



Manual control – ENMAC & BESSM HMI

EOS 09-0074

Smarter Network Storage – Training Slides
v02

Contents

- Roles & responsibilities of people involved
- What to check before use
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- Manual Operations through ENMAC
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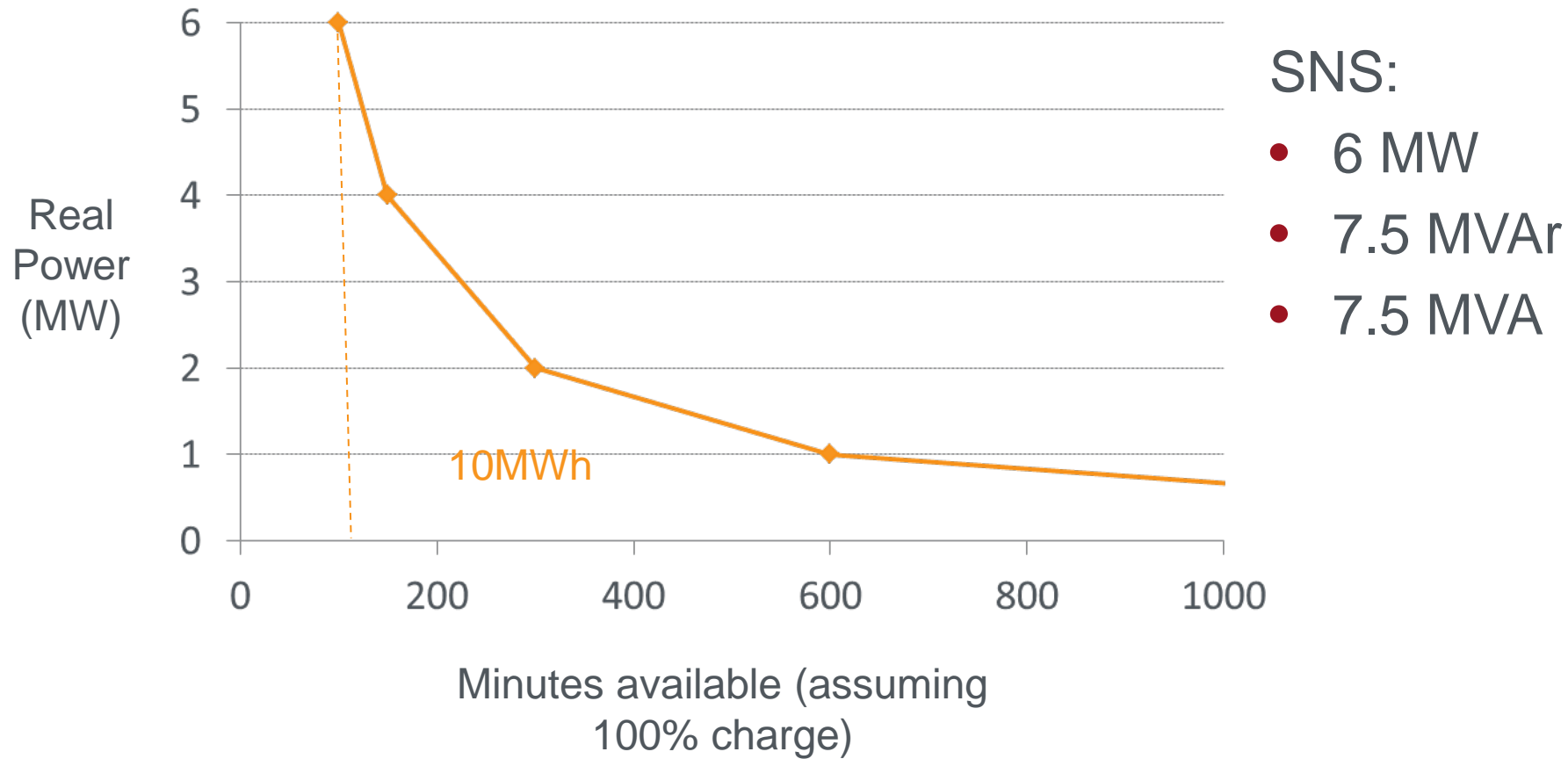
Roles & Responsibilities

- Network Control – remain in control of the network at all times
- Battery Manager – responsible for commercial scheduling and day to day operation of the ESD
- Equipment Suppliers – providing support as required & maintenance within contract period
- UK Power Networks engineers – working & supervising work safely at all times
- **Know your limits!** If you are not happy doing something STOP and ask for help.

