirements of the Code of Conduct outlined in section 7.3.3 that are enforceable under the disciplinary processes of the SO. No part of the benefit package enjoyed by any member of the SO staff shall be dependent on any identifiable aspect of the performance of any part of TNB operating in a competitive sector of the Malaysian electricity industry.

### 5.3 Compliance with Ring Fencing Obligations

- 5.3.1 The SO shall ensure that it has appropriate policies, systems and procedures in place to ensure that it is capable of complying with its legal and licence obligations and the GCPM.
- 5.3.2 In the event that the SO becomes aware that it is non-compliant with the GCPM it shall immediately inform the GCC and the Commission and put in place procedures to address the non-compliance. Where the SO establishes that it is impossible to comply with the requirements of any provision of the GCPM, it shall propose an amendment to the GCPM that allows compliance with the spirit of the GCPM as a whole and of the section it proposes to be amended.
- 5.3.3 The SO shall ensure it complies with the ring-fencing obligations but need not be limited to —
- (a) arrangements to ensure the independence of the senior staff of SO;
  - (b) arrangement for the protection of confidential and commercially sensitive information;
  - (c) an enforceable Code of Conduct is in place dealing with the handling of confidential information and the transparent and equal handling of all work on behalf of all network users;
  - (d) training of current staff and inclusion in induction training arrangements;
  - (e) arrangements for the quarantine of staff leaving the SO; and
  - (f) routine audit of different compliance areas selected on a rolling basis.

- 5.3.4 The obligations placed on staff of the ring-fenced SO shall also be placed on other staff in TNB providing corporate business services to the ring-fenced SO.
- 5.3.5 The SO shall identify a 'compliance officer', which need not be a single full-time position, who shall be responsible for ensuring compliance arrangements are established and maintained, and for ensuring that any complaints of discrimination are appropriately investigated. The compliance officer shall prepare a periodic report, at least annually, and arrange that it is submitted to the Commission following approval by the Head of SO. This report shall detail how compliance is achieved, the number of complaints of discrimination that have been received and the results of all complaint investigations undertaken.
- 5.3.6 In addition to any audits undertaken by the GCC, the Commission may undertake any action that it considers necessary to monitor compliance by the SO of its ring-fencing obligations.

#### **5.4 Oversight by the Grid Code Committee**

- 5.4.1 Section GC7 of the GCPM establishes the mechanism for overseeing the operations of the SO in accordance with the requirements of the GCPM. This oversight is the responsibility of the GCC, chaired by the Commission.
- 5.4.2 The GCPM provides the GCC with the right to appoint an external auditor to undertake an audit of all SO operations and imposes on the GCC the obligation to determine the rules and procedures for the external auditor subject to approval by the Commission.
- 5.4.3 Oversight by the GCC shall be limited to technical matters relating to the operation of the GCPM.

## **5.5 Oversight of Ring-Fencing Compliance**

- 5.5.1 The Commission shall establish an Oversight and may include representatives from other relevant parties to oversee compliance by the ring-fenced SO of its ring-fencing obligations.
- 5.5.2 Where the Commission or Oversight Panel determines that a review of the SO operations is necessary, the Oversight Panel shall—
- (a) determine the areas to be reviewed; and
  - (b) appoint a qualified external auditor to assess and audit the compliance of the SO according to these Guidelines.
- 5.5.3 The cost of the assessment and audit shall be borne by the SO and treated as recoverable operating expenditure for the purposes of calculating the SO Operations Tariff.
- 5.5.4 Except for representatives of the Commission, no members of such an Oversight Panel shall have the right to enter or inspect any activity undertaken by ring-fenced SO staff.

## **5.6 Audits for Governance**

- 5.6.1 There is a requirement to undertake audits of some information about or used by the SO. This includes the requirement for regulatory financial reports for the SO to be audited by a licensed independent auditor as if they are statutory financial statements.
- 5.6.2 The accounting systems should be capable of accounting for system operation activities separately to ensure that all expenditure is correctly accounted for in the books of account and that it can be reported to auditors and regulators on demand quickly and transparently.



