



**METROPOLITAN ATLANTA RAPID TRANSIT AUTHORITY**

**INDUSTRY DAY  
FOR  
SYSTEMWIDE TRACTION POWER &  
AUXILARY POWER SYSTEM UPGRADE**

# AGENDA

- 9:30 – 10:00 AM Participant Sign-In
- 10:00 – 10:05 AM Welcome – Keli Davis, Contract Specialist
- 10:05 – 10:15 AM CIP Overview - David Springstead,  
AGM Capital Programs & Development
- 10:15 – 11:00 AM Traction Power/Auxiliary Project Overview  
Everton Reid, Project Manager II
- 11:00 – 11:10 AM Disadvantage Business Enterprise – Antoine Smith,  
Manager, Supplier Diversity – Office of Diversity & Inclusion
- 11:10 – 11:40 AM Questions & Answers
- 11:40 – 11:45 AM Closing – Jose Peraza, Contract Specialist
- 11:45 – 1:00 PM Site Visits to Lindbergh Station & Networking

# PURPOSE OF INDUSTRY DAY

To provide:

1. A high level overview of projects on the horizon at MARTA
2. An opportunity for proponents to meet and network
3. A synopsis of the replacement activities for the Traction Power and Auxiliary Power Low Voltage Switchgear System-wide.



# WELCOME TO ATLANTA & MARTA

- Started bus and rail combined service in 1979
- 9<sup>th</sup> largest transit system in the U.S.
- Approx. 500,000 passengers daily (bus and rail)
- 338 rail cars, 48 miles of service via four lines  
Gold, Red, Blue and Green
- 122 miles of track
- 565 buses, over 100 routes
- 211 Mobility (paratransit) vehicles



# CIP OVERVIEW

MARTA's Capital Improvement Program (CIP) provides for the rehabilitation, replacement and enhancement and expansion of the Authority's infrastructure, facilities, equipment and rolling stock.

The current Ten (10) Year CIP is approximately \$2.5 Billion, equating to roughly \$250 million per year.

MARTA is looking to expand and provide more service to the region; however, being a 37 years old (middle aged) transit system, we have been and will continue to be in a steady state of renewal with heavy investment in “state of good repair” projects.

## ***SAFE-SECURE-SUSTAINABLE***

### Underway:

- CCTV & Video Analytics
- Audio Visual Information Systems (AVIS)
- Brady Mobility Facility
- Fire Protection System Upgrade (FPSU)
- Tunnel Ventilation System (TVS)
- Uninterruptible Power Supply (UPS)
- Standby Power Generators
- Train Control/SCADA (TCSU)
- Bus, Mobility and Maintenance Fleet Procurements
- Elevators & Escalators
- Sustainability/Greening – ISO14001 cert.
- Transit Oriented Development (TOD)

# CIP OVERVIEW

## On the Horizon:

- Bus & Rail Facility Rehabilitation and Expansion  
3 Bus Facilities, 3 Rail Yards, 1 Heavy Maintenance Fac. (Plant)
- Bus Procurement
- Mobility Vehicles
- Rail Vehicle Procurement (250 - 350 rail cars)
- Track Renovation IV (steel, switches and ties)
- Emergency Trip System (ETS)
- Art in Transit (AIT)
- Pavement & Bridges
- MARTA/COA Referendum



# PRIMARY GOAL (TPSS)

Primary Goal: Replace and/or refurbish existing aged equipment in MARTA Traction Power Substations (TPSS) and Gap Breaker Stations (GBS), and bring the facility to a state of good repair.

Two separate contracts:

- East-West line contract has (19) TPSS and (6) GBS
- North-South line contract has (30) TPSS and (7) GBS
- Goal to complete (2) TPSS and (1) GBS per year per each contract
- Traction Power to the contract site de-energized during construction



# PRIMARY GOAL (AUX)

Primary Goal: Remove and Replace existing aged Auxiliary Low Voltage equipment (AUX) in MARTA and bring the facility to a state of good repair.

