

PUBLIC UTILITIES REGULATORY COMMISSION (PURC), GHANA



PRELIMINARY INVESTIGATIVE REPORT ON ERRATIC POWER SUPPLY

**April, 2021
WITHOUT PREJUDICE**

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WITHOUT PREJUDICE

1.0 INTRODUCTION

This Report presents results of preliminary investigations conducted by the Public Utilities Regulatory Commission (PURC), into power system challenges on the National Interconnected Transmission System (NITS), over the period January 1 to April 14, 2021. It discusses various actions carried out by the Commission, elaborating on the present state of the power system. The Report also highlights possible regulatory breaches by various electric utilities of Key Performance Indicators (KPIs) and the Commission's Reliability and Regulatory benchmarks. Similar occurrences of power outages in 2020 and regulatory actions taken have been used as a basis for analysis in this report.

1.1 CONDITIONS PRECEDING CURRENT POWER SITUATION

In December 2019, the Ghana Grid Company (GRIDCo) formally notified the Public Utilities Regulatory Commission (PURC/Commission) of an impending pigging exercise on the West African Gas Pipeline (WAGP) which supplies natural gas from Itoki in Nigeria to Tema for electricity generation in Ghana. GRIDCo's analysis of the power system showed that there would be sufficient generation to meet the projected system demand. GRIDCo further notified key sector players of the need to ensure availability of alternative fuel during the exercise. In spite of the above assurances, the country experienced some major and frequent power interruptions in early 2020.

On January 29, 2020, the Commission requested GRIDCo to furnish it with the following reliability and regulatory information:

1. Status report on the National Interconnected Transmission System (NITS);
2. Detailed reports on all system disturbances from December 2019 to date (January 29, 2020);
3. Transmission system outlook for the first half of the year (2020).
4. Measures adopted to minimise the impact on customers;
5. Evidence of announcements made to the public.

The above data was to enable the Commission ascertain the causes of these unannounced interruptions and take measures to forestall future occurrences.

Preliminary analysis of data submitted indicated the following:

- Fuel supply challenges from the Ghana National Gas facility at the commencement of the pigging exercise in January 2020, resulting in unplanned outages as a result of some generators not running.
- GRIDCo's inability to meet the N-1 contingency criteria.
- GRIDCo's non-compliance with monitoring and maintenance schedules, with some outages caused by overgrown vegetation, brushing overhead line conductors which resulted in cascaded tripping of lines.

In 2020, the Commission constituted an independent Panel through its formal hearing process to undertake an extensive root cause investigation into the power system outages experienced in the first quarter of 2020. Despite being significantly affected by the COVID-19 Pandemic, the Panel is expected to submit its recommendations to the Commission by end of May, 2021.

In its preliminary investigation of power system challenges from January 1 to April 14, 2021, the Commission observed some areas of similarity with the outages of 2020. Nevertheless, this preliminary report is issued by the Commission without prejudice to the findings and recommendations of the Panel.

2.0 UPDATE ON POWER SYSTEM CHALLENGES

Over the period covering January 01, 2021 to April 14, 2021, the power system experienced and continues to experience various challenges on the NITS. The major challenges are outlined hereafter in chronological order. Per its procedures, the Commission will undertake a detailed investigation into each of these occurrences and will issue a comprehensive report at the end of the investigations. As with the 2020 Root Cause Analysis Investigation initiated by the Commission, the foremost objective of the Commission's actions is to forestall future occurrences. System weakness and breaches of statutory obligations will also be comprehensively addressed by the Commission.

2.1 Saturday February 27, 2021 – Gas Supply Challenges

On Saturday February 27, 2021, there was power curtailment which affected major parts of the country including Accra, Tema and Kumasi. GRIDCo attributed the curtailment to gas supply challenges from the offshore fields which led to a loss of power supply of about 1,000 MW resulting in a partial system collapse.¹ Please refer to attached Press Release from GRIDCo in Appendix 1.

2.2 Wednesday March 03, 2021 – Closure of Emergency Valve

On Wednesday March 03, 2021, there was closure of an emergency valve at the West Africa Gas Pipeline Company (WAPCo) which cut off gas supply to some generating plants in the country. Power supply to some Bulk Supply Points (BSPs) was curtailed by GRIDCo to prevent a total system collapse. Reference to this is as shown in Appendix 2.

