

# STRAY VOLTAGE INVESTIGATION

## IDENTIFICATION

*The investigator need only perform tests and record results sufficient to resolve the stray voltage concern.  
As a result, various portions of this report may intentionally be left blank.*

Date of Investigation: \_\_\_\_\_ Region: \_\_\_\_\_

Customer Name: \_\_\_\_\_ Township: \_\_\_\_\_

Farm Address: \_\_\_\_\_ County: \_\_\_\_\_

Mailing Address: \_\_\_\_\_ City & State \_\_\_\_\_ ZIP: \_\_\_\_\_

Phone #: \_\_\_\_\_ Phone # (Alt.): \_\_\_\_\_

Phone Co.: \_\_\_\_\_ Cable Co.: \_\_\_\_\_

Electrical Contractor: \_\_\_\_\_ Electrician's Name: \_\_\_\_\_

## NATURE OF INVESTIGATION

Advisory Investigation or isolator re-evaluation only. Customer not currently experiencing production or herd health problems.

Response to customer concern that stray voltage may currently be affecting production and/or herd health.

Rewire program

Other \_\_\_\_\_

Lead Investigator: \_\_\_\_\_

Others: \_\_\_\_\_

Service Center: \_\_\_\_\_

Report Prepared By: \_\_\_\_\_

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# STRAY VOLTAGE INVESTIGATION

Customer: \_\_\_\_\_

Date: \_\_\_\_\_

CASE HISTORY

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# Cows Milking: \_\_\_\_\_ R.H.A. \_\_\_\_\_ S.C.C. \_\_\_\_\_ DHI/OTHER: \_\_\_\_\_

Reason customer requests testing: \_\_\_\_\_

What effects on the herd does customer believe this has? \_\_\_\_\_

When was condition first observed and by whom? \_\_\_\_\_

What was done about it? \_\_\_\_\_

Were any other changes made around the time first observed? \_\_\_\_\_

Other concerns: \_\_\_\_\_

	Y/N	Describe:
Any electrical difficulties?	_____	_____

Any lightning damage?	_____	_____
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Do all animals react?	_____	_____
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Do animals avoid any areas?	_____	_____
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Does weather have an effect?	_____	_____
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Did farmer or electrician take any measurements?	_____	_____
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Common well (y/n)? \_\_\_\_\_

Well to tank \_\_\_\_\_ Metal \_\_\_\_\_ Plastic

Tank to house \_\_\_\_\_ Metal \_\_\_\_\_ Plastic

Tank to barn \_\_\_\_\_ Metal \_\_\_\_\_ Plastic

NOTES: \_\_\_\_\_

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# STRAY VOLTAGE INVESTIGATION

Customer:

Date:

ELEC. SYSTEM REVIEW

	<u>XFMR #1</u>	<u>XFMR #2</u>	<u>XFMR #3</u>	Total KVA
OH or UG	_____	_____	_____	
XFMR KVA	_____	_____	_____	_____
Phase Configuration	_____	_____	_____	
Equipment ID#	_____	_____	_____	
Isolator (y/n)?	_____	_____	_____	
End of line (y/n)?			_____	
Feeder number			_____	
Substation name			_____	
Line distance to substation from which supplied			_____	
Size and type of phase conductor on feeder serving the farm (at the tap)			_____	
Size and type of neutral conductor on feeder serving the farm (at the tap)			_____	
Phase configuration (at the tap)			_____	
Primary voltage			_____	

<b>ON FARM CONDITIONS (AS FOUND)</b>	<u>Y/N</u>		<u>Y/N</u>
Cows milked in stanchion or tie-stalls?	_____	Transmission Line within 1 mile of Farm	_____
Pipeline milking system?	_____	Transmission Line in Same Corridor	
Electronic pulsation?	_____	With Distribution	_____
Equipotential plane?	_____	Transmission Line Voltage	_____
Four-wire system?	_____		
Active suppression device (EGS)?	_____		
Isolation transformer?	_____		
Fencer/Trainer OK?	_____		

**NOTES:**

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# STRAY VOLTAGE INVESTIGATION

Customer:

Date:

TAILGATE

Job Description:  Load Box Test

Other \_\_\_\_\_

The scope of the work to be performed

Hazards that may be encountered

Safe practices for doing the work and the responsibilities of those involved

Special precautions \_\_\_\_\_

Energy source controls \_\_\_\_\_

## Personal Protective Equipment

Hard Hat

Face Shield

Respirator

Safety Glasses

Gloves / Sleeves

Foot Protection

Hearing Protection

Clothing (FRC)

Goggles

Other

Comments / Concerns:

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Troubleshooter:

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Crew Members:

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# STRAY VOLTAGE INVESTIGATION

Customer: \_\_\_\_\_

Date: \_\_\_\_\_

**SPOT CHECKS**

METER CHECK: \_\_\_\_\_ SHUNT RESISTOR \_\_\_\_\_ LEADS OK? \_\_\_\_\_

BARN/PARLOR SKETCH

**VOLTAGE (Volts unless otherwise noted)**

	FROM	TO	#1	#2	#3	#4	#5	#6	#7	#8
A	_____	_____	W							
			W/O							
B	_____	_____	W							
			W/O							
C	_____	_____	W							
			W/O							

SETUP AT MEASUREMENT LOCATION

NOTES: \_\_\_\_\_

\_\_\_\_\_ (1-8)

\_\_\_\_\_ (A-C)

**PRE-TEST SOURCE RESISTANCE**

	W Res.	W/O Res.	REF ROD RES.
Primary Neutral to Reference Voltage	_____	_____	_____
Secondary Neutral to Reference Voltage	_____	_____	_____
Cow Contact Voltage	_____	_____	SOURCE RES.

