

High Consumption Issues

City of Fountain Electric Department

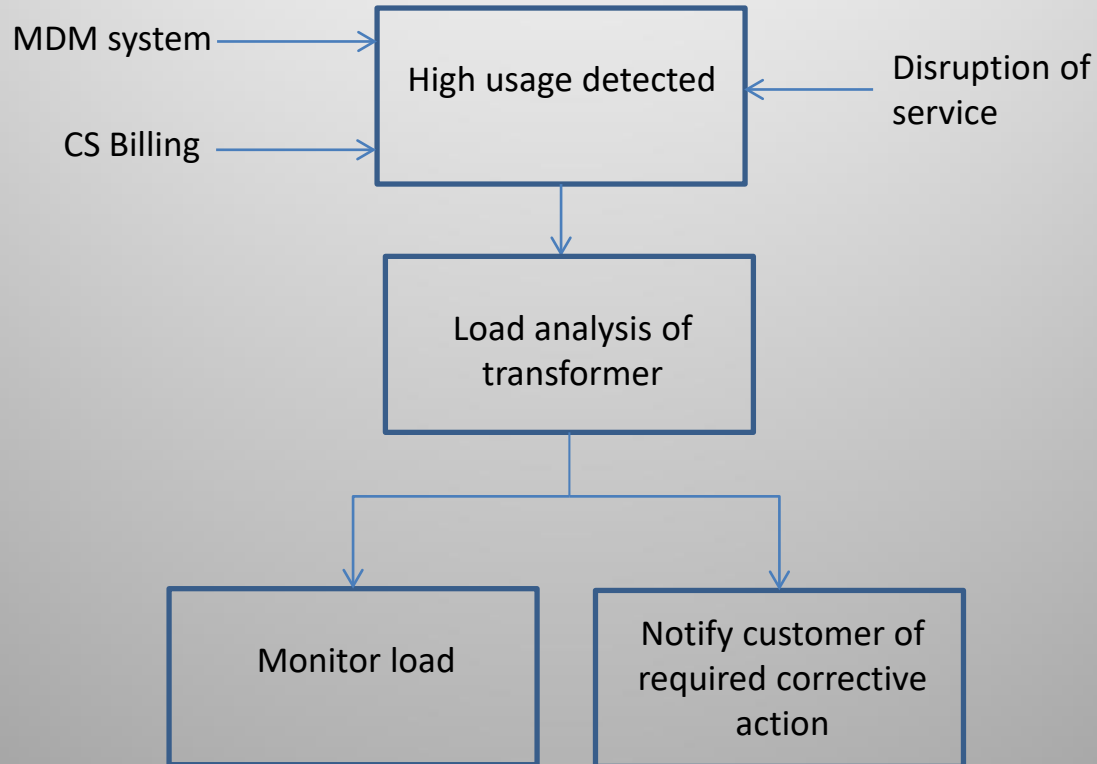
Fountain, Colorado

Carl Christian, Superintendent

Tracy Tillman, Distribution System Designer



Process Flowchart



Flagged Accounts

- Customer service flags accounts with consumption over 5000 kwh during billing operations and report it to Electric
- Disruption of service



Disruption of Service

- An outage takes place and customer calls into Customer Service
- Customer Service dispatches troubleshooter to scene
- Troubleshooter's investigation reveals a high consumption issue



Flagged Accounts

- Utilize new Meter Data Management software (MDM) and Advanced Meter Infrastructure (AMI) meters

The screenshot displays the SmartWorks Compass MeterSense software interface. The left sidebar contains navigation options: Reports, Actions, Setups, System Configuration, Meter Data, Task Manager, Rules Engine, and Utilities. The main content area is titled "Non-Comm Meter" and shows three reports for meter 69088086:

- AMI Service Level Report:** 3 rows found. Table with columns: Time Frame, Expected Reads, Available Reads, RESULT.
- Interval Read Status Report:** Interval Reads, Jul 2, 2018. Pie chart showing 8% (yellow), 47% (green), and 45% (grey).
- Register Read Status Report:** Register Reads, Jul 2, 2018. Pie chart showing 47% (green) and 52% (grey).

Below the reports is an "ESRI SmartWorks Compass Map" showing a geographic area with numerous colored markers (red, orange, yellow, green) representing meter locations. The bottom right corner features the City of Fountain logo with the tagline "Pure Colorado".