5.6.3 In regard to the organizational process and changes to organizational structure for information unbundling, the ring-fenced SO must be able to demonstrate and prove that it is operating in accordance independently to TNB Grid Division. This includes the separation of IT systems and of personnel with direct access to information and the separation of data between SO and TNB Grid Division.

5.6.4 Financially and commercially sensitive information should be kept confidential and not disclosed to other business units of the vertically integrated company. This should be proved by selective routine audit.

## **5.7 SO Website and Publications**

5.7.1 The SO Website shall be owned, operated and maintained by the SO and developed in such a manner as to promote transparency in the performance of the functions of SO.

5.7.2 The SO shall ensure that the SO website:

- (a) is accessible by the general public and that its security from cyber threats and/or attacks is consistent with good industry practice;
- (b) presents data and information clearly;
- (c) is updated regularly for new reports, market information, and data;
- (d) provides a link to the websites of all market participants requesting that a link to their website be placed on the SO website and to the Commission website; and
- (e) includes a market participant login area providing access to more sensitive data which should be available to authorized representatives of market participants.

5.7.3 Subject to Chapter 4.5, the SO shall publish the following key reports, data sets and forecasts on the SO Website:

- (a) public safety information;
- (b) general information regarding the structure of the electricity industry in Malaysia;
- (c) the organizational structure of the SO;
- (d) contact details for customers and others wishing to contact the SO;
- (e) the current version of the GCPM, and details of proposed changes;
- (f) the terms of reference for the GCC and membership of any SO or GCC working groups;
- (g) statements of compliance with ring fencing obligations and routine compliance reports submitted to the Commission;
- (h) any report following the audit instigated by the GCC assessing the compliance of the SO with the requirements of the GCPM;
- (i) the SO complaints procedure detailing how customers can make a complaint, how it will be handled, target periods for response, complaint escalation process and arbitration arrangements;
- (j) half hourly and real time system demand;
- (k) SO's performance indicator; and

(l) except where issues of national security are involved, any other report required by the Commission.

5.7.4 Where appropriate, and by agreement with the Commission and the Single Buyer, the SO may copy from or insert links to that part of the Single Buyer website where any of the required information is provided.

5.7.5 The SO may provide paper-based versions of any information provided on the SO website. Where paper-based versions are provided, the SO may make a reasonable administration charge as approved by the Commission.

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## **CHAPTER 6: REAL-TIME SECURITY-CONSTRAINED ECONOMIC DISPATCH SYSTEM**

### **6.1 Purpose**

6.1.1 This Chapter defines the Least Cost Dispatch Scheduling Methodology which the SO shall follow for Real-time Security-Constrained Economic Dispatch System and the requirements of the Dispatch Scheduling Model.

### **6.2 Least Cost Dispatch Scheduling Methodology**

6.2.1 The SO shall develop the Real-time Security-Constrained Economic Dispatch System based on a Least Cost Dispatch Scheduling Methodology such that the lowest marginal cost Generating Unit is forecast to be dispatched first to meet demand followed by the next lowest marginal cost Generating Unit until all demand is met. The marginal cost of generation shall comprise all payments that vary with the amount of electricity procured, that are made by the Single Buyer to the Generator, pursuant to Generator Contracts.

6.2.2 At all times the SO shall ensure that the Real-time Dispatch System cater adequately for system security, Operating Reserve requirements, transmission constraints, generation constraints, fuel availability and any other factors which could influence the security and reliability of electricity supply as specified by the GCPM.

6.2.3 The SO shall ensure that it has the required data and information to accurately calculate its marginal cost for the procurement of generation from each Generating Unit.

6.2.4 SO shall ensure that it promotes transparency by publishing key results on the SO Website.

### 6.3 Dispatch Scheduling Model

6.3.1 The SO shall ensure that the Dispatch Scheduling Model used to implement the Real-time Dispatch System minimizes the cost of electricity procurement given all transmission and system constraints and the key input data. Specifically, the SO shall ensure that the Dispatch Scheduling Model is based on the Least Cost Dispatch Scheduling Methodology and is capable of adequately taking the following parameters into consideration in optimizing the Real-time Dispatch:

- (a) transmission losses and System Constraints;
- (b) Operating Reserve requirements as set out in the GCPM;
- (c) key input data for the Day Ahead Dispatch Schedule as specified by Single Buyer; and
- (d) any other system security measures as deemed appropriate by the SO in compliance with the GCPM.

