Independent Assessment of the Safety Management Program at Southwestern Power Administration

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Office of Enterprise Assessments
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Acronyms

CAIRS	Computerized Accident/Incident Reporting System
CFR	Code of Federal Regulations
CRAD	Criteria and Review Approach Document
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
ECP	Employee Concerns Program
EHSS	Office of Environment, Health, Safety and Security
ES&H	Environment, Safety and Health
IH	Industrial Hygiene
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
LOTO	Lockout/Tagout
MAD	Minimum Approach Distance
NFPA	National Fire Protection Association
OFI	Opportunity for Improvement
ORPS	Occurrence Reporting and Processing System
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PSSH	Power System Safety Handbook
ROW	Right of Way
SMP	Safety Management Program
SWPA	Southwestern Power Administration

INDEPENDENT ASSESSMENT OF THE SAFETY MANAGEMENT PROGRAM AT SOUTHWESTERN POWER ADMINISTRATION

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of the effectiveness of the safety management program (SMP) at Southwestern Power Administration (SWPA) in April 2023. This assessment focused on SWPA's SMP institutional program and its implementation by observing work activities conducted by SWPA's three maintenance units: Springfield Maintenance Unit, Gore Maintenance Unit, and Jonesboro Maintenance Unit. Additionally, EA reviewed SWPA's acquisition and contracting procedures for flowing down DOE safety requirements for new construction projects.

EA identified the following strengths:

- SWPA has made notable improvements in its safety programs by hiring a certified safety and occupational health manager, updating SWPA Order 440.1B, *Worker Protection Management for DOE Federal Employees*, and updating the *Power System Safety Handbook* in 2023.
- Safety programs for high-risk activities, such as high-voltage electrical work and fall protection, are well developed and implemented.
- Tailboard job briefings conducted daily at the beginning of the workday are thorough in almost all cases and stop work authority is fully understood by work crews.

EA also identified several weaknesses, including three findings, which are summarized below:

- SWPA has not developed an integrated safety management system (ISMS) description that describes its implementation of the core functions and principles supporting the safe conduct of work. Consequently, EA identified weaknesses related to hazard identification and analysis, developing and implementing controls, and performing work within controls. (Finding)
- SWPA has not formalized training and qualification requirements to ensure that all workers possess the appropriate experience, knowledge, skills, and abilities necessary to fulfill their assigned responsibilities. (Finding)
- SWPA Order 440.1B does not include effective implementing procedures to report, investigate, and record SWPA occurrences in the Occurrence Reporting and Processing System (ORPS) database; consequently, reportable occurrences are not being reported in the ORPS database. (Finding)
- Additionally, deficiencies were identified in implementing bloodborne pathogens program requirements, conducting industrial hygiene monitoring, updating maintenance standards, performing safety oversight, and flowing down safety requirements in construction contracts.

In summary, SWPA has established generally effective mechanisms that support its SMP implementation during routine work activities associated with substations, transmission lines, and right-of-way vegetation maintenance. However, SWPA has not established an ISMS description, which has contributed to numerous integrated safety management (ISM) implementation weaknesses that impact the safe implementation of work. Other important weaknesses were identified in the areas of worker training and qualification, ORPS reporting, industrial hygiene monitoring, safety oversight, and flowing down safety requirements in construction contracts. Until the concerns identified in this report are addressed, some workplace hazards may not be properly identified or controlled, resulting in inadequate protection of worker safety and health at SWPA.

INDEPENDENT ASSESSMENT OF THE SAFETY MANAGEMENT PROGRAM AT SOUTHWESTERN POWER ADMINISTRATION

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Worker Safety and Health Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the effectiveness of the safety management program (SMP) at Southwestern Power Administration (SWPA). This assessment focused on SWPA's SMP institutional program and its implementation by SWPA's three maintenance units: Springfield Maintenance Unit, Gore Maintenance Unit, and Jonesboro Maintenance Unit. The onsite portion of the assessment was conducted April 10-13 and April 24-27, 2023.

In accordance with the *Plan for the Independent Assessment of the Safety Management Program at the Southwestern Power Administration, March 2023*, this assessment evaluated the effectiveness of SWPA's implementation of its SMP within the framework of the integrated safety management (ISM) core functions (define the scope of work, identify and analyze hazards, identify and implement controls, perform work safely within controls, and provide feedback and make improvements) with respect to work activities associated with transmission lines, substations, and right of way (ROW) maintenance. This assessment also reviewed SWPA's flowdown of DOE safety requirements to its prime contractors and their sub-tier contractors for new construction projects.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which EA implements through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. This report uses the terms "best practices, deficiencies, findings, and opportunities for improvement (OFIs)" as defined in the order.

As identified in the assessment plan, the criteria used to guide this assessment were based on selected objectives and criteria from DOE Guide 226.1-2A, *Federal Line Management Oversight of Department of Energy Nuclear Facilities*, appendix D, *Activity Level Work Planning and Control Criterion Review and Approach Documents with Lines of Inquiry*. In addition, EA used selected objectives and criteria from the following criteria and review approach documents (CRADs):

- EA CRAD 32-03, Rev. 1, *Industrial Hygiene Program*
- EA CRAD EA-32-10, Rev. 0, *Construction Safety*
- EA CRAD EA-32-11, Rev. 0, *Control of Hazardous Energy (Lockout/Tagout)*
- EA CRAD EA-32-12, Rev. 0, *Material Handling and Safety*
- EA CRAD EA-32-13, Rev. 1, *Electrical Safety*.

SWPA is a government-owned and operated organization and is under the regulatory jurisdiction of the Occupational Safety and Health Administration (OSHA). Therefore, additional criteria to guide this assessment were based on 29 CFR 1960, *Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters*, and DOE Order 440.1B, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*.

The planning and implementation of onsite work activities, including those associated with transmission lines, substations, and ROW maintenance, was observed across SWPA's three regions. EA examined key

activity-level work documents, such as maintenance standards and procedures, the Power System Safety Handbook (PSSH), job hazard analyses (JHAs), manuals, analyses, and policies. EA also interviewed key personnel responsible for developing and executing the associated programs and walked down SWPA's three maintenance facilities. The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

There were no previous findings for follow-up addressed during this assessment.

3.0 RESULTS

3.1 Safety Management Program

This portion of the assessment evaluated SWPA's SMP as well as safety program documents, worker training and qualification, reporting of occurrences and occupational injuries, the employee concerns program (ECP), and stop work authority, which collectively supports the safe performance of work in accordance with DOE Order 440.1B and ISM core functions.

