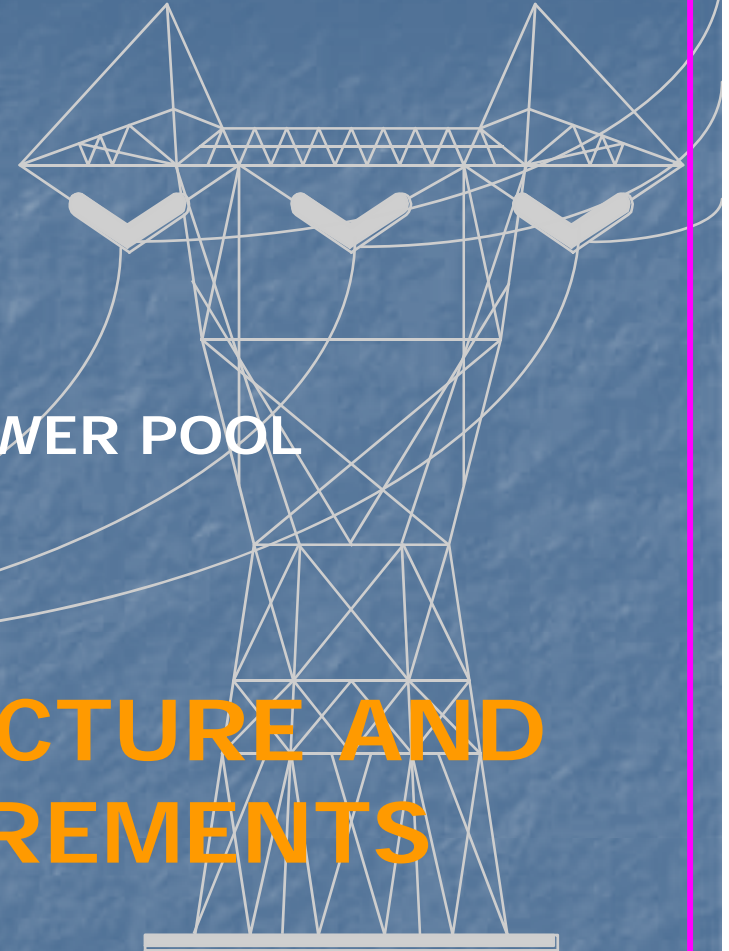




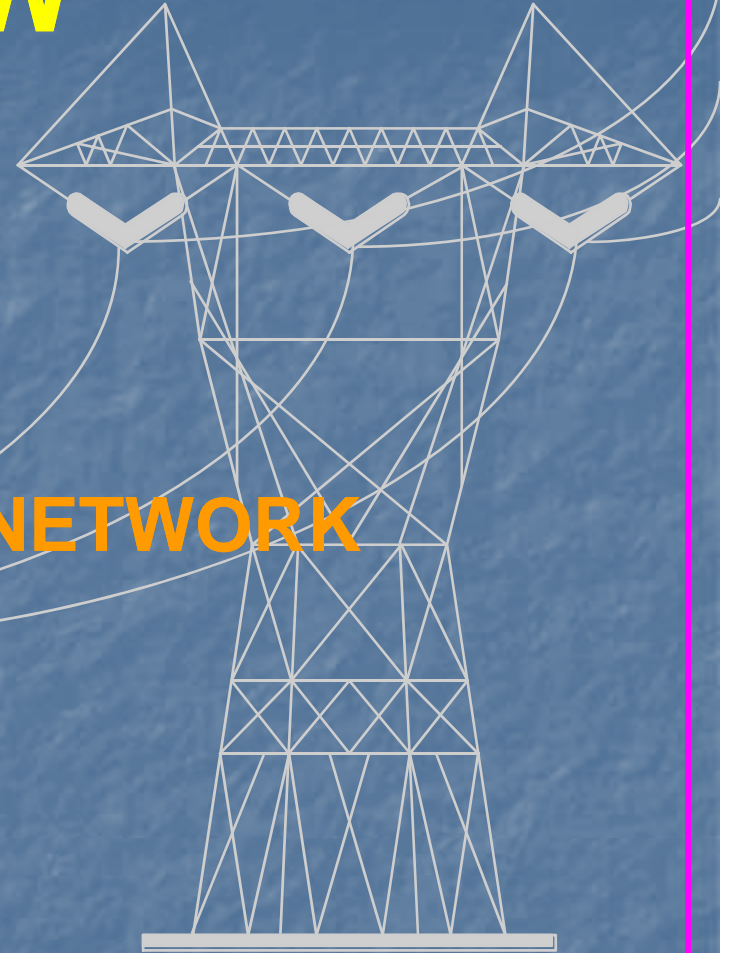
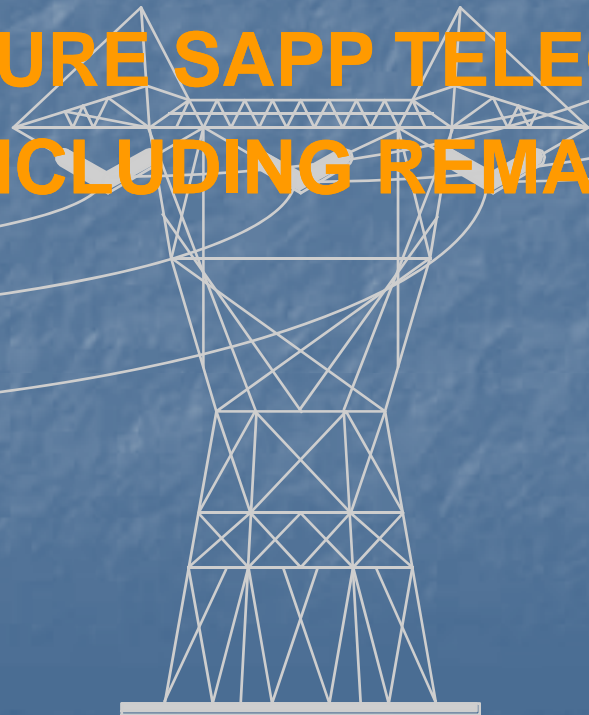
SOUTHERN AFRICAN POWER POOL

**SAPP IT INFRASTRUCTURE AND
SOFTWARE REQUIREMENTS**



OVERVIEW

- BACKGROUND
- SAPP REQUIREMENTS
- VSAT PROJECT
- FUTURE SAPP TELECOM NETWORK
- CONCLUDING REMARKS



BACKGROUND

- **SAPP CURRENT IT & TELECOMM INFRASTRUCTURE**
 - **POWER LINE CARRIER**
 - **CURRENT INTERCONNECTIONS BETWEEN NEIGHBOURING UTILITIES**
 - **LOW SPEED – JUST FOR VOICE AND LOW SPEED DATA**
 - **MICROWAVE RADIOS**
 - **NOT CURRENTLY USED FOR INTERCONNECTIONS**
 - **OPTIC FIBRE**
 - **IMPLEMENTATION ONGOING INCLUDING INTERCONNECTORS**
 - **NO PROPER INTERCONNECTIONS BETWEEN BETWEEN THREE CONTROL AREAS AND SAPP COORDINATION CENTRE (SAPP CC)**
 - **ESKOM, ZESA, ZESCO & SAPP CC**

BACKGROUND CONT'D

- **UTILITY CONTROL CENTRES**
 - **MOST HAVE SCADA SYSTEMS**
 - **SOME UTILITIES HAVE FULL OR PARTIAL EMS**
 - **NO INTER-UTILITY EXCHANGE OF SCADA AND EMS DATA**
- **CURRENT INTER-UTILITY SERVICES**
 - **TELEPHONY**
 - **PSTN**
 - **PAX: ON PLC**
 - **SAPP INTRANET**
 - **NOT EXISTING YET**

SAPP REQUIREMENTS

■ INFRASTRUCTURE

■ RELIABLE COMMUNICATION

- FOR INTER-UTILITY AND UTILITY - SAPP CC
- SHORT TO MEDIUM TERM: VSAT
- LONG TERM: OPTIC FIBRE (OPGW & ADSS)

