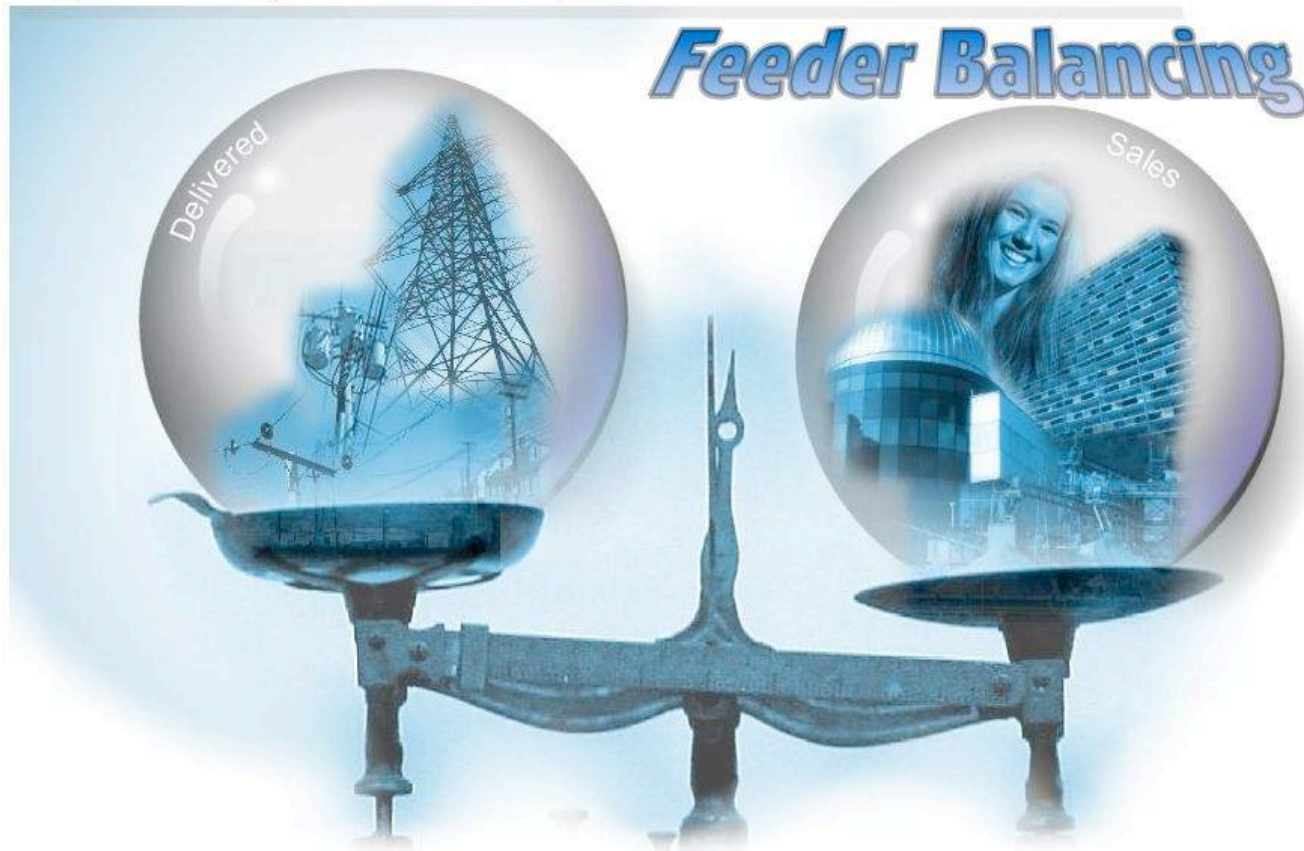
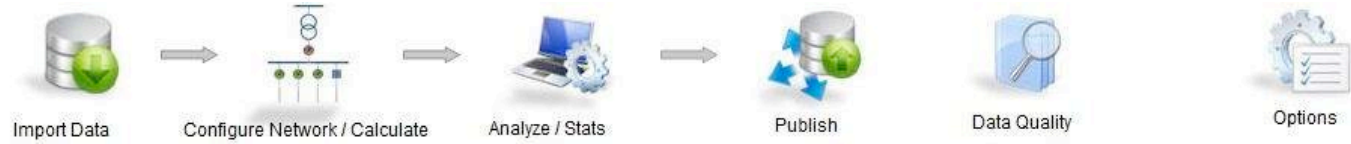




NEB

Network Energy Balancing

Workflow



About NEB

The main function of this solution is to effectively calculate, analyze and report customer / technical energy losses and to assist the business in planning targeted audits especially in areas of high losses (e.g. energy theft).