6.3.2 If the Dispatch Scheduling Model does not satisfy the conditions as specified in clause 6.3.1, then the SO shall prepare a System Upgrade Plan which must specify the timeframe and the cost required to upgrade the current Dispatch Scheduling Model such that it is compliant with the requirements as specified in clause 6.3.1.

6.3.3 The SO shall submit the System Upgrade Plan to the Commission for approval. Once the System Upgrade Plan has been approved by the Commission the SO shall implement the System Upgrade Plan as per the timeline specified in the System Upgrade Plan.

6.3.4 The SO shall review the Dispatch Scheduling Model in the event of any revision to the Least Cost Dispatch Scheduling Methodology or every

12 months, whichever is earlier, to ensure that the Dispatch Scheduling Model is compliant with the provisions of clause 6.3.1. In conducting the review, the SO shall ensure that:

- (a) the review is finalized no later than two months after expiration of the twelve (12) month period;
- (b) the outcomes of the review are submitted to the Commission within fifteen (15) days after the completion of the review; and
- (c) if the Dispatch Scheduling Model is non-compliant, a System Upgrade Plan to upgrade the model to ensure compliance is submitted to the Commission.

6.3.5 The review of the System Upgrade Plan must be prepared no later than three (3) months prior to the upgrade.

6.3.6 If at any time the SO proposes to enhance or upgrade the Dispatch Scheduling Model then it shall seek prior approval from the Commission before implementing its proposal.

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## **CHAPTER 7: RING FENCING OF ACCOUNTS**

### **7.1 Purpose**

7.1.1 Where necessary, the SO shall produce a chart of accounts for financial statutory purposes and a chart of accounts for regulatory purposes.

### **7.2 Ring Fencing of Financial Statutory Accounts**

7.2.1 As part of the unbundling process, the ring-fenced SO shall explicitly identify all direct and indirect costs incurred in the performance of the ring-fenced SO function, establishing and maintaining a separate set of accounts relating to its functions as the SO only.

7.2.2 Where necessary, the SO shall prepare a chart of statutory accounts to be signed off by the Head of SO and submitted to the TNB management for approval, which shall not be unreasonably withheld.

7.2.3 The financial accounts shall be based on the underlying accounting systems, specifically focused on the SO and the Generally Accepted Accounting Principles (“GAAP”) for Peninsular Malaysia.

7.2.4 In regard to the assets of the SO, the statement of assets shall include all SO assets, and accurately account for the historic value, age and remaining useful life of the assets required for the performance of the SO functions.

7.2.5 An asset register or statement of assets for the SO shall be separated within the corporate enterprise financial systems of TNB.

7.2.6 The ring-fenced SO accounts shall be subject to a financial audit at least annually.

7.2.7 The financial accounts of the SO shall be published on the website upon recommendation by the SO Website Working Group as stated in Chapter 4.5.

### **7.3 Ring Fencing of Regulatory Financial Accounts**

7.3.1 The regulatory framework for SO is regulated by the Commission. As part of the electricity tariff that customers pay, system operations is one component that makes up this tariff- known as the system operation tariff.

7.3.2 In order to determine the system operations tariff, the Commission published RIG setting out the Incentive Based Regulation (IBR).

7.3.3 In accordance with the requirements of the RIG, the SO shall submit regulatory accounts to the Commission.

7.3.4 The information for the regulatory accounts shall be accompanied by a submission setting out the process by which the regulatory accounts were drawn from the audited financial accounts.

7.3.5 The Commission shall set out guidelines for the SO on the type of information it requires for regulatory purposes.

7.3.6 SO shall adhere to the format of the data templates provided by the Commission as set out in the RIG.

7.3.7 SO accounts shall be consistent with the requirements from the Commission as set out in the RIG framework.

7.3.8 The regulatory accounts must comprise of the data requirements as requested by the Commission including the following:

- (a) the revenue based on the system operations tariff;



- (b) the operating expenditure incurred by the system operation in performing its functions;
- (c) the allocation of shared services / joint costs based on the cost allocation methodology by Commission;
- (d) the asset register/statement of assets required for system operation and useful life of these assets; and
- (e) the depreciation of assets.

