Memorandum

Prepared for: GUC Electric Engineering Department

Project Title: Master SCADA Replacement Design

Project No: GUC026900

Technical Memorandum No. 3.3.3

Subject: **Asset Management Tagging Standards**

Date: August 4th, 2011

To: Todd Rouse, PE

From: Advanced Enterprise Systems Corporation (AESC)

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1. MEMORANDUM INTENT

This memorandum defines a common tagging system for sites, equipment, and data points. The tagging and identification standards defined herein are based on existing identification systems of the utility, national cad institute, and ISA standards. The design team has defined these standards to accommodate the current and future expansion of utility sites and systems.

Beyond asset identification, the system defined herein is further designed to achieve efficient data management in sorting, filtering, data analysis, reporting, and SCADA development.

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2. INTRODUCTION

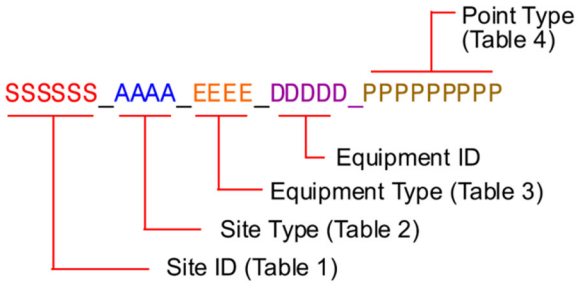
This Technical Memorandum (TM) is prepared for the GUC Electric Supervisory Control and Data Acquisition (SCADA) Upgrade Project. The purpose of this TM is to define the Asset Management Identification Plan (AMIP) for the system and designed to effectively contribute to the final upgrade business goals and objectives established for this system. These business goals and objectives have been defined through various discussions and meetings with GUC's direct and indirect stakeholders. These discussions have focused on lessons learned from past projects as well as objectives set forth herein related to defining the SCADA tagging and documentation identification requirements for the upgrade project.

The AMIP defined herein creates a comprehensive equipment and documentation identification system focused on scalability, maintainability, accessibility, and intuitive operability. The system is designed to bring together the many systems and infrastructure that make up the utility (existing and future) into an organized and defined identification system.

The tagging details and numbering systems presented herein are intended to establish identification of equipment and documentation that work together to form the AMIP. The drawing, equipment and instrument tagging are integrated with the specific geographical and equipment identification schemes to form a system that meets the goals of GUC and standard engineering and asset management identification practices.

3. EQUIPMENT TAGGING

The following diagram shows the equipment and instrumentation tagging logic. This logic is designed to meet the goals for the identification plan and uniquely define instrumentation, equipment, and data while maintaining correlation between documentation, equipment systems and geographical locations.



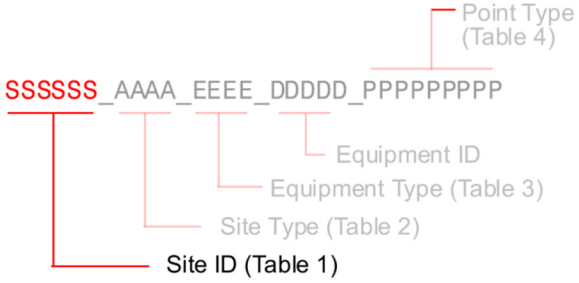
This tagging logic can be understood through correlation with the following tables and drawing identification logic defined below.

The tagging includes a combination of alpha and numeric identification codes that are intended to work together to meet the goals of the system while bringing an intuitive and easily coordinated database to the SCADA infrastructure.

Figure 1 - Asset Tag System

In general the tag length can be up to 32 characters. The Site ID, Site Type, Equipment Type, and Equipment ID make up the identification tag that may be found at the asset, equipment, or device. The point type is appended to this tag to represent data points or specific information related to the asset, equipment, or device. The full string is represented in SCADA and carried throughout all business and enterprise systems as a unique identifier for the specific data point.

3.1 Site ID (SSSSSS)



The following table (Table 1) illustrates the Site ID. It is the intention of this identifier to organize equipment and systems in to geographical areas. The Site ID is an identifier used in the AMIP to identify the geographical site in which the equipment is located. The Site ID's are defined herein as a six digit or less alphanumeric string established from lessons learned related to remote site naming.

