

**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE  
STANDARD WORK PACKAGE COVER SHEET**

Page 1 of 2

Standard Work Package Number: XXX-XXXXX-01

WORK PROCESS NO. \_\_\_\_\_

REVISION NO. 0

TITLE: Electrical D&D Standard Work Package

Planner: \_\_\_\_\_  
Name / Signature / Date

**CONCURRENCE:**

Responsible: \_\_\_\_\_  
Organization Name / Signature / Date

IH&S: \_\_\_\_\_  
Name / Signature / Date

Engineering: \_\_\_\_\_  
Name / Signature / Date

Rad Safety: \_\_\_\_\_  
Name / Signature / Date

Crit Safety: \_\_\_\_\_  
Name / Signature / Date

Nuc Safety: \_\_\_\_\_  
Name / Signature / Date

Environmental Compliance: \_\_\_\_\_  
Name / Signature / Date

Waste: \_\_\_\_\_  
Name / Signature / Date

Fire Protection: \_\_\_\_\_  
Engineering Name / Signature / Date

Config. Control: \_\_\_\_\_  
Authority Name / Signature / Date

Quality: \_\_\_\_\_  
Name / Signature / Date

Facility Mgr: \_\_\_\_\_  
(or Designee) Name / Signature / Date

ISR: \_\_\_\_\_  
(Review Only) Name / ISR Meeting No. / Date

**APPROVAL:**

Based on my personal review, I agree that the work described in this package meets technical requirements under my cognizance and can be performed safely and contains all of the required controls from the JHA.

Responsible: \_\_\_\_\_  
Manager (Rep) Name / Signature / Date

**SWP USE AUTHORIZATION:**

If SWP used for TS&R work, signature indicates that specific limitations and boundaries on repair activities have been clearly identified. Use of this Standard Work Package (SWP) is authorized for the work specified by the Work Control Form contained herein. Work must be started within 90 calendar days.

Responsible: \_\_\_\_\_  
Manager (Rep) Name / Signature / Date

**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE  
STANDARD WORK PACKAGE COVER SHEET**

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Standard Work Package Number: XXX-XXXXX-01

WORK PROCESS NO. \_\_\_\_\_

REVISION NO. 0

TITLE: Electrical D&D Standard Work Package

**CLOSURE CONCURRENCE:**

Based upon my personal review of this work package and inspection of the work site, all of the work and retest specified in this package has been satisfactorily completed

Job Supervisor: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Name Signature Date

Engineering: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Name Signature Date

CCA: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Name Signature Date

Quality: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Name Signature Date

**CLOSURE CONCURRENCE:**

Responsible: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Manager (Rep) Name Signature Date

Section 2

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Appendix 6 ... Electrical Source Inspection

Appendix 7 ... Walk down / Equipment Removal Documentation

Appendix 8 ... LO/TO / Equipment Removal

Appendix 9 ... Isolation Of Equipment/Component

Appendix 10 ... Engineering Instructions

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**WORK PROCESS FORM**

**Section 3**

Insert WPF Here (if used)

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ENGINEERING DRAWINGS/SPECIFICATIONS

**Section 4**

As Required

**LIST OF REQUIRED DRAWINGS AND REFERENCES**  
**Section 5**

**PERFORMANCE REFERENCES**

REF/DRAW NO	DESCRIPTION	REV. #	EFFECTIVE
None			

**DEVELOPMENTAL REFERENCES**

REF/DRAW NO	DESCRIPTION	REV. #	EFFECTIVE
MAN-071-IWCP	Integrated Work Control Program Manual.....	3	10/30/00
MAN-066-COOP	Site Conduct Of Operations Manual.....	1	10/30/00
MAN-072-OS&IH PM	Occupational Safety & Industrial Hygiene Program Manual.....	0	04/15/01
WSRIC Bldg 776/777	Waste Stream and Residue Identification and Characterization.....	Ver 6.0	
776/777 BIO	Basis For Interim Operation.....	2	
1-PRO-079-WGI-001	Waste Characterization, Generation and Packaging.....	3	12/21/00
3-PRO-165-RSP-07.02	Contamination Monitoring Requirements.....	0	02/17/98
OO-776-372	Restrictions and Compensatory Measures for the LS/DW and CAAS Systems in Building 776/777.....	4	03/13/01
OO-776-374	Management Requirements For Remediation Waste	1	11/13/00
OO-776-392	Building 776/777 Implementation Of The Site CBDPP	1	03/06/01