On this same date, GRIDCo wrote to the Commission giving an indication that due to shutdown of Bui Power Plant during the off-peak period, the system would be running in Alert State.

2.3 Sunday March 07, 2021 – Total System Collapse

On Sunday March 07, 2021, there was a major system outage. GRIDCo attributed this fault to snapping of a line insulator on the Prestea – Obuasi line. This fault

¹ It should be noted that upstream operations are subject to licensing and contractual arrangements rather than PURC's direct regulatory oversight. However, the Commission will exercise its general regulatory oversight responsibilities to investigate any shortcomings in fulfilment of service obligations.

resulted in cascaded tripping of lines within the Prestea-Obuasi corridor and eventually resulted in a total system collapse. Please refer to Press Release in Appendix 3.

2.4 Sunday March 08 – Friday March 12, 2021 – Planned Outage

From Sunday March 08 – Friday March 12, 2021, GRIDCo commenced execution of its planned outage programme to resolve oil leakage on a power transformer at the GRIDCo Asiekpe Substation. This led to a loss of supply of 18 MW during peak and 10 MW at off-peak, resulting in a rolling blackout which affected the Volta and Oti Regions. GRIDCo had earlier indicated the urgent need of these works which when delayed any further, could lead to complete loss of the transformer. GRIDCo's letter to the Commission advising of this outage is shown in Appendix 4.

2.5 Wednesday March 24, 2021 – Compressor Failure

On Wednesday March 24, 2021, there was a compressor fault upstream, reported by the Ghana National Gas Company which led to loss of gas supply. This resulted in curtailment of 750MW of power from Karpowership and VRA's Aboadze units. The situation affected power supply to the Accra East, Winneba, Techiman and Sunyani Substations of GRIDCo. Please refer to Appendix 5 for a Press Release issued by GRIDCo.

2.6 Saturday April 3, 2021 – Transmission Line Conductor Snapping

On Saturday April 3, 2021, a conductor on the Tema -Accra East transmission line fell at Trasacco - East Legon in Accra, leading to power outages in major parts of the Greater Accra Region. Appendix 6 shows a Press Release by GRIDCo on this outage.

2.7 Monday April 12, 2021 – Fault on 330 kV Transmission Line

On Monday April 12, 2021, there were outages in parts of Accra as a result of a fault on GRIDCo's 330 kV line from Aboadze to Anwomaso. This fault resulted in outage of the line and subsequent outages due to low voltages. Press Release issued on this outage by GRIDCo is shown in Appendix 8.

2.8 Frequently occurring system challenges

In addition to the various power system challenges listed above, there were numerous cases of manual load shedding in Kumasi and its surroundings as well as NEDCo operational areas. These were as a result of deterioration of voltage or overloading on GRIDCo's Anwomaso-Kumasi line. This is mainly due to shutdown of the Bui Hydro Plant at off-peak hours and reduced output during peak hours. Details of these network events are shown in Appendix 9 from the Press Releases issued by GRIDCo and from complaints made by ECG and NEDCo.

3.0 ACTIONS TAKEN BY PURC ON SYSTEM CHALLENGES

The Commission analyzed the irregular power supply situation based on its monitoring processes, utility information and consumer complaints received on these outages and has taken the following measures:

On **March 11, 2021**, the Commission requested ECG, GRIDCo, NEDCo and EPC to submit detailed data on the outages and network performance to enable the Commission to conduct further investigations and analysis to monitor compliance with regulatory standards.

Based on the data requested, the following responses were submitted by the public utilities:

1. On the issue of low voltages at various BSPs on the NITS reported by ECG, GRIDCo's response is that the low voltages were as a result of the unavailability of the Bui Hydro Plant which is required to regulate the voltage profiles in the central part of the grid. As a result, GRIDCo declared that the NITS is currently being operated in "Alert State". This is as discussed in Section 2.2 above.

The Commission notes that Art 12.11 of the Grid Code states that Alert States should not last for a period exceeding 10 minutes.

