SUBJECT ELECTRICAL SYSTEMS POWER SWITCHING PROCEDURE

PURPOSE

This procedure defines the responsibilities for the Kennedy Space Center (KSC) Power Distribution System configuration control and methods for changing the configuration of the distribution system through switching procedure. It also assigns responsibilities to the different departments and companies involved in switching at KSC.

SCOPE AND APPLICABILITY

This procedure is a basic operational guide to electrical systems power switching. It is important that all personnel follow the instructions of this procedure to ensure proper system configuration and personnel safety. This procedure applies to all Base Operations and Support Services (BOSS) personnel involved in eitherPower Generation, Transmission and Distribution switching (as defined in OSHA 29CFR1910.269) and Utilization Equipment switching (OSHA 29CFR1910 Subpart S). This procedure is required under BOSS Perfomance Work Statement (PWS) Section 3.2.2.2.4 and FPL-MOU-001, *Power Switching Limitation Policy at KSC/CCAFS Spaceport.*

PROCESS

1. GENERAL

1.1. General Policy Statement

1.1.1 Electrical Switching On Medium Voltage Systems

No switching will be performed on an energized medium voltage system without a properly approved Switching Order (SO), (KSC Form 26-67), or an approved detailed procedure for special operations, except for an emergency situation. Operation of switches on a de-energized or isolated system is not considered switching.

Re-energizing of medium voltage cables will not be permitted on feeders that run through manholes occupied by work personnel.

Where de-energizing switching is performed on medium voltage systems in support of a construction contractor, switching shall not be implemented unless arrangements have been made by construction management personnel with the contractor to accept the Work Permit (WP) (KSC Form 26-400) on site after switching operations are complete. Once the dWP is issued,

the Contractor shall be provided access to all necessary equipment to install the required lockout/tag out.

1.1.2. Electrical Switching on < Than 600 Voltage Systems

No switching will be performed on an energized, < 600 voltage system, within a substation without a properly approved Switching Order (SO) or an approved detailed procedure for special operations (KSC Form 26-67), except for an emergency situation or when a detailed test procedure is provided. Operation of switches on a de-energized or isolated system is not considered switching.

Where de-energizing switching is performed on < 600 Voltage system in support of a construction contractor, switching shall not be implemented unless arrangements have been made by construction management personnel with the contractor to accept the Work Permit (WP)(KSC Form 26-400) on site after switching operations are complete. Once the WP is issued, the Contractor shall be provided access to all necessary equipment to install the required lockout/tag out. Construction contractor or BOSS personnel may perform switching on branch circuits without the use of switch orders or WPs. (Branch Circuits are the circuit conductors between the final overcurrent device protecting the circuit and the outlet. Disconnect Switches shall be considered part of the branch circuit).

1.1.3 Overhead Bridge Crane Testing

SOs written to support testing on overhead bridge cranes shall not require an outage. (Example; VAB Overhead Bridge Cranes). Crane Operations personnel shall contact the BOSS power console and BOSS electrical systems shop 48 hours prior to scheduled crane testing operations to request support so that SOs can be prepared and electrical shop technicians can be scheduled to support the crane testing operation(s).

1.1.4 Relay Setting – Maintenance/Preferred

SOs written to support changing of relay setting in the main substation yards to support work in manholes or other special operations shall not require an outage.

1.1.5 All Electrical Switching Operations

In an emergency the Power Console/Management is to be contacted for approval of all switching. Switching steps will be recorded as performed and after-the-fact SO will be issued.

Where a switching operation involves more than one craft (electricians, technicians and/or lineman), one SO is to be issued and approved by the Power Console to cover the entire operation. The personnel involved will perform the activities jointly.

For all switching operations the Power Console shall be contacted prior to opening the outage, and prior to starting the switching operation via two way radios when possible Radio contact: Eagle Control on NET 301/101 (OIS-JSEP). When radio communication cannot be established contact KSC 867-

7300 or KSC 867-2777 or JBEP. A call shall also be made via same method above for the closing of the outage. The Power Console, with the concurrence of supervision, may terminate a switching operation or WP that could impact critical tests or poses a safety threat to life or property.

SO (KSC Form 26-67) must be stamped with the appropriate stamp prior to leaving the Power Console area. The copy which is used in the field must have “Field Copy” stamped in the heading and the copy retained in the Power Console area must have “Office Copy” stamped in the same area.

