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- Transmission pricing arrangements
- Emergency Energy handling
- Energy Imbalance Mechanisms
- Balancing Market Training
- Control area services and regulating reserve charges.

### GE Digital Orchestrate Workshop

The GE Digital Grid Software Customer conference was held on 9 -11 May 2023 in London, UK. It was attended by utility representatives, industry experts, and leading innovators from across the world united in one mission – to accelerate the energy transition. Experience on the GE latest solutions in transmission, distribution, asset management, renewables, telecoms, and analytics was demonstrated. The SAPP was represented by the IT Specialist at the workshop.

### USEA Corporate Volunteer Award

The SAPP was selected by the United States Energy Association (USEA) to receive their 2023 Corporate Volunteer of the Year Award and the SAPP CC Executive Director went to receive the award in Washington DC during the USEA Annual Meeting held on May 25, 2023.



SAPP CC Executive Director receives the USEA Corporate Volunteer for 2023 in Washington DC

USEA has a long-standing relationship with SAPP dating back to the setting up of the Coordination Centre when they brought in the first Centre Manager from the USA. SAPP has over the years supported the many program activities conducted

## Meetings, Workshops and Conferences

### Joint SAPP Sub-Committees Meetings

The SAPP Joint Sub-Committees meetings were held in Johannesburg, South Africa from 30 May to 1 June 2023. The SAPP Operating, Planning and Markets Sub-Committees deliberated on the following issues:



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by USEA with its partnerships and the award recognizes SAPP's contribution to the success of many of these activities. The cornerstone of these programs is the involvement of peer-to-peer volunteers who provide knowledge sharing by presenting global best practices to the participating utilities.

### System Planning

#### SAPP Transmission Pricing Task Team Meeting

The Transmission Pricing Task Team met at the SAPP CC in Harare on the 10 and 11 May 2023 and discussed the following:

- Carry out impact analysis of the Transmission Pricing Model (TPM) results on the competitive market trades and bilateral trades.
- Reassess the treatment of dedicated transmission assets.
- Review of the equipment cost database.
- Engagement of RERA on impact of charges and implementation arrangements
- Investigate possible double charging on proposed charging arrangements.

The resolutions from the Task Team meeting were presented to joint SAPP PSC, MSC and OSC meeting held on 30 May 2023 in Johannesburg, South Africa.

#### Continental Power System Master Plan

The SAPP as a major stakeholder continued to give technical support to the development of the Continental Power System Masterplan modelling. During the period under review the following activities were carried out:

- (i) Review of the draft deliverable 7 report: 2020-2040 Baseline and Reference Case Planning Scenario Results.
- (ii) Development of deliverable 8 draft report: CMP scenarios and sensitivity analysis.
- (iii) Development of deliverable 9 draft report: Cost Benefit Analysis (CBA): contents to be presented and discussed will include:
  - CBA methodology and data/assumptions

- identification of specific selected candidate generation/transmission projects for CBA
- key CBA outcomes, leading to the economic prioritization of generation/transmission projects implemented in the 2023 – 2032-time horizon.

(iv) Development of deliverable 10 draft report on Network Studies covering:

- the network studies scope and methodology for developing network models;
- study assumptions and technical criteria used in conducting the analysis; and
- Preliminary outcomes of the analysis.

#### Capacity Building from the Continental Masterplan Development Project

The SAPP Planning Engineer and Operations Engineer attended CMP modelling project capacity building from 22 to 25 May 2023 on advanced PSS/E modelling.

#### Energy Efficient Lighting and appliances National Workshop

Energy Efficient Lighting and Appliances (EELA) Project in East and Southern Africa held a national workshop in Harare, Zimbabwe on 24 May 2023. The workshop focused on the following:

- Introduction to the regional EELA project and national support
- Current state of adoption of energy efficient appliances in the country
- Overview of the regional Minimum Energy Performance Standards (MEPS) for lighting
- Regional compliance frameworks for EELA policies – guidance to assist national frameworks
- Conformity Assessment – Protecting Markets at Point of Entry
- Market Surveillance and Enforcement
- Guidelines for Energy Efficient Public Procurement for lighting and appliances.



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## Update on SAPP Projects

### Angola-Namibia Interconnector Project

In the month of May 2023, the ANNA Project Stakeholder Workshop was held on 16 May 2023, in Johannesburg, South Africa to discuss the way forward on the project. The workshop was attended by RNT, NamPower, SAPP, the World Bank and Development Bank of Southern Africa. The World Bank was conducting a mission to appraise the project and potentially identify techno-economic aspects that would need strengthening, to ensure a robust and sustainable business case to motivate for project financing.