2. GRIDCo wrote to ECG requesting load relief at Anwomaso to allow for a B-phase conductor replacement on a current transformer at Anwomaso on one of its autotransformers.

Art 9.48 of the Grid Code requires that there should be enough redundancy and operational flexibility to allow for repair or maintenance works to be carried out without curtailment to power supply.

In response to the Commission's queries, GRIDCo attributes the causes of recent and continuing system disturbances on the NITS to the following, among others:

1. System being in "Alert State" as a result of shutdown of Bui Hydro Plant at off-peak and reduced output during peak.
2. Emergency maintenance works being carried out at various sections on the NITS.
3. System upgrade and network enhancement projects which require outages to be completed.

3.1 Other Regulatory Actions taken by PURC

The Commission, on February 21, 2020, as a result of these outages and issues of non-maintenance, requested for details of load curtailments from January 01, 2020. Subsequent to this, and the investigations conducted, the Commission issued a letter on March 23, 2020, requesting GRIDCo to "Show Cause" as to why enforcement procedures should not be initiated for the incessant power outages on the NITS.

4.0 FURTHER INVESTIGATIONS BY PURC

Based on the responses noted above, the Commission carried out further investigations into causes of the erratic power supply and challenges on the NITS. The Commission established through its reliability and regulatory monitoring of the transmission and distribution networks, that the erratic power supply coupled

with low voltages especially during the peak hours have been caused by the following:

4.1 Transmission

1. Emergency upgrade and modification works at Anwomaso BSP which required outages in order to provide a safety corridor for workmen to carry out their operations.
2. Scheduled maintenance activities on various sections of the NITS.
3. Low reactive voltage support resulting from off-peak shutdown of the Bui Hydro Plant leading to collapse of voltages in the mid-portion of the country.
4. New transmission infrastructure being constructed on the NITS which include:
 - a. Upgrade of the 161kV Volta – Achimota corridor lines
 - b. Completion of the Pokuase (A4BSP) Substation
 - c. Completion of the 330kV Anwomaso – Kintampo transmission line
5. Delayed investments into the NITS and delayed completion of 330kV Anwomaso-Kintampo line among others.
6. Challenges with natural gas supply from upstream fields and WAGP.

The Commission also established that several key network enhancement projects commenced by GRIDCo which were stated in the 2020 Electricity Supply Plan, that were expected to have been completed were stalled. The delay in completion of these projects has posed serious transmission constraints to the grid. These projects include:

- a. Upgrade of the 161kV Volta – Achimota corridor lines
- b. Completion of the Pokuase (A4BSP) Substation
- c. Completion of the 330kV Anwomaso – Kintampo transmission line
- d. Repair works on the 40MVar STATCOM in Tamale
- e. Delayed investments in the NITS as well as delayed completion of 330kV Anwomaso-Kintampo line among others.

The Commission notes that the repair works on the 40 MVar STATCOM have been completed and is currently being used for voltage regulation in the northern part of Ghana. GRIDCo indicated that the other projects (a – c), listed above, would be completed before the end of July, 2021. Reference to this is as shown in letters from GRIDCo in Appendix 10.

The Commission, through its rigorous and effective monitoring also established that the following projects proposed by GRIDCo in the 2020 Electricity Supply Plan (ESP) to improve network reliability and availability are yet to commence:

- ✓ 161kV Aboadze-Takoradi-Tarkwa-Prestea
- ✓ 2nd Circuit 330 kV Prestea – Dunkwa – Kumasi line
- ✓ 330/161 kV Dunkwa substation
- ✓ 161kV Pokuase – Mallam line
- ✓ 161kV Aboadze – Mallam line Upgrade
- ✓ 161Kv Bogosu – Dunkwa – New Obuasi upgrade
- ✓ 161 kV Dunkwa – Asawinso upgrade
- ✓ 2nd Circuit 330 kV Aboadze – Pokuase
- ✓ Accra (Pokuase) – Kumasi (Anwomaso) 330 kV line

- ✓ Eastern Transmission Corridor Projects:
 - 161kV Kpando – Juale Line
 - 161kV Juale – Yendi Line
- ✓ Kumasi third Bulk Supply Point
- ✓ Transformers and Compensation devices
 - SCADA upgrade project
- ✓ Replacement of interconnection transformers with phase shifting transformers (Prestea and Nayagnia)

4.2 Distribution

4.2.1 ECG

Over the first quarter of 2021, ECG experienced a number of network challenges due to various reasons. Most of the outages within the ECG network were unplanned or resulted from emergencies. The outages were caused mainly by transient and cable faults, bad weather or jumper cuts. These constituted 89 % of the outages experienced by ECG. Other outages were experienced due to the activities on request from GRIDCo which led to load shedding in the Ashanti and Volta regions.