SWPA's SMP is directed and managed by a well-qualified safety and occupational health manager (certified safety professional and industrial hygienist) with over 20 years of relevant experience, including experience at two power marketing administrations. In addition, one contract safety professional supports the SMP.

SWPA asked EA to independently assess its SMP to provide insights into needed improvements. During planning discussions for this assessment, SWPA's safety manager stated that since being on board in 2020, they recognized that SWPA's SMP, which is described in SWPA Order 440.1B, *Worker Protection Management for DOE Federal Employees*, *May 16, 2007*, and SWPA's PSSH needed to be updated. Several programmatic areas needed improvement, in particular training management and documentation and incorporating ISM in SWPA Order 440.1B and implementing ISM in work planning. Accordingly, SWPA has made notable progress in its SMP, having revised the PSSH in January 2023, and updating other institutional SMP documents. A revised SWPA Order 440.1B has been drafted to incorporate regulatory changes and is currently going through SWPA concurrence. Additionally, SWPA has some processes that are documented in SWPA Order 440.1B, maintenance standards, the PSSH, and the *Power Operations Bulletin* that address select ISM core functions.

Despite the noted improvements in revising the PSSH and updating SWPA Order 440.1B, this assessment identified several weaknesses in SWPA's integrated safety management system (ISMS) implementation and JHA process, industrial hygiene (IH) program, training management, ORPS and CAIRS reporting, feedback and improvement, and flowing down safety requirements and contract management. SWPA's limited subject matter expertise and geographically dispersed work activities may present a challenge to the timely correction of the SMP issues identified in this report. (See **OFI-SWPA-1**.)

SWPA has a suite of generally adequate maintenance standards. These maintenance standards effectively provide standard operating procedures that cover general maintenance, transmission line, substation, and electronics work, and are written in accordance with MA-01, *Program for the Development and Application of Maintenance Standards*. Reviewed maintenance standards included clearly defined scopes of work and generally control significant hazards through appropriate warning and caution statements.

While some SMP procedures are adequate, EA identified the following weaknesses:

- Contrary to DOE Order 450.2, *Integrated Safety Management*, section 4.a, SWPA has not developed an ISMS description document that addresses the organization's approach for the implementation of

the ISM core functions and guiding principles that support the effective conduct of work. (See **Finding F-SWPA-1**.) Without a description for implementing ISM, managers and workers do not have a clear understanding of their roles and responsibilities in the implementation of the ISM core functions, and work hazards may be missed or not properly controlled.

- Contrary to DOE Order 440.1B, section 4.i.(2), and PSSH, section 17, activity level hazard analyses or JHAs have not been performed to address routine work activities associated with maintenance standards (ISM core function 2). (See the Finding F-SWPA-1 discussion above.) Not identifying all associated work hazards and controls could expose personnel to injuries and illness. The JHA process, as described in PSSH, section 17, adequately addresses specific higher risk work activities, but does not address lower-level risk work activities, and JHAs have not been completed for maintenance standards. For example, MA-23, *Vegetation Maintenance Program*, did not adequately address or identify hazards of lower-level risk maintenance work activities, resulting in workers:
    - Lubricating components under forestry clearing equipment without chocking and without workers wearing appropriate personal protective equipment (PPE).
    - Lubricating a circular cutting blade without having a hazardous energy control procedure for this task.
    - Blowing out air filters with air hoses without workers wearing dust masks.
- Not performing an activity level hazard analysis and updating maintenance standards every two years, as required, has resulted in some requirements inconsistent with the PSSH and the inclusion of outdated technical information. For example:
    - Ten of 28 transmission and substation maintenance standards refer to minimum approach distances (MADs) in 29 CFR 1910.269, table R-6, *AC Live-Line Work Minimum Approach Distances*, instead of the PSSH, which provides MADs that are specifically calculated for SWPA's power system.
    - MA-09, *Standards for Personal Protective Grounding*, sections 4.1 and 4.2, state that workers should stay 25 feet from ground rods and poles, but the PSSH states that workers should stay 10 feet from ground rods.
    - MA-01, *Program for The Development and Application of Maintenance Standards*, section 4.7, specifies that existing standards be reviewed every two years and updated, if required; however, interviews revealed that these reviews have not occurred, and EA's review of affected documents confirmed that necessary updates have not been made.
    - TR-10, *Pentachlorophenol* (PENTA), dated September 24, 2009, states that "the EPA [Environmental Protection Agency] has neither banned the manufacture of PENTA, nor significantly restricted its use as a wood preservative for utility poles" and that "PENTA is not listed as a hazardous material in Title 49 of the Code of Federal Regulations." Since 2009, adverse health effects of PENTA have been discovered. As a result, on February 4, 2022, EPA issued a final registration review document requiring the cancellation of PENTA over a five-year phase out policy. PENTA has also been found to be a hazardous material, poses cancer and non-cancer health risks to humans, and is highly toxic to aquatic organisms and honeybees.

3.1.1 Safety Program Documents

This portion of the assessment evaluated safety program documents associated with electrical safety, fall protection, IH, and motor vehicle safety.

Electrical Safety

SWPA's SMP implementing documentation for high-voltage electrical safety is well established. The updated PSSH was issued in January 2023, and is being implemented in the field. Certain requirements in the PSSH are more protective than those required in the OSHA standards. For example, SWPA requires testing of hot line tools every year, while OSHA has a two-year requirement. The *Power Operations Bulletin*, revised in 2022, establishes requirements for the operation of SWPA power systems, including issuance and release switching (operation of designated electrical switches), clearance (approval for an outage), and hot line orders (approval for work on or near energized high voltage). These effective implementing procedures provide power system requirements to protect both workers and the integrity of the power system.

The PSSH effectively integrates the requirements of 29 CFR 1910.269 and National Fire Protection Association (NFPA) 70E, *Standard for Electrical Safety in the Workplace*. The PSSH addresses requirements for electrical hazards risk assessments for shock and arc flash, safe work practices including hazardous energy control, training, and PPE for electrical worker safety. The *Study of Southwestern Power Administration Transmission System Anticipated Transient Over Voltage* establishes the SWPA MADs in accordance with 29 CFR 1910.269(I)(3)(ii). These MADs are included in the PSSH and MA-24, *Arc Flash Protective Equipment*. High-voltage hazardous energy is properly controlled by the clearance, switching, and hot line order processes. Hazardous energy controls for electrical power generation, transmission, and distribution work as described in the *Power Operations Bulletin* and the PSSH comply with 29 CFR 1910.269(m), *Deenergizing lines and equipment for employee protection*, and 29 CFR 1910.269(n), *Grounding for the protection of employees*.

