1 Purpose

1.1 The purpose of this procedure is to control introduction of foreign material into Sunflower Electric Power Corporation (Sunflower) critical plant systems and components to minimize the potential for damage to equipment and equipment downtime.

2 Scope

2.1 This procedure applies to all generation facilities and systems. Priority of systems or components shall determine the level of Foreign Material Exclusion (FME) control required.

2.2 Sunflower departments affected by the FME procedure include Generation Operations, Generation Maintenance, Generation Engineering Services, Laboratory, Coal & Material Handling, Purchasing and Warehouse.

2.3 All applicable contractor work will adhere to the standards and procedures set forth herein unless a contractor has their own FME program.

2.4 This procedure shall be reviewed every three (3) years or in when there is a foreign material exclusion damage event or near miss.

3 Definitions

3.1 FME Barrier: A temporary method for sealing and protecting a breached system or component from the introduction of foreign material when the system is left open or unattended. An FME Barrier should have these attributes: fire-resistant, non-brittle, tear resistant (paper should not be used), unlikely to deteriorate or decompose with time, inert, highly visible, and is retrievable.

3.2 Foreign Material Log Sheet: A log that is maintained to accurately account for and track items (entering and exiting) a foreign material exclusion area. A log may be hard copy or equivalent electronic copy.

3.3 Foreign Material (FM): Any material that is not part of the system as designed. This includes any item that is left inside of a system that could adversely affect the intended operation, components, or chemistry of the system. Items such as: rice paper, tissue paper, bread or other items used during tube and pipe maintenance work shall not be considered foreign material. The aforementioned items have been deemed no threat by Engineering when they are used in an approved manner.

3.4 Foreign Material Exclusion (FME): Specific controls to prevent the introduction of foreign material into a system to prevent physical damage to system(s) or equipment.

3.5 Foreign Material Exclusion Area (FMEA): A work area requiring specific controls to prevent the introduction of foreign material into a system(s).

3.6 Foreign Material Exclusion Control Plan: A document to be filled out when FME controls are desired. The document has portions to be filled out during the pre-job briefing, during the job, following the system closeout, and after the work has been completed.

3.7 Front-Line Supervisor (FLS): For the purpose of this procedure a Front-Line Supervisor shall include these titles: Mechanical Supervisor, EI&C Technician Supervisor, Maintenance Planning Supervisor, Lab Technician Supervisor, Generation Technician Services Supervisor, Shift Supervisor, Production Supervisor, Coal and Material Handling Supervisor, Purchasing Supervisor, and Warehouse Supervisor.

4 Responsibilities and Action Steps

4.1 The procedure shall have support from the highest levels of Sunflower management.

4.1.1 Sunflower is committed to establish and maintain a robust FME program and will ensure adequate resources are available.

4.1.2 Employees failing to implement FME procedures shall be subject to disciplinary actions up to and including termination.

4.1.2.1 Sunflower shall establish a committee to determine the proper course of action in matters regarding disciplinary actions. The committee will include the FME Coordinator, and four (4) Generation managers.

4.2 Engineering Department

4.2.1 The Generation Technician Services Supervisor shall designate the FME Coordinator.

4.2.2 The FME Coordinator shall:

4.2.2.1 act on this authority through development, implementation, and oversight of the FME procedures and have the full authority to enforce this program;

4.2.2.2 have authority and organizational freedom to identify plan problems and initiate actions that will result in solutions;

4.2.2.3 maintain FME related records;

4.2.2.4 maintain and make available procedure forms and templates;

4.2.2.5 make the final determination to the FME requirements for any contractor work;

4.2.2.6 make the determination if a contractor's proposed FME program will be satisfactory;

4.2.2.7 make the determination of FME requirements being met on work completed by Sunflower personnel or contractors;

4.2.2.8 lead root cause analyses in the event of Sunflower or contractor FME procedure failure;

4.2.2.9 periodically observe work conducted in FMEAs and evaluate reconciled Foreign Material Log Sheets to identify effectiveness and inadequacies of the procedure; and

4.2.2.10 oversee and coordinate scope, type, and frequency of the FME procedure training.

4.3 Contractors

4.3.1 If utilizing a contractor FME program, the substitute program must be validated to be as stringent as Sunflower's FME procedure.

4.3.1.1 A complete copy of contractor FME program will be provided to the FME Coordinator sufficiently in advance of conducting work on Sunflower equipment or systems to allow a reasonable time to review and approve the substitute FME program in advance of the work.

4.3.1.2 Approval of the contractor's FME program shall be provided by the FME Coordinator in writing prior to the contractor commencing any work on an affected Sunflower system or component.

