



INDEPENDENT COMMUNICATIONS  
AUTHORITY OF SOUTH AFRICA

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# THE IMPACT OF POWER OUTAGES ON NETWORK PERFORMANCE AND AVAILABILITY

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11-12 May 2026



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# INDEX

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**ITU SG12**

**BACKGROUND**

**SOUTH AFRICA: CASE STUDY**

**BACKGROUND**

**FINDINGS**

**IMPACT ON QOS**

**MITIGATION STRATEGIES**

**REGULATORY INTERVENTIONS**

**CONCLUSION**

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**01**

# ITU SG12 Work

# Background – ITU SG12 Work

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- ICASA made a proposal for the Technical document in the ITU QoS workshop at Maputo, Mozambique in 2024.
- **Editors** - Eric Nkopodi –ICASA, Phillip Ramalata –ICASA and Mohamed El Ghaly Wone - ARTP
- ITU-T Technical Report ESTR.POWER-OUT on "The impact of power outages on network and service availability" approved at the ITU-T Study Group 12 meeting held online, 03-March 2025.
- **SG12-TD288R1**
- This Technical Report analyses how load-shedding or power outages impact the network and service availability
- It examines causes, impacts, mitigation strategies, and regulatory approaches to improve network resilience.





02

## South Africa: Case Study

# Background – Loadshedding Inquiry

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- ICASA conducted an inquiry on the impact of power outages on network performance with the effects of Loadshedding on 25 May 2024,
- The purpose of the inquiry was to solicit views and inputs from interested stakeholders on the impact of loadshedding. The Inquiry was in the form of questions which required interested stakeholders to answer within forty-five (45) days from the date of publication.
- The Committee received twenty-eight written submissions by end of closing date.
- The Committee conducted public hearings on the Inquiry on 12 June 2024.