SWPA's written hazardous energy control program incorporates some requirements of 29 CFR 1910.147, *The control of hazardous energy (lockout/tagout)*, and 29 CFR 1910.333(b), *Working on or near exposed deenergized parts*. However, contrary to 29 CFR 1910.147 and NFPA 70E, the SWPA lockout/tagout (LOTO) program is incomplete and has not been audited (ISM core function 2 and 4). (See Finding F-SWPA-1 discussion above.) For example:

- Contrary to 29 CFR 1910.147(c)(4)(ii) and NFPA 70E 120.4, the SWPA LOTO program does not specifically require written procedures for complex LOTO.
- Contrary to NFPA 70E 120.4(B)(6)(1), the SWPA LOTO program does not require voltage test equipment to be tested after a voltage test to verify the proper operation of the equipment.
- Contrary to NFPA 70E 110.1(K)(3) and (4), SWPA has not conducted and documented annual audits of the LOTO program to determine and verify the effectiveness of LOTO devices and other hazardous energy control measures.

Employees could be exposed to hazardous energy when required written procedures for complex LOTO are missing and equipment is not properly tested, or annual audits are not performed.

Fall Protection

SWPA has established and implemented a generally effective fall protection program. The fall protection program specified in the PSSH, section 18, and SWPA Order 440.1B, program 21, *Fall Protection*, adequately meets applicable OSHA standards for general industry (29 CFR 1910, *Occupational Safety and Health Standards*) and construction (29 CFR 1926, *Safety and Health Regulations for Construction*). PSSH, section 18, adequately establishes the overarching fall protection policy, duty to wear fall protection, and basic requirements. SWPA's fall protection program is thorough and provides the necessary requirements to protect workers from hazards associated with work performed on communication, substation, and transmission line structures and equipment at heights of four or more feet.

In addition, a review of SWPA's Safety Committee minutes demonstrated their proactive approach to ensuring the effectiveness of the fall protection program. The annual fall protection training, which is required for all SWPA workers who wear fall protection, is comprehensive and includes hands-on exercises and emergency rescue drills. Interviewed workers who received fall protection training, were knowledgeable of fall protection requirements, and were observed donning and doffing fall protection equipment or demonstrated proper use techniques. Interviewed qualified climbers demonstrated a thorough understanding of the hazards and equipment related to climbing. Reviewed certification records showed personnel designated as fall protection competent persons were certified to inspect fall protection gear worn by the workers.

Industrial Hygiene Program

SWPA has established the foundation of an IH program. A qualified senior industrial hygienist leads the IH program. SWPA Order 440.1B encompasses the appropriate IH program areas likely to be encountered during the performance of activity-level work. Program areas include asbestos hazard abatement, hazard communication, bloodborne pathogens, ergonomics, respiratory protection, hearing conservation, confined spaces, PPE, and lead. EA identified the following weaknesses in two of these IH program areas:

- Contrary to 29 CFR 1910.1030(c), *Exposure control*, SWPA Order 440.1B, program 12, lacks several required elements of a bloodborne pathogen exposure control plan, such as a description of work practice controls, discussion of PPE controls, housekeeping requirements, and biowaste disposal and biohazard labels requirements. (See **Deficiency D-SWPA-1**.) A bloodborne pathogen program that lacks a detailed exposure control plan increases the risk of worker exposure to blood and other potentially infectious materials.
- Contrary to DOE Order 440.1B, attachment 1, section 5, SWPA has not developed a program for documenting exposure assessments nor has it documented any formal IH exposure assessments. Additionally, SWPA has not monitored or sampled workers for chemical or noise hazards. (See **Deficiency D-SWPA-2**.) A worker's health may be adversely affected when exposed to unknown concentrations of hazardous chemicals and noise. SWPA does not have procedures for the following: conducting exposure assessments that address initial or baseline surveys of all work areas or operations; coordinating with medical and environmental professionals; periodically conducting resurveys; conducting exposure monitoring when appropriate; and the use of appropriate IH standards when performing exposure assessments. (See **OFI-SWPA-2**.)

Motor Vehicle Safety

SWPA has established and implemented a generally effective motor vehicle safety program. The PSSH, section 14, contains adequate procedural requirements for safe motor vehicle operations. All SWPA employees who operate an over-the-road vehicle are appropriately required to have a valid driver's license or commercial driver's license. While enroute to field work locations in SWPA pickup trucks all drivers and passengers wore seat belts and the drivers consistently adhered to posted speed limits and traffic control signage. Observed all-terrain vehicles towed by pickup trucks were properly secured to trailers with chain binders. Also, observed pickup trucks were equipped with first aid kits and fire extinguishers. Before operating vehicles, employees consistently performed 360-degree visual pre-operational vehicle checks. Reviewed safety bulletins demonstrated that SWPA has performed comprehensive motor vehicle incident investigations that included an analysis of contributing factors and lessons learned. Reviewed training records contained training descriptions that included the use of SWPA safety bulletins as lessons learned. However, contrary to 29 CFR 1910.180, *Crawler locomotive and truck cranes*, and ANSI A92.2, *Vehicle-Mounted Elevating and Rotating Aerial Devices*,

maintenance standard MA-06, *Over-the-Road Vehicles and Cranes*, contains requirements that are not consistent with OSHA and ANSI A92.2. (See **Deficiency D-SWPA-3**.) Not following OSHA and ANSI A92.2 requirements for crane and over-the-road vehicle inspections could result in equipment malfunctions and personnel injuries. For example:

- MA-06 specifies inspections for brakes on cranes every three months, while 29 CFR 1910.180(d)(6), *Inspection records*, requires monthly inspections.
- MA-06 specifies wire rope inspections to be performed for cranes every three years, while 29 CFR 1910.180(g)(1), *Running ropes*, requires monthly inspections.
- MA-06 specifies maintenance service to be performed for bucket trucks every three years, while ANSI A92.2, section 8.2, requires daily to monthly frequent inspections and tests, and monthly to annual periodic inspections and tests.

The reviewed draft revision of SWPA Order 440.1B, Program 6, *Motor Vehicle Safety*, demonstrates SWPA's efforts to improve its motor vehicle safety program by incorporating requirements for personnel responsibilities and training.