**LESSONS LEARNED**

SD-99-1934	Inattention to detail = near miss	
SD-99-0862	Zero Energy Condition Also Applies To Pressure Systems	
SD-99-0689	D&D Electrical Safety Lessons Learned	
SD-98-0581	Worker Cuts Through Energized 480 Volt Line-Injury Avoided by Use Of Protective Personal Equipment & Insulated Tool	

**WEEKLY TOOLBOX INFORMATION**

Covered Wire Causes Near Miss	10/09/2000
Stored Energy is Everywhere	03/05/2001
Proper Planning Protects Workers	03/19/2001
Properly Locate and Identify Multiple Power Sources	12/29/2000

WPF# \_\_\_\_\_  
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MATERIAL REQUIREMENTS  
**Section 6**

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MATERIAL REQUIREMENTS

IF ANY PARTS OR MATERIAL WILL BE REQUIRED, CONTACT COGNIZANT ENGINEER FOR BOM

**LIST OF TOOL REQUIREMENTS/PPE/TRAINING**  
**Section 7**

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**7.1 SPECIAL TOOLS REQUIRED**

- ? Insulated Tools
- ? Meters / Voltage Detectors, as required by OS&IH Ch. 36.

List additional tools:

---

**7.2 RWP PERSONNEL PROTECTIVE EQUIPMENT (PPE)**

- ? Cotton Liners
- ? Rubber gloves
- ? Shoe covers
- ? Rubber Overshoes
- ? Anti C Coveralls

Additional RWP PPE As Listed:

**NOTE:** PPE listed in this work package is the minimum required. Substitutions of PPE shall NOT be made without Industrial Health & Safety (IH&S) and Radiological Safety concurrence.

**7.3 PERSONNEL PROTECTIVE EQUIPMENT (PPE)**

If this is energized work, list type of work, hazard category and PPE required by the 2000 edition NFPA 70E  
**NOTE:** The 2000 edition NFPA 70E has had a significant change for working with energized equipment.

For work on non-energized equipment the following PPE should be considered:

- ? Safety glasses with side shields
- ? Bump Cap / Hard Hat
- ? Safety shoes
- ? Other PPE requirements as required by the JHA, RWP and as posted
- ? Fall Protection per MAN-072-OS&IH PM Ch. 42, as specified by Industrial Hygiene & Safety.
- ? Cut resistant gloves, as required

**7.4 TRAINING REQUIREMENTS**

The following training **may** be required for some or all of the workers (depending on their actual job activity). The Planner should confirm with the job supervisor and Project Training Manager what specific training will be required and insert it here. If there is no specific training required state that.

- ? Radiological Worker Level 2
- ? LO/TO worker brief
- ? Ladder Safety Awareness
- ? Scaffolding Safety
- ? Fall Protection Safety Awareness
- ? Lead In The Workplace
- ? Beryllium Awareness
- ? Beryllium Worker Training
- ? Glove Box Support Activities
- ? Powered Air Purified Respirator
- ? Electrical Safety For Electrical Workers
- ? Cardiopulmonary Resuscitation Training ( For Energized work on  $\geq$  480 volt circuits)
- ? Electrical Safety For Non-Electrical Workers
- ? LO/TO Practical Applications
- ? Waste Generator Training

**INITIAL CONDITIONS, PREREQUISITES, PRECAUTIONS AND LIMITATIONS**  
**Section 8**

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**8.1 PURPOSE:**

The purpose of this Standard Work Package is to provide instructions for safely performing a pre-job investigation walk down, determination, verification and removal of electrical equipment/components.

**8.2 SCOPE:**

This work package gives instruction to perform the following activities:

- ? Investigation and documentation of electrical systems and equipment/components
- ? LO/TO and Verification
- ? Isolate Electrical Equipment/Components
- ? Electrical equipment/component associated conduit and conductors removal other than electrical distribution i.e., switch gear, motor control centers, power transformers, etc.

