Work scope details:

Title: Sairem GRP 1000 Transmitters Operations

Work Scope Summary: The work involves the operation, maintenance, and service of three Sairem Model GRP1000 RF transmitters, which are critical for supporting Fusion R&D; projects. Activities include normal operations, lockout/tagout (LTV) procedures, and routine service and repair, all conducted under strict safety protocols.

Key Work Scope Components:

• Normal operations of the Sairem GRP1000 transmitters

• Lockout/tagout (LTV) procedures for hazardous energy control

• Routine service and repair tasks by R&D; staff and F&O; craft

• Configuration management and operational verification

• Compliance with safety protocols and documentation requirements

Relevant previous events and lessons learned:

Event Title	Event Summary	Lessons Learned	Reference Link
Electrical Shock Incident at RF Facility	An employee received an electrical shock while performing maintenance on RF equipment due to inadequate lockout/tagout procedures.	Emphasized the importance of strict adherence to LTV protocols and ensuring all personnel are trained in electrical safety.	N/A
Equipment Failure During Operation	A transmitter failed during operation due to improper configuration, leading to a temporary shutdown of the facility.	Highlighted the need for thorough pre-operation checks and configuration verification before equipment use.	N/A
Ladder Safety Violation	An employee fell from a ladder while accessing equipment, resulting in injury.	Reinforced the necessity for ladder safety training and proper use of fall protection equipment when working at heights.	N/A
RF Exposure Incident	Personnel were exposed to RF radiation levels exceeding safety limits during transmitter operation.	Stressed the importance of conducting RF surveys and monitoring exposure levels regularly.	N/A
Inadequate Communication During Maintenance	A maintenance task was performed without proper communication, leading to a near-miss incident.	Underlined the significance of clear communication and coordination among team members during maintenance activities.	N/A

Missing Hazards:

Hazard	Missing or Inadequate Mitigation in Current Work Control Document	Recommended Mitigation for Revision	Reference Link	SBMS Link
Electrical Shock	Not addressed	Implement mandatory LTV training for all personnel and ensure compliance with LTV procedures.	N/A	N/A
RF Exposure	Not addressed	Conduct regular RF exposure assessments and ensure monitoring equipment is available and calibrated.	N/A	N/A
Ladder Safety	Not addressed	Require all personnel to complete ladder safety training and use fall protection when necessary.	N/A	N/A
Obstructed Access	Inadequate mitigation	Establish clear access pathways and ensure work areas are kept tidy to prevent tripping hazards.	N/A	N/A
Tool Operation	Not addressed	Ensure all personnel operating tools are trained and that tools are inspected before use.	N/A	N/A
Chemical Handling	Not addressed	Provide specific training on chemical handling and ensure appropriate PPE is available and used.	N/A	N/A
Confined Space	Not addressed	Assess work areas for confined spaces and implement necessary safety measures and training.	N/A	N/A
High Workload	Inadequate mitigation	Monitor workloads and provide additional support or resources during peak times to prevent errors.	N/A	N/A
Communication Failures	Not addressed	Implement structured communication protocols for all maintenance and operational tasks.	N/A	N/A
Overconfidence	Not addressed	Conduct regular safety briefings to reinforce the importance of following procedures and recognizing hazards.	N/A	N/A

Failure mode analysis:

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
Lockout/Tagout Procedures	Permit not obtained or expired	Potential for accidental re-energization during maintenance	Lack of oversight or communication	Implement a checklist to verify permits before work begins
PPE Requirements	PPE not used or inadequate	Increased risk of injury from electrical shock or RF exposure	Lack of awareness or training	Conduct regular PPE training and audits to ensure compliance
Work Instructions	Instructions not followed	Risk of equipment failure or personal injury	Poor communication or unclear instructions	Develop clear, concise work instructions and review them during pre-job briefings
Communication Protocols	Miscommunication among team members	Increased risk of accidents or operational errors	Lack of structured communication	Establish a formal communication protocol for all tasks
Emergency Response Procedures	Inadequate emergency response plan	Delayed response to incidents, increasing severity of injuries	Lack of training or drills	Conduct regular emergency response drills and update plans based on lessons learned
Tool Availability	Tools not available or inadequate	Delays in work and increased risk of using improper tools	Poor inventory management	Implement a tool inventory system to ensure availability and condition
Training and Competency Verification	Personnel not properly trained	Increased risk of accidents and incidents	Inconsistent training practices	Standardize training requirements and maintain records of training completion

Current Control	Failure Mode of the Control	Effect of Failure	Cause of Failure	Recommended Action
Configuration Management	Configuration changes not documented	Increased risk of operational errors	Lack of oversight and communication	Implement a formal configuration management process with regular reviews
RF Monitoring	RF surveys not conducted	Increased risk of RF exposure	Lack of awareness or resources	Schedule regular RF monitoring and ensure personnel are trained in exposure limits
Elevated Work	Ladder safety procedures not followed	Increased risk of falls and injuries	Lack of training or supervision	Require ladder safety training and implement a buddy system for elevated work tasks