3.1.2 Worker Training and Qualification

SWPA has established and implemented elements of a generally effective training and qualification program. SWPA Order 360.1, *Federal Employee Training*, provides general guidance on training administration, e.g., training cost reimbursement, preparation of individual development plans, and a list of Federally mandated training. During the past two years, the SWPA Division of Environmental, Health, Safety and Security (EHSS) has developed a useful training course matrix and linked training requirements to work positions. Reviewed worker training records showed that most workers have received a wide range of ES&H and job-specific training over the course of their careers at SWPA. Most workers and supervisors stated that training courses in fall protection, electrical safety, and crane operation are exceptional. Additionally, the observed switching training class was detailed, thorough, and reflected the subject requirements. SWPA procedure SU-04, *Training Standards for Substation Electrician Helpers*, provides a comprehensive, well-defined worker qualification program for substation electrical crews. However, EA identified the following weaknesses:

- Contrary to SWPA Order 440.1B, program 3, *Training and Safety Meetings*, SWPA has not formalized training and qualification requirements to ensure that all workers possess the appropriate experience, knowledge, skills, and abilities necessary to fulfill their assigned responsibilities. (See **Finding F-SWPA-2**.) Without a comprehensive training and qualification program tailored to all workers, safety hazards may not be adequately identified and controlled. For example, ROW maintenance and transmission line workers have no formal worker qualification or training standards. Qualification standards for these workers are based on the judgment of supervisors and may vary among the three SWPA regions for workers performing the same assigned tasks. (See **OFI-SWPA-3**.) Also, SWPA Order 360.1 lacks guidance on job-specific or ES&H training or qualification requirements. Further, over 90% of the training courses listed in the training course matrix are not available in DOE's Learning Nucleus (the online training application used by SWPA), resulting in supervisors and/or employees having to seek other training resources.
- Contrary to SWPA Order 440.1B, program 3, worker training records showed that some workers are not completing all required training or refresher courses, and some training received by workers has not been updated to reflect changing OSHA or SWPA ES&H requirements. (See the Finding F-SWPA-2 discussion above.) For example, some workers who are assigned to operate fork trucks have not received an evaluation of their performance every three years as required by 29 CFR 1910.178(l)(4)(iii), *Refresher training and evaluation*. Additionally, equipment-specific hazard

control training has not been formalized (noise, tip-over, rollover, struck-by, etc.). Some workers have not received hazard communication training since 2012, although both OSHA and SWPA hazard communication training and chemical labeling requirements have changed significantly since 2012. Also, one ROW worker who occasionally applies chemical herbicides has not completed hazard communication training. Finally, reviewed training records revealed that none of the workers had received annual bloodborne pathogen training as required by 29 CFR 1910.1030(g)(2) and SWPA Order 440.1B, Program 12.

3.1.3 Reporting of Occurrences and Occupational Injuries

SWPA Order 440.1B, program 2, *Investigation and Reporting Requirements/Procedures*, appropriately references DOE Order 232.2A, *Occurrence Reporting and Processing of Operations Information*, and DOE Order 231.1B, *Environment, Safety and Health Reporting*. Program 2 assigns computerized accident/incident reporting system (CAIRS) reporting responsibility to the EHSS director. The SWPA EHSS director confirmed his awareness of this responsibility. A review of the CAIRS database revealed that SWPA is reporting OSHA recordable occupational injuries. However, EA identified the following weaknesses:

- Contrary to DOE Order 440.1B, section 4.a.(2), which requires a written program, SWPA Order 440.1B, program 2 does not include effective implementing procedures to report, investigate, and record SWPA occurrences in the ORPS database. (See **Finding F-SWPA-3**.) Without implementing procedures for ORPS reporting, SWPA operating experience data is not available for viewing throughout the DOE complex. The ORPS database does not contain entries of known SWPA occurrences, even though SWPA has established three maintenance regions as facilities for this reporting. For example, two occupational injury cases involving a bone fracture (one each in 2020 and 2022) that met the DOE Order 232.2A, attachment 2, group 2, subgroup A, section 5(b) reporting criterion were not reported in the ORPS database. This reporting issue is directly related to the lack of clear direction in SWPA Order 440.1B, program 2.
- SWPA Order 440.1B, program 2 is not sufficient to ensure the quality of local OSHA occupational injury and illness recordkeeping logs and reported CAIRS data. (See **OFI-SWPA-4**.)

3.1.4 Employee Concerns Program

The SWPA ECP plan adequately describes the implementation of the program. Annual employee concern notifications signed by the SWPA Administrator are posted on safety bulletin boards at all three maintenance facility sites. The notifications contain the contact information of the ECP Manager and reporting methods for filing employee concerns. SWPA has been working with the Director of the DOE ECP, within the Department of Energy's Office of Environment, Health, Safety and Security (EHSS) in making improvements to the SWPA ECP. However, SWPA has not conducted an effectiveness review of the implementation of its ECP. The Director of the DOE ECP completed a review of SWPA's ECP in 2023; the associated report was still under development at the time of this assessment.

3.1.5 Stop Work Authority

Each employee's right and responsibility to stop any work they deem unsafe or immediately dangerous is appropriately identified in the PSSH, section 2.1.18. In addition, safety watchers are designated daily during tailboard job briefings with an assigned duty of stopping any maintenance work that they consider to be hazardous. For contracted work, SWPA "government inspectors" provide day-to-day oversight of contracted work and have the authority to stop unsafe activities.

Safety Management Program Conclusions

SWPA has made important progress updating SWPA Order 440.1B and other institutional SMP documents to address identified gaps. SMP implementing documentation for power system requirements provide effective safety implementing procedures to protect both workers and the integrity of the power system. High-voltage electrical safety and fall protection programs are well developed and effectively incorporate regulatory safety requirements. However, there are important weaknesses that detract from the safe conduct of work at SWPA, including the absence of an ISM system description, the lack of formalized training and qualification requirements, and weaknesses in recording and reporting operational occurrences and injury and illness data in DOE reporting databases. In addition, the bloodborne pathogen program lacks the required elements, an IH exposure assessment program has not been developed, and a maintenance standard was inconsistent with OSHA requirements.

3.2 Safety Management Program Implementation

This portion of the assessment evaluated SWPA's implementation of its worker protection program through the five core functions of ISM: defining the scope of work, identifying and analyzing hazards, developing and implementing hazard controls, performing work within controls, and providing feedback and making improvements. Observations focused on ROW vegetation maintenance, high-voltage electrical power line work, and substation work.