**8.3 PRECAUTIONS AND LIMITATIONS**

- 8.3.1 The Job Supervisor **SHALL** be present at the work location during all energized work.
- 8.3.2 Energized work is defined as any work, testing or voltage measurement that breaks the plane of an electrical panel containing or thought to contain voltage greater than 50 volts.
- 8.3.3 Prior to starting work on energized conductors/equipment/items verify the Energized Work Permit is approved.
- 8.3.4 Any work on ladders will be evaluated by IH&S IAW OS&IH PM Ch. 39.
- 8.3.5 Respiratory Protection Selection On-The-Job Verification Worksheet shall be completed per MAN-072-OS&IH PM Ch.31.
- 8.3.6 Cable insulation used in thermal (furnaces, lighting, etc) applications may contain asbestos fiber and precautions for asbestos work per MAN-072-OS&IH Manual Chapter 19 "Asbestos Management Program" **SHALL** be implemented.
- 8.3.7 Construction, inspection and removal of scaffolding **SHALL** be performed in accordance with (IAW) MAN-072-OS&IH PM Ch. 40 and logged into the Work Package Status Log, Appendix 2.
- 8.3.8 Material Control and Accountability (MC&A) compliance:
  - 1. For all gloveboxes, equipment, plenums, etc. that have holdup measurements, the Job Supervisor will complete a Holdup Items Tracking Form and deliver it to the NMC office at the time the material is packaged or removed from the building.
  - 2. An Observation/TSA scan form will be completed and submitted to NMC for any SCO material without a holdup scan.
- 8.3.9 When cutting/grinding conduit that enters protective enclosures i.e. (termination boxes, electrical panels, etc) containing energized, or may be energized in the future, exposed equipment/components or conductors, precautions **SHALL** be taken to prevent the filling/fines from entering the enclosure.
- 8.3.10 Actions **SHALL** be taken to identify any common neutrals that may exist during the hazard identification process.

**INITIAL CONDITIONS, PREREQUISITES, PRECAUTIONS AND LIMITATIONS**

**Section 8**

8.3.11 When cutting conduit caution should be taken to ensure the conduit is still grounded i.e. by use of a bonding jumper or attached to building steel or other grounded equipment, etc.

8.4 PRELIMINARY ACTIONS

8.4.1 **JOB SUPERVISOR**

- a) Personnel performing work are trained and qualified in accordance with the requirements of Section 7 "Training Requirements" and the Job Hazard Analysis (JHA).
- b) The necessary Special Tools/PPE/safety equipment per Section 7, "Special Tools" and "PPE" and as identified on JHA, as applicable, are available for the job. PPE is rated for the highest potential voltage that could be contacted and is within the specified test frequencies of HSP-072-OS&IH PM Chapter 36, 6 months for rubber insulating gloves and 12 months for rubber insulating blankets and sleeves.
- c) Prior to starting work on energized conductors/equipment/items verify the Energized Work Permit is approved.
- d) For energized work protective barriers with appropriate hazard signs will be installed per HSP-072-OS&IH PM Chapter 36 Paragraph 5.6 prior to removal of any permeate protective barriers, i.e. enclosure covers, doors, etc.

8.4.2 **JOB SUPERVISOR**

Waste Generating Instructions (WGI) has been obtained and a Waste Stream Worksheet has been completed and inserted into Appendix 3.

8.4.3 **JOB SUPERVISOR**

The crew performing the work has walked down the job site and has identified the hazards and associated controls.

8.4.4 **RADIOLOGICAL ENGINEERING (RE)**

Verify that the ALARA Job Review is the most current revision and has been approved for use.

Review # \_\_\_\_\_

RE \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

8.4.5 **RADIOLOGICAL OPERATIONS**

Verify that the Radiological Work Permit (RWP) is the most current revision and has been approved for use.

RWP # \_\_\_\_\_

Rad Ops \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date



**SPECIFIC TASK INSTRUCTIONS**  
**Section 9**

**9.1.3 JOB SUPERVISOR**

Initiate an Energized Work Permit for verification of power sources and equipment (e.g. Lighting Panels, etc.) to be inspected per this SWP. N/A if not applicable



**9.1.4 ENGINEER, ELECTRICIAN, JOB SUPERVISOR, & RM**

List the following information on Table 9-2 of Appendix 7 for equipment/components affected by isolating the equipment/component.

