ITS Substation Access Only Training – Module One

Ref #	Graphics (TBD)	Narration
	Title slide and welcome screen: ITS Substation Access Only Module 01: Substation Safety and Entry Procedures	Music/no narration
	Title: Course Introduction Graphics: Use the opening slide graphics with faded gray photos. Avatar with PPE on fades in when "Both individual, and substation, safety …." Text: Float in 1-5 in narration box	This course is designed to requalify personnel to safety enter, exit, and perform non-electrical work in a substation. It defines the relevant safety guidelines, hazard identification, and work considerations for an energized environment. This training does not authorize you to perform switching or change the status of any equipment on the Integrated Transmission System (ITS). Both individual and substation safety are emphasized throughout the program. This program is divided into the following online modules. (Float in – no narration) 1) Substation Entry and Safety Procedures 2) Substation Equipment & Work Considerations in an Energized Environment
	Title: Course Topics Graphics: Generic background Text: 1. Apply safety rules and procedures before and after entering a substation. 2. Identify basic substation equipment and explain any specific safety considerations associated with equipment. 3. Identify voltages and energized equipment to ensure proper minimum approach distance is maintained. 4. Understand your level of qualification and work authorization in a substation environment, as well as	And, here are the topics we'll review in these two modules. 1. Apply all safety rules in accordance with safety procedures before and after entering a substation. 2. Identify basic substation equipment and explain any specific safety considerations associated with equipment. 3. Identify voltages and energized equipment to ensure proper minimum approach distance is maintained. 4. Understand your level of qualification and work authorization in a substation environment, as well as GTC's expectations for work sites. 5. Apply all applicable rules and regulations when performing non-electrical work in a substation, such as spreading gravel, delivering materials & equipment, spraying herbicide, and other authorized activities.

	GTC's expectations for work sites. 5. Apply all applicable rules and regulations when performing non-electrical work in a substation, such as spreading gravel, delivering materials & equipment, spraying herbicide, and other authorized activities.	
	About This Module Graphics: Fly ins: Substation Entry with Clipboard, other related images Text: This module will provide the tools you need to safely enter and perform non-electrical work in a substation.	You have already attended initial Substation Access Only training, and you should be familiar with each of the concepts covered in this re-qualification program.This course serves as a refresher to prepare you for the final evaluation test at the conclusion of the e-learning. This module covers the topics you need to know to safely arrive at, enter, and exit a substation environment There will be some review questions throughout the program to help prepare you for the final evaluation.
	Title: Navigation (Generic nav instructions)	Want to learn about course navigation? Click the NAV button for a walkthrough.
	Let's Get Started Substation Entry and Safety Procedures	Now, let's get into our first module, Substation Safety and Entry Procedures.
	Section: Arriving at a Substation	
	Title: You're on Your Way Graphics: Substation Gate Entry-New station. Maybe have avatars in meeting outside gate, one with clipboard in hand, one with danger triangle overhead (responding to outage) Text: - Attend meeting - Perform work - Deliver supplies and equipment -	Think about the various reasons you enter a substation. You may be there to attend a meeting, to deliver supplies or equipment, or to perform work, such as applying herbicide or repairing a fence. Whatever your reason for visiting a substation, to protect yourself and others, you must know the proper safety procedures, communications guidelines, and potential hazards in the area.