Defining the Scope of Work

The work scopes for observed work activities were generally sufficiently detailed in maintenance standards to perform the major tasks and identify hazards and controls. Maintenance standards contained the work scope, equipment and tools, materials, PPE, and activities, and included general information, precautions, and procedures. For example:

- MA-23, *Vegetation Maintenance Program*, includes adequate vegetation management policies and procedures to ensure that the tasks performed in maintaining the ROW clear of vegetation are performed safely, efficiently, and in an environmentally responsible manner. This maintenance standard adequately describes the periodicity of vegetation control and maintenance of the ROW through inspections. SWPA's CASCADE utility maintenance information system triggers the job orders that identify the work to be performed and its location.
- TR-12, *H Structure 138 and 161kV Crossarm Replacement (De-energized, Aerial Manlift)*, provides a concise description of each task for the replacement: job briefing and clearance, truck positioning and preparation, connecting personal protective grounds, detaching conductors, removal of cross arm assembly, rebuilding and placement of the new cross arm assembly, reattaching conductors, disconnecting personal ground conductors, and re-energizing.
- SU-28, *Substation Maintenance and Testing Program*, lists equipment in the substation that requires testing and maintenance, and adequately describes the type of tests required for each piece of equipment and its testing intervals. Additionally, the program cross references pertinent maintenance and testing standards to follow if the equipment component is part of the protection system.

In addition to generally adequate maintenance standards, daily tailboard job briefings attended by EA appropriately identified the work to be performed for the day, work assignments, tools needed, site hazards, and emergency procedures. Although major tasks were covered in the maintenance standards and tailboard job briefings, supplemental routine tasks were not included in the scope of work. (See **OFI-SWPA-5**.) For example, vehicle maintenance work such as cleaning air filters and lubricating parts was

not included; consequently, hazards for these tasks were not identified and analyzed, and controls were not developed and implemented.

Identifying and Analyzing Hazards

Activity-level work hazards were generally adequately identified and communicated to workers during morning tailboard job briefings and field JHA reviews. Observed power line patrol inspections, substation inspections, and ROW maintenance tailboard job briefs included generally adequately identified hazards that were appropriately briefed. However, EA identified the following weaknesses:

- Contrary to DOE Order 440.1B, section 4.i.(2), and 29 CFR 1926.251(a)(2)(ii), SWPA did not properly analyze the hazards, plan and execute a tractor recovery. (See the Finding F-SWPA-1 discussion in section 3.1 of this report.) EA observed SWPA personnel recovering a stuck tractor. The work crew used a single chain attached to another industrial vehicle to pull the 17,000-pound tractor from a ditch. The work crew assumed the chain was new with a safe working load capacity of 20,000 pounds. An investigation performed after the vehicle was recovered found that the three-eighth inch grade 70 transport-rated chain had a safe working load limit of only 6,600 pounds. The morning tailboard and JHA discussion before ROW operations did not cover hazards associated with vehicle recovery. Failure of the chain could have resulted in serious injury to employees.
- Contrary to DOE Order 440.1B, section 4.i.(2), the hazards associated with using boats to access transmission equipment for maintenance work within rivers, lakes, or streams, and their associated minimum safety requirements and safe work practices were not addressed in the PSSH or a maintenance standard. (See the Finding F-SWPA-1 discussion in section 3.1 of this report.) Not identifying and analyzing water hazards could result in missing controls and boating safety requirements to prevent drowning. Boating equipment was observed during a shop walkthrough of the Gore facility. Interviews with SWPA Gore line crew management revealed that work assigned to that crew included crossing lakes and waterways in boats to access transmission equipment. No documentation of water hazards and controls could be provided.
- There were multiple examples where reviewed field JHAs (JHAs developed in the field using a standard form) and observed tailboard job briefings did not address some routine work activities. (See the Finding F-SWPA-1 discussion in section 3.1 of this report.) For example:
    - JHAs and briefings did not address the hazards and controls associated with mobile equipment inspection and readiness.
    - Worker exposures to noise for some equipment operation activities were not evaluated.
    - JHAs have not been prepared for the welding stations or machine shop equipment, and worker exposures to hazardous chemicals and noise have not been assessed.

Developing and Implementing Hazard Controls

Hazard controls were generally adequately established in the PSSH and maintenance standards. The PSSH and maintenance standards provide detailed instructions on how to control hazards, such as installation techniques for proper personal protective grounding. Also, maintenance standards provide warning and caution statements for transmission line, substation, and ROW hazards. These documents were generally available in the field for reference, as needed. However, after the Bull Shoals Tower generator relay failure incident, where electrical troubleshooting was required to identify the issue, there was a request for the maintenance standard describing troubleshooting and equipment repair with defined hazard controls, but one does not exist. (See **OFI-SWPA-6**.)

Defined hazard controls were generally effectively implemented in field work performance. Hazards associated with the observed work were adequately discussed and documented in the tailboard job briefings and notes. Observed clearances and general switching orders for substation and transmission line work were appropriately written to control hazardous energy, were completed to grant the clearance, and were properly released and documented. Safety tags and locks were properly attached to the operating point for the sources of energy as instructed by the system dispatcher. One ROW crew flagged all guywires in their immediate work area with high visibility ribbon above the vegetation to ensure that equipment operators could readily identify and avoid damaging guywires in response to the guywire fault incident safety bulletin.

Bucket trucks used for line work and substation breaker testing were appropriately rated category C or B for hotstick use for voltage testing and grounding of the de-energized 161 to 69 kV transmission lines with the operator outside of the MAD. The annual aerial device and dielectric boom inspection and testing on four observed bucket trucks were appropriately completed and up to date. The observed bucket trucks had appropriate identification, operational, and instructional markings. Annual inspections of two observed cranes were also up to date. However, SWPA management confirmed that there is no system to ensure that the bucket truck and crane annual inspection vendor-reported defects are tracked until repairs are appropriately completed. (See **OFI-SWPA-7**.)

The ROW crew's equipment was appropriately provided with rollover protective structures compliant with 29 CFR 1926.1002 to protect employees from the rollover hazards encountered while operating equipment on steep terrain around power transmission lines. However, inclinometers provided in most ROW equipment, which are intended to warn operators of a potential rollover, lack any equipment-specific warning markings to indicate the maximum permissible tilt level in degrees. (See **OFI-SWPA-8**.)

Personal protective grounds and hotsticks were appropriately marked with the completed annual inspection and testing date. Reviewed records of personal protective grounds testing included performance of the annual resistance test per MA-08, *Testing Standards for Personal Protective Grounding Jumpers.* Hotsticks were appropriately marked with the MAD for the voltage present and were tested annually by an outside vendor. However, contrary to 29 CFR 1910.269(g) (1910, subpart I (1910.137 (c)(2)(viii) table I-5), NFPA 70E, table 130.7(C)(7), and SU-26, *Use and Care of Rubber Gloves and Blankets*, rubber electrically insulated gloves observed in use in the field were beyond the 6-month test date. (See the Finding F-SWPA-1 discussion in section 3.1 of this report.) Not performing glove testing at required intervals could expose employees to a shock hazard. Reviewed glove testing records for 2021 and 2022 did not show that testing was performed at least every six months.