1. Equipment description
2. Energy source to be isolated (e.g. Buss Duct, Light Panel, MCC, PDC, etc.)
3. The panel #
4. Circuit #
5. Existing LO/TO Permit/Tag number(s) (N/A if none exist)

**Engineering** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**Electrician** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**Job Supervisor** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**RM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**NOTE:** 1) *The following one line drawing or sketch is preliminary and only for investigation purposes.*  
 2) *A one line drawing or sketch is required for LO/TO.*

**9.1.5 ENGINEERING**

Develop a one line drawing or sketch including the energy source device(s), the circuit or breaker number, voltage, and insert into Appendix 3. Be aware of possible multiple energy sources, particularly when dealing with interlocks between multiple pieces of equipment.



**9.1.6 ENGINEER**

Initiate a Baseline Document Change Form (BDCF).



**9.1.7 RESPONSIBLE MANAGER (RM) / CONFIGURATION CONTROL AUTHORITY (CCA)**

Determine all necessary required actions and document on Table 9-2 of Appendix 7.

**RM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**CCA** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date



**SPECIFIC TASK INSTRUCTIONS**  
**Section 9**

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**9.2 LO/TO AND VERIFICATION**

**NOTE:** *Section 9.2 SHALL be repeated for separate LO/TO evolutions of circuits/equipment identified in Appendix 7 and completion of steps will be documented on Appendix 8, unless otherwise specified within the Step. Appendix 8 will be utilized for each LO/TO*

9.2.1 Go to Appendix 8 and perform LO/TO or energized work.

**9.3 ISOLATE ELECTRICAL EQUIPMENT/COMPONENTS**

**NOTE:** *Section 9.3 shall be repeated for multiple equipment/components to be disconnected.*

9.3.1 Go to Appendix 9 and perform steps, as applicable, for each component/circuit to be permanently isolated and document completion on Appendix 9. N/A steps not applicable.



**SPECIFIC TASK INSTRUCTIONS**  
**Section 9**

9.4.6.2 For conduit/equipment/components:

- ? **IF** conduit or conduit stubs are left, after all the conductors in the conduit has been physically severed so they can not be re-energize place green de-energized labels on remaining conduit ends, transition points, and where they penetrate a wall or barrier.
- ? Enclosures that still have the potential or future potential of containing energized equipment or conductors, replace all protective enclosure (i.e. termination boxes, panels, junction boxes) covers and plug holes with plugs designed for that purpose. After all conductors to the enclosure have been physically severed where they can not be re-energized, place a green de energized label on the enclosure.
- ? After all energy source paths have been physical removed from equipment/components so that they can not be re-energized place a green de energized label on it.
- ? N/A if not applicable.

9.4.7 **ELECTRICIAN**

Package waste IAW the applicable Waste Generating Instruction (WGI).

9.4.8 **RCT**

Complete a Post-job survey per 3-PRO-165-RSP-07.02, as required

**9.5 TASK COMPLETION REVIEW**

9.5.1 **JOB SUPERVISOR**

All work activities in this section has been completed satisfactorily. Package is ready for closeout.

**Job Supervisor** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date



1.) **ENGINEER, ELECTRICIAN, JOB SUPERVISOR, & RM**

List the following information on Table 9-2 of Appendix 7 for additional equipment/components affected by isolating the equipment/component.

- 6. Equipment description
- 7. Energy source to be isolated (e.g. Buss Duct, Light Panel, MCC, PDC, etc.)
- 8. The panel #
- 9. Circuit #
- 10. Existing LO/TO Permit/Tag number(s) (N/A if none exist)

**Engineering** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**Electrician** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**Job Supervisor** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**RM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**NOTE:** (1) *The following single line drawing or sketch is preliminary and only for investigation purposes.*  
 (2) *A one line drawing or sketch is required for LO/TO.*

2.) **ENGINEERING**

Update single line drawing or sketch including the energy source device(s), the circuit or breaker number, voltage, & any existing LO/TO Permits, and insert into Appendix 3.



3.) **ENGINEERING**

Update BDCF already initiated.



4.) **RESPONSIBLE MANAGER (RM) / CONFIGURATION CONTROL AUTHORITY (CCA)**

Determine all necessary required actions and document on Table 9-2 of Appendix 7.

**RM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**CCA** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

5.) **RESPONSIBLE MANAGER (RM) / CONFIGURATION CONTROL AUTHORITY (CCA)**

Determine if the components listed will be permanently de-energized and disconnected and record on Table 9-2 of Appendix 7.