Business Benefits

- Analyse energy losses
- Minimise energy losses
- Plan audit cycles
- Provide information for analyses/case studies to reduce non-technical losses
- Provide information for Distribution monthly reports and KPIs
- Identify energy loss problem areas e.g. theft

Functional Areas

The solution is used to compare Energy Delivered vs. Energy Sales (actual energy consumption of customers) and technical losses on all Business levels, Substation and Feeder level thus catering for all the various network configuration scenarios. This is achieved by using Customer consumption data, Customer Network Link data, Network Location data and Stats Meter data.

The solution includes business intelligence interfaces (Charting, Diagrammatic Viewers, Heatmaps, Cubes) presenting stats of actual energy consumed on these paid service points :

- Premise level
- Transformer level
- Feeder level
- Substation level
- Business area levels

Import Workpage

The import functionality is designed to enable remote/off-line analysis. This helps minimize network traffic and to accelerate processing of large amounts of data.

Monthly (Stats Meters) file, Customer Dispensing Unit file, Prepaid User file, Conventional file, Network data, Customer Network Link data and NEB history data is imported into the NEB solution. This is done on a single import management screen.

The user can select to import a specific file or all files by checking the applicable checkboxes. The audit date is shown for each file after it has been imported. A Successful import is shown in green and an unsuccessful import in red. The time it took each file to import is shown.

Import Workpage

The screenshot displays the 'dBFocus - FBM2 [Ver 2]' application window. The interface includes a menu bar (File, Data, User, Viewers, Reporting, Tools, Help) and a toolbar with various icons. A 'Browser' pane at the top shows a workflow: Import Data → Configure Network / Calculate → Analyze / Stats → Publish → Data Quality → Options. The 'Import Data' step is currently active, indicated by a blue arrow labeled 'Current Data' pointing to a red vertical bar.

The main workspace is divided into several sections:

- Select All:** A checkbox that is checked.
- Engineering PMM+ dB:** A section with three checked items:
 - FBM (Catalogs/Stats/History) with date range 201003 - 201007
 - Network (Subs/Fdrs/Trfrs/Bulks) with date range 201002
 - CNL (Cust->Network link) with date range 201002
- MV90 & CC&B Text Files:** A section with four checked items, each with a 'Please Select...' dropdown and a 'Browse...' button:
 - MV90 (Stats Meters) with date range 201002
 - CDU (PPU unallocated) with date range 201002
 - PPU (allocated) with date range 201002
 - Conventional (LPU/SPU/Street) with date range 201002
- Generate Data Files (On Line):** A yellow bar with a checked checkbox and a small yellow progress indicator.
- Import Data Files (Off Line):** A green bar with a checked checkbox and a small green progress indicator.
- Compress Data (Off Line):** A green bar with a checked checkbox and a small green progress indicator.

On the right side, there are three configuration panels:

- Audit Month:** A dropdown menu set to 'Feb2010'.
- Meter Network Configuration based on:** A dropdown menu set to '201007'.
- History:** A dropdown menu set to '12' with the unit 'month(s)'.

A large blue 'Run' button is located at the bottom right of the main workspace.

The status bar at the bottom shows: Home | Bolden Ramogopa [SuperUser] | Home [] | Online/Dynamic # 8

Import Workpage

The screenshot displays the dBFocus - FBM2 [Ver 2] software interface. The main window is titled "dBFocus - FBM2 [Ver 2]" and features a menu bar (File, Data, User, Viewers, Reporting, Tools, Help) and a toolbar. Below the toolbar is a "Browser" section with navigation icons. The central area shows a workflow diagram with steps: Import Data, Configure Network / Calculate, Analyze / Stats, Publish, Data Quality, and Options. A "Current Data" arrow points to a table of data sources. The table is organized into sections: "Engineering PMM+ dB" and "MV90 & CC&B Text Files". Each row includes a checkbox, a description, a date range, and a duration. A "Run" button is located at the bottom right of the main area. On the right side, there are three panels: "Audit Month" (set to Feb2010), "Meter Network Configuration based on:" (set to 201007), and "History" (set to 12 month(s)). The bottom status bar shows "Home", "GenusSoft [SuperUser]", "Home []", "Online/Dynamic # 8", and the system tray with the time "03:00 PM".