Two separate contracts:

- East-West line contract has (23) facilities (2 Sub-stations each)
- North-South line contract has (22) facilities (2 Sub-stations each)
- Goal to complete (4) Auxiliary stations per year per each contract
- Auxiliary Power to the contract site energized during construction

# AUXILIARY/TRACTION POWER SYSTEM UPGRADE STAFFING

- Project Manager – Everton Reid
- Resident Engineer – Kaci Gamble
- Contract Specialists – Keli Davis & Jose Peraza
- Design Lead Traction – Sunish Mathew  
Tim Ledbetter  
Saiid Nikouee
- Design Lead Auxiliary– Conrad Samuels  
Xianwei (Henry) Wu

# AUXILIARY/TRACTION POWER SYSTEM UPGRADE

## GENERAL INFORMATION

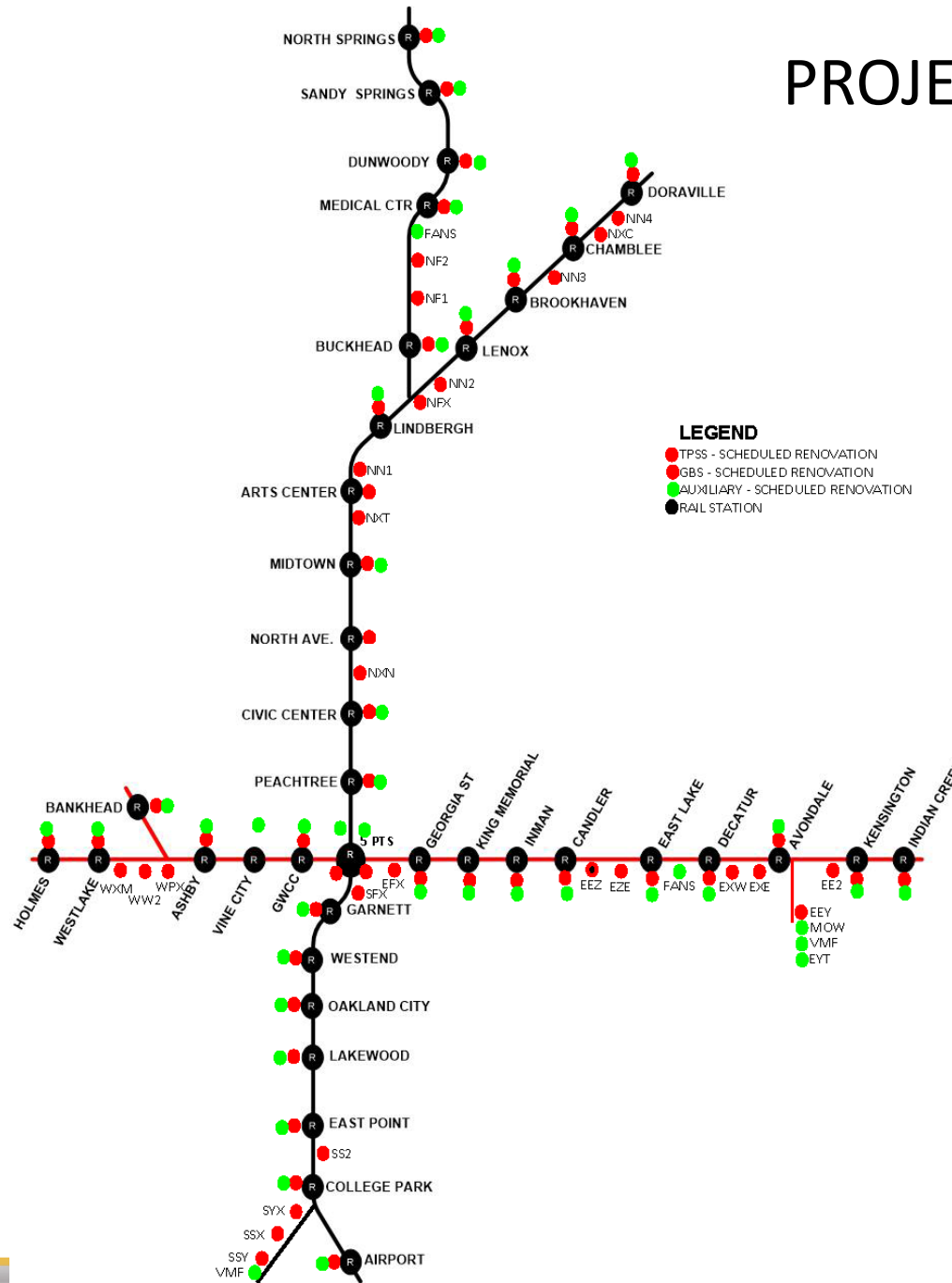
- 10 year installation schedule
- Detailed design for each location by the contractor. MARTA only provides typical design for each type
- IFB process - low responsive and responsible bid
- Federally funded – Buy America
- DBE participation percentage has not been determined