Further, following the workshop, the ANNA Project Management Committee (MANCO) meeting was held in the afternoon to review and endorse draft final deliverables. The MANCO meeting approved the following:

#### (i) Summary of Project Deliverables:

- The Market Analysis Report.
- The MANCO granted a partial approval of 70% to the Updated Financial Model and the Project Information Memorandum (PIM).
- The review of the Joint Investment Agreement and appointment of team members to the working committee.

#### (ii) Tender Documents and Financial Support:

The Consultant has started working on the tender documents and prequalification bids for market sounding. The RNT MANCO members requested the Consultant to prioritise the preparation of tender documents to ensure readiness should potential financiers approve the loan for the construction of the Angola section of the transmission infrastructure.

### Baynes HPP Transmission Lines Project

During the period under review, the PAU Procurement team has been working to closeout on contractual clauses with the potential Consultant and the Funders. Further, the procurement of an

Independent Panel of Experts (IPOE) has registered progress.

### Botswana Renewable Energy Project

The Project is for a feasibility study of 100MW PV-Solar, 100MW Wind, 200MW Concentrated Solar (CSP) and 50MW Battery Energy Storage System (BESS). Project preparation is funded by the World Bank and the Techno-Economic study consultant is Tractebel. The selected sites to be visited are listed below:

Table of Selected Project Sites

No.	Selected Site	RE Technology
1	Maun	CSP
2	Letlhakane	CSP
3	Jwaneng	Wind
4	Isang	PV-Solar
5	Pandamatenga	PV-Solar
6	Nata	PV-Solar
7	Site selection based on grid assessment	BESS

On 29 May 2023, a draft final Project Manual was developed and proposed by Tractebel to all stakeholders for review and update. The purpose of the Project Manual is to facilitate prudent governance of project implementation.

### Inga-Soyo Interconnector Project

Procurement activities to hire a Techno-Economic study and an Environmental and Social Impact Assessment study consultants for the project are awaiting the relevant approvals.

### Kolwezi-Solwezi Interconnector Project

Financial audit services are currently ongoing, to assess and report on the financial expenditure during project implementation. A final audited report and accounting will be issued in June 2023.

### Luapula Hydro Electric Power Scheme

Following the signing of the Letter of Agreement between SAPP and NEPAD-IPPF, for the latter to fund project preparation activities for the feasibility study, SAPP awaits the approval of the updated



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TORs that include an ESIA Key Expert, as part of the Techno-Economic study consultant.

### **Mozambique - Tanzania Interconnector Project**

Following a meeting with EDM and TANESCO on 11 May 2023, the Techno-Economic study and ESIA study TORs will be updated and resubmitted to NEPAD-IPPF.

### **Mozambique - Zimbabwe Interconnector Project**

Following the signing of the Letter of Mandate and the Inter-Utility Memorandum of Understanding by EDM and ZESA, the PAU has commenced the formulation of a Project Information Memorandum, to facilitate the application for project preparation funds from development partners.

### **Mphanda Nkuwa Technical Assistance**

Project preparation is progressing well.

#### **(i) Updated Inception Report**

A joint workshop on the Market Study was conducted on 3 May 2023, followed by the workshop on the Inception Report on 4 May 2023. The report has been updated with new comments and on 19 May 2023 was submitted to stakeholders for a final review.

#### **(ii) Transmission System Models**

The PSS/E models required for the transmission study are almost complete. Final adjustments are awaiting inputs from the demand forecasts prepared as part of the Market Study.

#### **(iii) Assumptions Report**

Completion of the Assumptions Report is on hold, awaiting the last few inputs from the Market Study. The main issue is the base case scenario for neighbouring countries and the need to adjust the case files received from SAPP.

### **Regional Transmission Infrastructure Financing Facility (RTIFF)**

The SAPP completed the terms of reference for the Fund Manager or Investment Advisor, and these will be subject to an open tender. It is expected that

the Fund Manager or Investment Advisor will avail a minimum of US\$ 25 million in equity investment.

The SAPP has also begun the processes of identifying the services required from a Management Company in Mauritius. The Management Company is a requirement for RTIFF to obtain a Global Business License but is not required as part of the funding structure. The Management Company usually performs administrative and company secretarial support and provides advice on adherence to local laws.