Figure 2 – Site ID

The Sites are defined below with three non-site specific identifiers; transmission, distribution, and generation. These identify the unique Site ID for equipment not located at the sites listed.

Table 1 - Site ID

SiteID	Description	Address	Latitude	Longitude
GEN	Generation Sites			
DIST	Distribution Sites			
TRANS	Transmission Sites			
EBYP	Eastern Bypass Substation	2350 Old Pactolus Road	35.62376	77.33401
EVAN	Evans Street Substation	190 E. Howell Street	35.60000	77.37442
BLFK	Bells Fork Substation	4000 Bells Chapel Road	35.56190	77.35050
DAVE	Dickinson Avenue Substation	2240 Dickinson Avenue	35.60000	77.39858
EBYP	Eastern Bypass Substation	2350 Old Pactolus Road	35.62376	77.33401
G231	Greenville 230 Substation	1101 N. Holly Street	35.62573	77.36529
G232	Greenville West 230 Substation	3280 MacGregor Downs Rd.	35.61427	77.43261
MGDN	MacGregor Downs Substation	3280 MacGregor Downs Rd.	35.61276	77.43213
MOG	Main Office Generator	400 S Washington Street	35.61204	77.37442
PCMH	PCMH CUP	518 Moye Blvd.	35.60778	77.39905
PPNT	Power Plant Substation	190 Plant Street	35.61549	77.37888
VERN	Vernon White Substation (TOW)	266 Vernon White Road	35.54105	77.39765
WELL	Wellcome Substation	5595 NE Greenville Blvd.	35.65600	77.35200
WINT	Winterville Substation	490 W. Firetower Road	35.55155	77.39340
WSDE	Westside Substation	1101 B's Barbeque Road	35.61731	77.42210
LMR1	Radio Tower	490 Aqua Lane	35.61127	77.30344

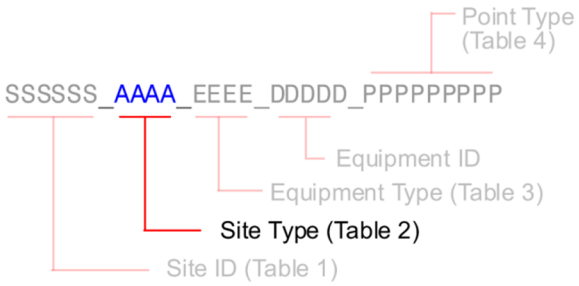
ECU	ECU Substation/Generator	150 Ficklen Drive	35.59946	77.37013
EVAN	Evans Street Substation	190 E. Howell Street	35.60000	77.37442
NSDE	Northside Substation	300 Staton Road	35.65107	77.36152
PGAM	P&G Substation/Generator	500 Industrial Blvd.	35.64420	77.35826
RTWR	Radio Tower	490 Aqua Lane	35.61127	77.30344
SSDE	Southside Substation	130 SW Greenville Blvd.	35.57497	77.38613
264A	264A Recloser	.500 US 13	35.58900	77.46650
38KV	Worthington Xrds Recloser	5173 County Home Road	35.53120	77.34850
903N	903N Recloser	1573 NC 903N	35.69409	77.31094
FRGL	Frog Level Substation	3308 Frog Level Rd.	35.56327	77.44514
HW33	NC 33E Recloser	5547 NC 33E	35.58845	77.26715
MTPL	Mt. Pleasant Substation	1039 Belvoir School Rd.	35.66427	77.40635
OKLY	Oakley Road Recloser	3378 Oakley Road	35.69197	77.31954
PACT	Pactolus Recloser	525 Second Street, Pactolus	35.62500	77.22100
PTVR	Pactolus Regulator A	585 US 264E	35.62300	77.22900
PTVR	Pactolus Regulator B	585 US 264E	35.62300	77.22900
PTVR	Pactolus Regulator C	585 US 264E	35.62300	77.22900
RNST	Renston Recloser	3175 NC 903S	35.52435	77.43023
SCHC	S Church St Substation (TOW)	2936 S Church St., Winterville	35.51595	77.40601