Engineering PMM+ dB	
<input checked="" type="checkbox"/> FBM (Catalogs/Stats/History)	201003 - 201007 0Hrs1m31s782ms
<input checked="" type="checkbox"/> Network (Subs/Fdrs/Tfrs/Bulks)	201002 0Hrs9m30s63ms
<input checked="" type="checkbox"/> CNL (Cust->Network link)	201002 0Hrs7m11s937ms

MV90 & CC&B Text Files	
<input checked="" type="checkbox"/> MV90 (Stats Meters) [Please Select...]	201002 0Hrs0m1s766ms
<input checked="" type="checkbox"/> CDU (PPU unallocated) [Please Select...]	201002 0Hrs0m1s719ms
<input checked="" type="checkbox"/> PPU (allocated) [Please Select...]	201002 0Hrs0m6s422ms
<input checked="" type="checkbox"/> Conventional (LPU/SPU/Street) [Please Select...]	201002 0Hrs0m21s766ms

<input checked="" type="checkbox"/> Generate Data Files (On Line)	0Hrs18m18s15ms
<input checked="" type="checkbox"/> Import Data Files (Off Line)	0Hrs18m50s609ms
<input checked="" type="checkbox"/> Compress Data (Off Line)	0Hrs20m17s765ms

Configure / Map Network

The user can map and configure the network to cater for all the various network configuration scenarios. The balancing is calculated based on these scenarios. A balancing scenario consists of Substations, Switching Stations, Feeders and Stats Meters.

These items can be connected to each other in different ways depending on the network, one to many, etc. The mapping is done by dragging the items from a list and dropping them into a graphical display. This allows the user to see exactly how the items are connected to each other.

Dashboards show a mapping overview on:

- Balancing Scenarios
- Feeder breakdown.