	Title: Before You Enter: First Steps]Graphics: (float in 1-3) Steps: 1. Conduct a visual inspection Sign into the substation	There are some important items to take care of before you enter the substation, These ensure your safety. The first two steps you'll always take are: one: conduct a visual inspection and two: Sign into the substation.
	Title: Before You Enter: Step 1 Graphics: Paragraph One: Visual Inspection of Outside; GSOC Control Center Paragraph Two: Substation Gate Entry-New station. Avatar looking, listening, Text: Paragraph One: Large 1: Conduct visual inspection. Large 2: Call GSOC Paragraph Two: Look for - Downed Lines, - Oil leaks, - - Broken porcelain, and - smoke - Listen for abnormal sounds.	Let's break these down, starting with visual inspection. When pulling up to a substation, perform a visual and audio scan to ensure that it's safe to approach the area. Look for downed Lines, oil leaks, broken porcelain, and smoke. Then, listen for any abnormal sounds.
	Title: Before You Enter: Step 2 Graphics: GSOC Transmission Control Center; GTC Ownership Sign Text: Provide the following information: - Name and Company Name - Contact Number - Key Number - Purpose of visit	The second step is to sign into the substation. You may either sign in electronically through the SENT app, or you may call GSOC's Transmission Control Center or your EMC dispatcher. GSOC's contact information can be found on the GTC Ownership Sign located on the substation fence – or you can make a note of it now. The number is 1-800-241-5375. Provide the Control Center operator with the following information: ● Name and Company Name ● Contact Number ● Key Number, and the ● Purpose of your visit Note that the key number is critical; it identifies your qualification.

	Title Job Briefing Graphics: Job Briefing Text: Your job briefing should include: ● Potential hazards ● Work tasks ● Emergency Plan	If others are going into the substation with you, then you must do a job briefing before you enter the station and begin work. During the job briefing you'll assess potential hazards and review the tasks you're there to do. You should also identify a plan of action in case of emergency, noting your physical location as well as the closest medical facilities. If you're by yourself, there's no need to have a documented job briefing, but you should still be aware of potential hazards.
	Title: Entry: Required PPE Graphics: Avatar with PPE for minimum entry. Can place avatar outside a substation gate. Text: Minimum PPE required for entry: - Hard hat - Safety glasses (as needed) - Appropriate Clothing (may be 100% natural fiber or Arc-rated clothing, based on work requirements) - Appropriate work shoes - Rubber overshoes (as needed)	Make sure you have all the required personal protective equipment before entering the substation. Inspect each piece of PPE to be in compliance. The minimum PPE required for entry includes: Hard hat, safety glasses (as needed, based on work requirements), appropriate clothing, appropriate work shoes, and rubber overshoes (as needed, based on work requirements) If you have occasional substation visits to attend meetings and maintain the MAD for electrically unqualified personnel, then 100% natural fiber clothing may be worn. However, if your job requires you to perform work activities in an energized substation on a regular basis, then AR/FR clothing (with a minimum rating of 8 calories) is required. Personnel with additional qualifications may be performing electrical tasks, such as switching, in the substation. They will be wearing additional PPE to perform these tasks.
	Title: Switching: Required PPE Graphics: Avatar with PPE for switching Text: Minimum PPE required for switching: ● Hard Hat ● Safety glasses ● AR/FR rated clothing (8 calorie minimum rating) ● High voltage rubber gloves with leather protectors ● Appropriate work shoes ● Rubber overshoes ●	PPE required for performing switching includes: A hard hat, safety glasses, arc-rated/fire-resistant clothing with a minimum of 8 calorie rating, high voltage rubber gloves with leather protectors, appropriate work shoes, and rubber overshoes If switching is being performed in the substation, all personnel present must wear a hard hat, safety glasses, rubber overshoes, and arc-rated/fire-resistant clothing with a minimum of 8 calorie rating.
	Review question	You just pulled up to a substation. What are the very first things you need to do? a) Perform a visual inspection and sign into the substation