SHAM	Shamrock Recloser	5000 Old Tar Road	35.52386	77.38468
WHIC	Whichard Recloser	4700 Whichard Road	35.66501	77.32028
	Stokes Recloser	2863 NC 903N	35.71700	77.26200
BLJK	Black Jack Recl/Reg	2624 BJ-Grimesland Road	35.50396	77.24567
HELN	Helens Xrds Recloser	6957 County Home Road	35.46869	77.34800
	Cal Jones Recloser	4647 Cal Jones Road	35.41611	77.26122
CRAN	Crandells Recloser	3400 NC 903N	35.72200	77.24200
BVRG	Belvoir Regulator	2389 NC 33W	35.99179	77.41360
DHC	DH Conley Generator	2006 Worthington Road	35.53021	77.32345
DYRF	Cox Comm. Generator	1150 Sugg Parkway	35.66100	77.34100
ESDE	Eastside Substation	1595 SE Greenville Blvd.	35.59042	77.34768
HLWD	Hollywood Substation	2032 Mills Road	35.53091	77.31943
JHR	JH Rose HS Generator	600 W Arlington Blvd.	35.59471	77.38499
KST1	Karastan Generator 1	2007 Dickinson Avenue	35.60102	77.39038
KST2	Karastan Generator 2	311 Staton Blvd.	35.65253	77.36071
MTRC	Metrics Generator	1240 Sugg Parkway	35.66100	77.33900
NACO	Nacco Generator	5200 Martin Luther King Jr Hwy	35.65100	77.34100
OTAR	Old Tar Substation (TOW)	4874 Old Tar Road	35.59291	77.38518
SIMP	Simpson Substation	1200 LT Hardee Road	35.57839	77.30251

SOM1	ECU School of Medicine Generator 1	2205 W 5th Street	35.61195	77.40433
SOM2	ECU School of Medicine Generator 2	2205 W 5th Street	35.61195	77.40433
STTN	Stokestown Substation	3850 NC 102 E	35.43059	77.29629
STVR	Stokes Regulator	2665 NC 903N	35.71400	77.27200
	43N Recloser	4143 NC 43N	35.64803	77.46208
	Avon Road South Recloser	2920 Avon Road	35.57033	77.27082
	Bell Arthur Recloser	4689 Stantonsburg Road	35.60451	77.48178
	Belvoir Recloser	3077 NC 33W	35.67911	77.43284
	Gardnersville Recloser	9580 County Home Road	35.39047	77.29654
	Gum Swamp Road Recloser	800 Gum Swamp Road	35.68516	77.43818
	Mobleys Bridge Recloser	3340 Mobleys Bridge Road	35.54702	77.26184
	Speight Seed Farm Recloser	2800 Speight Seed Farm Road	35.55204	77.48500
	Staton Mill Recloser	2000 Staton Mill Road	35.69217	77.34879
	Sugg Parkway Substation	Prescott Drive	35.66400	77.34400
LMR2	Operation Center	801 Mumford Road	35.63134	77.36172
PEC	Progress Energy (Skaale)	3401 Hillsborough Street, Raleigh	35.79020	78.62140
CNTL	Control Room	801 Mumford Road	35.63029	77.36325
NCP1	NCEMPA (Electricities)	1427 Meadowwood Blvd., Raleigh	35.82002	78.61258
NCPA	NCEMPA (Electricities)	1427 Meadowwood Blvd., Raleigh	35.82002	78.61258

OPCN	Operation Center	801 Mumford Road	35.63134	77.36172
SHOP	Transformer Shop	801 Mumford Road	35.63147	77.36337

3.2 Site Type ID (AAAA)



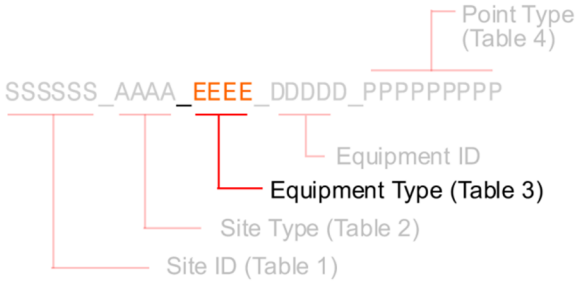
The following table (Table 2) illustrates the Site Type ID. It is the intention of this identifier to identify the type of site located at the geographic location. The Site Type ID is a typical identifier defined herein as a four digit or less alpha-numeric character string.