4.3.2 Contractors shall:

4.3.2.1 ensure Sunflower personnel access to the work to spot check their adherence to required FME procedures;

4.3.2.2 immediately notify Sunflower of loss of FME control; and

4.3.2.3 provide Sunflower copies of all FME records at the completion of work.

4.4 Front Line Supervisors' (FLS) shall:

4.4.1 know the content of this procedure, be able to recognize procedural requirements and the loss of FME integrity or control;

4.4.2 support training and awareness of this procedure and assist and advise workers in the proper control of FME from plant components and systems;

4.4.3 make sure that related company work policies and procedures are consistent with this procedure;

4.4.4 spot check work to ensure that proper FME practices are being followed;

4.4.5 notify the FME Coordinator of any event where the Sunflower or contractor FME procedures failed; and

4.4.6 assign a Foreign Material Exclusion Monitor (FMEM) when required.

4.4.6.1 FMEM shall be utilized whenever a Foreign Material Exclusion Area (FMEA) is setup.

4.4.6.1.1 When working alone in a FMEA, a worker may act as his/her own FMEM.

4.5 Foreign Material Exclusion Monitor (FMEM) shall:

4.5.1 complete the Foreign Material Exclusion Control Plan (Appendix A) located on SUN-NET Generation/Generation Blank Forms prior to beginning work in an FMEA;

4.5.2 track all items in and out of the FMEA, including any material that enters the FMEA that will be utilized and not removed from the area and properly complete the Foreign Material Log Sheet (Appendix B) located on SUN-NET Generation/Generation Blank Forms;

4.5.3 regulate the traffic entering and exiting the FMEA; and

4.5.4 not perform other tasks aside from job duties including fire watch and confined space standby in the same area.

4.6 Maintenance Department

4.6.1 Maintenance Manager shall:

4.6.1.1 ensure the implementation of the FME procedure within the Maintenance Departments;

4.6.1.2 ensure adequate staffing to cover FME procedural needs; and

4.6.1.3 reinforce FME standards and expectations as well as hold individuals accountable to those standards and expectations.

4.6.2 Maintenance Supervisors shall:

4.6.2.1 spot check a FMEA and work to ensure that affected maintenance activities are following FME procedures; and

4.6.2.2 have the authority to properly enforce the FME procedure (or approved contractor FME program) to the extent of stopping the job until the matter can be further investigated.

4.6.3 Maintenance Planning shall:

4.6.3.1 identify FME points and FMEA during work planning; and

4.6.3.2 attach the Foreign Material Exclusion Control Plan to the work order for work to be performed within the FMEA.

4.6.4 Craft Labor shall:

4.6.4.1 ensure final implementation and execution of FME procedures;

4.6.4.2 provide feedback to their supervisor as to the effectiveness of the FME procedures and suggest possible improvements; and

4.6.4.3 immediately notify the appropriate FLS of loss of FME controls.

4.6.5 Additional Positions (Job Leaders/Liaisons) shall:

4.6.5.1 support training and awareness of the FME procedure and assist and advise Craft Labor or contractor workers in the proper control of FME into plant components and systems;

4.6.5.2 spot check Craft Labor work or contractor work to ensure that work is following the FME procedure; and

4.6.5.3 have the authority to properly enforce the FME procedure (or approved contractor FME program) to the extent of stopping the job until the matter can be further investigated.

4.7 Operations

4.7.1 Shift Supervisors, Production Supervisors, and Coal & Material Handling Supervisor shall support training and awareness of this procedure and shall assist and advise operations workers in the proper control of FME from plant components and systems.

4.7.2 All Operations department FLS shall understand the FME procedures sufficiently to recognize the loss of FME control when spot checking any work (Operations, Maintenance, or contractor) and report the loss of FME control to the appropriate work supervisor.

4.7.3 Operations personnel shall follow FME procedures when opening, closing, and cleaning affected systems or equipment.

4.8 Laboratory

4.8.1 Laboratory personnel shall follow FME procedures when opening and closing affected systems or equipment under Laboratory control. Examples of affected systems or equipment shall include but not necessarily be limited to reactivators, polishers (when adding resin), condensers, etc.

4.9 Warehouse and Purchasing

4.9.1 Warehouse personnel shall be responsible for material stored in the warehouse, including:

4.9.1.1 Inspecting items for FM upon receipt. Any FM shall be noted, documented, and removed. FM possibilities include but are not limited to gravel, rocks, collapsed shipping plugs, paper, cardboard, water trapped in valve internals from valve hydro, nuts, bolts, or any item not on the shipping manifest.

4.9.1.1.1 In the event an item is delivered to the Warehouse, and by its nature or design cannot be checked for FM, it shall be tagged “not checked for FM”.