Issues were observed with communications and labeling of some hazards. Transmission line and ROW crews explained (and confirmed by EHSS) that cell phone and radio communications equipment is not always sufficiently reliable to ensure adequate communication between ROW and transmission field work groups and remotely located EMS support. Restricted communication with EMS can result in injured employees who do not obtain prompt medical attention and transport to a medical facility. (See **OFI-SWPA-9**.) There were missing or degraded safety/warning labels on some concrete electrical pits, which were not identified as permit-required confined spaces in accordance with 29 CFR 1910.146, *Permit-required confined spaces*. (See the Finding F-SWPA-1 discussion above.)

Performing Work Within Controls

Observed work was generally performed safely and within defined hazard controls. Planned work was effectively scheduled, authorized, and released using the CASCADE utility maintenance information system. Work activities performed by the ROW, electrical transmission line, and substation crews were appropriately identified and scheduled. Information input into CASCADE was consistent with SWPA

procedures. For example, vegetation maintenance requirements as defined in MA-23, *Vegetation Maintenance Program*, for surface mowing (four-year cycle) and side trimming (eight-year cycle) were accurately input into CASCADE and were consistent with SWPA requirements.

The observed daily tailboard job briefings for ROW, electrical line transmission, and substation work crews were well documented, and generally effectively communicated the hazards and controls of the work activity. These briefings appropriately included emergency response requirements, crew assignments, work to be performed, minimum approach boundary for high-voltage electrical lines (when applicable), and PPE required to perform the work safely. The observed briefings included discussions of emergency actions such as the location of the nearest hospital, check of emergency materials, and crew responsibilities during an emergency. Stop/pause work authority was appropriately emphasized during tailboard job briefings. Interviewed workers were aware that they had stop work authority, and there were multiple examples of pause work observed. For example, the line crew safety watchers for the Gore substation crew paused work during the installation of temporary personal protective grounds when potential issues were observed.

EA observed numerous examples of work being performed safely and within hazard controls, as specified in tailboard job briefings and SWPA work procedures. For example:

- Application and release of observed clearances and switching orders by line crews at Jonesboro, Gore, and Springfield were effectively implemented with clear communication between the system dispatcher and clearance holder. Three-way communications between the worker, supervisor, and dispatch operator were confirmed with 100% readback of each step to be performed prior to performing the step.
- Reviewed locks and/or tags were appropriately installed on the open switches, as required.
- Observed journeyman electricians working from bucket trucks maintained the hot line work MAD of 52-inches required by PSSH, using properly marked live-line tools during the installation and removal of temporary personal protective grounds at two substations.
- Observed substation and line patrol inspections of the ROW and transmission poles were adequately conducted using a checklist, with deficient items properly documented, and either repaired immediately or recorded for future action. Checklist results were appropriately entered into CASCADE.

Although most observed high-voltage work performed in each of the three regions was performed safely and within established hazard controls, EA identified the following weaknesses:

- Contrary to PSSH, section 2.2, SWPA has not ensured that crew leaders adequately supervise all work activities to verify that work is effectively planned and implemented within established hazard controls. (See **Deficiency D-SWPA-4**.) Ineffective work planning or incorrect application of hazard controls could expose employees to uncontrolled hazards. Specifically, EA observed the following instances of ineffective work planning resulting in potential worker exposures to hazards:
    - A ROW tailboard job briefing conducted by work crew/supervision did not discuss aspects of the performed work scope, such as the required maintenance actions to be performed by the crew in advance of line clearing work, and the associated hazards and controls when performing maintenance. Consequently, workers were exposed to nuisance dust while blowing out air filters and crawled under vehicles to lubricate components without using PPE or chock blocks.
    - During the cross-arm replacement near Checotah, Oklahoma, the potential for exceeding the bucket truck weight capacity of 700 pounds was neither discussed during the tailboard job briefing nor monitored by supervision during the performance of the work. After EA pointed out

the potential for exceeding the load capacity of the bucket, a calculation was done to determine the load in the bucket.

- Contrary to NFPA 70E, section 130 (G), substation crew members violated restricted approach boundaries without proper controls. (See the Finding F-SWPA-1 discussion in section 3.1 of this report.) Substation crew members at multiple tower locations were not using voltage-rated gloves when testing the voltage output of 240 V rated generators. Not using voltage-rated gloves could expose workers to a shock hazard. Also, during two additional observations, when opening an electrical cabinet during inspections, workers inappropriately used the "Avoid Contact" restricted approach electrical shock boundary as a hazard control rather than the posted 1-foot restricted approach boundary in energized 120/240V AC /130V DC electrical cabinets.
- During several work evolutions, EA observed PPE that was incorrectly used or not properly inspected. For example:
  - While working in a bucket truck, one substation worker incorrectly donned a fall protection harness that was loose fitting and had the fall arrest attachment (D-ring) point located low on the individual's back and not between the shoulder blades, as required by the manufacturer's harness instructions. The Safety Manager properly adjusted the harness on the individual after EA identified the concern.
  - During a ROW work activity, the operator of a forestry brush cutter and mulcher did not use hearing protection while operating the equipment even though the operator's compartment was marked as "Hearing Protection Required During Operation."
  - Three instances of misuse or absence of voltage-rated gloves by crew members were observed. In one instance, a lineman donned gloves that had exceeded the required six-month retest date by one month.
  - Reviewed records showed that one of five observed safety harnesses donned by substation and line transmission crews were not inspected annually, as required by SWPA Order 440.1B, program 21, section 3.b.

Feedback and Improvement

SWPA has generally implemented effective feedback and improvement. SWPA's EHSS generally conducts annual workplace inspections and develops corrective actions for inspection findings in accordance with SWPA Order 440.1B, program 4, *Inspection and Corrective (Abatement) Procedures*, and 29 CFR 1960. Reviewed records show that SWPA performed safety and health inspections at three maintenance facilities to fulfill the annual 2022 workplace inspection requirements of 29 CFR 1960.25(c). SWPA has generally adequately documented and communicated lessons learned from recent events and near misses. Since September 2020, EHSS has developed and distributed fourteen informative industrial and vehicle investigation and near miss reports, which included detailed lessons learned. SWPA EHSS personnel have also been proactive in developing safety bulletins based on existing negative trends to create safety awareness.

While SWPA has implemented some effective feedback mechanisms, EA identified several weaknesses:

- Despite the high frequency of past ROW vehicle recovery operations, SWPA had not developed a safety bulletin communicating lessons learned to address mitigating factors to help prevent such incidents until after EA observed the ROW tractor incident.
- SWPA does not conduct post job debriefs to acquire work performance feedback that could enhance future similar work.