■ INTRANET

- CLOSED NETWORK FOR SAPP MEMBERS ONLY
- SERVER AT SAPP-CC IN HARARE
- SERVER TO BE ACCESSED BY ALL SAPP MEMBER UTILITIES

SAPP REQUIREMENTS CONT'D

■ SOFTWARE

■ EXCHANGE OF SCADA AND EMS DATA

- SERVER AT COORDINATION CENTRE
- IMPLEMENT INTER-CONTROL CENTRE PROTOCOL (ICCP) IN UTILITY CONTROL SYSTEMS AND SAPP CC
- TO BE UPDATED PERIODICALLY TO SHOW STATUS

■ TRADING INFORMATION

- SERVER TO BE HOSTED AT COORDINATION CENTRE
- ONLINE TRADING SOFTWARE
- COULD BE WEB BASED

■ PLANNING AND OPERATIONS

- OFFLINE PLANNING AND SYSTEM PLANNING TOOLS

SAPP REQUIREMENTS CONT'D

■ REQUIRED SERVICES

■ TELEPHONY

- CLOSED TELEPHONE SYSTEM FOR SAPP
- INTERUTILITY & UTILITY – SAPP-CC
- INDEPENDENT OF PSTN
- HOTLINE FUNCTIONALITY
- POSSIBILITY TO CONNECT TO UTILITY PBX's