4.9.1.2 Ensuring items in inventory storage have covers on any open ends and verify the covers are still in place before items are issued for use.

4.9.1.3 Ensuring covers remain in place when delivering items to the job location. They shall also take note of the location they stage said items as not to inadvertently introduce FM into a component, i.e., not staging items on the ground where sand and rocks might be blown into or fall inside of ends when opened.

4.9.2 Purchasing personnel shall inform vendors of Sunflower’s FME procedure requirements for equipment or materials provided, including:

4.9.2.1 Stating wherever and whenever necessary the site requirements for FME; keeping in mind that all tube, pipe, valves, gearboxes, and other system components, need to arrive on-site free of FM and with shipping plugs or blinds intact.

4.9.2.2 Ensuring proper language is entered on the Purchase Order (PO) and Request for Qualifications so that vendors are made aware of site expectations.

4.10 All Employees

4.10.1 When a purchase is made with a Procard or a PO is generated for a part that has already been received, the proper language would not be provided to the vendor prior their delivery of that part. To maintain the integrity of the FME it is necessary to use the following steps when a method other than routine is used to procure parts.

4.10.1.1 Should a part be procured with the intent to issue a PO after-the-fact; the proper language of expectations shall be provided to the vendor prior to delivery of parts.

4.10.1.2 Should a Procard be used, and the transaction is face-to-face, the language of expectations need not be provided prior to the transaction. However, it shall be the responsibility of the item procurer to ensure the item has the proper FM countermeasures and a reasonable inspection shall be performed.

4.10.1.3 If parts are ordered by Procard through the internet and FME language cannot be exchanged special care should be taken to inspect items upon their arrival.

4.10.1.4 Proper language to be provided to vendors may be obtained by contacting the Purchasing Department at Holcomb Station.

5 FME Instructions & Steps

5.1 Work Order Planning

5.1.1 Any time a work order may require plant personnel to breach a piping system, open an electrical enclosure, or open any plant equipment component not normally accessible, some degree of FME control must be considered.

5.2 Predetermined FMEA

5.2.1 If an FMEA can be properly secured when work is not being performed (i.e., lunch, break, end of shift, work is being performed outside FMEA, etc.) the FMEA may be considered inactive and continuous monitoring is not needed.

5.2.2 The following components, along with any system that directly impacts the operation or could directly limit their integrity or availability, shall be considered critical equipment, and shall always be designated as an FMEA.

5.2.2.1 Turbine and generator during assembly or disassembly, including generator bus work, generator excitation system and all lube oil systems and hydraulic systems.

5.2.2.2 Any boiler when water, steam, or selected gas paths are breached.

5.2.2.2.1 In the case of a boiler the following shall be considered major, and critical components: main steam; reheat steam; feedwater; auxiliary steam; and condensate return.

5.2.2.3 Any boiler feed pump or a boiler feed pump turbine during disassembly or reassembly and while disassembled.

5.2.2.4 Any combustion turbine in its entirety during disassembly or reassembly and while disassembled.

5.2.2.5 Emergency fire protection pumps and systems during disassembly or reassembly and while disassembled.

5.2.2.6 Medium and high voltage motors or junction boxes 600V and above.

5.2.2.7 Medium and high voltage breaker or enclosure 600V and above when breaker is being removed or replaced including the following exceptions.

5.2.2.7.1 The cabinets of the 480V essential bus when they are breached for any reason.

5.2.2.7.2 The cabinets and components of the vital distribution system when they are breached for any reason.

5.2.2.8 Any reciprocating internal combustion engine when they are breached for any reason.

5.2.2.9 Any combined module of a reciprocating internal combustion engine when they are breached for any reason.

5.3 Work Order Execution

5.3.1 Scheduling and Assignment:

5.3.1.1 FLS shall make certain workers are briefed properly on FME requirements and that workers understand their individual FME responsibilities prior to beginning work.

5.3.1.2 FLS shall review work order FME requirements and ensure FME procedure and the completed Foreign Material

Exclusion Control Plan is being properly followed throughout the execution of the work order.

5.3.1.3 FLS shall ensure that work is scheduled to allow sufficient time to adhere to the FME procedure.

5.3.1.4 FLS shall assign workers to act as Foreign Material Exclusion Monitors (FMEM) when appropriate per this procedure.

5.3.1.5 FLS shall identify the need for FMEA associated with a work order and help set their boundaries prior to beginning work on the work order. FLS shall inform Operations of any FMEA that will be established as part of a work order prior to work beginning.

5.3.1.6 FLS shall ensure proper inspections are being carried out, both following the system or component breech, during work, and prior to its closing.