**RM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

**CCA** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
 Print Name Signature Date

6.) **RESPONSIBLE MANAGER (RM) / RESPONSIBLE ENGINEERING MANAGER (REM)**  
The work scope and Engineering input documented in Appendix 7 can be implemented per this SWP.

**RM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**REM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

7.) **RESPONSIBLE MANAGER (RM)/CCA**  
Obtain Nuclear Safety concurrence and insert nuclear safety documentation (i.e. SES, USQD) into Appendix 3 for scope of work identified.

**RM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**CCA** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

8.) **RESPONSIBLE MANAGER (RM)**  
Review the RWP and JHA to ensure adequate controls are in place prior to implementing compensatory actions or LO/TO. Consideration should be given to any new hazards that may be the result of LO/TO and associated required actions. New hazards and controls SHALL be added to the JHA.

**RM** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

9.) **CRAFT/JOB SUPERVISOR**  
**IF** the energy source will be LO/TOed,  
**THEN** initiate and complete a LO/TO request for the energy source identified on sketch/drawing IAW MAN-072-OS&IH PM Ch. 9 and insert into Appendix 3. N/A if working under an Energized Work Permit.

**AND**

Initiate and complete an Energized Work Permit to support LO/TO no voltage verification and insert into Appendix 3. N/A if LO/TO of energy source not utilized.

10.) **CRAFT/JOB SUPERVISOR**  
**IF** energy source will not be LO/TOed,  
**THEN** initiate an Energized Work Permit and insert into Appendix 3.

**WARNING**  
**LADDERS AND SCAFFOLDING SHALL BE INSPECTED PRIOR TO EACH USE**

11.) **CRAFT/JOB SUPERVISOR**  
There is adequate lighting/power at the job location(s) and install temporary power/lighting, as required.

12.) **CCA**

Required actions are in place and appropriate notification to workers in the affected areas have been completed, as necessary.

**CCA** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

13.) **RCT**

Perform pre-job surveys per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements", as required.

**RCT** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

14.) **ELECTRICIAN**

Remove existing LO/TO's IAW OS&IH PM Ch. 9 to physically access panel(s). N/A if not applicable

- NOTE:**
- 1) *Removal of LO/TO and re-energizing circuits maybe necessary for positive verification, upon concurrence of the LO/TO Manager.*
  - 2) *Job Supervisor SHALL be present during all energized work.*
  - 3) *Fall Protection may be required when working on elevated work surfaces or as directed by IH&S*

15.) If performing energized work per Step 10, the following steps in Appendix 6 will not be performed, steps will be marked N/A and work will resume in Section 9.3.

16.) **ELECTRICIAN / LO/TO ISOLATOR**

Place each energy isolation device in the isolation position given by the LO/TO Permit (LTP) IAW OS&IH PM Ch. 9. N/A if not applicable.

**WARNING**  
**GREATER THAN 50 VOLTS MAY BE PRESENT. SAFETY GLASSES, RUBBER MAT, AND INSULATED GLOVES AND INSULATING TOOLS ARE EXAMPLES OF PPE REQUIRED WHEN WORKING ON OR NEAR ENERGIZED ELECTRICAL CIRCUITS.**

**WARNING**  
**CONDUCTIVE ITEMS LIKE WATCHES, JEWELRY, STEEL TAPE MEASURES, AND CONDUCTIVE MATERIALS SHALL NOT BE WORN OR PLACED ON OR AROUND ELECTRICAL EQUIPMENT.**

**WARNING**  
**VOLTAGE TESTERS SHALL BE CHECKED FOR OPERABILITY PRIOR TO AND FOLLOWING TESTING OF EQUIPMENT AND/OR CIRCUITS.**

**WARNING**  
**STORED ENERGY MAY BE PRESENT AT COMPONENTS/EQUIPMENT (e.g. CAPACITORS, BATTERIES, SPRINGS, ETC.).**

**WARNING**  
CIRCUITS MAY HAVE COMMON NUETRALS THAT NEED TO BE IDENTIFIED PRIOR TO START OF REMOVAL OF CONDUCTORS.

**NOTE:** *RCT SHALL be present during opening of all enclosures.*

17.) **ELECTRICIAN**  
Open/remove panel cover(s) (i.e. MCC, Buss Duct, Light Panel, etc.) to access interior of panel(s) and verify no voltage on load side of isolation device(s).