Most of the outages attributable to GRIDCo were due to system disturbances and faults. ECG identified 381 outages which were attributable to the actions or requests by GRIDCo. These constituted 11% of the total outages in the network. ECG is currently experiencing low voltages at some of their BSPs resulting from shutdown of the Bui Hydro Plant during off-peak hours.

4.2.2 NEDCo

NEDCo, over the first quarter, experienced sustained outages that mostly lasted for more than an hour. These outages were widespread, sporadic and were caused from within the NEDCo system or as a result of system shutdowns from GRIDCo.

The faults emanating from within the NEDCo system were predominantly earth and overcurrent faults. In some cases, the faults were as a result of low voltages. These faults were mostly experienced in the Upper East, Northern and Sunyani Operational areas. NEDCo identified 673 outages which were attributable to actions or requests made by GRIDCo. These constituted 32% of the total outages on the network. The NEDCo system is currently being impacted by low voltages due to the reduction in output from the Bui Hydro Plant.

4.2.3 EPC

In the first quarter of the year, EPC reported various outages within their network. Apart from some outages due to faults within their network and maintenance work, EPC attributed a greater duration of their outages within this period to GRIDCo. There was no complaint of low voltages upstream from GRIDCo.

In light of aforementioned, the Commission will continue to carry out its regulatory monitoring of GRIDCo and other electric utilities with particular focus

on the execution of outlined projects which are critical to the performance and reliability of the NITS and the entire power system.

5.0 MEETING WITH POWER UTILITIES TO DISCUSS POWER SYSTEM CHALLENGES

The Commission, invited power utilities and stakeholders on April 26, 2021 in a meeting at Alisa Hotel to understand causes of the frequent power supply challenges experienced till date. The meeting confirmed investigations carried out by the Commission which are discussed below.

5.1 TRANSMISSION – GRIDCo

GRIDCo confirmed that there is enough generation to meet the system demand, noting that though operation of Bui is impacted by lower hydrology, the demand can be served by other thermal power plants down south when required.

GRIDCo however noted that, there are issues with the transmission grid for power to flow over longer distances to meet the demand in the mid-portion and northern parts of the country. This results in increased transmission system losses and increase in voltage drops.

The unavailability of Bui according to GRIDCo, has impacted negatively on voltage regulation on the grid especially in the mid and northern portions. There is therefore urgent need for installation of a 50 MVar STATCOM device in Kumasi at a cost of USD 15 million.

The Anwomaso – Kintampo part of the 330 kV backbone line from Aboadze to Bolgatanga which is earmarked for power export to Burkina is pending with a huge impact on transmission system losses.

These issues have resulted in the grid being in the alert state with subsequent power outages in Kumasi and surrounding areas.

GRIDCo further noted that there are a lot of power system challenges in Accra area which are expected to improve with completion of various projects including the Pokuase Substation, Tema – Accra upgrade project and the Kasoa Substation Project. These are expected to reduce the impact of outages on consumers in the capital.

To improve the power situation in the western part of the grid, there are plans to upgrade the old low-capacity lines from Aboadze through Prestea and Dunkwa to Kumasi. Most of these lines are heavily loaded resulting in voltage drops and increased system losses.

There are also plans to break into the 330 kV Aboadze – Kumasi (Anwomaso) line at Dunkwa and connect it into the 161 kV network in order to increase availability of the line and also strengthen the 161 kV network. To improve power supply to Kumasi, a 330 kV loop to Kumasi is required which GRIDCo noted as being planned in the short to medium term.

The company stated that many of the transmission reinforcement projects have stalled due to various reasons including financial.