		b) Check your safety glasses for cracks and inspect your hard hat. c) Conduct a job briefing. d) None of the above. Answer: A
	Review question	Which figure is wearing the correct PPE for substation entry? (Show two avatars – one with PPE for normal entry and one with PPE for switching)
	Review question	True or False? You don't have to have a documented job briefing if you're by yourself, but you still must identify hazards. Answer: True
	Section: Pre-Entry Hazard Assessment	
	Title: Hazard Awareness Graphics: Clip board with check marks being checked off as spoken – Visual inspection (check); Sign into Substation(check); Required PPE (check) Text: Hazard identification is recognizing potential sources of harm, and taking steps to mitigate or eliminate them.	You've done your visual inspection, signed into the substation, and made sure you have the proper PPE, but there are still a few more things to do before you can safely enter the substation. Prior to entering the station, you need to be aware of potential hazards that may be present. Hazard identification is recognizing potential sources of harm, and taking steps to mitigate or eliminate them.
	Title: Potential Substation Hazards (Interaction – tabbed image) Graphics: Substation Entry1 with tabs in two columns – away from equipment so as to not be misleading Text: What are some potential hazards in a substation? Click on each tab to find out.	What are some potential hazards in a substation? Click on each triangle to find out. When you're done, click Next to continue. No narration: Arc flash, electrical contact, wildlife, pinch points, sharp objects, and environmental conditions.
	Title: Hazard Identification Graphics: Substation - Perimeter Fence – Visual Inspection; Look for washes & holes in fence; Avatar with rubber overshoes Text: Identifying Potential Hazards - Electrical or telephone lines or trees on fence - Holes or washes - Cut fences	And, how do you identify potential hazards? Do a perimeter check to ensure that there are no trees, electrical or telephone lines, lying across the fence, and no holes or washes are present that might allow entry into the substation. Also check for cut fences that could indicate vandalism. Due to potential hazards from "step and touch" potential, if you are not wearing rubber overshoes, someone with rubber overshoes must verify all fence and gate grounds are intact prior to substation entry.

	If you are not wearing rubber overshoes, someone with rubber overshoes must verify all fence & gate grounds are intact prior to substation entry.	
	Title: Emergency Information Graphics: Substation Gate Signs; Substation Danger Sign and Substation Danger Sign2; Text Check the substation signs to ensure they're in place and in good condition.	Once the perimeter check has been done, look at the signs on the substation gate to ensure they are in place and in good condition.
	Title: Gate Grounds Graphics: Gate Grounds; Gate Grounds2 Text: Before touching the gate, make sure both gates are properly grounded. Once you've inspected the gate grounds, you can safely enter the substation.	We're still outside the substation and there's one important item left to check … the gate grounds. Before touching the substation gate, check to make sure that both gates are properly grounded. Each gate post should have a 4/0 awg ground riser attached. In some older substations you may see a 2/0 awg ground riser. A braided ground strap should be attached to the post and to the substation gate so that the gate is properly grounded. Once you've inspected the gate grounds, you're ready to safely enter the substation.
	Review Question	True or False? You must look for potential hazards in the substation prior to entering. Answer: True
	Review Question	When inspecting gate grounds, you should … Perform your inspection before touching the gate Have sunglasses on Ensure the ground strap is attached to the post and substation gate A&C above
	Section: Inside the Substation	
	Vehicle Safety Graphics: Vehicle Overhead Clearance (mimic arrows as on PPT); Cable Trays; Cable Tray Crossing Text: Park vehicle off to side Maintain a minimum distance of 20' vertically and horizontally of energized equipment Cross over cable trays at designated locations, usually marked with pylon post	If you don't need to bring your vehicle inside the substation, park it off to the side, outside the substation fence. Do not obstruct the entrance. If you're performing a task in the substation that requires your vehicle to be parked inside, make sure to maintain a minimum distance of 20 feet vertically and horizontally from energized equipment at all times. Always ensure that you have sufficient clearance for the vehicle you are operating. If cable trays are present in the substation, cross over them at designated locations, usually marked with a pylon post. If you're not sure where to cross, stop and confirm.