Load Analysis of Transformer

- Once a high consumption meter is identified, a virtual transformer for that meter is created to look at total load on the transformer
- Steps:
 - Locate distribution transformer and addresses served from it (Utilizing ArcGIS)
 - Gather AMI data for each meter connected to the distribution transformer using MDM SmartWorks
 - Sum the data to provide an idea of the total load on the transformer, which is completed with the MDM SmartWorks.



Load Analysis of Transformer

ARC GIS: transformer to address relationship

Smartworks: address to meter # relationship

Yukon: supplies meter data

Transformer Loading Dashboard

Analysis Period
 Start Date (yyyyMMdd) End Date (yyyyMMdd) [Update](#)

Search

Transformer Details
 Transformer ID [>>](#) Transformer Type
 Transformer Group KVA Rating Above Below

Geographic Location
 Latitude Between and
 Longitude Between and [Select Using Map](#)

Loading Statistics
 Peak KVA as % of Rating Above % Below %
 Optimal Operating Band Above % Time Below % Time
 Recent to Historic Peak Ratio Above Below

[Search](#) [Reset](#)

[Excel](#) [PDF](#) [KML](#) [Schedule](#)

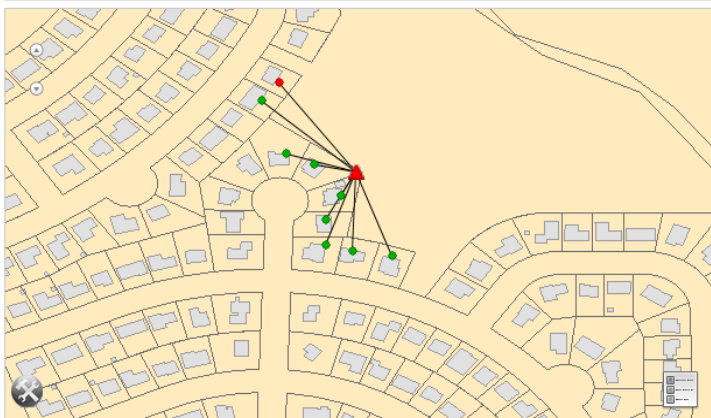
1 rows found

Transformer ID	Alternate ID	Type	KVA Rating	Peak KVA as % of Rating	% Time Above Operating Band	% Time Below Operating Band
0641	81309697416-AMR:0	PM	25	168.16	14.16	4.22

Details for 0641 (81309697416-AMR:0)

Alternate Transformer ID	81309697416-AMR:0
Transformer Type	PM
KVA Rating	25
Optimal operating band - Analysis Period	14.16% above, 81.63% within, 4.22% below
Optimal operating band - Recent (Last 30 days)	14.16% above, 81.63% within, 4.22% below
Optimal operating band - Historical (365 days prior to Recent)	0% above, 48.7% within, 51.3% below
Peak KVA - Analysis Period	42.04
Peak KVA - Recent	42.04
Peak KVA - Historical	31.57
Recent to Historic Peak Ratio	1.33 Excel

