



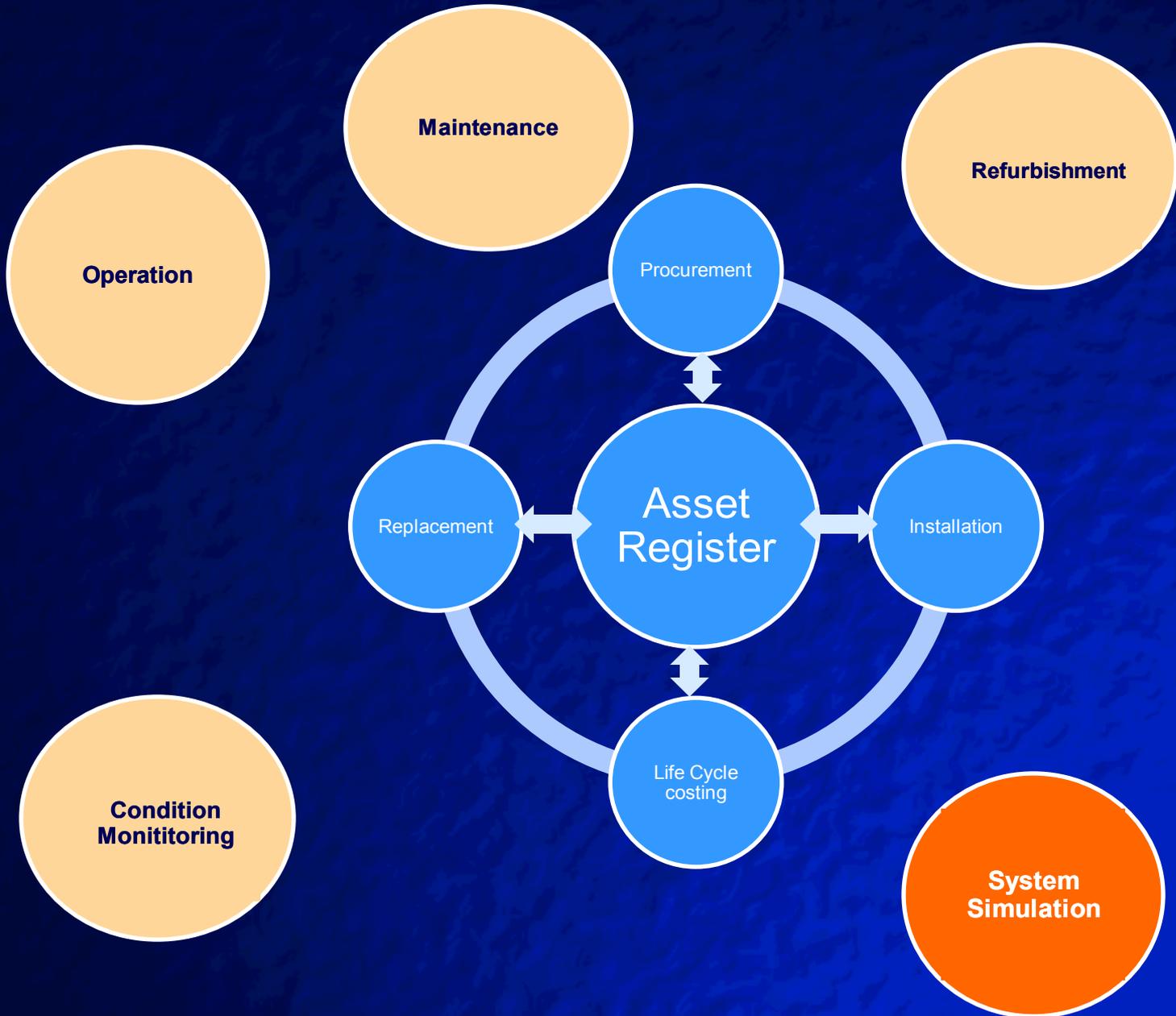
# LOAD FLOW DATA PREPARATION AND ASSET MANAGEMENT TOOL

# ASSET MANAGEMENT

- *"Asset management is managing infrastructure assets to minimize the total cost of owning and operating them while continuously delivering the service levels customers desire."*  
-- from the publication, **Managing Public Infrastructure Assets**