	Title: Secure Gate	Once inside the substation, it's a good practice to close the gate when feasible. If you're in a very small substation, closing the gate might not be possible, as it may inhibit your ability to get out safely if something happens with the substation equipment.
	Title: Situational Awareness Graphics: Situational Awareness – walking to control house. Maybe avatar looking, listening Text: Maintain a high level of situational awareness. - Visual/audio scan - Look for abnormalities (broken porcelain, missing or cut grounds - Listen for abnormal sounds **If you notice missing grounds or hear abnormal sounds, exit immediately and contact your dispatcher or GSOC**.	You did a good job of inspecting the substation for safety issues before entering, but just because you're inside now, don't let your guard down. As you begin work in the substation, remember to maintain a high level of situational awareness. Continue to do a visual, and audio, scan of the substation. As you walk towards the control house or outdoor battery cabinet, look for any abnormalities such as broken porcelain and missing or cut grounds. Listen for any abnormal sounds that may be coming from the equipment. During your visual and audio scan, if you notice missing grounds or hear abnormal sounds coming from substation equipment, exit immediately and contact GSOC Transmission Control Center and/or your EMC dispatcher with your findings.
	Minimum Approach Distance (MAD) Graphics: Demonstrate with avatar and diagram; MAD diagram Text: Minimum Approach Distance (MAD) is the minimum air (or tool) insulation distance plus an additional 1-2 feet for inadvertent movement.	When you are inside the substation, it's important to maintain Minimum Approach Distance (MAD). Minimum Approach Distance (MAD) is the minimum air (or tool) insulation distance plus an additional 1-2 feet for inadvertent movement. Minimum Approach Distance is established to protect workers from a potential electrical contact or arc flash. Workers should NOT encroach within the Minimum Approach Distance.
	The MAD Table Graphics: Perhaps fade out Avatar lines and circles and insert a substation behind him. Put the link to MAD table in a box. Text: You are an electrically unqualified worker. When you are working in a substation, you must maintain a minimum of 20' between you and/or your equipment and any energized parts in the substation. When you are planning for your	You are considered an electrically unqualified worker. When you are working in a substation, you must maintain a minimum of 20' between yourself, your equipment and any energized parts in the substation. When you are planning for your distance, you must also add an additional 1-2' to account for potential reach and movement.

	distance, you must add an additional 1-2’ to account for potential reach and movement. For qualified workers who’ve been trained to distinguish energized parts, identify hazards and work on and around electrical equipment, MAD distances vary. If you would like more information on MAD for qualified workers, click HERE to view the MAD table. Devices and specific configurations in areas of the system may be used to reduce MAD to perform certain planned work activities. However, deviation from the default table requires the completion of a detailed engineering study to support the safety of any work modifications.	For qualified workers who’ve been trained to distinguish energized parts, identify hazards, and work on and around electrical equipment, MAD distances vary. Qualified workers have undergone extensive, in-depth training on the electrical system and have been authorized to operate electrical equipment on the ITS. This Substation Access Only training DOES NOT make you a qualified worker. If you would like more information on MAD for qualified workers, click on the link to view the Minimum Approach Distance table that serves as a conservative guideline for maintaining appropriate distance. On-screen only (No VO): To facilitate the performance of certain planned work activities, devices and specific configurations in areas of the system may be used to reduce MAD. Note, however, that deviation from the default table requires the completion of a detailed engineering study to support the safety of any work modifications.
	Review Question	If you are required to drive your vehicle into the substation, what is the minimum distance required? a. 20’ b. 25’ c. 50’ Answer: A
	Review Question	Once inside the substation, it is mandatory that you close the gate. True or False? Answer: False
	Review Question	During your visual and audio scan, you notice missing grounds or hear abnormal sounds coming from equipment, What should you do? a. Investigate the problem b. Contact GSOC Transmission Control Center and/or your dispatcher c. Exit the substation immediately d. Both B&C Answer: D

	Exiting the Substation	
	Logbook Graphics: Logbook Cabinet Exterior2; Logbook Cabinet Exterior; Logbook in Outside Cabinet Text: Complete the logbook with: - Name - Date and time - Purpose of visit You should also find: - Station prints - Substation one-line diagram - Switching order pad - Operating instructions	Before you leave a substation, you may need to make an entry in the logbook. Logbooks are there to record actions that result in a change to the substation or its environment that could have future impact. You should make an entry in the logbook if you are performing any action that changes the status or configuration of the substation. For example, bringing in heavy equipment or material, mowing grass, repairing fencing, herbicide treatment, etc. An entry should include: Your name, the Date, your entry and exit Times, and the purpose of your visit. This is a very important document and must be accurate, because It can become a legal document.