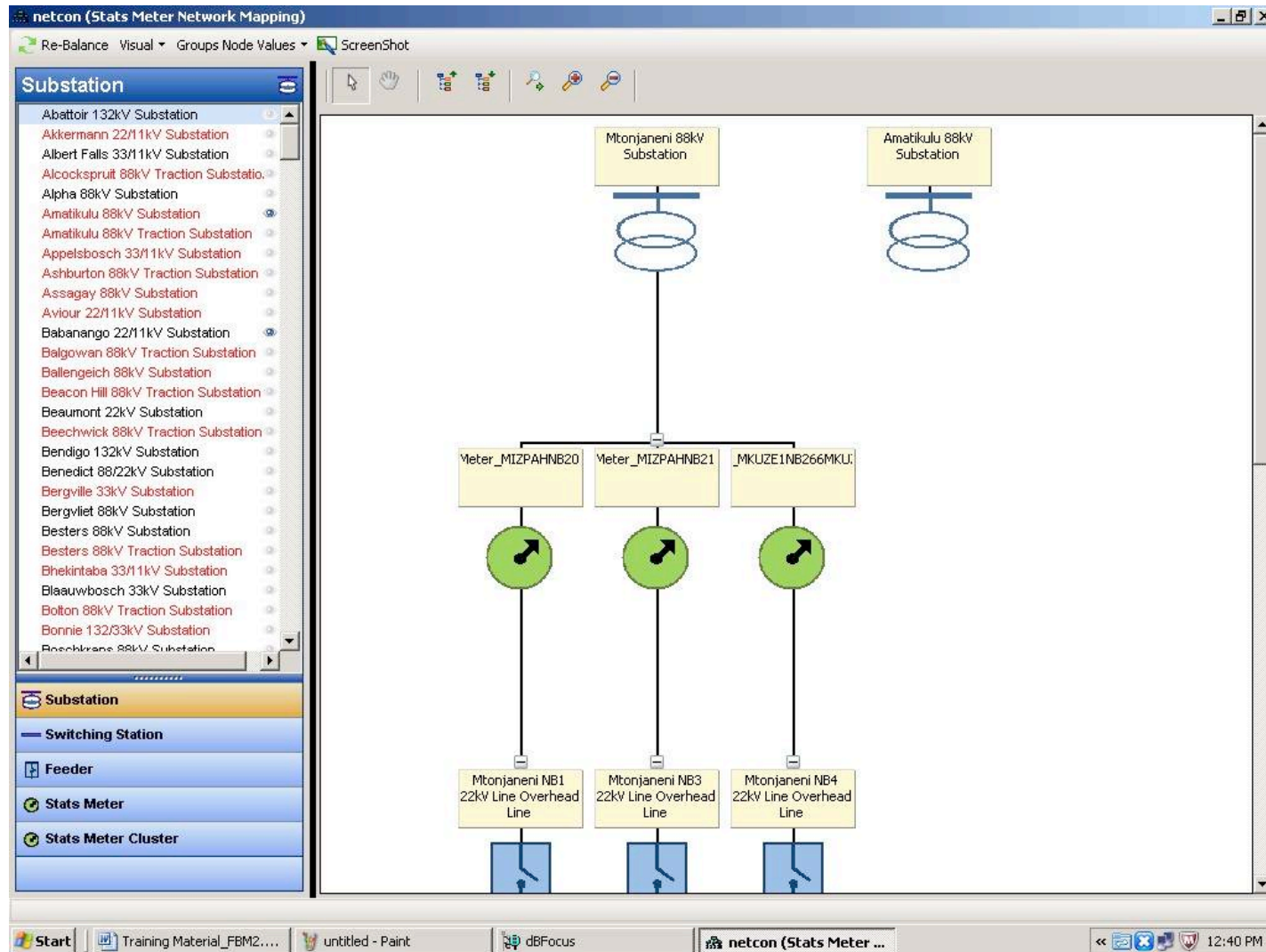
Configure / Map Network

The screenshot displays the dBFocus - FBM2 [Ver 1] software interface. The main window features a menu bar (File, Data, User, Viewers, Reporting, Tools, Help) and a toolbar. Below the toolbar is a 'Browser' section with a workflow diagram consisting of icons for 'Import Data', 'Configure Network / Calculate', 'Analyze / Stats', 'Publish', 'Data Quality', and 'Options'. A secondary workflow below it shows 'CDU', 'Network', and 'Calculate Balancing' with red 'X' marks, and a 'Feeder Breaker Data (Optional)' section with links for 'Compare with Current Mapping', 'Update', and 'Remove'. Two data tables are visible: 'Scenarios' and 'Feeder breakdown'. A 'Scenarios' button and a large blue arrow are at the bottom of the main content area. The status bar at the bottom shows 'Home', 'Temporary [SuperUser]', 'Import_SourceData', 'Online/Dynamic', and '# 8'.

Scenarios		
Substation not Mapped	537	100%
Total	537	

Feeder breakdown		
Fdrs Metered	0	0%
Metered via Sub meter	0	0%
Metered via Fdr meter	0	0%
Fdrs Not Metered	0	0%
Fdrs Not Mapped	1720	100%
Total	1720	

Configure / Map Network



Analyse Stats Workpage

In this section the user can use various analysis tools to analyze the balancing results. The analysis can be done on the whole network or on smaller sections of the network depending on where stats meters are installed.

These tools include:

- a Graphical network display with calculated KPI's
- Pivot Grids with various customizable filters
- Heat Maps that can show different KPI's in size and color
- Cubes with customizable views and dynamically calculated results, etc.

On the graphical display the user can make adjustments on the balancing as long as a valid reason is supplied. The technical loss on feeders can also be modified.

- Dashboards show a balancing analyses overview on:
- Total Analysed Substations & Feeders
- Non-technical loss % and kWh on the Business Levels.

Analyse Stats Workpage

Analyzed - Total

Substations	161	37.53%
Feeders	594	56.20%

Balancing Non Tech Loss - MWh

Eastern WMA	11438.77	3.94%
Empangeni FSA	-9334.41	-24.61%
Margate FSA	386.78	0.55%
Newcastle FSA	33983.61	40.41%
Pietermaritzburg FSA	-13597.2	-13.9%

Home [No User] Import_SourceData Online/Dynamic # 82

Analyse Stats Workpage

The screenshot shows the 'netcon (Substation/Feeder Meter Energy Balancing)' application window. On the left is a 'Substation' list with 'Babanango 22/11kV Substation' selected. The main area displays a data table for 'Mtonjaneni 88kV Substation' with a 'Node Value Edit' dialog box open over it.