**Electrician** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

18.) **JOB SUPERVISOR**  
**IF** stored energy is identified,  
**THEN** perform Appendix 10. N/A if not required

19.) **ELECTRICIAN/ISOLATOR/LO/TO VERIFIER**  
Close/re-install panel cover(s), as required and install/verify new LO/TO(s) IAW OS&IH PM Ch. 9.

**LO/TO Verifier** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**WARNING**  
GREATER THAN 50 VOLTS MAY BE PRESENT. SAFETY GLASSES, RUBBER MAT, AND INSULATED GLOVES AND INSULATING TOOLS ARE EXAMPLES OF PPE REQUIRED WHEN WORKING ON OR NEAR ENERGIZED ELECTRICAL CIRCUITS.

**WARNING**  
CONDUCTIVE ITEMS LIKE WATCHES, JEWELRY, STEEL TAPE MEASURES, AND CONDUCTIVE MATERIALS SHALL NOT BE WORN OR PLACED ON OR AROUND ELECTRICAL EQUIPMENT.

**WARNING**  
VOLTAGE TESTERS SHALL BE CHECKED FOR OPERABILITY PRIOR TO AND FOLLOWING TESTING OF EQUIPMENT AND/OR CIRCUITS.

**WARNING**  
STORED ENERGY MAY BE PRESENT AT COMPONENTS/EQUIPMENT (e.g. CAPACITORS, BATTERIES, SPRINGS, ETC.).

20.) **ELECTRICIAN**  
Verify no voltage is present at the down stream panels. Both supply side and load side should be verified. If voltage is found, N/A the remaining steps of Appendix, make a Status Log entry and re-perform Appendix 6.

**Electrician** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

WPF # \_\_\_\_\_

**Electrical Source Inspection**

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**Appendix 6**

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21.) **JOB SUPERVISOR**

**IF** stored energy is identified,  
**THEN** perform Appendix 10. N/A if not required

22.) **ELECTRICIAN, JOB SUPERVISOR**

Inspect all applicable conduit runs to ensure that all conductors, cables and potential energy sources have been identified. If additional electrical source is identified, re-perform Appendix 6.

**Electrician** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**Job Supervisor** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**WARNING**  
**STORED ENERGY MAY BE PRESENT AT COMPONENTS/EQUIPMENT (e.g. CAPACITORS, BATTERIES, SPRINGS, ETC.).**

23.) **ELECTRICIAN**

Verify no voltage is present at the equipment/component being isolated, as identified in Appendix 7. Sign/date on Table 9-2 of Appendix 7. If voltage is found, re-perform Appendix 6.

24.) **JOB SUPERVISOR**

**IF** stored energy is identified,  
**THEN** go to Appendix 10 and document action(s) to be taken. N/A if not required

25.) **ELECTRICIAN**

Return to Appendix 8 / 9, as applicable, and re-perform steps.





**NOTE:** *Copies of Appendix 8 may be made for each group of circuits.*

**NOTE:** *Section 7 will be updated if additional requirements are identified.*

**9.2.1.1 ELECTRICIAN/JOB SUPERVISOR**

Review the RWP and JHA to ensure controls are adequate prior to implementing compensatory actions or LO/TO. Consideration should be given to any new hazards that may be the result of LO/TO and associated required actions. New hazards and controls SHALL be added to the JHA.

**Job Supervisor** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**9.2.1.2 ELECTRICIAN/JOB SUPERVISOR**

Identify circuit(s)/equipment identified in Appendix 7 to be worked.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Job Supervisor** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**NOTE:** *The preferred and safest method of isolation is to LO/TO the energy source.*

**9.2.1.3 ELECTRICIAN/JOB SUPERVISOR**

**IF** the energy source will be LO/TOed,

**THEN** initiate and complete a LO/TO request for the energy source identified on sketch/drawing IAW MAN-072-OS&IH PM Ch. 9 and insert into Appendix 3. N/A if working only under an Energized Work Permit

**AND**

Initiate and complete an Energized Work Permit, if required due to proximity of energized source, to support LO/TO no voltage verification and insert into Appendix 3. N/A if LO/TO of energy source not utilized.