# Findings

**Power outages caused ICT sector businesses to experience frequent disruptions in their operations.**

**Loadshedding further affects customer experience, leading to:**

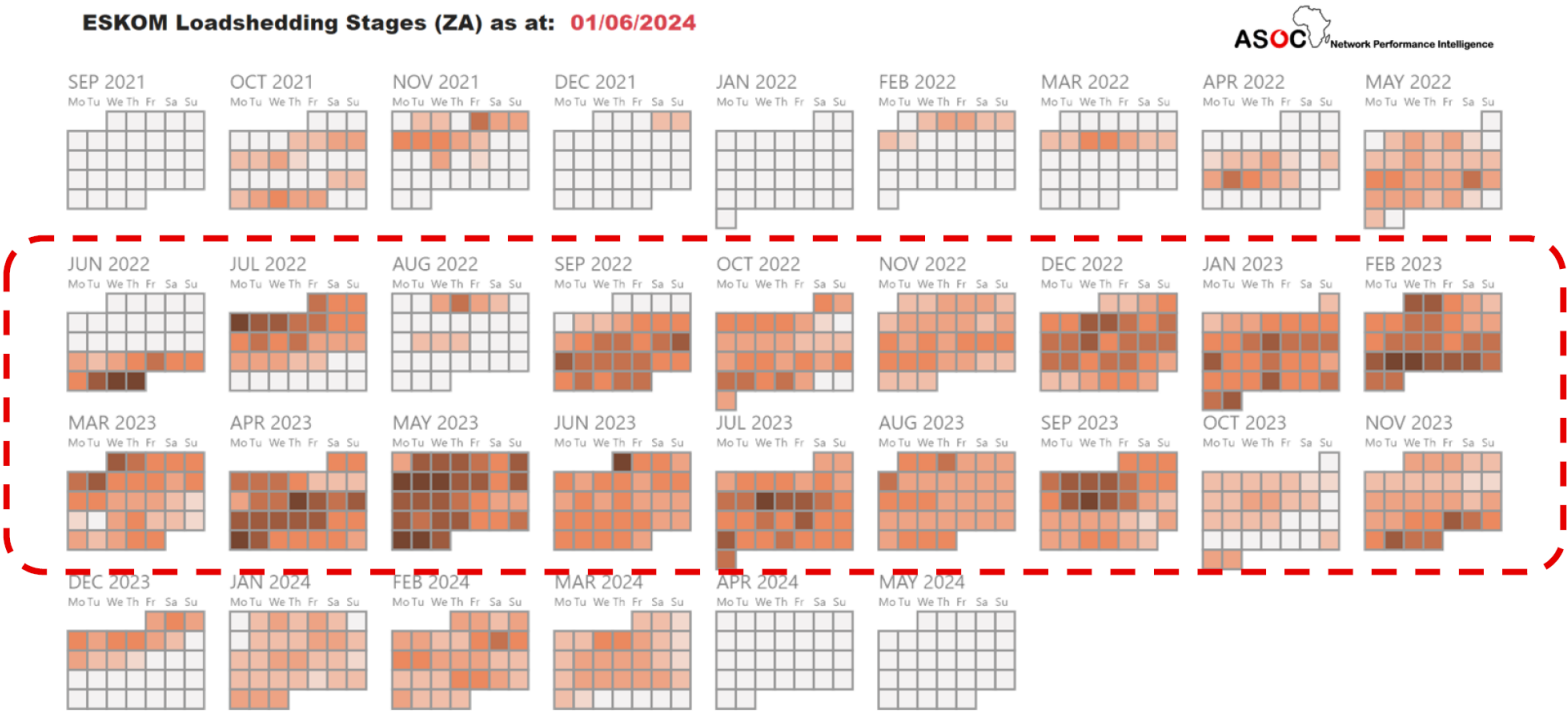


- **Frustration: Frequent disruptions to communication services cause frustration to customers which lead to loss of trust and loyalty.**
- **Decreased Satisfaction: Unavailability of services during loadshedding periods negatively impacts customer satisfaction and their bottom lines.**

# Findings

## South Africa Context | FY24 Loadshedding – Worsening

Loadshedding intensity of stages greatly increased between 2022 – 2023  
This places a greater strain on our batteries, which will also mean having to replenish them sooner.



• Please note that the Stages in this dashboard are based on ESKOM's actual MLR GW shed & not the announced Stages by ESKOM

| Stage 0 = 0GW | Stage 1 = 1GW | Stage 2 = 2GW | Stage 3 = 3GW | Stage 4 = 4GW | Stage 5 = 5GW | Stage 6 = 6GW | Stage 7 = 7GW |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 0             | 1             | 2             | 3             | 4             | 5             | 6             | 7             |



# Findings

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- **Downtimes:** Frequent power outages result in extended periods of downtime and significant loss of productivity and revenue.



- **Network Congestion:** When the power is restored, network congestion occurs as all devices and systems simultaneously come back online.



- **Revenue Loss:** The communications sector indicated that a lot of revenue was lost due to downtime, reduced productivity, and the inability to provide services to customers.



- **Increased Expenses:** Businesses stated that they incur additional costs to mitigate the effects of loadshedding through investing in backup power systems, generators, and fuel.

# Impact on Quality of Service (QoS - Technical Metrics)

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- **Network Downtime:** Outages lead to partial or total loss of connectivity in affected areas as batteries drain, impacting network availability.
- **Congestion:** When active base stations go down, surrounding sites experience an overload of traffic, resulting in bottlenecks.
- **Performance Degradation:** Power issues cause increased packet loss, higher latency (delays), and reduced throughput (data rates).
- **Equipment Damage:** Frequent, abrupt power cuts can damage sensitive telecommunications hardware, requiring maintenance