Node Value Edit Dialog:

KWH_Deliver_Adjust	200000	
Comment_Adjust		performing an adjustment

Main Data Table (Mtonjaneni 88kV Substation):

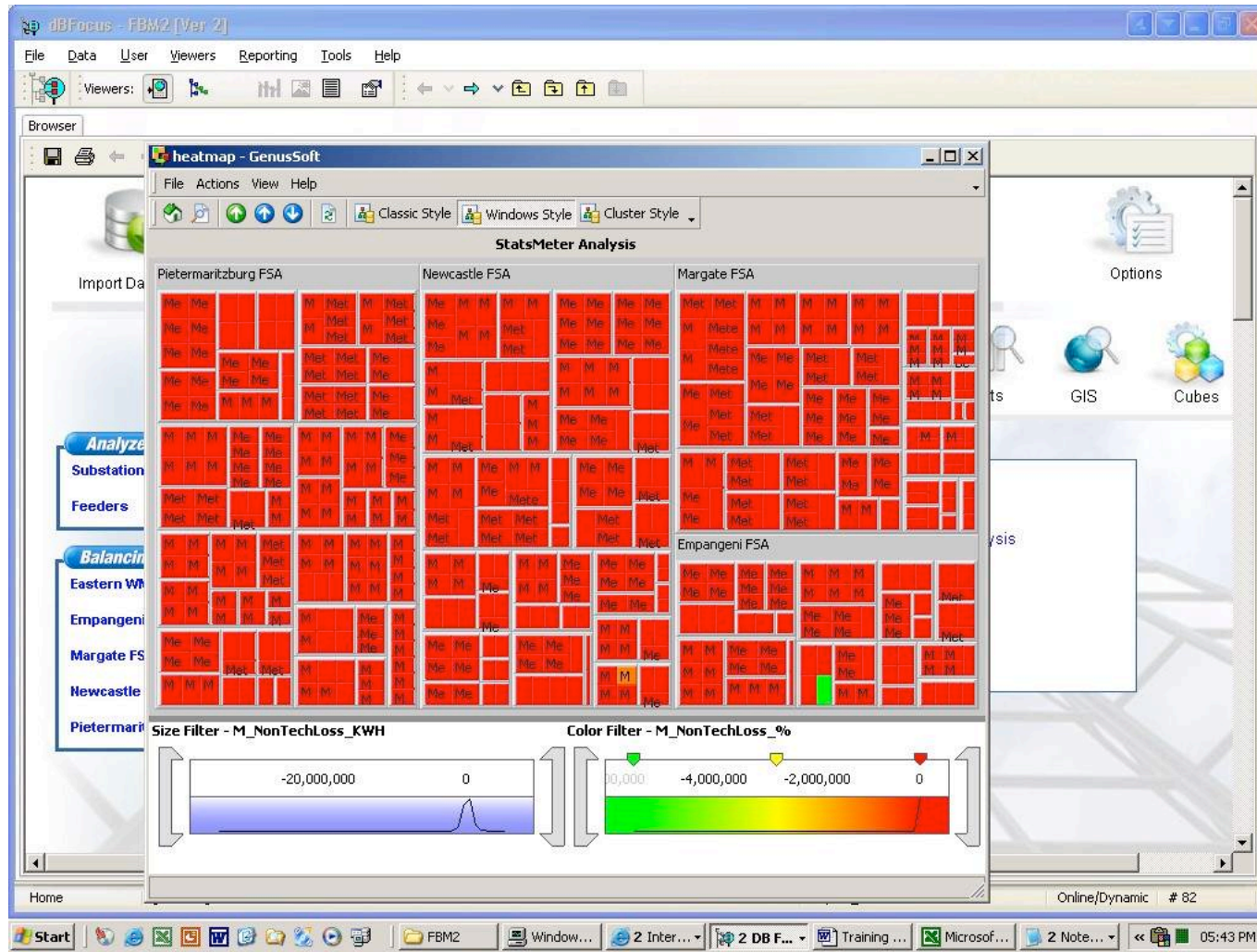
Tech_Loss_KWH	54714	
All_KWH_Used	876093	
KWH_Deliver_Adjust	0	

Other Data Tables (Bottom):

