

PROVISION OF BLACK START CAPABILITY BY GENERATORS AS ENSHRINED IN THE GRID CODE (GC), MARKET RULES (MR), ANCILLARY SERVICES AGREEMENT (ASA) AND OTHER PROVISIONS CONNECTED THERETO.

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INTRODUCTION:

The Grid Code defined Black Start as:

“the procedure necessary for a recovery from a Total Shutdown or Partial Shutdown.”

While Black Start Capability is defined thus:

“the capability of a Power Station to commence operation without an outside Energy supply so as to energise a defined position of a TCN controlled grid.”

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Furthermore, the Electric Power Sector Reform Act, 2005, defines Ancillary Services thus;

“... those functions necessary for reliable operation of a power system, which may include, but are not limited to, services that would provide or permit the following-

a)..... b)..... c)..... d)..... e) black start.

While the Eligible Customer Regulation, 2017, defined Ancillary Service as;

“A service, other than the primary production of electricity, which is used to operate a stable and secure power system including but not limited to: reactive power, operating reserve, frequency control and black start capability.”

PROVISIONS ON BLACK START CAPALITY AS ENSHRINED IN THE GC - EXTRACTS:

GC Section 17.3.1 provide as follows:

“Black Start is a mandatory Ancillary Service. The System Operator shall contract for Black Start to enable it to operate the Power System securely at all times.

(a) Existing Generators can appeal to the SO for derogation from this duty; or

(b) New Generators can appeal to SO/TSP for derogation on the basis of:

technological incapability (e.g. wind and photo-voltaic), size (e.g. small hydro) or excessive cost (in this case the SO may choose to cover the extra cost in the Ancillary Service Agreement)."

GC Section 17.2.1 provide as follows:

"Generating Units have to be identified that can start on own resources from a total De-energised state which may be due to emergency condition declared by System Operator as in Section 18 or Appendix 8 of this Code. Such Generating Units may be necessary to start other Generating Units and revive the Power System following a Total Shutdown. The necessary contracts must be executed between the System Operator and Generators to provide Black Start Capability and appropriate tests must be done on a regular basis to ensure that the Power System can be reactivated following such an extreme emergency situation."

GC Section 17.4.1 provide further as follows:

"The System Operator shall set out the requirements for Black Start Stations to enable recovery of the Power System from a Partial Shutdown or Total Shutdown."

GC Section 17.4.2 state thus:

"Requirements for Black Start Stations:

(a) Black Start Stations shall have the ability for at least one of its Generating Units to start-up from shutdown and to energise a part of the total system, or be Synchronised to the System.

(b) The Black Start Stations shall perform Black Start upon instruction from the System Operator, without an external electrical power supply.

(c) The Black Start Power Station shall inform the System Operator if during the Demand restoration process any Black Start unit cannot, because of the Demand being experienced, keep within its safe operating parameters.

(d) The System Operator shall where possible, either instruct Demand to be altered or will re-configure the Transmission System or will instruct a User to re-configure its system in order to alleviate the problem being experienced by the Generator.

(e) However, the System Operator may decide to keep a Generating Unit in a Power Station operating outside its safe operating parameters, for a limited period of time.

(f) The System Operator shall accept that the Generator operator may change Generation on that unit if it believes it is necessary for safety reasons. The Generator shall inform the System Operator as soon as reasonably practical if such a change is made without prior notice.”

PROVISIONS ON BLACKSTART CAPABILITY AS ENSHRINED IN THE MR - EXTRACTS:

MR 34.8 provide for Black Start Capability.

MR 34.8.1 provide as follows:

“The System Operator shall determine, with the approval of the Commission, the cost of

procuring Black Start Capability pursuant to Section 8 of the Grid Code.” Kindly see the said section 8 for complete details.

MR 38.8.2 provide further as follows:

“The costs incurred by the System Operator on procuring Black Start Capability during any Billing Period shall be recovered from all Load Participants through a charge, in N/MWh, which shall be calculated for each Billing Period. The applicable charge for every Billing Period shall be collected from each Load Participant in the ratio that the Meter Quantity of that Participant bears to the total Meter Quantity of all the Load Participants during the Billing Period.”