# AUXILIARY/TRACTION POWER SYSTEM UPGRADE

## IMPORTANT TENTATIVE DATES

- Nov 2017 – Project advertisement
- Dec 2017 – Pre-bid conference and site visit
- Feb 2018 – Bid receipt
- Feb 2018 – Bid opening
- Late Spring 2018 – ANTP
- TBD – SNTP

# PROJECT SITE PLAN



# TRACTION POWER SYSTEM UPGRADE

## GENERAL SCOPE OF WORK

- Demolition of existing TPSS/GBS equipment
- Building Structure and Architectural repair/enhancement
- Testing/conditional replacement of existing cables
- Underground Utilities in the courtyard
- Integrate TPSS/GBS Smart technology into MARTA SCADA system

# TRACTION POWER SYSTEM UPGRADE

## GENERAL SCOPE OF WORK (cont.)

- Replacement of TPSS/GBS equipment
  - (18) indoor 27KV class, main-tie-main AC switchgear
  - (12) walk- in type prefab 27kV class outdoor AC switch gear.
  - (43) 3MW, 12 pulse rectifiers, AC & DC Bus ducts
  - (62) 750 VDC switchgear, and (440) DC breakers
  - (24) indoor manual DC disconnect switches
  - (62) Local Control Panels (LCP)
  - (62) 125VDC control power battery banks, and chargers



# TRACTION POWER SYSTEM UPGRADE

## GENERAL SCOPE OF WORK (cont.)

- Refurbish existing equipment
  - (34) Cast-coil type and (27) oil type Rectifier Transformers
  - (19) indoor 27KV class main-tie-main AC Switchgear
  - (18) 3MW, 12 pulse Rectifiers
- Mechanical Ventilation
- (11) Super capacitor energy storage system
- Lighting and control power upgrade
- Dielectric Flooring replacement

# AUXILIARY LOW VOLTAGE SYSTEM UPGRADE

## GENERAL SCOPE OF WORK

- Replacement of Auxiliary equipment
- Provide safety plans and sequence of work for each location
- Providing temporary power to station
- Providing structural, architectural, and mechanical upgrades
- Integration to MARTA's SCADA system