5.3.1.7 FLS shall document any practice or event that falls outside the FME control plan, and/or approving said practice.

5.3.1.8 FLS shall forward all FME documentation to the FME Coordinator.

5.3.2 Pre-Job Briefing

5.3.2.1 A comprehensive discussion of applicable FME requirements shall be included in work order Pre-Job Briefings. FME topics to be discussed shall include:

5.3.2.1.1 Assignment of FMEA including methods for establishing, posting, and controlling boundaries.

5.3.2.1.2 Establishing controlled access point(s) for FMEA and identifying staging and lay down areas for materials, tools, and other job-related equipment.

5.3.2.1.3 Designating a FMEM.

5.3.2.1.4 Reviewing log-in procedures for entrance and exit from the FMEA.

5.3.2.1.5 Surveying the work area and surrounding areas to determine specific precautions that may be required to prevent foreign material generated from that work activity and to ensure

foreign material is not allowed to contaminate critical plant systems within the FMEA.

5.3.2.1.6 Identifying specific FME protective devices and covers that will be required to protect breeched systems.

5.3.2.1.7 Filling out the FME Loss of Control Form (Appendix C) located on SUN-NET Generation/Generation Blank Forms.

5.3.2.1.8 Appropriate FME measures shall be taken to protect both the removed component/assembly and the system/component that was breached.

5.3.2.1.9 Continuing FME considerations shall be given for removed items that are transported to shops or otherwise removed from normal areas.

5.3.3 Establishing the FMEA

5.3.3.1 FMEA shall be established prior to beginning work activity for areas where high levels of FME control are desired.

5.3.3.2 FMEA boundaries shall be constructed by the assigned workers. These boundaries shall be set up in a reasonable fashion allowing room for work activities.

5.3.3.3 Workers shall post boundaries using signs, barriers, and other notifiers so that the FMEA is clearly defined.

5.3.3.4 The FMEA should include clearly defined entrance and exit points.

5.3.3.5 A Foreign Material Log Sheet should be set up at all entrance and exit points to keep track of all material entering and leaving the FMEA.

5.3.3.6 FMEA barriers shall be properly labeled.

5.3.4 Work Execution within the FMEA

5.3.4.1 Once FMEA boundaries have been established, all workers must enter and exit the FMEA through the defined entrance and exit points.

5.3.4.2 All materials brought into and taken out of the FMEA must be logged on the Foreign Material Log Sheet. Log entries should include the name of the item including quantity, and the time and date of entry of the material from the FMEA. Logs should be reconciled regularly throughout the job

(possibly as often as once a shift) and prior to closure of an FMEA to assure accountability.

5.3.4.3 Workers shall make every effort to limit the quantity of items brought into the FMEA. Unneeded tools and equipment shall not be brought into the FMEA. Personal items such as watches, body piercing, jewelry or loose change shall not be brought into the FMEA.

5.3.4.4 Workers shall safely secure all tools, personal protective equipment, and other necessary items (such as glasses, badges, radios, cell phones, etc.) prior to entering the FMEA. Whenever possible the method of securing this equipment will include the use of taglines and lanyards to keep any material that may be dropped under control.

5.3.4.5 Prior to taking any required tools, parts, or other material into a FMEA, workers shall thoroughly inspect the material for loose pieces or other defects which could cause the material to break apart and contaminate a critical plant system.

5.3.4.6 Workers shall remove all trash as it accumulates in and around FMEA to the maximum extent practical. Trash cans shall not be placed within the FMEA unless completely unavoidable.

5.3.4.7 Workers shall perform related tasks outside of FMEA whenever possible.

5.3.5 Breaching Plant Equipment and Systems

5.3.5.1 Upon initial breach of a plant system or piece of equipment, workers shall inspect the equipment to insure there is no FM present.

5.3.5.2 Once a system has been breached, workers shall properly cover all open systems before leaving them unattended. This includes breaks and lunches, as well as leaving for the end of shift.