		The logbook may be found in the control house, battery cabinet, or in the station print box. Wherever the logbook is located in the substation you should also find: Station Prints, the Substation One-Line Diagram, the Switching Order Pad, and the Substation Operating Instructions (if applicable).
	When You Leave the substation <u>Graphics</u>: Closed Substation Gate; avatar standing outside - leaving	When you leave the substation: ● Note any trouble found and to whom it was reported. ● Sign out of the substation either via the SENT app or by calling GSOC Transmission Control Center and/or your EMC dispatcher.
	Review Question	You must sign out before leaving the substation. True or False? Answer: True.
	Transition slide: Graphics: LIR sign (maybe a partial snip – CIP Access Controlled Area	You've just reviewed how to safely enter and exit a substation. What we've not covered yet are the Critical Infrastructure Protection – or CIP –standards and procedures for accessing and working in a substation. In this final section, we'll do just that.
	CIP Considerations	
	CIP Considerations Graphics: Transmission substation; Douglas substation Text: GTC has Critical Infrastructure Protection (CIP) substations which will either be medium impact rated (MIR) or low impact rated (LIR).	GTC has Critical Infrastructure Protection (CIP) substations. These substations will either be medium impact rated (MIR) or low impact rated (LIR). These two types of substations have certain levels of security and access requirements that must be maintained for GTC to be in compliance. Let's define the two types now.

	CIP Substations MIR Substations Any transmission substation that operates at 500kV or above, or any transmission substation having 5 or more incoming or outgoing 230kV lines. LIR Substations Any substation that is not categorized as a high or medium impact rating and has connectivity to the Bulk Electric System (BES) network.	AnMIR, substation is generally any transmission substation that operates at 500kV or above, or any transmission substation having 5 or more incoming or outgoing 230kV lines. An LIR substation is a non-radial networked substation connected at 115kV or greater that is not Medium Impact Rated. These substations contain reactive resources (such as capacitor banks) connected at 115kV or greater. They also provide the generation interconnection for any group of generation resources greater than 75MVA or any individual generation unit greater than 20 MVA.
	CIP Access Q&A Graphics: CIP MIR and LIR signage (reveal as they're described in the answer) Text: Q: that the site is restricted according to CIP standards?	Now that you know how they're defined, let's do a little Q&A about access. How will you know that a site is restricted according to CIP standards? You must take note of the signage. MIR sites will have signs indicating that the site is a "CIP Restricted Area" and the sign will have NO border markings. LIR sites will have signs indicating that the site is a "CIP" access controlled area and the sign will have a blue striped border.
	CIP Access Q&A Graphics: Control Center2. Key lock box on door Text: Contact GSOC's Transmission Control Center and/or your dispatcher. Visitors who are not CIP qualified will be escorted and continuously monitored. A key lock box is mounted on the control house beside the door as backup entry for CIP qualified personnel if the card reader does not work. GSOC's Security Network and Operations Center (SNOC) monitors CIP access.	Next, are there controls for entering an MIR or LIR substation? No, there are no controls for entering any CIP MIR or LIR substation yard, other than an ITS padlock. If you have to enter a CIP Substation, contact GSOC's Transmission Control Center and/or your dispatcher and let them know that you are entering the substation. MIR control houses are managed by card access, cameras and a visitor log book. Visitors who are not CIP qualified must be escorted and continuously monitored by a person who is CIP qualified. Since you are not a qualified operator and will not be CIP qualified, you will need to make special arrangements to be escorted if your work requires you to access CIP Restricted or Access Controlled areas, such as the control house. Most of GTC's substations are low-impact rated. Click here if you would like to learn more about the 4 types of LIR substations, as well as information on electronic locks and smart keys.
	Types of LIR Substations (Interaction - folders) Graphics: Substation Aerial View See new photos for each folder	What will you find at each type of LIR substation? Click on each folder to learn the answers. Type 1 – ● Has a control house ● Has card reader access with backup key box entry if SNOC cannot remotely unlock the door