See below, the provisions of MR 27.14.3, 27.14.4, 27.14.5, 27.14.6 & 27.14.7.

MR 27.14.3 provide as follows;

“Ancillary Services contracts will cover payments from the System Operator to the Generator for increased losses, lost efficiency, increased maintenance, and in the case of Black Start, operational administrative costs and capacity cost of the Black Start equipment.”

MR 27.14.4 provide as follows;

“These costs shall be agreed between the System Operator and the Generators and approved by the Commission.”

MR 27.14.5 further provide as follows;

“Alternatively the Special Trader may pay for Ancillary Services costs within Power Purchase Agreements with Generators and recover the costs in Vesting Contracts with Distributors.”

MR 27.14.6 state thus;

“The System Operator shall propose the required amounts of Ancillary Services for the year ahead (or shorter period if necessary) in accordance with the Grid Code and submit these requirements to the Commission for approval.”

MR 27.14.7 provide as follows;

“The System Operator shall sign Ancillary Services contracts with all the Generators covering Ancillary Services, except:

(a) Where the Generator has received a derogation under the Grid Code for one or more Ancillary Services, these shall be excluded: Or

(b) The PPA covers the requirements to provide the Ancillary Services and the associated costs of increased losses, lost efficiency and increased maintenances.”

The MR define “Agreements” as follows:

“...means conditions agreed between the Market Operator and a Participant, or the System Operator and a Participant such as Market Participation Agreement, Reliability Must-Run Agreement, Black Start Agreement and other agreements executed by the System Operator or the Market Operator in connection with the provision of the Market Operator in connection with the provision of services, required for implementing these Rules or the Grid Code.”

PROVISIONS ON BLACKSTART CAPABILITY AS ENSHRINED IN ASA - EXTRACTS

It is pertinent to state that the ASA extracts herein is generic, it applies to all parties to an ASA, however the clauses may slightly differ.

Clause 3.6.1 of the ASA provide as follows:

“The Black Start Capability of the Company is set out in Schedule 2 (Black Start Capability).”

Clause 3.6.2 state as follows:

“The SO shall, not less than 30 Business Days of the Closing Date of this agreement, or when there is a relevant amendment to the Grid Code, develop a Black Start procedure applicable to the Black Start Capability of the Power Station in consultation with the Company (“Black Start Procedure”). In developing the Black Start Procedure the SO shall take into account (i) all reasonable comments and opinions of the Company and the Technical Limits of its Generating Units and (ii) the requirements of the Grid Code. The Black Start Procedure may also include various scenarios and safety precautions to be taken during a Black Start. A copy of the Black Start Procedure shall be provided to the Company no later than the tenth (10th) Business Day after the date on which the Black Start Procedure was agreed. The Company shall keep a copy of the Black Start Procedure in the main control room as well as the local control room of the Generating Units(s) with Black Start Capability. The SO shall promptly inform the Company of any changes in the Black Start Procedure. The Company shall follow the Black Start Procedure during a Black Start without any deviation unless such deviation is approved in writing by the SO.”

Clause 3.6.3 state as follows:

“The SO shall not issue a Dispatch Instruction requesting Black Start until the Black Start Procedure has been provided to the Company in accordance with Clause 3.6.2 and the Power Station has achieved the Commercial Operations Date.”

Clause 3.6.4 further provide as follows:

“Subject to Clause 3.6.3, upon receipt of a Dispatch Instruction from the SO requesting Black Start the Company shall provide a Black Start.”

Clause 3.6.5 state as follows:

“The Company shall keep the SO informed at all times of the status of its Black Start Capability. In the event that the Black Start Capability is compromised due to any reason the Company shall notify the SO of its failure to provide Black Start Capability within twenty-four (24) hours of any such failure. Within seventy-two (72) hours of such failure the Company shall provide the SO with a remedial plan setting out the improvements the Company will make to recover its Black Start Capability within thirty (30) days of such failure for the duration that the Black Start Capability is compromised, as described in this Clause 3.6.5, the SO shall not issue a Dispatch Instruction to the Company requesting a Black Start.”

