Enhancing Asset Management With Detailed Asset Data & Connected Network Model

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DESIGNATION: PROJECT EXECUTIVE

QUALIFICATION: BSc - ENG, MBA, PR ENG

AMEU CONVENTION
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Prepared in conjunction with:
• 1st eThekwini Municipality AMIP developed in 2008
  - AMIP defined 2, 5 and 10 year objectives
• eThekwini Electricity initiated unit wide project to address AMIP objectives in 2009

• Effective asset management reliant on good asset data. Asset data initiatives launched:
  - Phase 1: Strategic/HV network assets
  - Phase 2: Medium & Low voltage network assets
• Define asset & equipment structures to support TE
• Field capture all TE network MV and LV assets:
  − Positional data
  − Equipment attributes
• Model all equipment with supporting attributes in GIS environment
• Enable system integration
<table>
<thead>
<tr>
<th>Envisioned</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MV &amp; LV Field Items</strong></td>
<td></td>
</tr>
<tr>
<td>671,261</td>
<td>960,000</td>
</tr>
<tr>
<td><strong>Resources</strong></td>
<td></td>
</tr>
<tr>
<td>18 Field Teams</td>
<td>30 Field Teams</td>
</tr>
<tr>
<td>18 Office Data Capturers</td>
<td>50 Office Data Capturers</td>
</tr>
<tr>
<td><strong>Field Capture Duration</strong></td>
<td></td>
</tr>
<tr>
<td>15 months</td>
<td>18 months</td>
</tr>
<tr>
<td>Supply area = 2,300km²</td>
<td></td>
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</table>
FIELD CAPTURE CHALLENGES
CAN YOU IDENTIFY THE EQUIPMENT SHOWN?

- Autorecloser
- Sectionaliser
- Metering Transformer
- Pole Transformer
<table>
<thead>
<tr>
<th>CHALLENGES</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical qualified field personnel = high cost</td>
<td>HIGH COST</td>
</tr>
<tr>
<td>Detailed asset data field recording = time consuming</td>
<td>TIME CONSUMING</td>
</tr>
<tr>
<td>Field data attribute quality not verifiable</td>
<td>AUDIT</td>
</tr>
<tr>
<td>Field data capture = exhausting (harsh environment, criminal activity etc.)</td>
<td>HARSH ENVIRONMENT</td>
</tr>
<tr>
<td>Data queries only addressed through revisit</td>
<td>DATA MANAGEMENT</td>
</tr>
<tr>
<td>No additional data available apart from capture spec</td>
<td>DATA LIMITATION</td>
</tr>
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</table>
Field work focus on detailed photographs

- Reduce time, skill level, cost
- Provides persistent evidence & reference

Office resources:

- Large pool of non-engineering data capture resources
- Overseen & assisted by small technical team:
  - Data capture training
  - Advise on specialised/unique equipment
  - Quality Assurance
Data model must support project objectives

Geographical Network Information System (GNIS) supporting real connected network modelling used

GNIS enhances modelling quality and added value to the deliverable as a result of functionalities enabled from connectivity.

Advantages:

- Equipment Supply Areas
- Property-Network-Link
- Support other initiatives (OMS)
Minisubstation – start of trace at substation transformer element

Red Area indicates supply area constructed based on trace from substation transformer. Helpful for capacity planning, outage management etc.

Trace Encountered multiple electrical components – stops at Service connection point & open switchgear / points.

Network Trace Results of “visited” elements

Details of all service connection points visited
OPPORTUNITY FOR SYSTEM INTEGRATION

- NMS (Network Management)
- SCADA (Supervisory Control & Acquisition)
- TDMS (Technical Document Management System)
- PNR (Project & Need Registration)
- QOS (Quality of Supply / Service)
- DMS (Distribution Management)
- CRM (Customer/Property Network Link)
- MIMS (Materials / Inventory Management)
- SHEQ (Safety, Health, Environment and Quality)
- EMS (Energy Management)
- GNIS (Geospatial Network Information System)
- IRLM (Insurance Register & Liability Management)
- CMR (Compliance Monitoring & Reporting (Regulatory, Management etc.))
- OMS (Outage Management)
- GIS (Geographical Information System)
- RMS (Risk Management System)
- AMR/AMI (Automated Metering, Reading & Interfacing)
- ENGINEERING
  - Planning
  - Design
  - Tariffs & Supply
- MMS (Maintenance Management)
- WMS (Workflow Management)
- PMS (Project Management)
- SGMS (Smart Grid Management)
- & More.....
Information of network equipment and how it is connected or related to each other is critical for SG planning.

Also supports future operations (post SG implementation) – provides data for intelligence in SG deployment.
Low!!!

Tap Changer

?
KEY TAKE AWAY POINTS

- Asset management requires extensive asset data
- Eating away at the elephant
- Data capture approach
- Importance of Geographical Network Information System (GNIS) during data capture & modelling exercise
- Enterprise Asset Management System misnomer
Q&A

You have Questions
We have Answers