#### **7.4 Cost Allocation**

- 7.4.1 SO shall ensure that the joint costs/ shared services between TNB corporate or any other business unit within TNB are allocated between these parties and the SO in accordance with the RIG cost allocation methodology guidelines that have been approved by the Commission.
- 7.4.2 The translation of data from the audited financial accounts to the regulatory accounts (including compliance with the cost allocation methodology) shall be audited by a certified accounting firm.

#### **7.5 Framework for Calculation of Cost of Service for SO**

- 7.5.1 The RIG by the Commission sets out the framework for the calculation of the cost of service for system operations.
- 7.5.2 SO shall follow and abide by the guidelines for the calculation of the cost of service for system operation as defined by the Commission.
- 7.5.3 SO shall accurately and clearly identify the costs of their services, including assets and activities related to the system operation function.

- 7.5.4 The RIG states that the Commission will provide a Revenue Requirement Model for the calculation of revenue requirements for TNB business entities, in this case system operation.
- 7.5.5 This model describes the data requirements for system operation and the calculation of revenue requirements.
- 7.5.6 SO shall provide and submit to the Commission the data required for the calculation of the revenue requirements.
- 7.5.7 In accordance with the principles established in RIG, charges for system operation services will be levied initially against TNB Customer Services. Whenever the electricity market is opened to competition, these charges shall be levied on all Retailers (TNB Customer Services being deemed to be a Retailer), customers able to buy at the wholesale market and exporting traders in proportion to their shares of total energy traded.
- 7.5.8 Where the applied SO tariff results in an over-recovery or under-recovery in any financial year, such sum shall be deducted from or added to the sum to be recovered during the following review period in accordance with the provisions of section 3.4 of RIG 2.

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## **CHAPTER 8: REPORTING AND AUDITS**

### **8.1 Operational Reporting**

8.1.1 Operational reporting is related to reports that are produced providing details of the grid system performance.

8.1.2 The information to be included at the minimum consists of:

(a) generation availability and outages;

(b) general system performance e.g., system frequency and frequency deviation; and

(c) incident investigation and analysis (limited to system level)

8.1.3 Standardized reporting templates shall be developed so that the same format for the reports can be used each time.

8.1.4 Subject to Chapter 4.5, the above-listed reports shall be published on the SO's website to enhance transparency.

### **8.2 Regulatory Reporting**

8.2.1 SO shall provide information to the Commission as part of the RIG.

8.2.2 SO shall establish and maintain accounting and financial accounts relating to its operations and functions as system operator.

8.2.3 For regulatory accounting, the SO shall present and submit the necessary information in the required format as requested by the Commission.

8.2.4 The regulatory financial accounts shall be subject to an audit on an annual basis and submitted to the Commission.

### **8.3 Financial Audits**

8.3.1 SO shall arrange that its accounts, ring-fenced as established in Chapter 7, are subject to the same minimum level of audit by a licensed independent auditor as it required for statutory accounts filed in Malaysia.

8.3.2 In undertaking the audit, the independent auditor shall comment on the arrangements for the separation of the SO accounts from those of other parts of TNB in any shared accounting systems and shall comment on the appropriateness of the accounting systems used for an organization having the number of staff and turnover of the SO.

### **8.4 Audit - Compliance with Ring Fencing Obligations**

8.4.1 SO's own quality assurance (QA) personnel shall monitor, assess, and enforce compliance with processes using a number of monitoring processes to collect information in order to make assessments of compliance.

8.4.2 SO's audit and reporting programme should support the SO compliance programme to reassure stakeholders that processes are being adhered to and that where problems are identified mitigation procedures are in place.

8.4.3 The compliance programme process approved by the Commission shall set out the overall process steps for the compliance program and shall include:

- (a) Evidence of the independence of the senior management of SO from TNB;

- (b) An enforceable Code of Conduct is in place and applicable to all SO staff and those staff of TNB providing services to the SO.
- (c) Access controls in place relating to premises occupied by SO and IT systems used by the SO.
- (d) Training for existing SO staff regarding their obligations under the Code of Conduct and inclusion of such training in the SO's induction program for new staff;
- (e) Arrangements for the quarantining of staff leaving the SO who have had access to information of a commercially confidential information relating to a competitor of their new employer; and
- (f) The provision of an [annual] report to the Commission, most of which shall also be made publicly available, recording evidence of compliance with the requirements of the compliance programme. This report shall be prepared following an audit of the SO's arrangements for meeting the compliance provisions.