Scenario Analysis
 Replacement KVA Growth Factor (%)
 0 25 50 -10 0 10



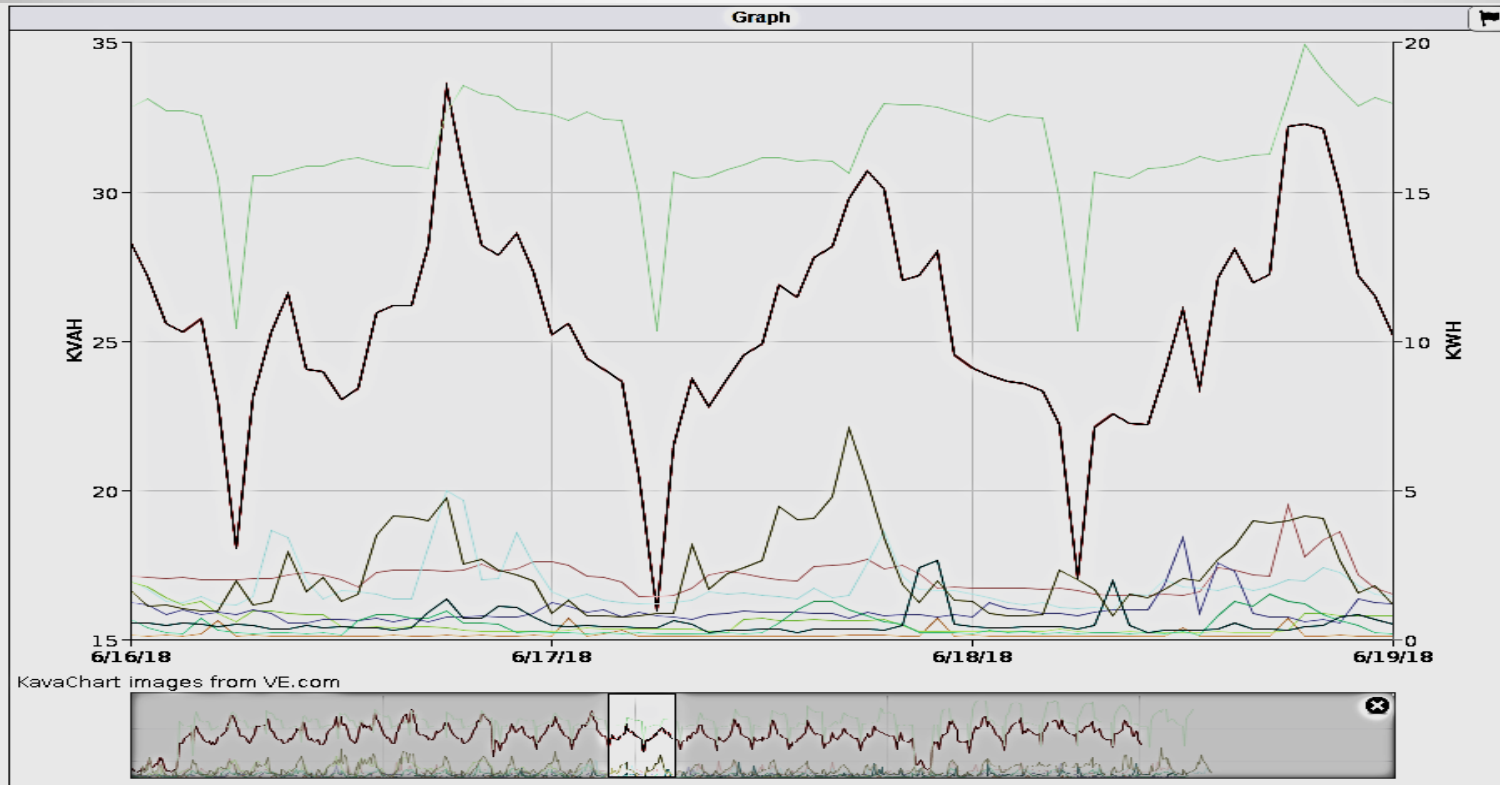


Load Analysis of Transformer

- Once all data is collected, a plot would be generated showing each meter's contribution to distribution transformer loading and summed to show the total loading on the transformer
- The new SmartWorks MDM system we have implemented does all of this.



Load Analysis of Transformer



KavaChart images from VE.com

Statistics					
Dataset	Min	Max	Avg	Standard Deviation	Avg To Max Ratio
0641_xfrmVM INTERVAL [KVAH]	3.499	42.044	25.75	6.888	0.612
69073683 INTERVAL [KWH]	0.437	9.217	2.57	1.651	0.279
69073717 INTERVAL [KWH]	0.096	4.907	0.57	0.577	0.117
69073686 INTERVAL [KWH]	0.146	4.121	0.81	0.729	0.197
69073713 INTERVAL [KWH]	0.136	4.397	0.87	0.467	0.199
69074808 INTERVAL [KWH]	0.142	6.821	1.65	1.457	0.241
69073684 INTERVAL [KWH]	0.598	23.757	16.33	4.621	0.687
69073685 INTERVAL [KWH]	0.215	5.351	1.42	0.57	0.265
69073711 INTERVAL [KWH]	0.067	0.896	0.18	0.145	0.202
69074809 INTERVAL [KWH]	0.283	5.958	1.89	0.786	0.317



Monitor Load

- If the peak meter load is 130% of the rated transformer capacity, the transformer is monitored.
 - For excessive individual loads
 - For cool down period
 - Voltage issues
- If we feel we the service is creating interference with the quality of service supplied to the neighborhood a notice of required corrective action is given to the high consumption customer