# AUXILIARY LOW VOLTAGE SYSTEM UPGRADE

## GENERAL SCOPE OF WORK

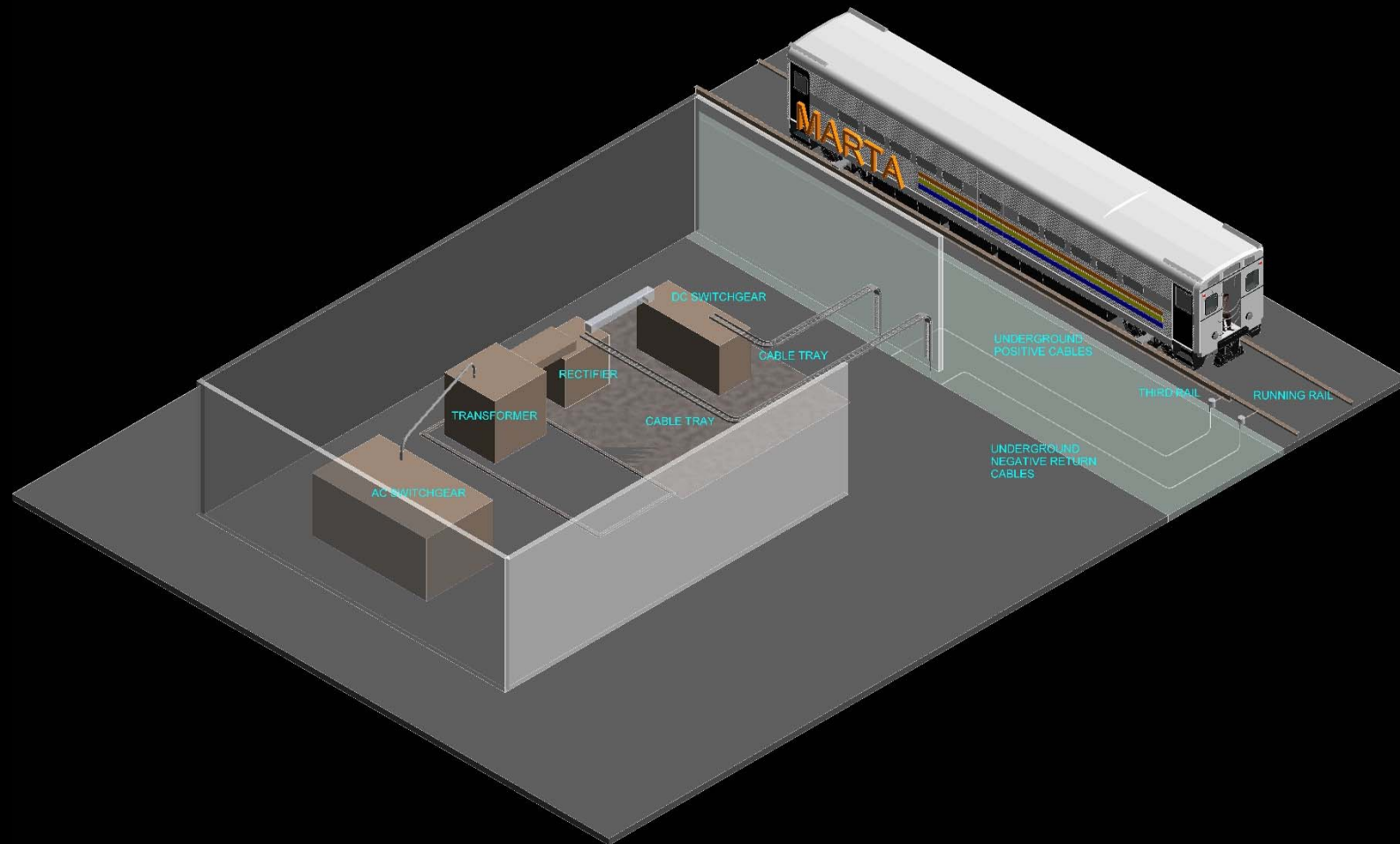
- Replacement of Auxiliary components
  - (71) indoor 27KV class, Main
  - (71) indoor 19.8kV/480 Volt Transformer.
  - (90) Low Voltage AC Switchgear/Switchboard
  - (60) Indoor 480 Volt Automatic Transfer Switches
  - (62) Indoor Manual Transfer Switches
  - (172) Breakers
  - (69) Knife-Switches