LOTO will be performed in accordance with SHP-P-0147, *Hazardous Energy Control (Lockout/Tagout),* and the requirements of the SO and the work order.

The Power Console will use the Systems Electronic Tie-In Log (SETI) to record all daily activity between field personnel and the C-3 console.

Per SHP-P-3100, J*ob Hazard Analysis (JHA),* a job briefing will be performed as well as the completion of an EJHA form, (SHP-F-3100A).

2. POWER SWITCHING

2.1. Basic Guidelines for Power Switching

Buddy system:

All medium voltage switching will be performed by a minimum of two switching qualified personnel, “Buddies”, who will work together to accomplish the required switching operation. In additions, they should discuss the switching to perform to ensure a timely and safe operation. The only exception to the above buddy system is for On-The-Job training where a switching qualified personnel can switch with an electrical qualified personnel who is in training in the High Voltage Department on switching operations that are considered non-complicated by the supervisor.

Equipment Familiarization:

The equipment at the Space Center is unique. Study the equipment physically and read available manufacturing specifications. Learn how each type of equipment operates.

Total Electrical System:

Familiarization of the total electrical system is a must. Learn the areas of single and redundant sources of power and how they interrelate. Utilize the system status board at the Power Console office. Study individual hard copies of isolated systems from the electrical console.

Record As-Found Configuration:

Before performing switching to de-energize equipment, current phasing and voltage must be recorded in the remarks block of the switch order. This includes recording the color code of the wiring of the equipment that is going to be worked on and the configuration of all breakers in the substation or panelboard. In lieu of

documenting color code and breaker configuration a picture can be taken of the equipment that clearly shows the configuration. The information must be used to ensure proper wire terminations and phasing are correct before re-energizing the equipment. All breaker configurations must be returned to as-found positions before energizing.

Communication:

Communication when switching must be accomplished via a two way radio or OISM between the field personnel and Power Console personnel. Prior to the start of any switching operation a call must be made via two way radios to the Power Console to get a “Go” to start. If no SO is be used then a call must be made via two way radios after the completion of the switching operation to inform the Console as to the configuration of the system. Telephone numbers in section 1.1 may be used when radio communication cannot be established.

Personal Protective Equipment (PPE):

PPE usage is dictated by requirements in BOSS Policies SHP-P-0303, *Electrical Safety*, and PPS-P-2011, *Electrical Safety For Power Generation, Transmission And Distribution Systems*, for medium voltage gear. When the NFPA 70E tables call out for no PPE required, the minimum requirement for BOSS personnel is:

- Safety Glasses
- Leather Footwear
- Long Cotton Pants
- Long-Sleeve Cotton Shirt
- Gloves (does not have to be voltage rated)

2.2. Procedures for Executing Switching

Understand the purpose for switching on the system.

Complete a EJHA per Procedure SHP-P-3100

Know the configuration of the electrical system BEFORE executing the switching.

Open the outage by calling the Power Console via two way radio. Ensure you have a “GO” from the Power Console before starting switching and all affected parties are notified.

The minimum protective clothing and PPE shall be that required for a Hazard/Risk Category 2 per NFPA 70E, Table 130.7(C)(16) for medium voltage switching. For Low Voltage switching (<600V) follow the NFPA 70E, Tables 130.7(C) and requirements as stated in SHP-P-0303.

Direct special attention to the status of known or potential grounds and/or temporary generator hookups, temporary power cable interconnections, and Mechanical Aerial Connectors (MAC) installed for temporary power feeds.

Check each step of the SO on the status board for medium voltage and substation switching, where applicable, to ensure it is safe to execute in the sequence as written.

If using drawings or Work Order steps as a guide to performing the switching, ensure drawing matches the panel schedule before starting. If unclear seek clarification from System Engineer (SE), Power Console, or supervision.

Agree the switching operation will, in fact, accomplish the desired configuration and purpose as stated.

Know the configuration of the electrical system when the switching is complete.

When switching is complete call Power Console to report status of the switching and report the configuration of the electrical system via a two way radio when possible.