5.2 GENERATION - VRA

VRA confirmed that there were no major issues with VRA power generation. All VRA generation units, are fully functional except the steam units of TICO which were out due to faulty components. They are expected to be online by end of April. 2021.

VRA's thermal plant, TT1PP, is called on at Peak to run for a short duration anytime Bui is not running. This is not conducive for the operation of thermal power plants which are expected to run for longer hours and not to be shut down and started over shorter intervals.

5.3 DISTRIBUTION – ECG and NEDCo

Both ECG and NEDCo have reported low system voltages which stems from the challenges within the NITS. These voltage issues have in some cases resulted in continuous power outages in Kumasi and surrounding areas towards the northern parts of Ghana.

These companies have also asked for advance communication from GRIDCo in order to prepare adequately and inform consumers ahead of an outage or immediately there is a forced outage.

5.4 TAKEAWAYS FROM THE MEETING

Stakeholders corroborated the results of investigations that were conducted prior to the meeting, regarding the network challenges from the NITS and the impact on the distribution companies downstream especially in Kumasi and the northern parts of Ghana.

The Commission has noted GRIDCo's information on severe transmission capacity constraints on the NITS.

The meeting identified that some of the reinforcement projects by GRIDCo are currently under construction whilst other planned projects are at the prefeasibility stage and require financing to be executed.

It was agreed at the meeting that there is the need to update the existing generation and transmission master plan as a guide to development of the NITS.

The Commission noted there was poor communication between the distribution companies and the transmission utility. In view of this, the Commission requested the relevant utilities to submit within two weeks, an effective and comprehensive communication strategy and protocols that will ensure efficient management of the power system. This is expected to detail the challenges, projects in place, outcomes and expected impacts.

The Commission also instructed the utilities to adhere to their maintenance regimes.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The Commission notes from the analysis of system challenges outlined in this report that all electric utilities have experienced outages due to various faults as a result of technical issues within their networks. It is however important to point out that most of the network challenges with the greatest impact on the power system were from the NITS. These resulted in widespread outages across the distribution systems downstream.

The Commission's meeting with the various electric utilities has confirmed the investigations conducted and the discussions at the meeting have given directions on the way forward to providing services that are safe, adequate and efficient.

The power system is currently experiencing low voltages due to insufficient voltage support in the mid-portion of the NITS. The Commission observes that the low voltage challenges have been exacerbated by operational inefficiencies within the NITS. Additionally, it is observed that the system is unable to meet the N-1 contingency criteria.

The Commission established that some of the contributory factors to the power system challenges were delays in the implementation of various capital projects that were required to improve network reliability and availability. Some of these projects are currently ongoing and the Commission will continue to closely monitor the works to ensure compliance with quality-of-service benchmarks.

The imperative for an updated and consolidated generation and transmission master plan cannot be overemphasized. The Commission would therefore engage all relevant stakeholders to ensure that this is achieved.

Finally, the Commission calls for capital injection by the shareholders for the speedy execution of their stalled and planned network improvement projects.

7.0 APPENDICES
7.1 Appendix 1


GHANA GRID COMPANY LIMITED
PRESS STATEMENT

POWER OUTAGES IN PARTS OF THE COUNTRY

Tema, Saturday February 27, 2021 – Ghana Grid Company Limited (GRIDCo) wishes to inform the general public that at approximately 18:55PM on Saturday February 27, 2021, gas supply challenges, emanating from the Offshore fields, led to loss of power supply totaling about 1,000MW.

To prevent a total system shutdown, power curtailment was carried out, which affected major parts of the country including Accra, Tema and Kumasi.

Gas supply has resumed upstream and power to the affected areas will be restored shortly.

GHANA GRID COMPANY LIMITED
System Operator
National Interconnected Transmission System (NITS)

---ENDS---

7.2 Appendix 2



GHANA GRID COMPANY LIMITED PRESS STATEMENT

POWER OUTAGES IN PARTS OF THE COUNTRY

Tema, Wednesday March 03, 2021 – Ghana Grid Company Limited (GRIDCo) wishes to inform the general public that, at approximately 06:30AM on Wednesday March 03, 2021, the closure of an emergency valve at the West Africa Gas Pipeline Company (WAPCo), cut off gas supply to some generating plants in the country.