Figure 3 - Site Type

Table 2 - Site Type

Site Type	Description
SUB	Substation
CAP	Capacitor Bank
GEN	Generator
115K	115K Site
34KV	34KV Site
12KV	12kv Site
REGU	Regulator
RECL	Reclose
CUST	Customer
METR	Meter
COMM	Communications

3.3 Equipment Type ID (EEEE)



The following table (Table 3) illustrates the Equipment Type. It is the intention of this identifier to organize equipment by type within a site. The Equipment Type is an identifier defined herein as a four digit or less alpha character string. This Equipment Type character set defines the equipment type.

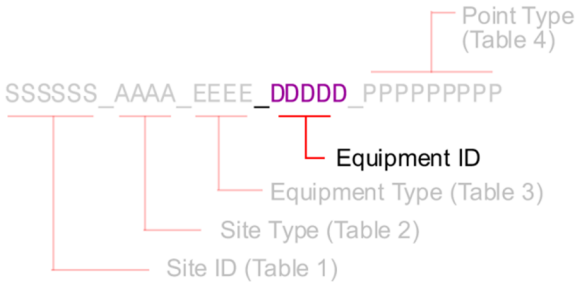
Figure 4 – Equipment Type

Table 3 – Equipment Type

Equip Type ID	Description
CKSW	
XFMR	Transformer
IED	
SWCH	Switch
BBKR	
FBKR	
REGU	Regulator
LTC	
CAP	Capacitor Bank
RTU	Remote Terminal Unit
BATT	Battery
BUS	Bus
SITE	
SWBD	
GEN	Generator
PLC	

METR	Meter
UPS	Uninterruptable Power Supply

3.4 Equipment ID (DDDDD)

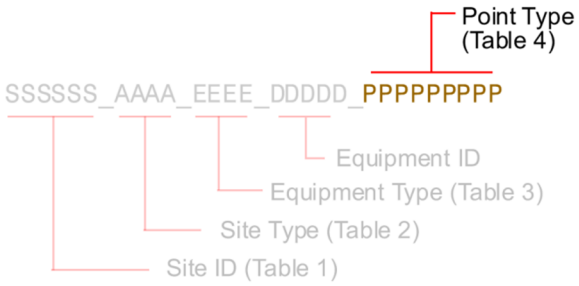


The five digits or less equipment ID (DDDDD) is an alpha-numeric identifier of a specific piece of equipment. This number will typically be a numeric value representing the index of a device within a group of equipment types at the same location and site type.

This number or id can represent an existing legacy identifier for existing equipment in the field.

Figure 5 – Equipment ID

3.5 Point Type (PPPPPPPPP)



The following table (Table 4) illustrates the Point Type. It is the intention of this identifier to identify the type of variable or data point the data represents. This identifier is mainly used by SCADA and any digital communications of data representing the given point. The full tag string will represent a unique identifier for the data representing the point and will be carried across the enterprise systems and historians.

Figure 6 – Point Type

Table 4 – Point Types

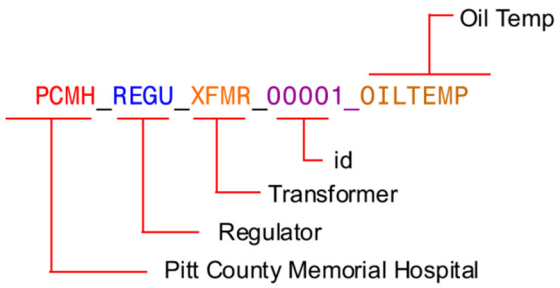
Point Type	Description
VOLTS	Voltage
AMPS	Amperes
TEMP	Temp
LEVEL	Level
POSITION	Position
KW	kilowatts
KVAR	
PF	Power Factor
SPRING	

69SWITCH

4. ASSET MANAGEMENT IDENTIFICATION EXERCISE

The following exercise is designed to illustrate how the AMIP works.

Example 1:



Let's say we have a piece of equipment tagged as follows:

PCMH_REGU_XFMR_00001_OILTEMP.

What does this tag tell us; let's analyze, take a look at Figure 7 on the left.

As you can see this tag can tell us everything we need to know to identify the type of data it represents as well as its specific location within the system.

Figure 7 – Tagging Example 1