NOTE: *SF6 Filled Equipment (VFI's, LBS's, Circuit Breakers): CAN BE SWITCHED ONLY AFTER VERIFYING APPROPRIATE GAS PRESSURE.*

2.3. Executing Neutral Grounding Resistor (NGR) Switching

SOs written to support the operation of the NGR switches shall require a notification/real time outage. This can be accomplished by sending an email to outage coordinators informing them of the NGR in circuit timeframe.
There will be three configurations at the Orsino or C5 yard as follows:

1. Relays in Preferred Settings and NGRs out of the circuit (normal)
2. Relays in Maintenance Settings and NGRs in the circuit (during manhole work entry)
3. Relays in Maintenance Settings and NGRs out of the circuit (manhole inspection only)

Switching In:

1. Change all relays in the Orsino or C5 yard to maintenance settings using an approved SO.
2. Use an approved SO to switch in the NGRs. One switch order can cover a predetermined block of time with multiple repetitive steps.
3. Switch in each NGR for all three transformers by operating the NGR VCB push button to open position or remotely by the console. (Note: all on-line transformers must be in the same configuration)
4. Verify the BOSS employee or contractor representative performing the work in the manhole has installed a Danger Tag on each VCB.

Switching Out:

1. Verify the BOSS employee or contractor representative performing the work in the manhole has removed the Danger Tag on each NGR VCB.
2. Use an approved SO to switch out the NGRs. One switch order can cover a predetermined block of time with multiple repetitive steps.
3. Switch out each NGR for all three transformers by operating the VCB push button to the close position or remotely by the console. (Note: all on-line transformers must be in the same configuration)
4. Change all relays in the Orsino or C5 yard to preferred settings using an approved SO (not required to be changed daily).

Circuit Fault Response and Testing:

In the event a fault occurs when the NGRs are in the circuit the following shall be performed before troubleshooting begins.

1. Verity all personnel are out of the manholes
2. Switch out all NGRs per the above section “Switching Out”
3. Start troubleshooting process to restore power
   *****CAUTION***
4. Ensure transformer grounding continuity is not broken when attempting to perform step #5. Review with Systems Engineer if required.
5. Verify that each NGR resistance has not changed from the nameplate value (+/- 10% ohms). Notify Engineering if the value is outside of these limits.

2.4. Switching Order (SO)

Detailed test or operating procedures developed by System Engineer can be used in place of switch orders when performing operational test on electrical systems.

Switch orders written on equipment not displayed on the status board nor requiring verification on the board can be sent via electronic format (fax or scanned into an email).

When switch orders are required per this procedure, switching will be performed from an approved SO, KSC Form 26-67.
SOss to be completed by designated personnel are as follows:

- Blocks 1 thru 12: Completed by the Power Console.
- Blocks 13 thru 14: Completed by the personnel performing the switching
- Blocks 15 : Completed by the Power Console
- Block 16 thru 18: Completed by BOSS personnel receiving WP
- Blocks 19 thru 21: Completed by the personnel performing the switching
- Blocks 22 thru 25: Completed by the Power Console for pertinent information – i.e., Alerts/Warnings

3. WORK PERMIT (WP)

3.1. Work Permit, KSC Form 26-400

Is issued only when the system is de-energized and safe to work.
Is never issued to perform work on an energized circuit or equipment.
Is recovered from personnel who was issued permit prior to energizing circuit
If issued to a non-electrical group the electricians issuing the permit must explain the permit and help fill in the required blocks.

3.2. Work Permit, Itemized Instructions

- Blocks 1 thru 11: Completed by the Power Console.
- Blocks 12 thru 13: Completed by the operators.
- Block 14: Completed by the Power Console.
- Blocks 15 thru 35: Completed by the personnel performing work.
- Blocks 18 thru 20: Always note when and where grounds are placed before performing work and notify the Power Console.
- Blocks 21 thru 22: When work is completed always note when groundsare removed and notify the Power Console.
- Blocks 23 thru 25: Note when and where lock-overs are installed.
- Blocks 26 thru 27: Note when and where lock-overs are removed.
- Block 28: Note when and where stop tags are installed.
- Blocks 29 thru 30: Note when and where tags are removed.
- Blocks 31 thru 33: Completed by personnel originally issued Work Permit to transfer responsibility to another person.
- Blocks 34 thru 35: Completed by personnel performing work – when work is completed and all personnel are clear of system/equipment. These personnel should be advised to treat the system/equipment as energized when the permit is released.
- Blocks 36 thru 39: Completed by switching personnel on completion of SO and system is energized.
- Block 40: May be used to accent hazards that may exist method of switching, i.e., Incoming Pothead at TX is hot.