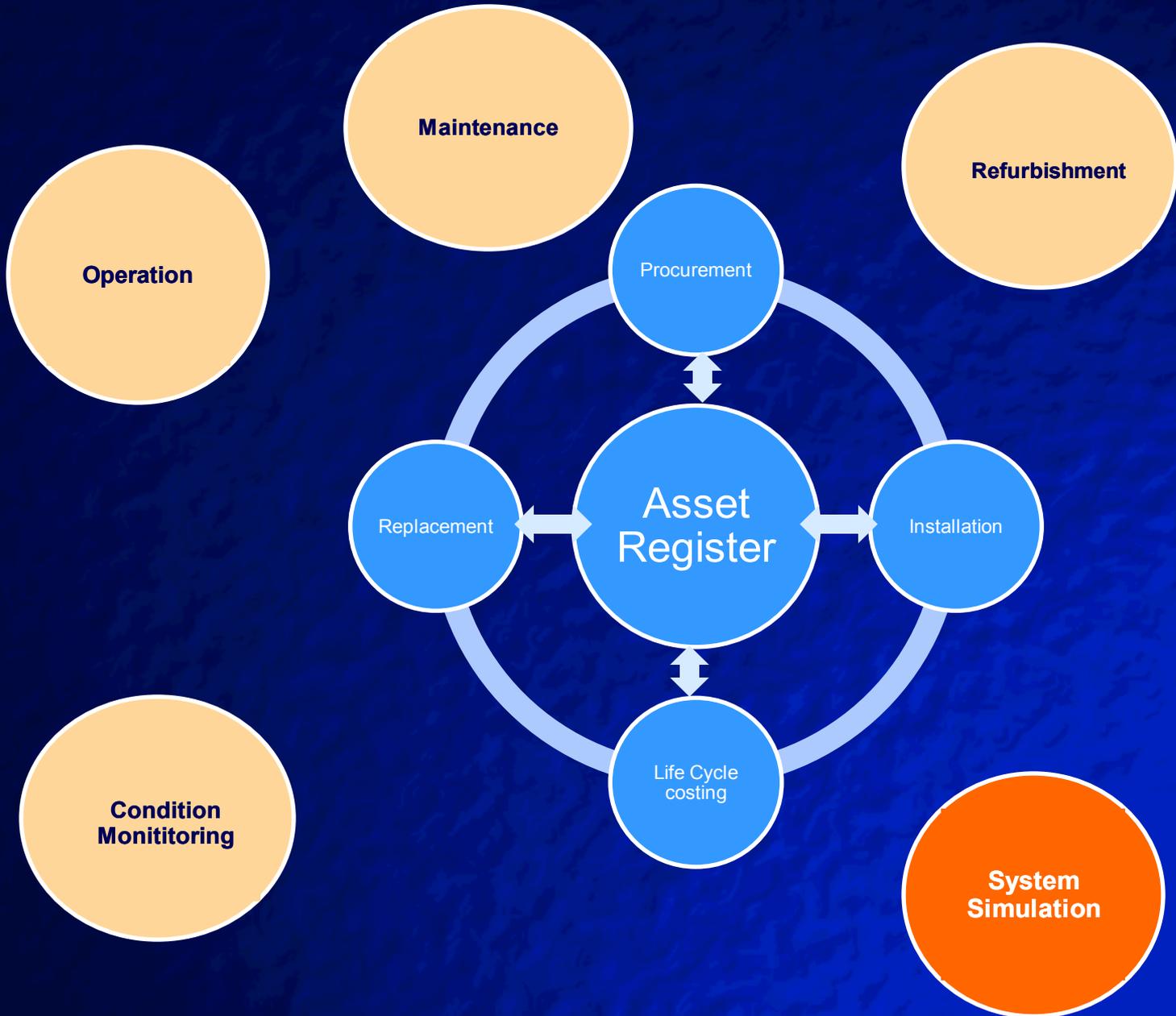
# FINANCE FOCUSSED ASSET MANAGEMENT



# SYSTEM LOAD FLOW SIMULATION CHALLENGES



# FINANCE FOCUSSED ASSET MANAGEMENT





# LOAD FLOW SIMULATION CHALLENGES

- **Asset register and load flow library not synchronised**
- **Stand alone system asset data**
- **Maintenance of asset data**
- **Difficulties to simulated year-based scenarios**
- **Asset movement implications affecting network configuration**