# TRACTION POWER SYSTEM UPGRADE

Design Lead  
Sunish Mathew

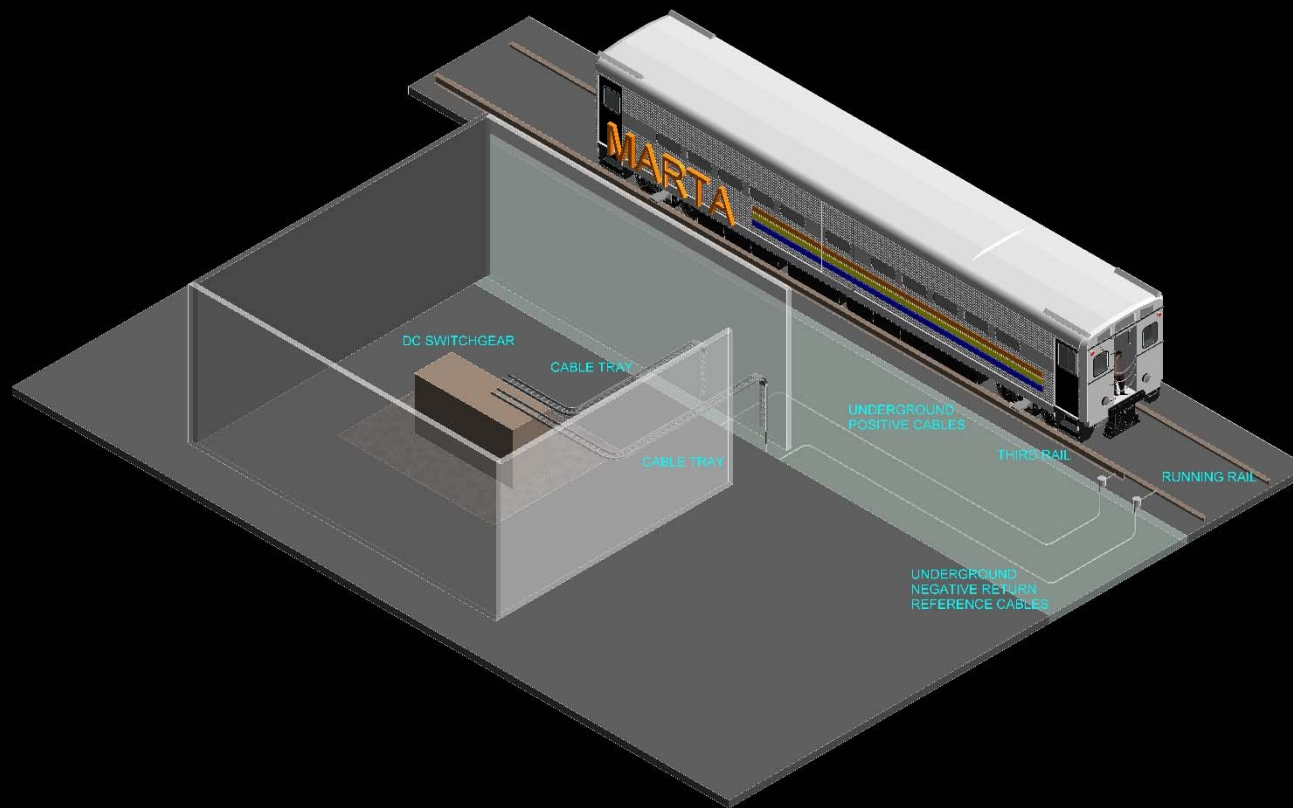
# TRACTION POWER SYSTEM UPGRADE

## TYPICAL TPSS ROOM LAYOUT



# TRACTION POWER SYSTEM UPGRADE

## TYPICAL GBS ROOM LAYOUT



# TRACTION POWER SYSTEM UPGRADE

## DESIGN TYPES

- 62 total locations, classified to (8) design types

Need to develop drawings for each location

MARTA will provide typical drawings for each design type

Type 1 - Indoor Substation; Oil-filled Transformer(s).

Type 2 - Indoor Substation; Dry-type Transformer(s).

Type 3 - Indoor/Outdoor Substation, Outdoor AC Switchgear and Oil-filled Transformer(s).



# TRACTION POWER SYSTEM UPGRADE

## DESIGN TYPES (CONT.)

Type 4 - Indoor/Outdoor Yard Substation, Outdoor AC Switchgear and Oil-filled Transformer(s).

Type 5 - Indoor Yard Substation, Dry-type Transformers.

Type 6 – WPX Gap Breaker Station.

Type 7 - Typical Gap Breaker Station.

Type 8 - Pre-fabricated Substation; Dry-type Transformer.