4. Training

All Switching personnel will attend QG173OSH (Electrical Safety for the Qualified Person). Attend QG260OSH (LOTO Authorized). Attend QG308KSC/QG309KSC (Blood Borne Pathogens). Attend QG315KSC (CPR/AED/First Aid). They will also read and acknowledge the Hazardous Energy Control LO/TO Procedure, SHP-P-0147, Electrical Safety Procedure, SHP-P-0303, and the Power Switching Procedure, PPS-P-0004.

4.1. Certifications

All Switching personnel performing primary switching should be familiar with switching in Orsino and C5 substation yards and will be certified with the following certifications:

BOS233CN (Electrical Switching Device Operator):

- Powell Esco or Esco VFI (Vacuum Fault Interrupter)
- Powell Esco or Esco LBS (Load Break Switch)
- G&W VFI (Vacuum Fault Interrupter)
- G&W LBS (Load Break Switch)

BOS230QCN (Qualified Electrical Worker) and BOS232CN (Lockout/Tagout).

All Switching personnel performing secondary switching, 600 volts and below, will be certified with the following certifications:

BOS230QCN (Qualified Electrical Worker) and BOS232CN (Lockout/Tagout).

RECORDS

The following records are retained by the organizations listed below:

Record	Responsible Organization
KSC Form 26-67, Switching Order	BOSS FSEU, Power Console Office
KSC Form 26-400, Work Permit	BOSS FSEU, Power Console Office
Field Copy and Office Copy	BOSS FSEU, Power Console Office

AFFECTED DIVISIONS

Engineering Services
Construction Management
FSEU
Mission Support
Quality Safety & Environmental

ROLES AND RESPONSIBILITIES

Department Supervisor:

- Approve any field actions performed without a SO in emergency situations.
- Approve any changes to SO steps prior to performing due to change in equipment status not known at the time switch order was written.
- Concur with and approve the normal and launch/test power distribution system configuration.
- Approves the use of detailed procedures when required

Engineering:

- Provide to the Power Console updates of modifications to the systems as they occur either written or by drawing.
- Perform system walk-downs when required to ensure actual configuration of the system is as called out in the document that will be used for switching.
- Provide a detailed testing or operating procedure as required in place of switch orders.
- This group will provide technical guidance of normal and launch/test power distribution system configuration.

Construction Services/Management:

- Request all switching support on support request or work order to the electrical department.
- Notify construction contractor they may perform switching on branch circuits without the use of switch orders or WPs. (Branch Circuits are the circuit conductors between the final overcurrent device protecting the circuit and the outlet. Disconnect Switches shall be considered part of the branch circuit) Notify Power Console of time frame for switching required and insure construction contractor’s representative is on site to accept the WP when used in conjunction with switch orders, verify the

installation of required lockout/tag out immediately after switching is complete, and note the location of all contractor locks and tags on the WP.
- Open and close all outages with the Power Console via a two way radio when possible. Ensure a “Go” is given by the Power Console before proceeding with the switching.
- Construction management personnel must be on site with the subcontractor to ensure the subcontractor understands WP system.
- A copy of this document must be furnished to the subcontractor and adhered to for any work performed on the KSC power distribution system.
- Signature on WPs, blocks 15 through 35, should be from subcontractor personnel performing approved tasks; not the signatures of the CM personnel.
- Shall notify Power Console daily on any configuration changes made to high and medium voltage power systems. This will allow Consoles to update the power distribution board so any emergency switching can be accomplished in a safe manner.
- When work is complete ensure WP is signed/dated in blocks 34-35 and returned to BOSS Power Personnel before circuit can be energized.

Power Console:

- Prepare SOs needed to change the system configuration as required for test or work to be performed. A detailed testing or operating procedure developed by a System Engineer may be used in place of the SO.
- Ensure statement “Electrical System Power Switching Procedure will be adhered to with no unapproved deviation” is included on the switch order.
- Perform all SO steps from power console on equipment designed for remote operations.
- Maintain the systems status board and SCADA Power Console to conform to switching performed.
- Provide system status to all pertinent organizations
- Notify pertinent shop personnel and engineering of reported anomalies.
- Coordinate all switching operations with other organizations.
- Prepare WPs, (KSC Form 26-400) as required.
- Ensure all contractors (including NASA and other governmental/private sector organizations within their areas of responsibilities) have an approved WP prior to beginning work on any medium voltage system or < 600 voltage system.
- Where a NASA construction contractor is involved the Power Console shall insure the contractor is on site prior to the end of switching to immediately accept the WP and be provided access to install the required contractor lockout/tag out.
- Issue SOs and WPs with required interlock keys as needed.
- Ensure operating personnel review and compare the SO to the Status Board so that all personnel concur with the SO as accurate and will safely accomplish the required task.
- Provide step-by-step approval on all switching operations. The responsibility for switching may be transferred from the Power Console to a Field Supervisor when