■ SCADA & EMS

- POWER FLOW, VOLTAGE, FREQUENCY, TIE LINE BREAKER STATUS, GENERATION STATUS

■ TRADING SERVICES

■ PLANNING AND OPERATIONS

SAPP COORDINATION CENTRE

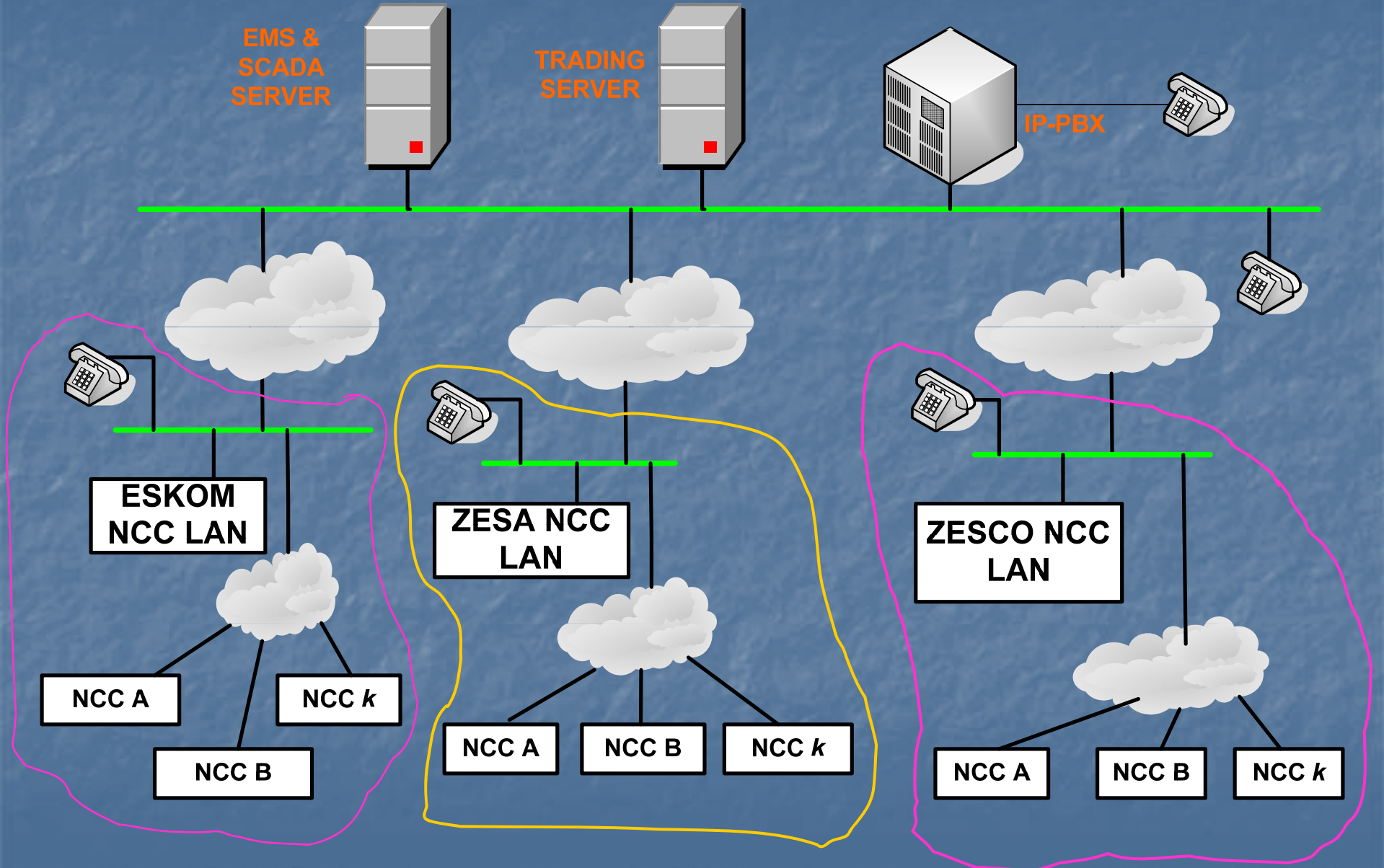


FIGURE 1: PROPOSED NETWORK DIAGRAM

SAPP VSAT PROJECT

- **VSAT TERMINAL AT ZESCO NCC, ZESA NCC AND ESKOM**
 - **REPRESENTING THE THREE CONTROL AREAS**
 - **FIBRE LINK BETWEEN ZESA NCC AND SAPP COORDINATION CENTRE**
 - **PROJECT COST: USD 492,000 INCLUDING SERVICES FOR 3 YEARS**
- **OTHER UTILITIES TO IMPLEMENT LATER**
- **EMPERION OF DENMARK IS IMPLEMENTING THE PROJECT**
 - **INSTALLATIONS CARRIED OUT AT ZESCO AND ZESA NCC**
 - **COMPLETED IN NOVEMBER 2005**
 - **ESKOM INSTALLATION ON HOLD**
 - **REGULATORY ISSUES IN SOUTH AFRICA**