- EHSS did not conduct workplace inspections with the appropriate rigor to ensure that hazards were properly identified and controls were fully developed. (See **OFI-SWPA-10**.) During a walkdown, EHSS workplace inspectors did not identify several potential OSHA non-compliances related to hazard communication, material handling and storage, machine guarding, and electrical safety.
- SWPA does not have an oversight process, assurance system, or an effective tool to manage the evaluation and disposition of safety issues, nor does it track corrective actions to closure in a timely manner, trend issues, or institute recurrence controls. (See **OFI-SWPA-11**.) EHSS personnel currently use an Excel spreadsheet to track safety inspection findings and corrective actions for events associated with higher risk work activities.

Safety Management Program Implementation Conclusions

SWPA's implementation of the five core functions of ISM is generally adequate for high-voltage work. The work scopes for observed work activities covered in maintenance standards and the PSSH adequately identified major tasks, hazards, and controls. Planned work was effectively scheduled, authorized, and released, and observed work was generally performed safely and within defined hazard controls. SWPA has generally implemented effective feedback and improvement. However, EA identified the following weaknesses associated with ISM implementation that support Finding F-SWPA-1: (1) a tractor recovery procedure was not properly planned, (2) hazards associated with boating safety requirements were not addressed, (3) some field JHAs did not address routine work activities, (4) workers used rubber electrically insulated gloves that were beyond the six-month test date, (5) permit-required confined spaces were not labeled, and (6) observed substation crew members violated restricted approach boundaries without proper controls. In addition, SWPA has not ensured that crew leaders adequately supervise all work activities.

3.3 Flowdown of Safety Requirements to Construction Contractors

This portion of the assessment evaluated SWPA's flowdown of DOE safety requirements to its prime contractors and their sub-tier contractors performing construction in SWPA facilities or ROWs; communication of SWPA safety requirements to contractors during pre-work meetings; and SWPA oversight of contracted construction work. Implementation of contract safety requirements was not evaluated because scheduled contract construction work was not available for observation during the assessment.

SWPA has flowed down most requirements in DOE Order 440.1B through its contracts with construction companies. Three reviewed construction contracts (Clarksville to Structure 87 Line Rebuild, Sikeston Substation Fence Replacement, and Piggott Substation Grounding and Drainage Improvements) generally address safety requirements such as compliance with Federal OSHA standards and SWPA's expectation for subcontractors to follow its contract safety requirements. SWPA contracting officers, in coordination with the construction project manager, routinely conduct pre-work meetings to discuss engineering and contracting requirements with the contractor management. A reviewed SWPA Form 542.14, *Checklist – Post Award Conference Agenda*, included documentation related to these topics.

SWPA's approach to safety oversight of contract construction work is generally appropriate to the type of contracted work. Contract construction project management plans for reviewed contracts appropriately require the designation of an SWPA "government inspector" to oversee construction activities, including safety performance, and report back to the SWPA program sponsoring the contract. If SWPA does not have the requisite inspection expertise on staff, it uses an established contract to acquire qualified inspectors and give them stop work authority for safety hazards. For example, the reviewed project plan for the Clarksville to Structure 87 Line Rebuild appropriately designated a SWPA "government

inspector," who was a SWPA electrical lineman with the knowledge and skills needed to oversee the contracted lineman work. The Clarksville to Structure 87 Line Rebuild contract specifically states that the SWPA electrical lineman "government inspector" is required to be on site when work is performed and hold/verify the line clearances as work progresses. The project management plan also designates a project manager from the line program (Transmission Engineering and Planning Division) and a safety professional to periodically make safety observations of the line rebuild work. The results for the safety oversight of contract work were minimal and primarily documented by the safety manager on a site visit checklist. (See **OFI-SWPA-12**.)

Although SWPA generally flows down most requirements to subcontractors, EA identified the following weaknesses:

- Contrary to DOE Order 440.1B, SWPA has not included all construction safety requirements in its construction contracts with Clarksville to Structure 87 Line Rebuild, Sikeston Substation Fence Replacement, and Piggott Substation Grounding and Drainage Improvements. (See **Deficiency D-SWPA-5** and **OFI-SWPA-13**.) Specifically, the following construction safety requirements are missing in construction contracts:
    - Use of the American Conference of Governmental Industrial Hygienist (ACGIH) *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, per DOE Order 440.1B, section 4.m.(9)
    - Use of ANSI Z49.1, *Safety in Welding, Cutting and Allied Processes*, sections 4.3 and E4.3 of the 1999 edition, or equivalent sections of subsequent editions, per DOE Order 440.1B, section 4.m.(12)
    - Use of NFPA 70E per DOE Order 440.1B, section 4.m.(14)
    - Project safety and health plan approval prior to any onsite project work per DOE Order 440.1B, attachment 1, section 1.b.(4). Only the Clarksville to Structure 87 Line Rebuild contract work had the required safety and health plan, but it was not specific to the contract work and was based on California OSHA requirements.
    - Revision of project safety and health plans and hazard analyses, as necessary, to address identified deficiencies in project safety and health performance or changes in project operations, contractors, or personnel per DOE Order 440.1B, attachment 1, section 1.b.(5). The reviewed JHAs provided for each of the three contract work activities only addressed needed PPE but did not address the specific hazards at the work-activity level.
    - Recording and reporting of occupational-related injuries and illnesses of contractor/subcontractor workers consistent with DOE Order 231.1B per DOE Order 440.1B, attachment 1, section 11.a.(2).

  Not including these safety requirements in construction contracts exposes construction workers to potential uncontrolled hazards or precludes the collection of work-related injuries and illnesses data.
- Contrary to DOE Order 440.1B, attachment 1, section 1.a.(3), SWPA has not established effective implementing instructions to delineate construction safety responsibilities/duties of SWPA project management, safety, and acquisition personnel to ensure that all DOE construction safety requirements are included in construction contracts. (See **Deficiency D-SWPA-6**.) Without clear roles and responsibilities, SWPA cannot ensure consistent operational performance. For example, SWPA Order 440.1B, Program 8, *Construction Safety* (current 2007 and draft versions), repeats the DOE Order 440.1B construction requirements without providing implementing instructions for SWPA organizations. Additionally, the missing contract requirements addressed in the preceding bullet are attributable to SWPA's lack of defined procedures.

- Contrary to DOE Order 440.1B, attachment 1, section 1.b.(3), SWPA Form 542.14, *Checklist – Post Award Conference Agenda*, does not include safety personnel as required participants or include the review of safety requirements as a standard agenda topic for construction contractor pre-work meetings. (See **Deficiency D-SWPA-7**.) The lack of SWPA safety staff participation in construction pre-work safety meetings precludes the communication of project safety and health requirements to workers. Interviews with the safety manager, transmission engineer, and acquisition/contract director revealed that safety personnel are not always informed of or attend pre-work meetings to review safety requirements with the contractor.