# Impact on Quality of Service (others)

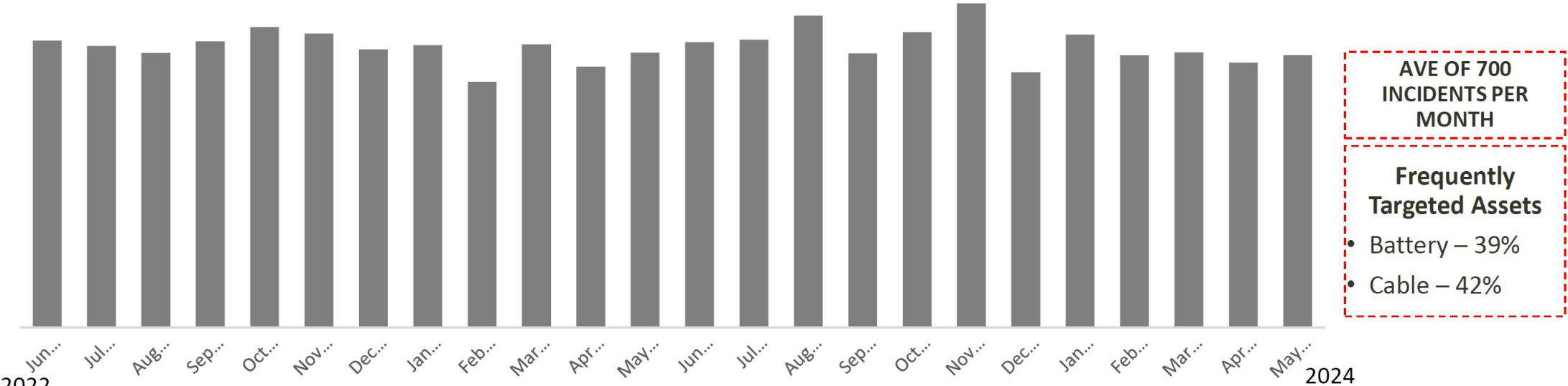
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- ❑ Increased reliance on back-up power due to long outage periods (networks were not originally designed for this)
- ❑ Frequent outages don't allow sufficient time for batteries to recharge
- ❑ Increased reliance on diesel generators, at a high cost
- ❑ There is increased traffic directed to mobile networks during loadshedding
- ❑ Increased incidents of theft, vandalism and sabotage during power outages
- ❑ Network performance compromised (lower availability and reliability)

# Findings

## Loadshedding | Theft and Vandalism incidents

The number of theft and vandalism incidents have increased with loadshedding with nearly 40% of sites experiencing repeated incidents in the same month



# Mitigation Strategies –Network Resilience

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- **Renewable Energy:** Deploying solar energy at base stations to reduce dependence on the grid.
- **Enhanced Backup:** Upgrading battery capacity and increasing the use of fuel-efficient, reliable backup generators.
- **Efficient Energy Management:** Using network optimization to manage power consumption efficiently during outages
- **Network Infrastructure Mapping:** improves on the resilience of the network.



# Network Resilience

## MTN's resilience plan

*A multi-faceted, nationwide resilience plan mitigated against significant network downtime*



### Alternative energy

21 500 batteries  
900 static & mobile  
generators  
5100 High efficiency  
rectifiers



### Security measures

Fortification of batteries,  
security gates, cube  
enclosures, generator  
security cages, smart locks  
and technology, concrete  
bunkers



### Proactive measures

Ongoing monitoring and  
adaptation of strategies  
based on historical trends  
assist optimizing network  
reliability



### Effective results

Network availability has  
improved  
Drop call rates have  
decreased  
Call setup success rates  
improved



# Regulatory interventions

## Compliance forbearance

- ☐ End-User and Subscriber Service Charter (“EUSSC”)
- ☐ Code of conduct
- ☐ Code for persons with disabilities
- ☐ Standard licence T&C

## Resources access

- ❖ Temporary spectrum access framework
- ❖ Rapid deployment
  - Speed up type approvals
  - spectrum applications
  - facility leasing requests

## Reprioritisation of funds

- ✓ Extension of ITA obligations
  - Data throughput,
  - coverage
  - Social (PBO and PSIs)
- ✓ Payment holiday, USF
  - Radio frequency spectrum fees
  - USAF
  - Annual license fees

– **Thank You**