Clause 3.6.6 went further to provide thus:

“The Company shall coordinate with the SO to carry out maintenance of the Black Start Capability in accordance with the Grid Code and Good Industry Practice.”

Clause 3.6.7 also provide as follows:

“The Company shall carry out routine maintenance of the engines and generators which provide its Black Start Capability and shall start those engines and generators at least once a month.”

Clause 3.6.8 state thus;

“The Company shall perform a Black Start Test as and when required by the SO provided the SO gives the Company at least one (1) Business Day prior written notice of the need to perform

a Black Start Test.”

Clause 3.6.9 provide as follows;

“The Company shall ensure that:

(a) it has a current written procedure setting out how the Company shall perform Black Start;

(b) its staff is fully trained on the Black Start Procedure and the Company’s own procedure for the performance of a Black Start;

(c) its Black Start Procedure is updated within thirty (30) days of any relevant amendment(s) to the Grid Code and its staff are retrained within three (3) months of the effective date of the relevant amendment(s) to the Grid Code; and

(d) its staff shall rehearse, at least once a year, its Black Start Procedure unless the Company has provided a Black Start, in a manner satisfactory to the SO, within the preceding two (2) year period.”

Clause 3.7 of the ASA made provisions for obligation to operate safely by Generator.

Clause 3.7.1 provide as follows:

“The Company shall ensure that all of the Generating Units at the Power Station are operated at all times within their respective Technical Limits and in accordance with the requirements of the Grid Code. If the Company considers, acting reasonably, that delivery of an Ancillary Service requested in a Dispatch Instruction issued by the SO will result in a Generating Unit operating in violation of its Technical Limits then the Company shall promptly inform the SO and the

Company shall not be required to deliver the Ancillary Service in the manner described in the Dispatch Instruction and the Company shall not be in default under this Agreement. Following receipt of any such notification, the SO shall revise its Dispatch Instruction to ensure that the Generating Unit can operate within its Technical Limits.”

Clause 3.8 of the ASA made provision for Reporting Requirements.

Clause 3.8.1 provide as follows:

“The Company shall provide to the SO and the Market Operator the information specified in the relevant sections of the Grid Code and the Market Rules respectively at the times and intervals, and in the manner, specified therein. Without prejudice to the foregoing sentence, and subject to Clause 3.8.2, the Company shall provide the following information to the SO:

(a) Available capacity of each Generating Unit in the Power Station for each hour of the following day;

(b) Any condition which may limit or restrict the capability of any Generating Unit to provide any Ancillary Service within that Generating Unit’s Technical Limits, the impact on the Technical Limits, estimated duration of such impact and the steps the Company intends to take to remedy the condition;

(c) Any change in the condition, performance and setting of automatic voltage regulator, stabiliser, Governor Control System and control system of any Generating Unit;

(d) The status of the Black Start Capability of each relevant Generating Unit; and

(e) If the Company has given the SO notice pursuant to Clause 3.6.5 that its Black Start Capability is compromised, the steps the Company intends to take in order to restore its Black Start Capability and an estimate of the time required to restore its Black Start Capability.”

Clause 3.8.2 of the ASA further provide thus;

“If at any time during a day there is any change in the condition of the Power Station and/or in Black Start Capability which may compromise the ability of the Company to perform its obligations under this Agreement, the Company shall promptly inform the SO and in any event no later than one (1) hour after the Company has become aware of the relevant change in condition. Such communication shall include the nature of problem, the estimated effect on the Company’s ability to perform each Ancillary Service in quantitative terms and the estimated time required to restore the status of the relevant Generating Unit(s) at the Power Station to normal conditions so that it can perform each Ancillary Service in accordance with this Agreement.”