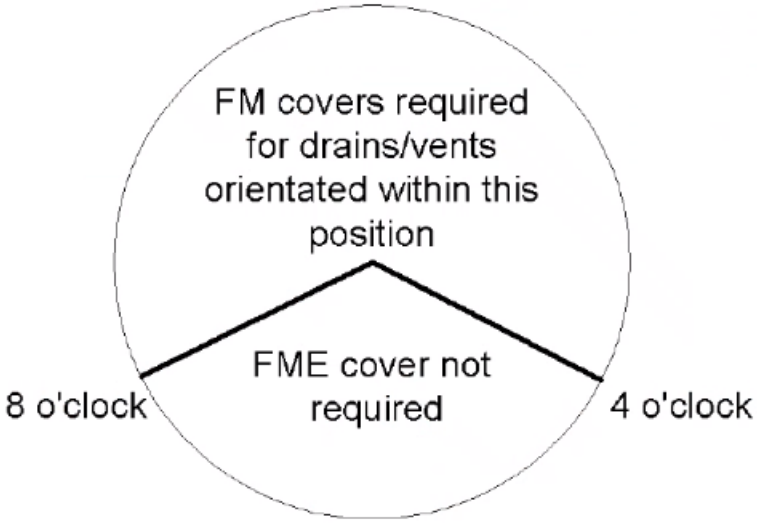
5.3.5.2.1 Covers can be made from any suitable material unless by its nature it can become FM by entering the system. Any cap or cover used should be clearly marked “FME” and included on the Foreign Material Log Sheet.

5.3.5.2.2 In the event internal (sponge or bladder type) barriers are used they shall either be tethered

or marked in a manner conspicuous enough to prevent them from being unnoticed and included on the Foreign Material Log Sheet.

5.3.5.3 Piping in the configuration shown below need not be covered:

5.3.5.3.1 Depending on the system sensitivity and make up this guideline may be the minimum.



5.3.5.4 Workers shall ensure that any component is free of FM prior to installing it in a system. To help ensure proper protection, workers shall inspect all parts received from the Warehouse for FM including but not limited to paperwork, rock, gravel, plugs, shipping covers, bolts, fasteners, rags, fire blanket, solvents, oils, and water, etc.

5.3.6 FMEA Pre-Closure Inspection and Closeout

5.3.6.1 A pre-closure inspection is required for all FMEA's. Workers shall complete this inspection prior to final closure of the FMEA to verify there is no Foreign Material remaining within the FMEA boundaries.

5.3.6.2 Workers shall inspect all tooling being used within the FMEA to be sure there are no pieces or parts missing.

5.3.6.3 The Job Coordinator shall reconcile the Foreign Material Log Sheet prior to final closure of the FMEA and provide to the FME Coordinator with the completed work order for record keeping.

5.3.6.4 When the above steps have been completed, the system may be closed.

5.3.6.5 After all FMEA pre-closure inspections and reconciliations are complete, and the system is closed, workers shall remove all FMEA barriers, signs, and postings.

5.3.7 Restricted Re-opening of Equipment or System previously an FMEA

5.3.7.1 At times it may be necessary to re-open a previously closed system. Examples may include but are not limited to:

5.3.7.1.1 Opening to verify closeout.

5.3.7.1.2 Opening to retrieve FM that was missed in the initial close out.

5.3.7.1.3 Opening to do minimum maintenance activities that may have been missed.

5.3.7.2 When a system is opened in this manner it shall be for a short period of time (less than one shift) and shall have continuous monitoring of any opened access.

5.3.7.3 Through proper planning and scheduling this practice shall be considered the exception rather than the rule.

5.3.8 FME Loss of Control

5.3.8.1 Workers shall notify their FLS and FME Coordinator anytime FME control is lost.

5.3.8.2 The FME Loss of Control Form shall be used whenever FME control is lost.

5.3.8.3 All reasonable attempts to retrieve FM shall be made unless item has been deemed “no threat” by FME Coordinator review.

5.3.8.3.1 Deeming “no threat” will not be common practice.

5.3.8.4 If FM retrieval is required, the retrieval should be carefully planned. Factors to consider include:

5.3.8.4.1 Can the FM be reliably retrieved?

5.3.8.4.2 Will the FM break apart when being retrieved?

5.3.8.4.3 Could the FM be repositioned during recovery creating a more difficult situation?

6 Training

6.1 Training will be provided to employees considered applicable to this procedure.

6.1.1 Introductory training shall be provided as part of orientation for new employees.

6.1.1.1 Depending on the job function, employees will be trained to set up and closeout FMEA's, reconcile Foreign Material Log Sheets, properly cap and cover equipment to prevent FM entry, and correctly close a system.

6.1.2 Refresher training shall be provided at a minimum on an annual basis.

7 References

7.1 Foreign Material Exclusion Control Plan

7.2 Foreign Material Log Sheet

7.3 FME Loss of Control Forms

8 Records

8.1 Copies of contractor FME approved programs and the FME Coordinator's approval letter are maintained on SUN-NET Generation/Tech Services and retained per the applicable retention rule.

8.2 Completed Foreign Material Exclusion Control Plans, Foreign Material Log Sheets, and FME Loss of Control Forms are maintained on SUN-NET Generation/Tech Services and retained per the applicable retention rule.