### **System Operations**

#### **System Disturbances**

The number of reported SAPP system disturbances rose sharply from six in April 2023 to seventeen in May 2023. The disturbances reported in May 2023 fell under three categories: i) low frequency incidences; ii) high frequency incidences; and iii), general loss of equipment. Low frequency excursion incidences to below 49.50 Hz were eight in number. Five were caused by tripping of generation units in South Africa. One was caused by loss of part of the scheduled output from the Mozambique-South Africa HVDC link. Two were caused by loadshedding activities of up to 4000 MW, rotating from one area to another.

High frequency excursion incidences to above 50.50 Hz were four in number. The other two also occurred during loadshedding in South Africa. But they were triggered by running and synchronising emergency OCGT generators to supplement conventional generators.

The next two reported system disturbances mainly affected Mozambique North. The bus coupler circuit breaker for AC and HVDC loads tripped in Mozambique North due to power swing. On the central corridor the Zimbabwe - Botswana interconnector also tripped. Then the generator assigned to AC loads in Mozambique North tripped due to oil pressure low protection. Then Mozambique north temporarily imported about 225 MW from the interconnected power system via Zimbabwe.

In the next one, about 300 MW generation was lost in Zimbabwe. The bus-coupler circuit breaker in Mozambique for AC and HVDC loads tripped,



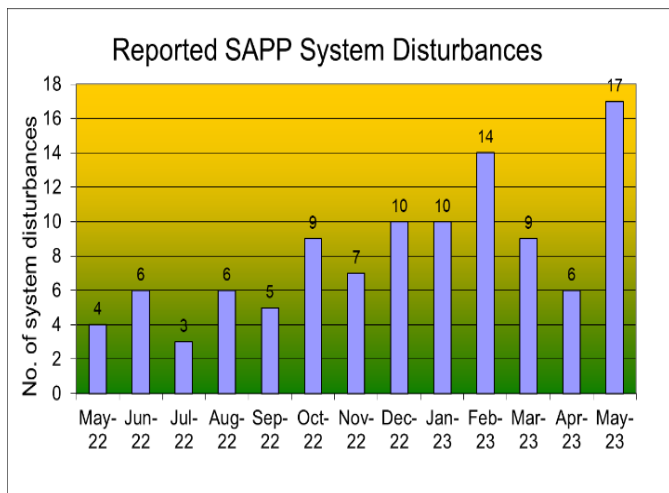
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resulting in power swings in the central corridor. Subsequently, in DR Congo generation tripped and the 220 kV interconnectors between Zambia and DRC tripped on directional over power protection.

In the last but one, one after another generation units tripped at one power station in South Africa and a total of about 997 MW were lost, leading to power frequency excursion to a minimum of 49.377 Hz. The cause was loss of 11 kV station supplies.

In the last one, the Botswana power system collapsed following tripping of interconnectors to Eskom while the interconnector from Zimbabwe was out on planned works. The 400 kV interconnector to South Africa tripped on earth fault due to birds activities. Generation in Botswana also tripped. Refer to Figure below for the general outlook of system disturbances in the last twelve months.



*Reported SAPP system disturbances*

### Power Supply – Demand Situation

The table below shows the power supply and demand situation in May 2023 in some SAPP member utilities.

Country, Utility	Available (MW)	Recorded Peak Demand (MW) <sup>1</sup>	Load Shed (MW)
South Africa, Eskom	25,854	26,062	4,000
Botswana, BPC	630	581	-
Eswatini, EEC	71	228.7	-

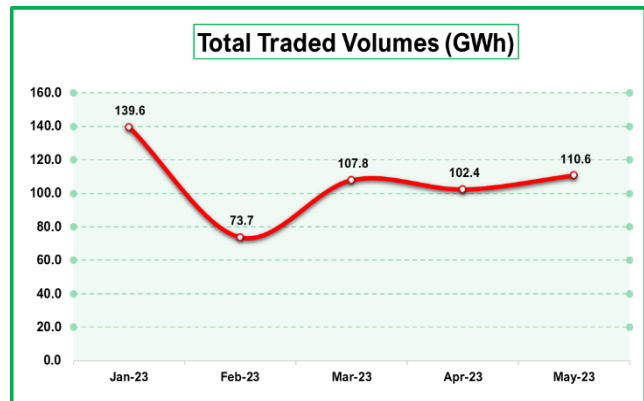
Mozambique, EDM and HCB	2,246	992	-
Namibia, NamPower	369.5	616	-
Zambia, ZESCO, GEC	2,350	2,273	-
Zimbabwe, ZESA <sup>2</sup>	1,622	1,622	300
Lesotho, LEC	74	166	-
DR Congo, SNEL	1,808	2,034	200

**Notes:** <sup>1</sup>Recorded peak demand – after load shedding  
<sup>2</sup>Estimated figures

## Electricity Trading

### Traded Volumes

Total traded volumes on the Day Ahead Market (DAM), Intra-Day Market (IDM), Forward Physical Monthly Market (FPM-M), and Forward Physical Weekly Market (FPM-W) increased by 8% to 110.6 GWh in the month of May 2023, from the April 2023 volume of 102.4 GWh.