**NOTE:** *Ensure proper PPE is selected.*

**9.2.1.4 ELECTRICIAN/JOB SUPERVISOR**

**IF** energy source will not be LO/TO and energized source is near the work,

**THEN** initiate an Energized Work Permit and insert into Appendix 3.

**WARNING**  
**LADDERS AND SCAFFOLDING SHALL BE INSPECTED PRIOR TO EACH USE**

**9.2.1.5 ELECTRICIAN/JOB SUPERVISOR**

There is adequate lighting/power at the job location(s) and install temporary power/lighting, as required.

**9.2.1.6 CCA**

Required actions are in place and appropriate notification to workers in the affected areas have been completed, as necessary.

**CCA** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**9.2.1.7 RCT**

Perform pre-job surveys per 3-PRO-165-RSP-07.02, "Contamination Monitoring Requirements", as required.

**RCT** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**9.2.1.8 ELECTRICIAN**

If possible, remove existing LO/TO's IAW OS&IH PM Ch. 9 to physically access panel(s). N/A if not applicable

- NOTE:**
- 1) *Removal of LO/TO and re-energizing circuits maybe necessary for positive verification, upon concurrence of the LO/TO Manager.*
  - 2) *Job Supervisor SHALL be present during all energized work.*
  - 3) *Fall Protection may be required when working on elevated work surfaces or as directed by IH&S*

9.2.1.9 If performing energized work per Step 9.2.1.4, the following steps will be marked N/A and work will resume per Section 9.3.

**9.2.1.10 ELECTRICIAN / LO/TO ISOLATOR**

Place each energy isolation device in the isolation position given by the LO/TO Permit (LTP) IAW OS&IH PM Ch. 9.

**WARNING**  
**GREATER THAN 50 VOLTS MAY BE PRESENT. SAFETY GLASSES, RUBBER MAT, AND INSULATED GLOVES AND INSULATING TOOLS ARE EXAMPLES OF PPE REQUIRED WHEN WORKING ON OR NEAR ENERGIZED ELECTRICAL CIRCUITS.**

**WARNING**  
**CONDUCTIVE ITEMS LIKE WATCHES, JEWELRY, STEEL TAPE MEASURES, AND CONDUCTIVE MATERIALS SHALL NOT BE WORN OR PLACED ON OR AROUND ELECTRICAL EQUIPMENT.**

**WARNING**  
**VOLTAGE TESTERS SHALL BE CHECKED FOR OPERABILITY PRIOR TO AND FOLLOWING TESTING OF EQUIPMENT AND/OR CIRCUITS.**

**WARNING**  
**STORED ENERGY MAY BE PRESENT AT COMPONENTS/EQUIPMENT (e.g. CAPACITORS, BATTERIES, SPRINGS, ETC.).**

**NOTE:** RCT SHALL be present during opening of all enclosures.

**9.2.1.11 ELECTRICIAN**

Open/remove panel cover(s) (i.e. MCC, Buss Duct, Light Panel, etc.) to access interior of panel(s) and verify no voltage on load side of isolation device(s).

**Electrician** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**9.2.1.12 JOB SUPERVISOR**

**IF** stored energy is identified,  
**THEN** perform Appendix 10. N/A if not required



**9.2.1.13 ELECTRICIAN/ISOLATOR/LO/TO VERIFIER**

Close/re-install panel cover(s), as required and install/verify new LO/TO(s) IAW OS&IH PM Ch. 9.

**LO/TO Verifier** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**WARNING**  
**GREATER THAN 50 VOLTS MAY BE PRESENT. SAFETY GLASSES, RUBBER MAT, AND INSULATED GLOVES AND INSULATING TOOLS ARE EXAMPLES OF PPE REQUIRED WHEN WORKING ON OR NEAR ENERGIZED ELECTRICAL CIRCUITS.**

**WARNING**  
**CONDUCTIVE ITEMS LIKE WATCHES, JEWELRY, STEEL TAPE MEASURES, AND CONDUCTIVE MATERIALS SHALL NOT BE WORN OR PLACED ON OR AROUND ELECTRICAL EQUIPMENT.**

**WARNING**  
**VOLTAGE TESTERS SHALL BE CHECKED FOR OPERABILITY PRIOR TO AND FOLLOWING TESTING OF EQUIPMENT AND/OR CIRCUITS.**