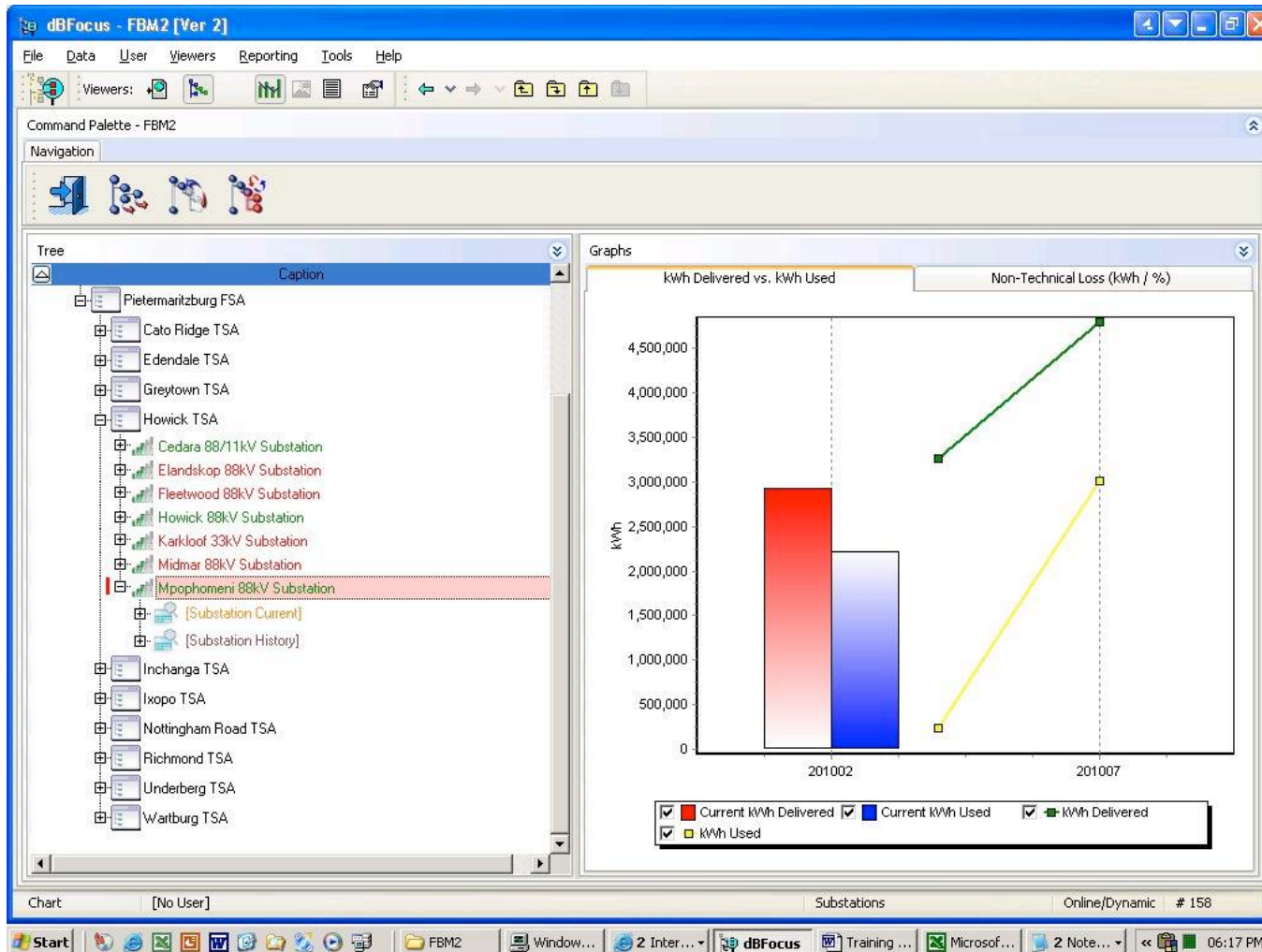
Tech_Loss_KWH	17451.9	Tech_Loss_KWH	9599.6	Tech_Loss_KWH	27662.5
All_KWH_Used	429093.42	All_KWH_Used	127111.46	All_KWH_Used	319888.12
KWH_Deliver_Adjust	0	KWH_Deliver_Adjust	0	KWH_Deliver_Adjust	0
Comment_Adjust		Comment_Adjust		Comment_Adjust	
M_KWH_Deliver	174519	M_KWH_Deliver	95996	M_KWH_Deliver	276625
M_NonTechLoss_KWH	-272026.32	M_NonTechLoss_KWH	-40715.06	M_NonTechLoss_KWH	-70925.62
M_NonTechLoss_%	-155.87	M_NonTechLoss_%	-42.41	M_NonTechLoss_%	-25.64