*Monthly Traded Volumes (GWh) in DAM, IDM, FPM-W, and FPM-M (January 2023 to May 2023)*

### Market Revenue

A total of USD 5.9 million was exchanged on the competitive market during the month of May 2023 compared to USD 7.0 million exchanged in April 2023. The change is mainly attributed to a change in traded volumes and prices. USD 7.0 million was exchanged on the competitive market during the same month of May in 2022.



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## Market Surveillance (MS)

### Market Monitoring and Surveillance

During the period under review, the MS Unit observed anomalies in DAM clearing prices, and on analysis it was shown that there was no market manipulation as both the upward and downward spikes were caused by the interplay between market supply and demand.

On the 12th of May 2023 DAM prices were high during standard hours as they were affected by unavailability of the Insukamini-Phokoje interconnection. There were no major generator outages, however there were two transmission capacity outages reported during the month under review on the Insukamini-Phokoje Interconnector.

The Market Operator observed its own processes and procedures. The MTP system generally performed according to expectations during the month of May 2023. There were no cases of market abuse recorded during the month of May 2023.

## Environmental Corner

### PCB Awareness

Evaluation of financial bids from prospective Poly-Chlorinated Biphenyls (PCB) Awareness Consultants is currently underway. The successful firm will assist with development of the SAPP PCB Standard Operating Procedure and training material for associated capacity building and awareness activities during the continuous four months period.

### Drought Sensitivity RAS for SAPP

Drought Sensitivity Resilience Assessment for the SAPP(DSRAS) phase 1 report is still being finalised. The focus of this report will be on the sensitivity of hydro-energy generation to climate-induced drought.

## MOZA Capacity Building

Between the 23<sup>rd</sup> and 25<sup>th</sup> of May ESIA capacity building workshops were carried out by WSP

consultants under the auspices of SAPP PAU. The workshops were undertaken as the final deliverable for the Mozambique – Zambia (MOZA) interconnector project. Participants included engineers, environmental experts and social scientists drawn from both EDM and ZESCO. ZESCO staff attended the workshop on the 23<sup>rd</sup> of May at M’Kango Cresta in Lusaka while the EDM team did the same on the 25<sup>th</sup> at Melia Maputo.

Key takeaways from the workshop included the ideal mechanisms of managing the following:

- Gender Based Violence
- Grievance Redress
- Stakeholder Engagement, and
- Community related health and safety risks

## Upcoming Events – 2023

DATE	EVENT
30 May – 1 June 2023	Joint SAPP MSC, OSC and PSC Sub Committee meetings, <b>Johannesburg, South Africa.</b>
5 - 9 June 2023	APUA Annual Meetings, <b>Lilongwe, Malawi</b>
15 June 2023	55th SAPP CC Board meeting, <b>Harare, Zimbabwe</b>
20 - 23 June 2023	25 <sup>th</sup> Africa Energy Forum, <b>Nairobi, Kenya</b>
3 – 6 July 2023	Energy Stakeholder Roadshow in <b>Mauritius</b>
10 – 14 July 2023	Africa Hydropower Conference, <b>Kampala, Uganda</b>
26 - 27 July 2023	SAPP CPWG meeting, <b>Blantyre, Malawi</b>
1- 4 Aug 2023	7 <sup>th</sup> SADC Industrialization Week, <b>Angola</b>
22 - 24 Aug 2023	Controllers Certification Training, <b>South Africa</b>
28 - 31 Aug 2023	CIGRE 2023 Meetings
6 September 2023	56 <sup>th</sup> SAPP CC Board Meeting
4 - 8 Sept 2023	61 <sup>st</sup> SAPP Meetings, <b>Gaborone, Botswana</b>
12 -14 Sept 2023	Traders Certification Training, <b>South Africa</b>
October	Traders and Operator's forum, <b>Lesotho</b>
Oct 2023	55 <sup>th</sup> SAPP Executive Committee Meeting, <b>Luanda, Angola</b>



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Oct 2023	African Power Pool Forum, <b>Luanda, Angola</b>
24-27 Oct 2023	11 <sup>th</sup> CIGRE Southern Africa Regional Conference, <b>Pretoria, South Africa</b>
December	57 <sup>th</sup> SAPP CC Board Meeting



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