Pre-use checks

- Is your work / planned use scheduled in?
 - What are the commercial implications?
 - Contact the Battery Manager if in doubt
- Are there any existing or planned network outages during your work?
 - Are you putting Leighton Buzzard customers supplies at risk?
 - What is the current / forecast site demand?
 - Contact Network Control

Energy storage device capabilities



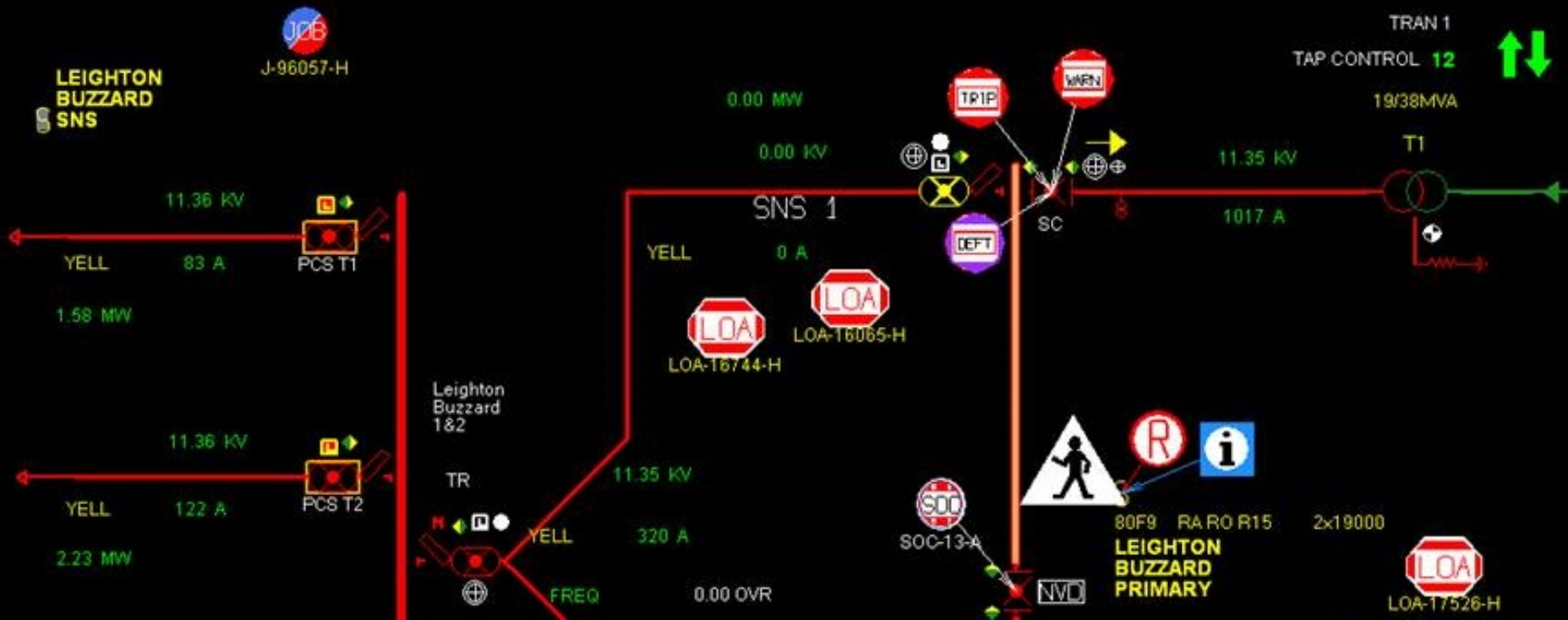
Note – Reactive power is available from the PCS units indefinitely

ESD Operations

- Sundon – Leighton Buzzard circuits both in service
 - Full automatic or manual operation
 - Commercial and network support services
- N-1 single circuit outage
 - Commercial services suspended
 - ESD will do peak shaving or can be controlled manually

ENMAC

- Appearance still being finalised – watch this space!
- ESD is under 33kV control desk
- Site “Leighton Buzzard SNS”
 - go have a look!