To avert a total system shutdown, power supply to some Bulk Supply Points was disrupted, causing outages in parts of the country.

Key stakeholders in the power value chain, including WAPCo, are currently working to restore gas supply shortly. Meanwhile, arrangements have been made for other generating plants to come online to restore supply to the affected areas.

Any inconvenience caused is deeply regretted.

---ENDS---

For enquiries, kindly contact:

Ebenezer Amankwah

Corporate Communications Manager

GHANA GRID COMPANY LIMITED

+233 303 318 700

7.3 Appendix 3


GHANA GRID COMPANY LIMITED
PRESS STATEMENT

TOTAL POWER OUTAGE IN THE COUNTRY

Tema, Sunday March 07, 2021 – Ghana Grid Company Limited (GRIDCo) wishes to inform the general public that, at approximately **2:10pm** on **Sunday March 07, 2021**, a challenge in the power system led to a total system shutdown. This led to an interruption in power supply to all parts of the country.

The Technical team is currently working to restore power supply to all Bulk Supply Points (BSPs) in the country.

GRIDCo is also working to ascertain the reasons behind the total system shutdown and will update the relevant stakeholders in due course.

Any inconvenience caused is deeply regretted.

---ENDS---

Issued by:
Manager, Corporate Communications
GHANA GRID COMPANY LIMITED
Telephone: +233 303 318 700


GHANA GRID COMPANY LIMITED
PRESS STATEMENT

REASON FOR TOTAL POWER OUTAGE IN THE COUNTRY

Tema, Monday March 08, 2021 – GHANA GRID COMPANY LIMITED (GRIDCo) wishes to inform the general public that the total power system shutdown experienced at **2:10pm** on **Sunday March 07, 2021**, was due to a technical fault on one of the major transmission lines between Prestea and Obuasi.

This situation led to overloads on other adjacent transmission lines, leading to a sequence of trips and an eventual power system shutdown in the country.

Restoration works by the Technical team began immediately and power supply was restored to all Bulk Supply Points (BSP) at **6:30pm** that same day.

GRIDCo is assuring all Ghanaians that there is adequate generating capacity to meet demand in the country. All relevant stakeholders in the power sector value chain will also continue to work to ensure consistency of supply to Ghanaians.

---ENDS---

Issued by:
Manager, Corporate Communications
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7.4 Appendix 4



Ghana Grid Company Limited

P. O. Box CS 7979, Tema, Ghana
Digital Address: GK-0208-2247

Our Ref: 1001/004/479

Your Ref:

February 26, 2021

The Executive Secretary
Public Utilities Regulatory Commission
P. O. Box CT 3025
Cantonments, Accra

Dear Sir,

PLANNED OUTAGE TO GRIDCo SOGAKOPE SUBSTATION

We write to advise that there will be an outage to our Sogakope substation from 8th – 12th March, 2021.

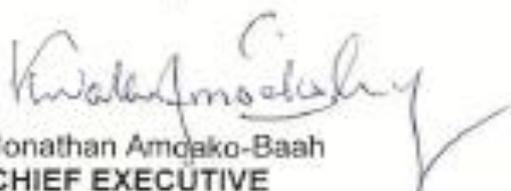
This is to enable our maintenance team repair oil leakage on our power transformer at Asiekpe substation which supplies power to Sogakope through our 69kV transmission line from Asiekpe substation.

The outage to the transformer will result in interruption of power supply to ECG customers being supplied from our Sogakope substation.

We have therefore made the necessary arrangement with the Volta Regional Office of ECG to transfer some customer loads from the Sogakope substation to Aflao and Kpong substations to minimize the impact of the outage during the period.

Counting on your usual cooperation.

Yours faithfully,


Jonathan Amoaako-Baah
CHIEF EXECUTIVE

cc: The Honourable Minister
Ministry of Energy
Private Mail Bag
Ministries Post Office
Accra

7.5 Appendix 5



GHANA GRID COMPANY LIMITED PRESS STATEMENT

GAS FLOW CHALLENGES IN POWER SYSTEM

Wednesday March 24, 2021 – At 1:02am on **Wednesday March 24, 2021**, a compressor fault upstream, reported by the Ghana Gas Company, led to the loss of 750MW of power from some generating plants; specifically, Karpowership and VRA's Aboadze units

The situation affected power supply to parts of the Greater Accra and Central regions, particularly Accra East, Winneba, Techiman and Sunyani.