Flowdown of Safety Requirements to Construction Contractors Conclusions

SWPA has flowed down most requirements in DOE Order 440.1B, and SWPA's approach to safety oversight of contract construction work is generally appropriate to the type of contracted work. However, six requirements specified in DOE Order 440.1B were not included in the three reviewed construction contracts; SWPA safety staff does not always participate in construction pre-work safety meetings to provide contractors clear understanding of safety requirements; and SWPA's oversight documentation of its construction contractors was minimal.

4.0 BEST PRACTICES

No best practices were identified during this assessment.

5.0 FINDINGS

Findings are deficiencies that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. DOE line management and/or contractor organizations must develop and implement corrective action plans for findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, to manage the corrective actions and track them to completion.

Southwestern Power Administration

Finding F-SWPA-1: SWPA has not developed an ISMS description document that addresses the organization's approach to implementing the ISM core functions and guiding principles that support the effective conduct of work. (DOE Order 450.2, sec. 4.a)

Finding F-SWPA-2: SWPA has not formalized training and qualification requirements to ensure that all workers possess the appropriate experience, knowledge, skills, and abilities necessary to fulfill their assigned responsibilities. (SWPA Order 440.1B, Program 3)

Finding F-SWPA-3: SWPA Order 440.1B, program 2 does not include effective implementing procedures to report, investigate, and record SWPA occurrences in the ORPS database. (DOE Order 440.1B, sec. 4.a.(2))

6.0 DEFICIENCIES

Deficiencies are inadequacies in the implementation of an applicable requirement or standard. Deficiencies that did not meet the criteria for findings are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

Southwestern Power Administration

Deficiency D-SWPA-1: SWPA's bloodborne pathogen program, described in SWPA Order 440.1B, program 12, lacks several required elements of a bloodborne pathogen exposure control plan. (29 CFR 1910.1030(c))

Deficiency D-SWPA-2: SWPA has not developed an IH exposure assessment program or assessed workplace exposures. (DOE Order 440.1B, att. 1, sec. 5)

Deficiency D-SWPA-3: SWPA maintenance standard MA-06 contains requirements inconsistent with OSHA requirements. (29 CFR 1910.180 (d) and (g); and ANSI A92.2)

Deficiency D-SWPA-4: SWPA has not ensured that line managers provide adequate oversight of all work activities to verify that work is effectively planned and implemented within established hazard controls. (PSSH, sec. 2.2)

Deficiency D-SWPA-5: SWPA has not included all construction safety requirements specified in DOE Order 440.1B in its construction contracts. (DOE Order 440.1B, secs. 4.m.(9), 4.m.(12), and 4.m.(14); and att. 1, secs. 1.b.(4), 1.b.(5), and 11.a.(2))

Deficiency D-SWPA-6: SWPA has not established effective implementing instructions to delineate the respective construction safety responsibilities/duties of project management, safety, and acquisition personnel to ensure that all DOE construction safety requirements are included in construction contracts. (DOE Order 440.1B, att. 1, sec. 1.a.(3))

Deficiency D-SWPA-7: SWPA does not systematically ensure that contractors are aware of contract safety requirements during pre-work meetings. (DOE Order 440.1B, att. 1, sec. 1.b.(3))

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified the OFIs below to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies in assessment reports, they may also address other conditions observed during the assessment process. These OFIs are offered only as recommendations for line management consideration; they do not require formal resolution by management through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

Southwestern Power Administration

OFI-SWPA-1: SWPA should consider conducting a staffing analysis to identify the appropriate level of support needed to fully comply with DOE Order 440.1B.

OFI-SWPA-2: Consider developing and implementing an IH exposure assessment procedure consistent with the principles outlined in the American Industrial Hygiene Association publication, *A Strategy for Assessing and Managing Occupational Exposures*.

OFI-SWPA-3: Consider developing a training and qualification standard for the ROW and transmission crew workers, similar to the SWPA training and qualification standard developed for substation electrician helpers.

OFI-SWPA-4: Consider addressing the following items in SWPA Order 440.1B, program 2 to ensure rigor in recording occupational injuries and illnesses:

- Quarterly reporting of work hour
- Completion of the OSHA 300 log within 7 days of injury
- Occupational case management, including updating recordability classification changes
- Completion and posting of the annual OSHA 300A summary
- Responsibility and method for case submittals to CAIRS and quarterly case updates
- Quarterly quality assurance checks of CAIRS/OSHA log data
- Establishing CAIRS organization reporting codes for distinct types of work to include a code for contractor (construction and services) injuries and ensuring that contractor injuries are included on appropriate OSHA recordkeeping documents (e.g., 300 log).

OFI-SWPA-5: Consider including supplemental routine work into maintenance standards.

OFI-SWPA-6: Consider creating a maintenance standard to appropriately limit and control the hazards of troubleshooting and repair work.

OFI-SWPA-7: Consider creating a system to ensure that any defects reported in the bucket truck and crane annual inspection reports are tracked until repairs are completed.

OFI-SWPA-8: Consider providing equipment-specific inclinometer markings to help control rollover hazards.

OFI-SWPA-9: Consider obtaining alternate means of communication for use in remote areas, such as land mobile satellite communications.

OFI-SWPA-10: Consider using CRADs and broadening the scope of facility maintenance inspections to facilitate rigorous, systematic hazard identification and analysis, and incorporation of safety and health controls in institutional safety inspection processes.

OFI-SWPA-11: Consider evaluating the applicability of DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, including implementing an oversight process, assurance system, and instituting a system that effectively tracks and trends inspections and corrective actions to completion.

OFI-SWPA-12: Consider using a software application to document safety issues found during oversight. For example, Fermi Research Alliance, LLC at the Fermi National Accelerator Laboratory has effectively and efficiently used the SafetyNet Predictive Solutions application for documenting and analyzing safety issues identified during its oversight of subcontract construction work. Safety professionals, project managers, and SWPA government inspectors could document their oversight activities/results in the application while on site.

OFI-SWPA-13: Consider establishing contract language and/or guidance documentation to provide contractors with a standard format and content for their submitted project-specific safety and health plans and JHAs (such as project-level and daily/task-level JHAs). The Bonneville Power Administration and the Fermi National Accelerator Laboratory are good sources for such documentation.

Appendix A
Supplemental Information

Dates of Assessment

Onsite Assessment: April 10-13 and April 24-27, 2023

Office of Enterprise Assessments (EA) Management

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