VSAT PROJECT CONT'D

■ EQUIPMENT

- VSAT TERMINAL WITH RESPECTIVE MODEMS
- VoIP ROUTERS
- ROUTERS FOR INTRANET

■ SATELLITE SYSTEM

- EUTELSAT W3A
- KU BAND
- LINK BANDWIDTH: 128 kbps

■ POSSIBLE SERVICES

- TELEPHONY: ZESCO, ZESA, ESKOM, SAPP CC
- LAN INTERCONNECTION: FOR SAPP INTRANET

VSAT PROJECT CONT'D

- **INTERFACES**

- **TELEPHONE (SUBSCRIBER)**
- **ETHERNET (10/100BT)**

- **SYSTEM COMMISSIONING**

- **AWAITS THE ESKOM SITE COMPLETION**
- **PROCURRING OF THE SAPP PBX IN PROGRESS**

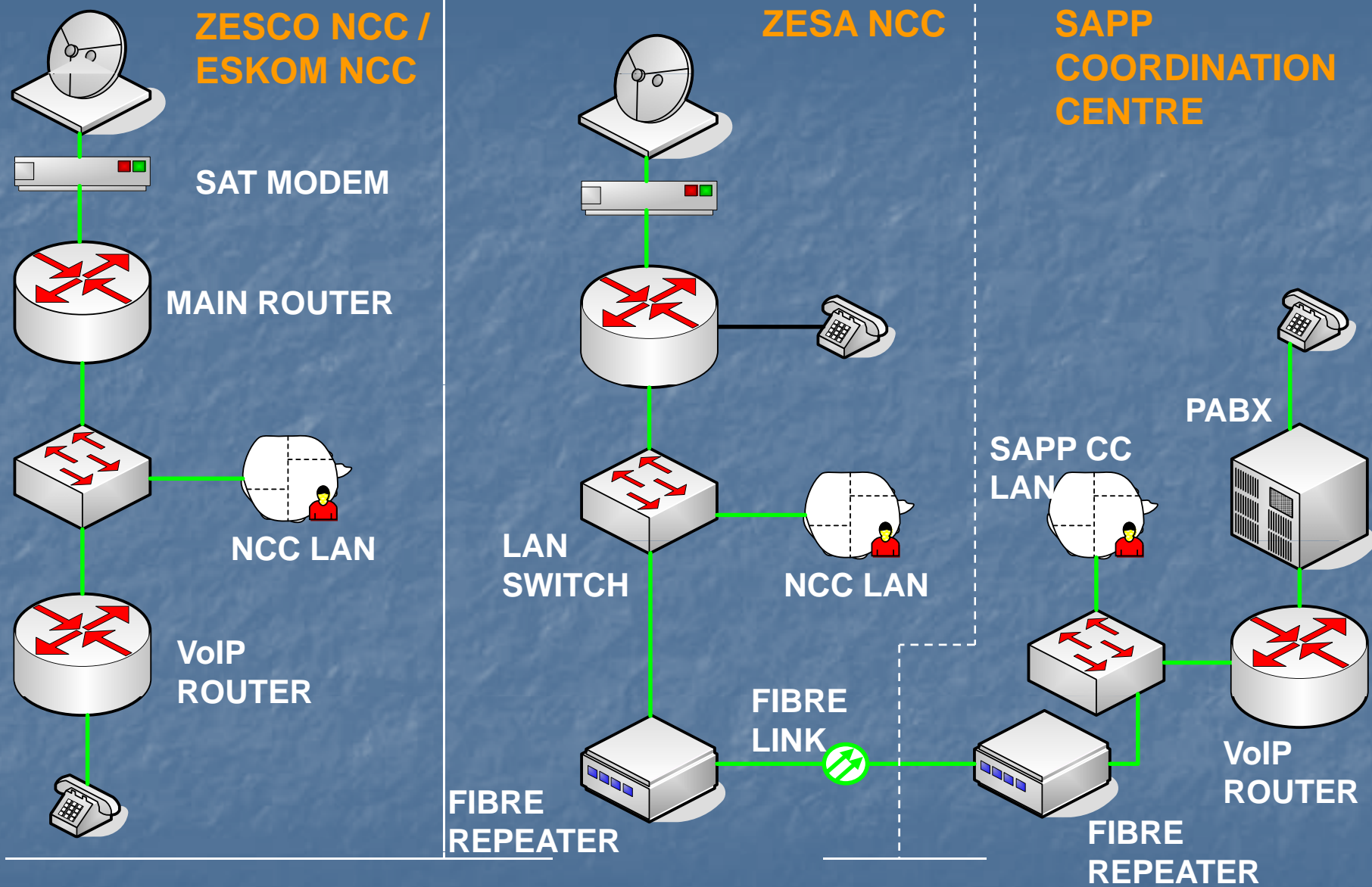
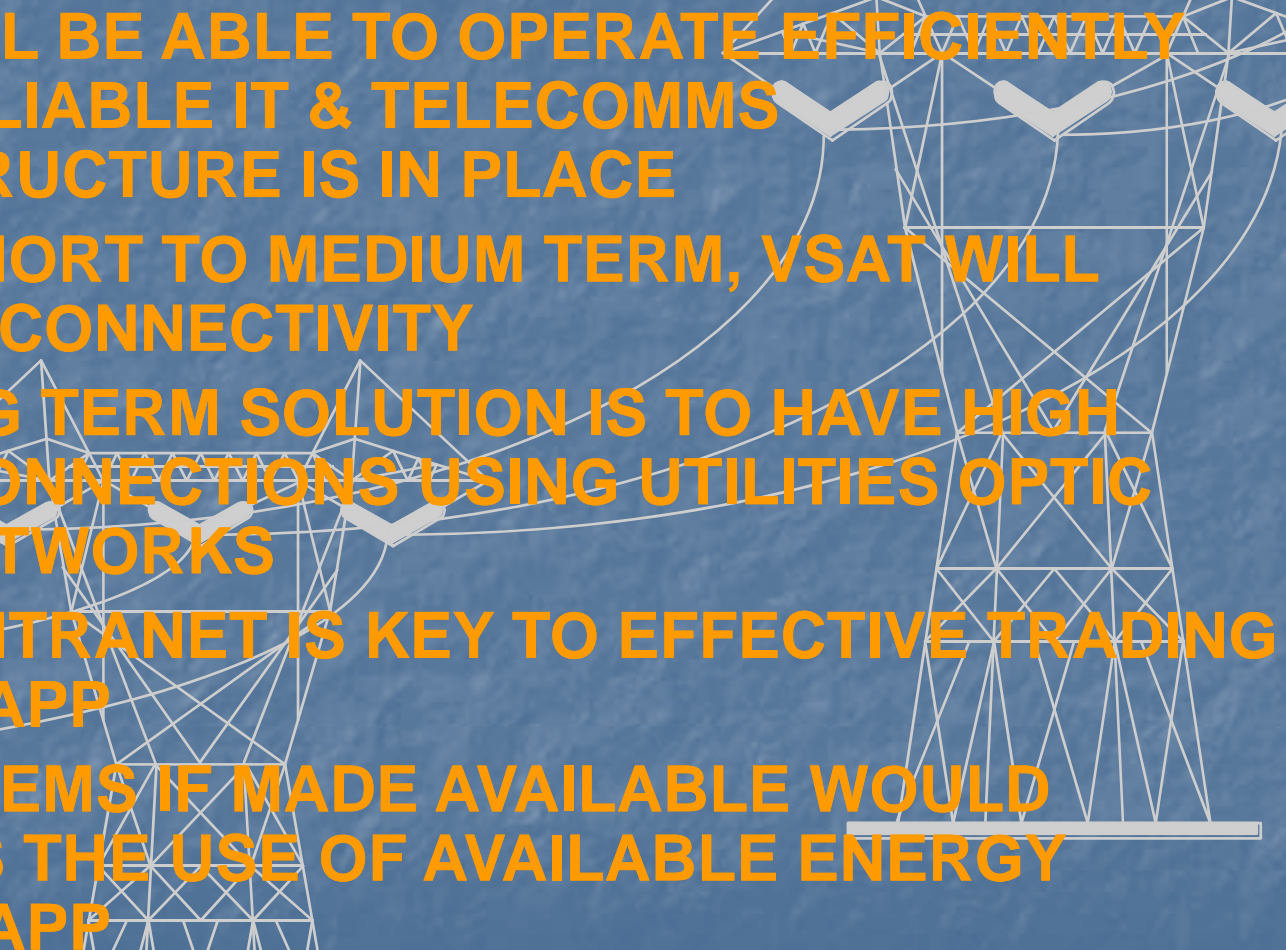