Notice of Required Corrective Action

- A letter of high consumption is hand delivered to the customer advising upgrades needed
- Customer required to pay for all costs associated with the required upgrades
- If no payment after notification and their high consumption results in an outage, their power will not be re-energized until upgrade payments are made
 - If the load also exceeds service panel ratings, they are also required to upgrade panel



Notice of Required Corrective Action



City of Fountain Electric Department

Notice of Required Corrective Action

5/25/18

To whom it may concern:

The electric load at **1234 Example Dr.** is overloading the transformer that provides service to you and your neighbors. **Immediate action is needed.**

Interference with Quality of Service

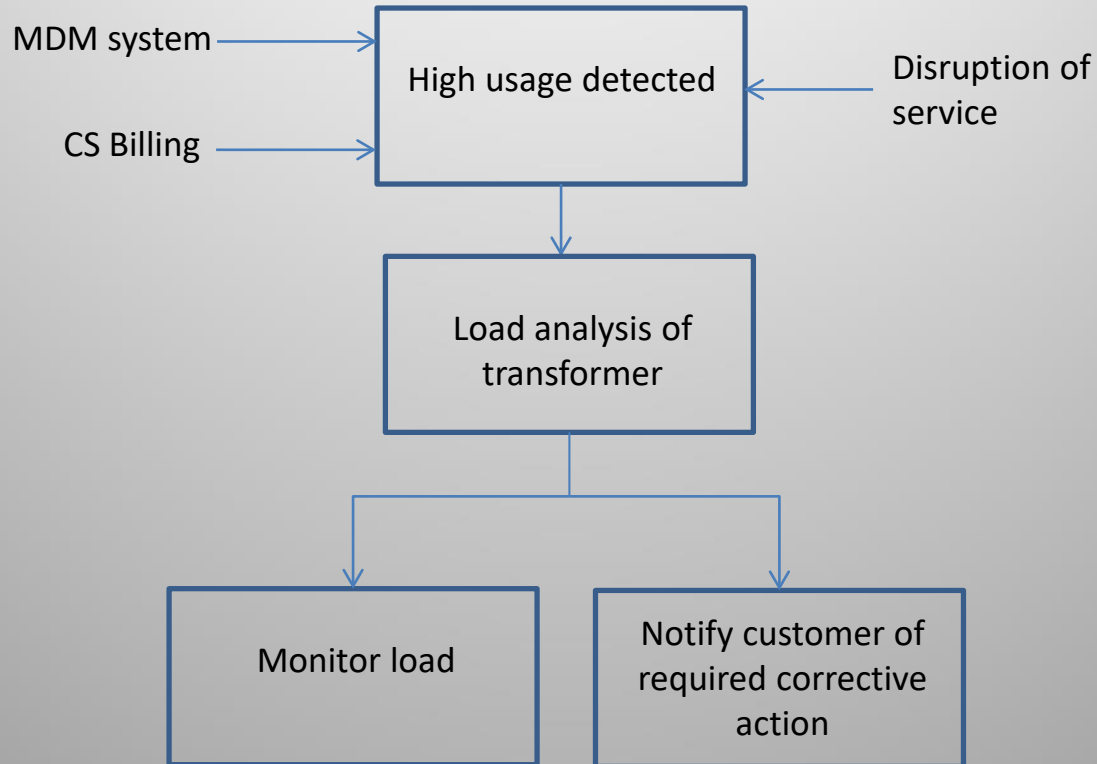
If, in the opinion of the Electric Department, service to a customer creates interference with the quality of service supplied to neighboring customers, including those situations where the customer fails to comply with these Regulations and the Codes, the Electric Department may require the customer to provide at the customer's own expense such special or additional equipment as is required. The Electric Department may, in its discretion, provide such equipment if customer fully pays the net estimated installed cost of such equipment. **If the customer refuses to provide its own corrective equipment, or to reimburse the Electric Department for the cost of such additional or special equipment as is required to eliminate interference with the quality of service to neighboring customers resulting from the failure to install corrective equipment or take appropriate corrective practices, Utilities may refuse or discontinue the customer's service.**

See attached invoice and contact our Distribution System Designer or Asset & Planning Designer at (719) 322-2092 to schedule necessary upgrades.



Per Fountain Code

Process Flowchart



Questions

- Questions and comments
- Thank you!