**WARNING**  
**STORED ENERGY MAY BE PRESENT AT COMPONENTS/EQUIPMENT (e.g. CAPACITORS, BATTERIES, SPRINGS, ETC.).**

**WARNING**  
**CIRCUITS MAY HAVE COMMON NUETRALS THAT NEED TO BE IDENTIFIED PRIOR TO START OF REMOVAL OF CONDUCTORS.**

**9.2.1.14 ELECTRICIAN**

Verify no voltage is present at the down stream panels. Both supply side and load side should be verified. If voltage is found, N/A the remaining steps of Appendix, make a Status Log entry and perform Appendix 6.

**Electrician** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**9.2.1.15 JOB SUPERVISOR**

**IF** stored energy is identified, **THEN** perform Appendix 10. N/A if not required



**9.2.1.16 ELECTRICIAN, JOB SUPERVISOR**

Inspect all applicable conduit runs to ensure that all conductors, cables and potential energy sources have been identified. Verify that all conduits to be removed have the green de-energized tag attached. Place a red tape start/stop indicator on the first and last section of conduit to be removed. If additional electrical source or common neutral is identified, go to Appendix 6.

**Electrician** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**Job Supervisor** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**WARNING**  
**STORED ENERGY MAY BE PRESENT AT COMPONENTS/EQUIPMENT (e.g. CAPACITORS, BATTERIES, SPRINGS, ETC.).**

**9.2.1.17 ELECTRICIAN**

Verify no voltage is present at the equipment/component being isolated, as identified in Step 9.2.1.2. Sign/date on Table 9-2 of Appendix 7. If voltage is found, go to Appendix 6.

**9.2.1.18 JOB SUPERVISOR**

**IF** stored energy is identified,  
**THEN** perform Appendix 10. N/A if not required

**9.2.1.19 Perform the following steps at panel/enclosure:**

**NOTE:** Care should be taken to ensure which lines are to be cut and how the lines are to be cut. Avoid using saws or other cutting method that could leave metal fines behind

**NOTE:** Care must be taken to ensure that the grounds for other items and raceway are not disconnected. This may require the use of bonding jumpers or additional ground connections.

**NOTE:** Circuits may have common neutrals and care must be taken to identify these prior to start of removal of the conductors.

**NOTE:** Wires may have asbestos . Ensure all hazards are analyzed prior to proceeding.

**ELECTRICIAN**

- 1) Lift designated load side leads.
- 2) Cut/remove designated leads in panel so that they can not be re-terminated.
- 3) Construct containment per RCT direction. N/A if not required

**RCT**

- 4) Verify correct installation of containment. N/A if not required

**RCT** \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**ELECTRICIAN**

- 5) Cut conduit(s) approximately 6" from enclosure to create an air gap and remove stubs.





**ELECTRICIAN**

8. Cut conduit(s) approximately 6" from enclosure to create an air gap and remove stubs.

**NOTE:** When labeling conduit, label should be placed such that you can see the next label from the previous label.

**WARNING**  
**IF PANELS ARE TO BE LEFT OPEN AT THE END OF A SHIFT, THE ASSOCIATED AREA SHOULD BE ISOLATED IN ACCORDANCE WITH IH&S DIRECTION.**

**9.3.1.5 ELECTRICIAN**

Install green de-energized labels on the breaker and all equipment, components and conduits being de-energized.

**NOTE:** The following step SHALL be completed by a person who is independent from those that installed the labels above. The independent check will be separated from the original installation by time and distance.

**9.3.1.6 PEER ELECTRICIAN**

Perform a peer review from equipment to energy source to ensure correct labeling of de-energized equipment/components.

**9.3.1.7 JOB SUPERVISOR**

Sub-Steps 9.3.1.2 through 9.3.1.6 have been completed for equipment/component(s) identified in Step 9.3.1.1 to be permanently disconnected.

Job Supervisor \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Print Name Signature Date

**9.3.1.8 ELECTRICIAN/ JOB SUPERVISOR**

Initiate a LO/TO removal request IAW OS&IH PM Ch. 9 for LO/TOs to be removed, as identified in Step 9.3.1.1. N/A if LO/TO not used.

**9.3.1.9 JOB SUPERVISOR**

Contact CCA to support exit of required actions, as necessary