# SINGLE ASSET REGISTER CENTRED OPERATIONS



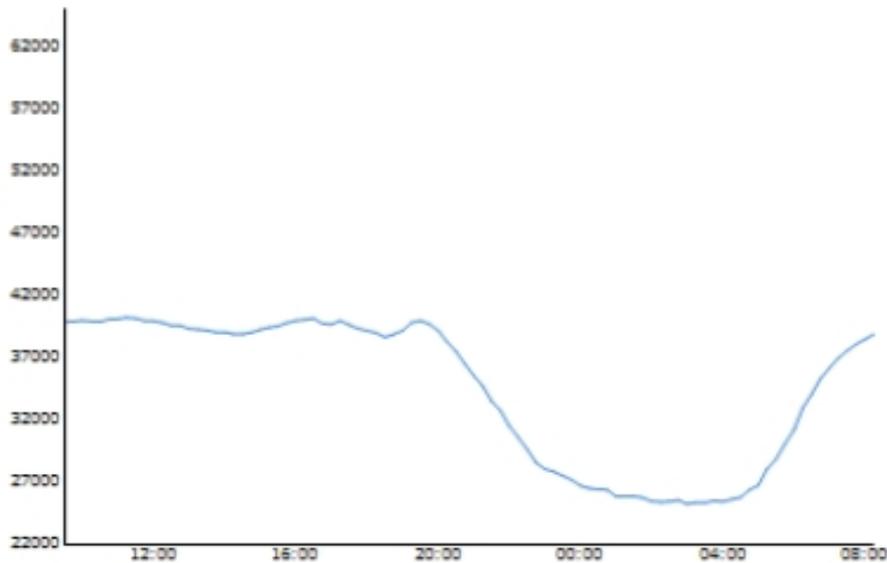
# PIESA CATCHMENT ASSET REGISTER?



# DATA AVAILABILITY?

nationalgrid

## Electricity demand - Last 24 Hours



GB Real time data

Source: National Grid UK Website

# LOAD FLOW OPERATIONS

- Get asset parameters
- Format asset data
- System zoning
- Reduction of neighbouring systems
- Selection of slack bus
- General integrity check of library data
- System scenarios, year based



# LOAD FLOW DATA PREPARATION TOOL

<b>1- DATA ENTRY</b>	<b>2- DATA ERROR CHECK</b>	<b>5- GEN. SCHEDULING</b>	<b>- LOAD FLOW PROG. INPUT DAT</b>
AREAS	UN IDENTIFIED LOAD CONNECTION	SYSTEM MAXIMUM DEMAND	7a - SLACK BUS SEARCH
CIRCUIT TYPES	UNKNOWN BUS VOLTAGES	SCHEDULE GENERATORS	TOTAL GENERATION PER NODE
CONNECTIONS	UNKNOWN SUBST_KNOWN ZONES	<b>6- SYSTEM REDUCTION</b>	TOTAL CONNECTIONS PER NODE
CUSTOMERS	UNKNOWN SUBSTATIONS_ZONES	<b>6a - GENERATION GROUPING</b>	7b- BUS INPUT FILE
DEMAND TYPES	LINE/TX CONNECTION ERRORS	TOTAL GEN REDUCED NETWORK	BUS RECORDS
GENERATOR STATUS	<b>3- GLOBAL SETTINGS</b>	UPDATE GENERATOR DETAILS	7c- GEN. INPUT FILES
GENERATOR TYPES	GENERATOR STATUS REPORT	<b>6b - DEMAND GROUPING</b>	NORMAL GENERATOR RECORDS
GENERATORS	ENABLE/DISABLE GENERATOR	TOTAL LOAD REDUCED NETWORK	WIND GENERATOR RECORDS
LOADS	<b>4- LOSSES</b>	UPDATE LOAD DETAILS	7d- LOAD INPUT FILES
NODES	DEM. WITH FIXED LOSSES ONLY		LOAD RECORDS
NOMINAL VOLTAGES	DEMAND PER AREA		7e- CONNECTIONS INPUT FILES
OWNERS	GEN TX LOSSES PER SUBSYSTEM		LINE RECORDS
REACTIVE COMPENSATION	MW-KM CALCULATION		TX RECORDS
SEASONS	Tx. LINE HEATING LOSSES		7f- REACTIVE COMP. INPUT FILE
SUBSTATIONS	COMBINED GTX AND TX LINE LOSSES		REACTIVE COMPENSATION
SYSTEM MODES	UPDATE GENERATOR DETAILS		
ZONES			
<b>EXIT</b>			



# TOOL FUNCTIONS

- **Asset data maintenance**
- **Data error checks**
- **System reduction**
- **Search of slack bus**
- **Generation of load flow data**
  - **Bus data**
  - **Generator data**
  - **Line data**
  - **Reactive compensation data**