FIGURE 2: SAPP VSAT PROJECT

FUTURE SAPP TELECOMS NETWORK

- OPTIC FIBRE PLANNED TO REPLACE VSAT IN LONG TERM
 - TO BE USED FOR INTER-UTILITY COMMUNICATIONS
- SOME UTILITIES HAVE IMPLEMENTED OR ARE IMPLEMENTING OPTIC FIBRE NETWORKS
 - ESKOM
 - ZESA
 - NAMPOWER
 - ZESCO
 - SOME INTERCONNECTORS ALSO PLANNED TO HAVE OPTIC FIBRES

CONCLUSION

- SAPP WILL BE ABLE TO OPERATE EFFICIENTLY ONCE RELIABLE IT & TELECOMMS INFRASTRUCTURE IS IN PLACE
 - IN THE SHORT TO MEDIUM TERM, VSAT WILL PROVIDE CONNECTIVITY
 - THE LONG TERM SOLUTION IS TO HAVE HIGH SPEED CONNECTIONS USING UTILITIES OPTIC FIBRE NETWORKS
 - A SAPP INTRANET IS KEY TO EFFECTIVE TRADING WITHIN SAPP
 - SCADA & EMS IF MADE AVAILABLE WOULD HARNESS THE USE OF AVAILABLE ENERGY WITHIN SAPP
- 

Thank You!!!