8.4.4 The Code of Conduct shall address confidentiality, non-discrimination and transparency.

8.4.5 IT system access controls shall be designed to prevent access to data by unauthorized persons and record the identity of system users inputting or changing data items.

8.4.6 The compliance report to the Commission shall include details of each incidence of non-compliance detected by the SO or reported by stakeholders.

8.4.7 The public version of the compliance report shall contain details of the number of non-compliances of each type separately; by those detected by the SO, and those reported by stakeholders.

8.4.8 The compliance report shall not be prepared by a person with managerial responsibility for the matters being reported.

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## **Appendix A - Identified Shared and Corporate Services**

Shared and Corporate Services to which the SO should continue to have access to include shared buildings, shared ICT infrastructure and services and corporate service shall be made subject to SLA and, for those services which require the involvement of non-SO staff in their provision, the SLA should include obligations under the SO's Code of Conduct.

### **Shared Buildings**

Currently, the SO occupies parts of TNB buildings. Access control arrangements should be initiated such that only members of the SO staff and visitors under the direct supervision of members of the SO staff have access to these areas. These areas include:

- (a) 3rd floor NLDC building;
- (b) 5th floor NLDC building;
- (c) 6th floor NLDC building;
- (d) 7th floor NLDC building;
- (e) Backup control centre; and
- (f) Backup control room.

In considering the arrangements for the continued use of shared buildings, appropriate consideration must be given to facilities management services associated with these buildings including:

- (a) Main power supply and backup power supply (standby diesel generators);
- (b) Auxiliary police services;
- (c) Office cleaning services; and
- (d) Landline telephone services (TM);

## Shared Services

Two categories of shared services required by the SO are procured by TNB or provided by other parts of TNB to the SO to enable its operation. The first category includes services procured or directly provided by TNB for the exclusive use of the SO. These includes but not limited to:

- (a) Software licences;
- (b) Lightning locator service;
- (c) Annual maintenance and development services for SCADA/EMS computer software;
- (d) Lightning locator service;
- (e) Fault/disturbance recorder & lightning detection;
- (f) Repair and maintenance of RTU's and distributed front ends;
- (g) ICT - telecommunication services - Fibre optic links: main control centre, backup control centre and backup control room;
- (h) ICT – data centre colocation services for SCADA/EMS system; and
- (i) Building facilities services – Aircond, fire protection system, lift, lighting & CCTV.

In addition, SO makes use of other services which, while clearly identifiable as a SO required service, are connected to communications networks or systems also used by others. These include but not limited to:

- (a) ICT - telecommunication services;
  - (i) Ethernet communication services to all power stations and substations: voice and data communication a hotline telephone service; and



- (ii) Ethernet communication services between floor to floor within NLDC building.
- (b) ICT - support services;
  - (i) Backup services for SO's operation;
  - (ii) Unified communication services for voice communication;
  - (iii) Database services for SO's operation;
  - (iv) Alerts and performance monitoring tools services;
  - (v) Cyber Security Control Centre ("CSCC") and Network Operation Centre ("NOC") for real time first level monitoring and support; and
  - (vi) VPN and advanced security protection services.

Recognizing that section CC6.6 of the GCPM places responsibility with the network user for the remote end communication equipment required at power stations and substations, the SO should conclude SLA with the ICT department Division for the continued provision of the ICT services where responsibility for their provision rests with the SO.

### **Corporate Services**

The SO obtains corporate services from TNB and will require their continued provision. These includes but not limited to:

- (a) Human resources related and other administrative services such as salary payment, medical services for staff and families, staff training etc;
- (b) Finance services including management and regulatory accounts;
- (c) Legal services;
- (d) Procurement and Logistics; and/or

(e) Insurance.

SO should conclude SLA with the relevant service provider departments of TNB for the continued provision of these services. These SLA should include obligations under the SO's Code of Conduct.

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