ENMAC

- Manual control available:
 - Reset system faults
 - Enable/disable BESSM (whole system)
 - Enable/disable BESDMs (each 1/6 of ESD)
- Power control (set points) still under development.

BESSM

BESDM 1_1

BESDM 1_2

BESDM 2_1

BESDM 2_2

BESDM 3_1

BESDM 3_2

ENMAC – Power control

- What would be more useful?
 - Type in values (Watts / VARs / duration)?
 - Click on boxes (fixed amount Watts / VARs)?
 - Specify duration or “until you run out of power or say otherwise”

Alarms & trips

- Detailed in EOS 09-0074 Section 8
- “Urgent” alarms show an immediate Network or H&S risk
- “Non-urgent” alarms require action, but not immediate

Alarm text	Description	Comments
Battery room Temp HI HI	Battery room Temp HI HI	Non-urgent alarm. Scheduled commercial services should be suspended automatically but system is available for emergency use if required. At this temp (28°C) the battery life is reduced through operation.
Battery room cooling fail	Battery room cooling fail	Non-urgent alarm - system operation can continue but monitor for temp alarms. Contact S&C for maintenance / repair.

BESSM (Battery Energy Storage System Manager)

- Access controlled with hierarchy:
 - ENMAC / super-user / operator / read only
 - Individual super-user/operator accounts
- Access using remote desktop / thin client
- Ultimately Control Engineers would get logins

BESSM HMI main screen

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Network Storage



Younicos
Let the fossils rest in peace

Main Batteries Graph

CB5 LB Primary 1&2

-2968.8 kW Active Power
4531.3 kVAr Reactive Power
5429.7 kVA Apparent Power
282.8 A Current
11.18 kV Voltage

Trend

Power -2968.8 kW

Frequency 49.945 Hz



Main

BESSM Control State:

Manual control BESSM HMI

69 % SOC
100 % SOH

States

- BESSM Control
- N-1 Condition
- BESDM 1_1 Communication
- BESDM 1_2 Communication
- BESDM 2_1 Communication
- BESDM 2_2 Communication
- BESDM 3_1 Communication
- BESDM 3_2 Communication

Active server

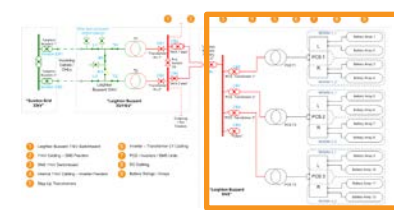
User: Supervisor

15:44:26 03.11.2014

Control client

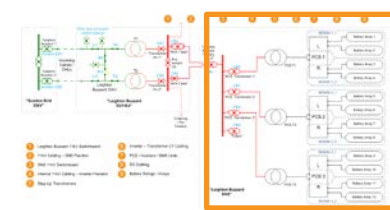


BESSM States 1



State type	Title	Description
Control	Maintenance	
	Manual Control ENMAC	The ESD is being driven by ENMAC
	Manual Control BESSM HMI	A user (eg: Battery Manager) is controlling the ESD)
	Automatic control (FOSS)	Fully automatic scheduled control – normal operation
Operational	Off	The ESD is off, all devices disconnected
	Idle	The ESD is online and connected but not providing power
	Running	The ESD is online, connected and providing power
	Test	The BESSM controller is in “test” mode

BESSM States 2



State type	Title	Description
Fault	No fault	
	Warning	An error has occurred but operation is not limited – monitor
	Minor	An error (eg battery string fault) has occurred with small limitation on ESD operation (eg 0.5% in this case), investigate when convenient
	Major	An error (eg PCS fault) has occurred with major limitation on ESD operation (eg 33%, 2MW in this case) or making operation impossible, investigate urgently (network at risk – now at N-1)

In all cases either investigate in BESSM, contact Battery Manager or S&C 24h Contact Centre. Unless ESD required for network support these will wait until next-day.



Thank you

<http://www.ukpowernetworks.co.uk/innovation>