the Power Console does not have sufficient knowledge of the operations. The Power Console will be apprised of all switching operations.
- Record time that each step is reported. Complete and notify field personnel of time.
- Update systems status board and console pseudo and close out SOs and WPs when complete.
- Maintain SOs and WPs to historical files for minimum of three years.
- Upon completion of a specified task, ensure the system is returned to normal configuration.

Power & Lighting Shop Personnel:

- Review SOs if provided and compare to the Status Board for accuracy if applicable, understanding of the task, address safety concerns and system configuration. Resolve all questions and discrepancies with the Power Console.

- Review test procedure, drawings, work order instructions and any other documents used to identify switching operation for accuracy. Resolve all questions with System Engineer, Power Console, or Supervision.

- Record as found voltage and phasing in the remarks block
- Open the outage by calling the Power Console via two way radio where possible. Ensure you have a “GO” from the Power Console before starting the switching and all affected parties are notified.
- Perform switching as specified in SO or other document with no unapproved deviations.

- Physically identify the equipment to be switched noting the number of the load break, VFI, breaker, etc. to insure the correct mechanism is about to be switched.

- Verify the position and verbally read it back to your partner or console before performing the operation.

- When executing a SO which involves switching a VFI to the **OPEN** or **GROUND** position and after getting a “GO” and placing the lever in the **OPEN** position, the switchman will physically look into the sight glass for that position to ensure it did fully **OPEN** and disconnected the load.

- When switching a POWELL-ESCO ARC WHIPPER VFI **READ** the instructions on the plate adjacent to the cocking mechanism on the SOURCE position of the VFI. Verify on the two way radios that the instructions have been read.

- Contact the Power Console for approval immediately prior to performing each step on the SO. Identify the step number and describe the operation to be performed.

- Notify the Power Console upon completion of each SO step.

- When switching is complete call the Power Console to report status of the switching and report the configuration of the electrical system via a two way radio where possible.
- Upon completion of switching and issuing of WP to contractor or shop personnel, provide the required access to all necessary switching points for personnel performing work to install their required lockout/tag out.

- Acknowledge the receipt of a WP by affixing their signature in the block titled “Work Permit Received By.”

- Ensure the WP is at the job site at all times. In case of loss, a duplicate permit may be obtained from an BOSS Power Console.

- Help fill in required blocks when issuing WPs to non-electrical groups.

- Ensure placement and removal of any protective grounds. The location, date, time and personnel’s name that places the grounds shall be entered on the WP. NOTE: Signs will be placed on equipment where grounds have been placed if possible. Signs read “Grounds Placed” (red 5” letters on white background).

- Acknowledge completion of the work by ensuring all protection grounds have been removed (locations, date and time are reported to the Power Console and entered on the WP when each ground is removed) and by affixing their signature in block “Personnel Clear – Work permit released by.” This action signifies that the specific task is complete and it is safe to energize the system or equipment.

- Return SOs, WPs and interlock keys to the Power Console after task completion.

WARNING

- The Power Console must be advised of the locations and time that each protective ground or mechanical jumper, if installed, is placed and the location and time that each protective ground or mechanical jumper, if installed, is removed.

- The Power Console shall note, on their copy of the WP, all of the protective grounds or mechanical jumpers, if installed, placed on the 60 Hz power system and verify with all the switchmen that they were removed before the system can be energized.