# BUS RECORDS

## Bus Records

Number	Name	Area Name	Nom kV	PU Volt	Volt (kV)	Angle (Deg)	Area Num	Zone Num
6768	ABNE1Q	SHETL	132	1	132	0	1	4
6769	ABNE30	SHETL	33	1	33	0	1	4
6770	AIGA1Q	SHETL	132	1	132	0	1	1
6771	AIGA80	SHETL	33	1	33	0	1	1
6772	AKRW8W	SHETL	33	1	33	0	1	1
6773	ALNE1Q	SHETL	132	1	132	0	1	1
6774	ALNE30	SHETL	33	1	33	0	1	1
6775	ANDE10	SHETL	132	1	132	0	1	4
6776	ANDE30	SHETL	33	1	33	0	1	4
6777	ARBR1Q	SHETL	132	1	132	0	1	4
6778	ARBR30	SHETL	33	1	33	0	1	4
6779	ARDK10	SHETL	132	1	132	0	1	1
6780	ARDK32	SHETL	33	1	33	0	1	1
6781	ARDK80	SHETL	33	1	33	0	1	1



# LINE RECORDS

## Line Records

From Number	To Number	Circuit	Status	Xfmr	R	X	B	Lim A MVA	Lim B MVA	Lim C MVA
7142	7347	1	Closed	No	0.00037	0.00061	0.35009	121	121	121
7142	7347	2	Closed	No	0.00037	0.00061	0.35009	121	121	121
7185	7388	1	Closed	No	0.00023	0.00068	0.15643	400	400	400
7193	7266	1	Closed	No	0.00023	0.00033	0.24478	100	100	100
7193	7333	1	Closed	No	0.00037	0.00068	0.43618	210	210	210
6832	6877	1	Closed	No	0.0001	0.00044	0.09556	177	177	177
6832	6877	2	Closed	No	0.0001	0.00044	0.09556	177	177	177
7250	7252	1	Closed	No	0	0.00003	0.01148	250	250	250
7250	7252	2	Closed	No	0	0.00003	0.00746	250	250	250
7250	7261	1	Closed	No	0.00009	0.00064	0.37133	229	229	229
7258	7375	1	Closed	No	0.00007	0.0001	0.06801	110	110	110
7258	7375	2	Closed	No	0.00007	0.0001	0.06801	110	110	110
7268	7398	1	Closed	No	0.00021	0.00035	0.23014	139	139	139
7268	7398	2	Closed	No	0.00021	0.00035	0.23014	139	139	139
7280	7296	1	Closed	No	0.00015	0.00144	0.02955	760	760	760
7280	7296	2	Closed	No	0.00015	0.00144	0.04046	760	760	760
7312	7314	1	Closed	No	0.00009	0.0001	0.05768	132	132	132
7312	7314	2	Closed	No	0.00007	0.0001	0.05251	132	132	132
7333	7398	1	Closed	No	0.00098	0.00185	0.69875	84	84	84