	Text: Types 1 – 4 in narration column	Type 2 – ● Has a control house ● Does not have a card reader but the control house door is secured with an ITS 4 lock ● Inside the control house, cabinets containing relays or communications equipment connected to the network will have an electronic lock Type 3 – ● Does not have a control house ● Communications equipment is housed in an outdoor cabinet ● GTC may deem other cabinets as LIR cabinets with equipment tied to the network Type 4 – ● Houses relays inside of equipment cabinets in the field ● Has a smart key/key refresher box that will require CIP card access ● SNOC must supply a key code for access to the smart key if CIP card access does not work
	Electronic Locks LIR substations without control houses should have electronic locks on the following cabinets: Communication cabinets RTU cabinets Cap bank protection cabinets Other in-scope cabinets, as defined by GTC	LIR substations without control houses should have electronic locks on the following cabinets: ● Communication cabinets ● RTU cabinets ● Cap bank protection cabinets, and, ● Other in-scope cabinets, as defined by GTC.
	Intelligent Smart Keys Graphics: Smart key, pad lock, Cliq Connect Text: The smart key will be renewed or refreshed using the CLIQ connect application. A Bluetooth connection is made by the user between the cell phone and the smart key. (This should take 5-10 seconds.) The smart key must be renewed every 14 days or as needed to unlock the electronic lock	The smart key will be renewed or refreshed using the CLIQ connect application. A Bluetooth connection is made by the user between the cell phone and the smart key. The process should only take approximately 5-10 seconds depending on signal strength. The smart key must be renewed every 14 days or as needed to unlock the electronic lock.
	Cutting a Smart Lock Interaction: Circles (maybe put a lock in the middle)	If access cannot be gained in an LIR substation due to a damaged electronic lock, or an emergency situation occurs, you may gain access by cutting the lock. If the lock has to be cut, you must follow the cut lock procedure.

	If a Smart Lock is cut, secure the cabinet with the enclosed tamper tag and an ITS-4 lock. Contact GSOC's Security Network Operations Center (SNOC) at 770-270-7085 immediately to relay the following information: ● Substation name and cabinet where the cut lock is located ● Tamper tag number used ● Your name and ITS Key number ● Reason lock was cut (found cut, operational emergency and smart key failed, etc.) Tamper tags may only be removed with prior approval from Security Operations, except during emergencies.	Click on each item on the clipboard to review the cut lock procedure. (Not narrated) 1. If a Smart Lock is cut, secure the cabinet with the enclosed tamper tag and an ITS-4 lock. 2. Contact GSOC's Security Network Operations Center (SNOC) at 770-270-7085 immediately to relay the following information: a. Substation name and cabinet where the cut lock is located b. Tamper tag number used c. Your name and ITS Key number d. Reason lock was cut (found cut, operational emergency and smart key failed, etc.) 3. Tamper tags may only be removed with prior approval from Security Operations, except during emergencies.
	PACS Problems Graphics: Avatar standing outside photo: Control house door Text: – Card access not working – Control house doors not closing or latching – Control house doors difficult to open or binding – Control house doors or frames appear warped – Control house interior lighting fixtures burned out Notify the SNOC at 770-270-7085 to report problems with the control house access system.	You may encounter problems with the Physical Access Control System, or PACS, for reasons such as those shown here. For problems or difficulties, including any not listed here, notify the SNOC at 770-270-7085 to report problems with the control house access system.

	Module 01 Conclusion	
	Exit Instructions	To receive credit for viewing this course, you must exit properly. Click the Nav button to learn more.
	Concluding slide This concludes Module 01 of the ITS Substation Access Only course. After exiting, you can: Click on Module 02: Substation Equipment & Work Considerations in an Energized Environment to continue your Substation Access Only Re-Qualification training right away. or Logout of the LMS and return to continue your requalification in another session. You may now exit this program.	This concludes Module 01 of the ITS Substation Access Only course. After exiting, you can: Click on Module 02: Substation Equipment & Work Considerations in an Energized Environment or Logout of the LMS and return to continue your Substation Access Only Re-Qualification in another session.