The fault was rectified at 6:45am and power has since been restored to all affected areas in the country.

---ENDS---

CORPORATE AFFAIRS
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7.6 Appendix 6



GHANA GRID COMPANY LIMITED PRESS STATEMENT

NO PLANS FOR LOAD SHEDDING IN POWER SECTOR

Wednesday March 31, 2021 – Recent media engagements by the **GHANA GRID COMPANY LIMITED** (GRIDCo), about ongoing projects in the power sector, appear to have heightened perceptions of impending nationwide power cuts.

GRIDCo wishes to assure the general public that it has no intention of embarking on a nationwide load shedding programme.

The transmission company is currently carrying out key projects to enhance power supply reliability in Greater Accra.

These projects are:

- Millennium Development Authority (MIDA) funded **Pokuase substation** and **Kasoa Bulk Supply Point** installations.
- French Development Agency (AFD) funded **Tema - Accra transmission line** reinforcement project.

The contractors for these projects are aiming at full-scale completion between the months of June and July this year. At some point during the process, the contractors will need to interconnect to the current transmission system. For this to happen, intermittent power outages will be required at different periods to safely connect the new installations.

Consequently, these **outages are not nationwide and will affect only parts of Accra and Winneba.**

GRIDCo is working with ECG, MIDA and other stakeholders to ensure minimum impact on customers in the affected areas.

GRIDCo is assuring all Ghanaians that there is a concerted effort by all stakeholders, led by the Energy Ministry, to ensure consistent, accessible and reliable power supply at all times.

---ENDS---

CORPORATE AFFAIRS
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7.7 Appendix 7



GHANA GRID COMPANY LIMITED PRESS STATEMENT

OUTAGES IN PARTS OF ACCRA

Sunday April 04, 2021 – At **11:06pm** on **Saturday April 3, 2021**, a conductor on the Tema - Accra East transmission line fell at Trasacco, leading to power outages in major parts of the Greater Accra region.

The maintenance team was able to work round the clock to restore power to the Mallam, Achimota and Accra Central Bulk Supply Points (BSPs) at about **4:00am** on **Sunday April 4, 2021**.

Power supply has, however, been reduced to 50% in areas around Trasacco as the team works to permanently fix the fault.

---ENDS---

CORPORATE AFFAIRS
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7.8 Appendix 8


GHANA GRID COMPANY LIMITED
PRESS STATEMENT

OUTAGES IN PARTS OF GHANA

Monday April 12, 2021 – At **1:36pm** on **Monday April 12, 2021**, the power system experienced a fault on the Aboadze-Anwomaso transmission line, leading to the loss of supply to some parts of the country.

The Technical team immediately initiated restoration efforts and was able to fix the transmission network within 30-minutes.

GRIDCo is working with relevant players in the generation and distribution chain to resume power transmission to all affected areas.

Currently, more than 80% of the affected substations have been fully restored. Efforts are ongoing to restore the remaining 20%.

Any inconvenience caused is deeply regretted.

---ENDS---

CORPORATE AFFAIRS
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7.9 Appendix 9

ELECTRICITY COMPANY OF GHANA LTD.

ELECTRO-VOLTA HOUSE



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Your Ref.....

Date Recd. MD/GRIDCO/136/024 on 11th March, 2021.....

The Chief Executive
Ghana Grid Company Limited
P.O. Box CS 7979
Tema

Dear Sir,

LOW SYSTEM VOLTAGES AT BULK SUPPLY POINTS

ECG has for the past few weeks, recorded general low system voltages at the various Bulk Supply Points (BSP) across the country. Please find attached some records taken at selected BSPs.

As you may be aware, the impact of these low system voltages on our customers is huge. Some industrial customers including mining companies, who require continuous supply of electricity have temporarily reduced their off-take from the grid and relying on generators. This is resulting in loss of revenue to both ECG and GRIDCo. Additionally, the backlash on the Energy Sector entities including GRIDCo and the generating companies with ECG at the forefront is increasingly becoming unpleasant.