REFERENCE DOCUMENTS

The following documents are referenced in this procedure:

Document Number	Title
KSC Form 26-67	Switching Order
KSC Form 26-400	Work Permit
PPS-P-2011	Electrical Safety for Power Generation, Transmission and Distribution Systems
SHP-P-0147	Hazardous Energy Control Program (LO/TO)
SHP-P-0303	Electrical Safety
SHP-P-3100	Job Hazard Analysis (JHA)
SHP-P-3100A	Electrical Job Hazard Analysis (EJHA)
FPL-MOU-001	Power Switching Limitation Policy at KSC/CCAFS Spaceport

ACRONYMS

BOSS	Base Operations and Support Services
CM	Construction Management
EJHA	Electrical Job Hazard Analysis
KSC	Kennedy Space Center
NGR	Neutral Grounding Resistor
PPE	Personnel Protective Equipment
SETI	Systems Electronic Tie-In Log
SE	Systems Engineer
VCB	Vacuum Circuit Breaker
VFI	Vacuum Fault Interupter

DEFINITIONS

After-the-Fact Switching Order: A Switching Order (SO) written from verbal instructions that were issued by the Power Console/Management to perform power distribution switching during an emergency situation.

Branch Circuits: The Circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

Emergency Situation: When personnel recognize that without a quick reaction or resolution to a situation, that a possibility exists that there could be physical injury to personnel or damage to electrical equipment, the power distribution system, or to other systems or equipment connected to, or controlled by the power distribution system.

In House Switching: Is performed to isolate a section of the power distribution system without an interruption to the user.

Low Voltage: Voltages below 600 volts.

Medium Voltage: Voltages above 600 volts.

Power Console: The Power Console is the personnel monitoring the electrical power systems 24/7. The area has electronic equipment which has remote monitoring control capability and displays and graphic representation of segments of the 60 Hz power system on a color CRT. The graphic display shows high voltage feeders, primary switches, transformers, secondary main/tie breakers, and branch distributions circuit breakers.

Primary Switching: Switching performed on the Primary source of voltage above 600 volts.

Secondary Switching: Switching performed on equipment fed from the Primary source of voltage.

Switching Order: The Switching Order (SO) is a sequence of written instructions to perform power distribution switching (KSC Form 26-67). Switching Personnel: Qualified and trained personnel per Certifications in 5.1 above.

System Status Board: The System Status Board is a one-line, manually updated, circuit diagram displaying all high voltage feeders, primary switches, transformers and secondary main/tie breakers.

Work Permit: The Work Permit (WP) document(KSC Form 26-400), is issued by the BOSS Power Console, to ensure that a system has been de- energized, made safe by an SO and protective grounds placed as required to perform specified work. A completed work activity has ended, all tags and grounds have been removed, and the system has been returned to normal configuration it was in when the WP was issued. If the system cannot be returned to this configuration for any reason, the Power Console must be notified.

REVISION RECORD

The following revisions have been applied to this document:

Revision Number	Change Description	Date
0	Initial Release to define responsibilities for KSC Power Distribution System Configuration Control and methods of changing the configuration of the distribution system by switching.	9/20/2000
1	Revised under JBOSC.	11/7/2002
2	Revised under JBOSC.	7/15/2003
3	Revision to remove the statement “SGS Company Proprietary – JBOSC Competition Sensitive” from this document.	3/3/2005
4	Revision to remove the statement “SGS Company Proprietary – JBOSC Competition Sensitive” from this document.	5/30/2007
5	Complete revision to ISC format	3/2/2010
6	Revised steps to add double checks to the work performed in the procedure.	11/09/2010
7	Added requirement in the functional roles and responsibilities of the Power & Lighting Shop Personnel to notify Power Console of the installation of any mechanical jumpers. (Page 9, “WARNING” section)	1/10/12
8	Added clarification to when switching orders and work permits are required and made changes to functional roles.	9/20/2013
9	Added clarification to switching in support of construction contractors and support to VAB Crane operations.	3/25/2014
10	Added switching process for Neutral Grounding Resistors	7/29/2014
11	Removed the requirement to de-energize the transformer when checking the NGR after a fault.	9/05/2014
12	Revised the use of the buddy system per SHP-P-0006 and added requirements for C5 NGR use.	11/21/2014
13	Minor changes to include: changing JHA to EJHA, revised 70E tables per new 2015 code, and revised switching certifications per new training certs. Also added language for new NGR VCBs.	4/27/2016
14	Minor changes to remove the requirement to switch G,H,and N line when using NGR at C5 switch yard. Also added requirement for work permits.	6/26/2017
15	Added general guidelines to record as-found configurations and requirements for OJT.	7/6/2018
16	Revised Section 2.4 Switch Order Form	9/18/2018
17	Revised to BOSS format.	03/11/2020

DOCUMENT APPROVALS

X	X
James Welter	Mike Lopez
Sr Manager, FSEU O&M	Manager, FSEU Technical Operations