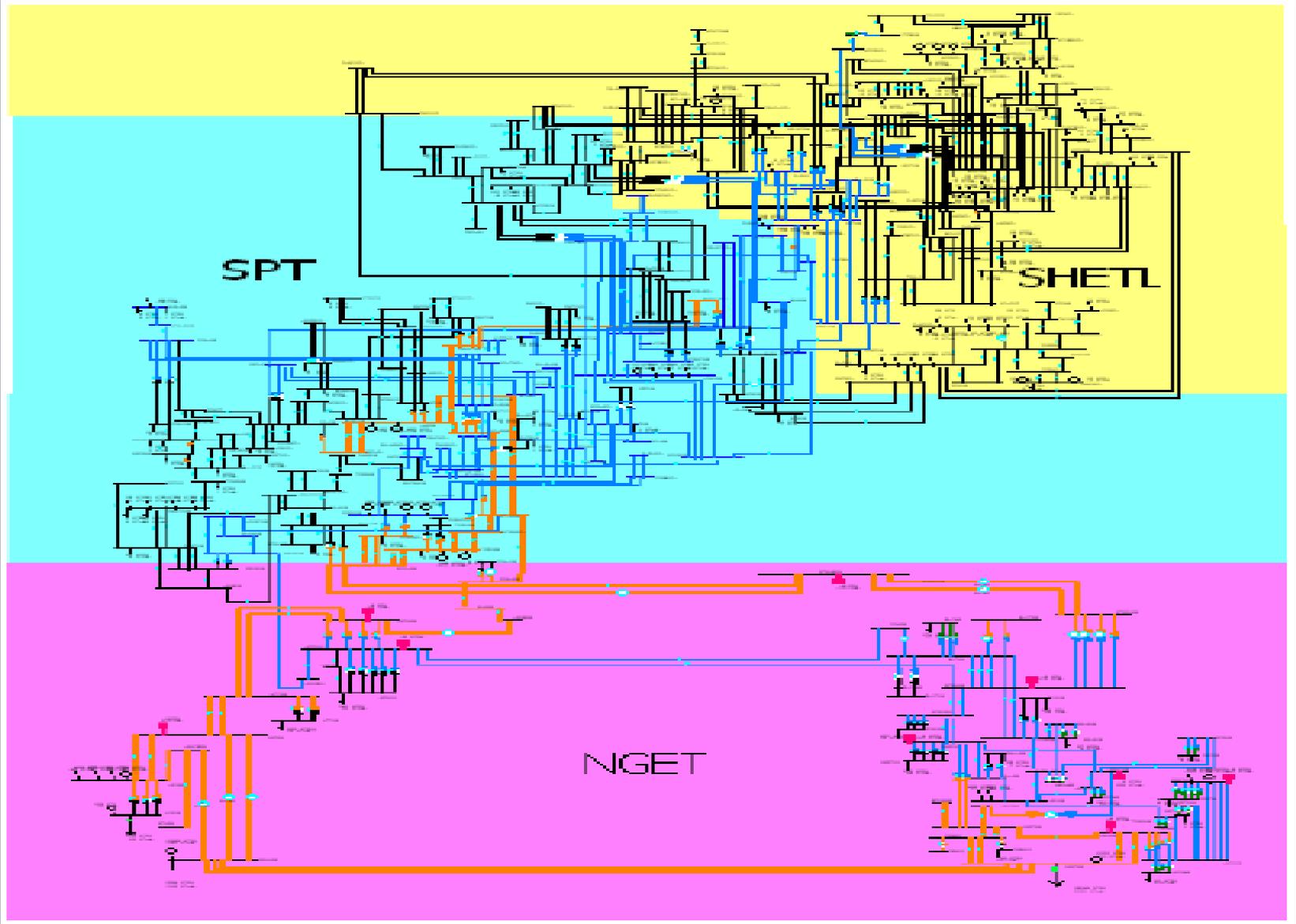
# LOAD RECORDS

## Load Records

Number	Name	ID	Status	MW	Mvar	MVA	S MW	S Mvar	I MW	I Mvar	Z MW	Z Mvar
6769	ABNE30		40 Closed	41.6	4.99	41.9	41.6	4.99	0	0	0	0
6774	ALNE30		40 Closed	27.1	3.25	27.29	27.1	3.25	0	0	0	0
6778	ARBR30		40 Closed	36.8	4.41	37.06	36.8	4.41	0	0	0	0
6785	ARMO30		40 Closed	25	3	25.18	25	3	0	0	0	0
7073	AUCH20		40 Closed	0	0	0	0	0	0	0	0	0
7081	BAGA30		40 Closed	60.8	7.29	61.24	60.8	7.29	0	0	0	0
7082	BAIN10		40 Closed	42.8	5.13	43.11	42.8	5.13	0	0	0	0
6793	BEAU30		40 Closed	29.7	3.56	29.91	29.7	3.56	0	0	0	0
7085	BERW1Q		40 Closed	30.1	3.61	30.32	30.1	3.61	0	0	0	0
7466	BLYT60		40 Closed	175	21	176.26	175	21	0	0	0	0
6804	BOAG30		40 Closed	28.9	3.46	29.11	28.9	3.46	0	0	0	0
7093	BONN20		40 Closed	66.4	7.96	66.88	66.4	7.96	0	0	0	0
6808	BRAC30		40 Closed	37.4	4.48	37.67	37.4	4.48	0	0	0	0
7097	BRAE10		40 Closed	37.5	4.5	37.77	37.5	4.5	0	0	0	0
6812	BRID30		40 Closed	32.1	3.85	32.33	32.1	3.85	0	0	0	0
7100	BROX1Q		40 Closed	55.3	6.63	55.7	55.3	6.63	0	0	0	0
6820	BUMU30		40 Closed	49.8	5.97	50.16	49.8	5.97	0	0	0	0
6822	CAAD30		40 Closed	17.3	2.07	17.42	17.3	2.07	0	0	0	0
7105	CAFA1Q		40 Closed	5	0.6	5.04	5	0.6	0	0	0	0
6835	CASS30		40 Closed	1.2	0.14	1.21	1.2	0.14	0	0	0	0
7106	CATY1Q		40 Closed	55.4	6.64	55.8	55.4	6.64	0	0	0	0
6837	CEAN1Q		40 Closed	0.1	0.01	0.1	0.1	0.01	0	0	0	0
7108	CHAP10		40 Closed	46.2	5.54	46.53	46.2	5.54	0	0	0	0
6844	CHAP30		40 Closed	88	8.84	88.88	88	8.84	0	0	0	0



# SYSTEM REDUCTION



# SINGLE ASSET REGISTER CENTRED OPERATIONS



**fail.**



**THE END**

**Thanks for listening**