Article 12.10 of the Grid Code requires GRIDCo to maintain voltages at each node of the NITS to within $\pm 5\%$ of the nominal voltage under "Normal State" and within $\pm 10\%$ under "Alert State" for at most 10 minutes. Under "Emergency State", it is to be within ± 10 for a maximum of 30 minutes.

Article 9.215 requires GRIDCo to declare and communicate to all grid participants when the NITS is in an "Alert State".

ECG would appreciate it if you could offer some explanations to the occurrence of the low system voltages and indicate when the situation is expected to return to normalcy. This is urgently required so we could communicate same to our customers as required by our Regulators.

Counting on your usual cooperation,

Yours faithfully,

KWAME AGYEMAN-BUDU
(MANAGING DIRECTOR)

7.10 Appendix 10


GHANA GRID COMPANY LIMITED
PRESS STATEMENT

NO PLANS FOR LOAD SHEDDING IN POWER SECTOR

Wednesday March 31, 2021 – Recent media engagements by the **GHANA GRID COMPANY LIMITED** (GRIDCo), about ongoing projects in the power sector, appear to have heightened perceptions of impending nationwide power cuts.

GRIDCo wishes to assure the general public that it has no intention of embarking on a nationwide load shedding programme.

The transmission company is currently carrying out key projects to enhance power supply reliability in Greater Accra.

These projects are:

- Millennium Development Authority (MIDA) funded **Pokuase substation** and **Kasoa Bulk Supply Point** installations.
- French Development Agency (AFD) funded **Tema - Accra transmission line** reinforcement project.

The contractors for these projects are aiming at full-scale completion between the months of June and July this year. At some point during the process, the contractors will need to interconnect to the current transmission system. For this to happen, intermittent power outages will be required at different periods to safely connect the new installations.

Consequently, these **outages are not nationwide and will affect only parts of Accra and Winneba.**

GRIDCo is working with ECG, MiDA and other stakeholders to ensure minimum impact on customers in the affected areas.

GRIDCo is assuring all Ghanaians that there is a concerted effort by all stakeholders, led by the Energy Ministry, to ensure consistent, accessible and reliable power supply at all times.

--ENDS--

CORPORATE AFFAIRS
GHANA GRID COMPANY LIMITED
+233 303 318 700

Our Ref: 1001/002/793

Your Ref:

March 19, 2021



The Managing Director
Electricity Company of Ghana
Electro Volta House
Accra

Dear Sir,

RE: LOW SYSTEM VOLTAGES AT BULK SUPPLY POINTS

We refer to your letter referenced MD/GRIDCo/V3/024 and dated March 1, 2021 informing us of low voltages at the bulk supply points, that is making your customers temporarily reduce their off-take from the grid and relying on generators.

We advise that due to the critically low water level in the Bui dam, the operation of the Bui units in active mode has been restricted to the evening peak hours since February 17, 2021. In view of this, voltages around the middle portion of the NITS have since been relatively low.

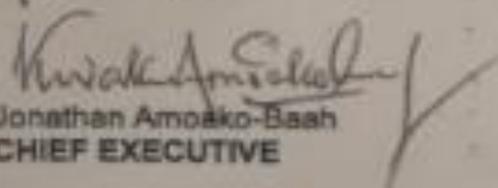
Per our letters dated March 03, 2021 and March 12, 2021 (copies attached), we informed you that the power system is in alert state due to the shutting down of the Bui units during off-peak periods because of the low water level in the dam.

We have therefore liaised with Bui Power Authority and we are currently operating the Bui units in synchronous condenser mode to generate reactive power to help regulate voltages in the middle portion of the NITS.

We are also expediting work on the 330 kV transmission line between Anwomaso and Kintampo which is expected to be completed by the end of July 2021. The completion of this project will help to restore voltages on the NITS to normal.

We count on your cooperation.

Yours faithfully,


Jonathan Amoako-Baah
CHIEF EXECUTIVE

cc: The Honourable Minister
Ministry of Energy
Private Mail Bag
Ministries Post Office
Accra