Clause 6 of the ASA deals with Invoicing and Payments

Clause 6.1.1 made provisions for mandatory payment for Ancillary Services. It provide thus;

“Payment for Mandatory Ancillary Services

Company shall provide Ancillary Services pursuant to the requirements of the Relevant Rules. Except to the extent outlined in Clause 6.2 for provision of Black Start, Company shall be compensated for the provision of such mandatory Ancillary Services pursuant to the payment provisions agreed between NBET and the Company in the Power Purchase Agreement.”

Clause 6.2 of the ASA made provision for payment for Black Start.

Clause 6.2.1 provide as follows;

“Company shall be compensated by TCN for the provision of Black Start services in accordance with the applicable tariff approved by NERC, (as may be amended from time to time) as follows;

A. A monthly Black Start payment (“Monthly Black Start Payment”) to provide for the following:

a. the cost of fuel consumed for the monthly test runs conducted subject to Clause 3.6.7;

b. the cost of any dedicated trained staff; and

c. the cost of all maintenance activities associated with the equipment dedicated to the provision of Black Start;

B. A payment of a fixed amount (Naira) per successful Black Start Test to cover the variable costs (such as fuel and consumables) incurred by the Company to carry out full Black Start Test (the “Black Start Test Payment”);

C. A payment of a fixed amount (Naira) for each successful Black Start to cover the variable cost such as fuel and consumables incurred by the Company to carry out full Black Start (the “Black Start Variable Cost Payment”).”

Clause 6.2.2 of the ASA provide thus;

“Each month (in accordance with the Market Rules) the Company shall submit an invoice to the SO for the Monthly Black Start Payment, Black Start Test Payment and Black Start Variable Cost Payment, as applicable, which are due to the Company for the previous month pursuant to Clause 6.7.1.”

Clause 6.2.3 further provide as follows;

“Within five (5) Business Days of receipt of an invoice from the Company, the SO shall:

(a) if it reasonably considers the invoice to be incorrect, return it to the Company for correction with details of why the SO believes it to be incorrect; or

(b) if it reasonably considers the invoice to be correct, submit it to the Market Operator within ten (10) Business Days of receipt from the Company for payment, confirming to the Market Operator that the invoice is correct.”

Clause 6.2.4 of the ASA state thus;

“When the Market Operator receives a confirmed invoice from the SO pursuant to Clause 6.7.5(b), TCN shall procure that the Market Operator shall pay the full amount of such invoice to the Company in accordance with the Market Rules.

The Company shall be entitled to charge Late Payment Interest in accordance with the Market Rules.”

Clause 7 of the ASA provide for failure to provide an Ancillary Service.

Clause 7.1 talks about Underperformance of Ancillary Services

Clause 7.1.1 of the ASA provide as follows;

“The SO shall monitor the performance of all of the Company’s Generating Units providing Ancillary Services. If the SO (acting reasonably and in accordance with Good Industry Practice) considers that the performance of one or more Generating Units is not in accordance with its Dispatch Instructions and/or this Agreement (“Underperformance”) it shall notify the Company in

writing of this Underperformance, giving details of the nature and extent of the Underperformance.”

Clause 7.1.2 of the ASA provide thus;

“The Company shall investigate and consult with the SO if needed to find the cause of the Underperformance notified to it.”

Clause 7.1.3 of the ASA state as follows;

“Within five (5) Business Days of receipt of notification pursuant to Clause 7.1.1 from the SO the Company shall submit a report to the SO detailing;

- (a) the cause of the relevant Underperformance,
- (b) the steps the Company plans to take to remedy the situation, and
- (c) the time period required to rectify the cause of the relevant Underperformance.”

Clause 7.1.4 of the ASA went further to state as follows;

“If the Company (acting reasonably and in accordance with Good Industry Practice) has provided notice to the SO in accordance with Clause 3.7, its failure to provide an Ancillary Service in accordance with the relevant Dispatch Instruction shall not be considered Underperformance.”

While Clause 7.1.5 of same ASA provide thus;

“The SO shall not issue a Dispatch Instruction which would require the Company to operate one or more Generating Units in violation of its Technical Limits.