The taskbar at the bottom shows the Start button, taskbar icons, and active windows including 'FBM2', 'Windows T...', '2 Intern...', '3 DB Foc...', 'Training M...', and 'Microsoft ...'. The system clock shows '04:07 PM'.

Analyse Stats Workpage



Analyse Stats Workpage



Analyse Stats Workpage

GenusSoft DynaCube Viewer (Trial Version provided by GenusSoft): Cube_All_Calc_Data.Configuration (542 Records Processed)

File View Tools Help

Dimensions

Columns

ACCMONTH REGION FSA TSA Substation Meter Status Stats Meter Type Stats Meter

NonTechLoss % NonTechLoss KWH TechLoss KWH

Value Value Value

ACCMONTH	REGION	FSA	TSA	Substation	Meter Status	Stats Meter Type	Stats Meter	NonTechLoss %	NonTechLoss KWH	TechLoss KWH
201002	Eastern	WMA						14.88	42628609.10	28639047
			Empangeni FSA					-23.96	-9135683.79	3794113
			Empangeni TSA					-2.22	-203556.64	918216
			Mhlatuze 88kV Subst	Future	FBM			0.00	-2966726.80	0
			Mtunzini 88kV Substa	Online	Fdr_Meter			-3.69	-63626.24	172464
						Meter_MKUZENB7		-15.07	-106688.00	70794
						Meter_MKUZENB58		-173.04	-335731.60	19402
						Meter_MKUZENB10		46.04	378793.36	82268
			Ngoye 88kV Substati	Other				49.60	1030477.70	207759
			Ngwelezana 88kV Sul	Other				-113.60	-274746.72	24186
			Nseleni 132kV Substa	Online	Fdr_Meter			35.91	1221424.48	340162
						Meter_MTFRERENB22		50.64	543715.76	107372
						Meter_MTFRERENB21		9.75	123785.02	127000
						Meter_MTFRERENB20		52.36	553923.70	105789
			Zircon 132kV Substat	Online	Fdr_Meter			48.93	849640.94	173643
						Meter_UPLANDSNB102		50.78	568633.50	111971
						Meter_UPLANDSNB101		45.57	281007.44	61671
			Eshowe TSA					17.12	610707.38	356774
			Madungela 132kV Sul	Other				-26.79	-19104.64	7131
			Mandawe 88kV Subst	Online	Fdr_Meter			36.98	774846.08	209516
						Meter_MADADENINB9		-22.23	-122688.80	55202
						Meter_MADADENIN...		39.40	262165.10	66544
						Meter_LUDEKENB46		72.39	635369.78	87769
			Nkwaleni 88kV Subst	Online	Fdr_Meter			-14.57	-174767.56	119949
Total by COLUMNS								14.88	42628609.10	28639047

Measures

NonTechLo NonTechLo TechLoss K TechLoss % KWH Used KWH Delive KWH Adjust Fdrs KWH LPU KWH SPU KWH PPU KWH STREE

KWH CDU Customer T Customers Customers Customers Customers Customers KVA NMD Total NMD LPU NMD SPU NMD STREE

Start FBM2 Window... 2 Inte... 2 DB F... Training... Microso... 2 Not... 06:31 PM

Publish Workpage

In this section the user publishes and updates the central database with all the calculated and summarized balancing results as well as all the mapping information for trending and historical purposes. Confirmation is given when all the information has been published successfully for the audit month.

The published data is used by the corporate solution to generate a consolidated view of the whole business where comparisons and analysis could be made.

Data Quality Workpage

In this section various pivot grids are available for the user to look at data discrepancies that could have an impact on the outcome of the calculated balancing results.

These include:

- Missing Network and Stats meter items that were previously mapped
- Stats meters without readings
- Feeders without consumption
- CNL %, etc.

Reports can be generated directly into different formats: excel, CSV, html, xml, etc.

Thank You