# TRACTION POWER SYSTEM UPGRADE

## SYSTEM POWER

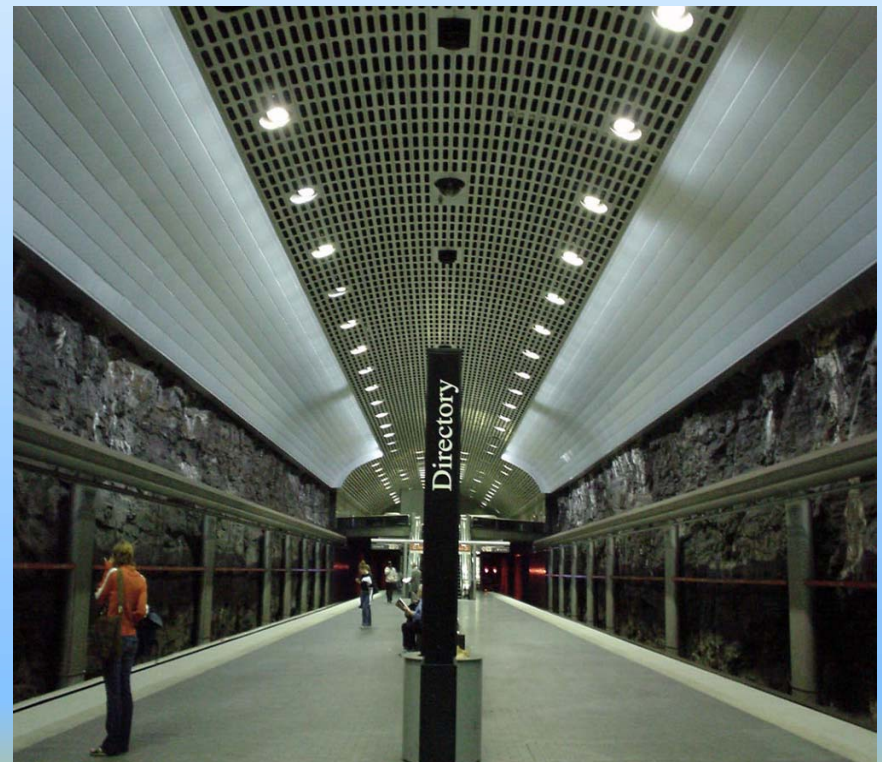
- Incoming AC  
Georgia Power 19.8 KV, 3 Phase, 60Hz
- Rail Traction Power  
750VDC Nominal

# AUXILIARY LOW VOLTAGE SYSTEM UPGRADE

Design Lead  
Conrad Samuels

# AUXILIARY LOW VOLTAGE SYSTEM UPGRADE OVERVIEW

1. Our substations are either bottom or top fed 20KV GPC redundant feeders.
2. Each GPC feeder can provide service to multiple substations at a time, this includes both our APSS and TPSS.
3. Main substation components
  - Medium voltage switchgear
  - Transformer
  - Low voltage switchgear
  - Switchboards
4. Typical Station Loads
  - Uninterruptible Power Systems
  - Automatic Train Control
  - Facility/Station Lighting
  - Emergency Ventilation
  - Elevators & Escalators



# AUXILIARY LOW VOLTAGE SYSTEM UPGRADE

## APSS CRITICAL LOADS

Lighting and people movers are critical for our operations



Automatic Train Control systems makes it possible system supervision.





# AUXILIARY LOW VOLTAGE SYSTEM UPGRADE DESIGN CONCEPTS

CONCEPT 1 - above ground stations with a main-tie-tie-main configuration.

CONCEPT 2 - courtyard set-up and a smaller equipment footprint and scope of work.

CONCEPT 3 - similar in configuration to design Concept 1. They are primarily underground stations and feed our emergency ventilation systems.

CONCEPT 4 - fan facilities that will undergo much needed upgrades because of water intrusion and structural deterioration.

CONCEPT 5 – upgrade of equipment at two of our yard locations, with the addition of a Fire Pump system feed from the main switchgear.



# AUXILIARY LOW VOLTAGE SYSTEM UPGRADE

## SCOPE

- Temporary equipment will be utilized.
- Demolishing the existing switchgear and replacing it with new equipment.
- New components will be interfaced with our SCADA system.
- System operability tests.
- Training maintenance personnel.

## DELIVERABLES & STANDARDS

- As Builts
- Equipment Certificates
- Test Reports
- O & M Manuals
- Design & Safety Standards



# DIVERSITY & INCLUSION

- DBE Goal Requirements
- Certified DBEs (GAUCP Directory)
- Good Faith Efforts
- Equal Employment Opportunity Requirements
  - EEO Statistical Data Form
  - EEO Policy Statement
  - Affirmative Action Plan

# QUESTIONS & ANSWERS

## PANEL