**BONDING**

	WATERLINE TO SEC NEU.	WATERLINE TO REF. ROD	SEC NEU. REF. ROD	
Pre-Bond	_____	_____	_____	Bonding Required (y/n)? _____
Post-Bond	_____	_____	_____	Bonded For Test (y/n)? _____
Post-Bonded Vcc AC	_____ w	_____ w/o		Source resistance _____
Post-Bonded Vcc DC	_____ w	_____ w/o		

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# STRAY VOLTAGE INVESTIGATION

Customer:

Date:

**SKETCH**

Indicate location of all stock waterers, feed bunks, panels, fencers, trainers, wells, the location of the driven reference rod, the length and sizes of service drops and the panel to which you are bonded.

A large rectangular area with a dotted border, divided into a 4x3 grid of cells, intended for a sketch.

# STRAY VOLTAGE INVESTIGATION

Customer: \_\_\_\_\_

Date: \_\_\_\_\_

**VOLTAGE DROP**

LOCATION			
TIME	ON		OFF
LOAD	<input type="checkbox"/> GND <input type="checkbox"/> NEU		
PRI-REF			
SEC-REF			
PRI-SEC			
VCC			
MDP-REF			
PNL-REF			
MDP-PNL			

LOCATION			
TIME	ON		OFF
LOAD	<input type="checkbox"/> GND <input type="checkbox"/> NEU		
PRI-REF			
SEC-REF			
PRI-SEC			
VCC			
MDP-REF			
PNL-REF			
MDP-PNL			

Thru zero? (Y/N) \_\_\_\_ Meas'd Vdrop \_\_\_\_\_

Thru zero? (Y/N) \_\_\_\_ Meas'd Vdrop \_\_\_\_\_

LOCATION			
TIME	ON		OFF
LOAD	<input type="checkbox"/> GND <input type="checkbox"/> NEU		
PRI-REF			
SEC-REF			
PRI-SEC			
VCC			
MDP-REF			
PNL-REF			
MDP-PNL			

LOCATION			
TIME	ON		OFF
LOAD	<input type="checkbox"/> GND <input type="checkbox"/> NEU		
PRI-REF			
SEC-REF			
PRI-SEC			
VCC			
MDP-REF			
PNL-REF			
MDP-PNL			

Thru zero? (Y/N) \_\_\_\_ Meas'd Vdrop \_\_\_\_\_

Thru zero? (Y/N) \_\_\_\_ Meas'd Vdrop \_\_\_\_\_

LOCATION			
TIME	ON		OFF
LOAD	<input type="checkbox"/> GND <input type="checkbox"/> NEU		
PRI-REF			
SEC-REF			
PRI-SEC			
VCC			
MDP-REF			
PNL-REF			
MDP-PNL			

LOCATION			
TIME	ON		OFF
LOAD	<input type="checkbox"/> GND <input type="checkbox"/> NEU		
PRI-REF			
SEC-REF			
PRI-SEC			
VCC			
MDP-REF			
PNL-REF			
MDP-PNL			

Thru zero? (Y/N) \_\_\_\_ Meas'd Vdrop \_\_\_\_\_

Thru zero? (Y/N) \_\_\_\_ Meas'd Vdrop \_\_\_\_\_

NOTES: \_\_\_\_\_

Farm isolated for this portion of the testing? \_\_\_\_ (Y/N)

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## STRAY VOLTAGE INVESTIGATION

Customer: \_\_\_\_\_

Date: \_\_\_\_\_

SIGNATURE TEST

	LOCATION	TYPE OF LOAD	TIME ON	TIME OFF	REV?
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

NOTES: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Farm isolated for this portion of the testing? \_\_\_\_ (Y/N)

# STRAY VOLTAGE INVESTIGATION

Customer: \_\_\_\_\_ Date: \_\_\_\_\_ **LOAD BOX TEST**

Farm Off \_\_\_\_\_ Farm On \_\_\_\_\_  
 Other Off \_\_\_\_\_ Other On \_\_\_\_\_  
 Other Off \_\_\_\_\_ Other On \_\_\_\_\_

TIME -->	SERVICES OFF	LOAD BOX 1 ON	LOAD BOX 1+2 ON	LOAD BOX 1+2+3 ON	SERVICES ON LB'S ON	LB'S OFF
(NOTE TIME ABOVE)					(NOTE TIME ABOVE)	
Pri Crnt (up)						
Pri Crnt (dn)						
Pri Neu (up)						
Pri Neu (dn)						
Sec Neu Net 1						
Sec Neu Net 2						
Sec Neu Net 3						
Sec Neu 1						
Phase 1						
Phase 2						
Sec Neu 2						
Phase 1						
Phase 2						
Sec Neu 3						
Phase 1						
Phase 2						
Load Box						
Pri Gnd Crnt						
Sec Gnd Crnt						
Pri Gnd Res						
Sec Gnd Res						
Vp-ref						
Vs-ref						
Vp-s						
Vcc						

ISOLATOR JUMPERED OUT @ \_\_\_\_\_

ISOLATOR ACTIVATED @ \_\_\_\_\_

Farm isolated for this portion of the testing? \_\_\_\_ (Y/N)

# STRAY VOLTAGE INVESTIGATION

Customer: \_\_\_\_\_

Date: \_\_\_\_\_

**WATERER/BUNK FEEDER TEST**

Draw a simple sketch of the farm, indicating the locations of the waterers and bunk feeder(s), numbering each location.

Measurements taken during which test:  Sig  Load Box  Vdrop  24Hr

$V_{\text{PANEL-REF}}$  \_\_\_\_\_  
(Prior to testing)

$V_{\text{PANEL-REF}}$  \_\_\_\_\_  
(After to testing)

LOC. #	VOLTAGE		TIME
	with	w/o	
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____
9	_____	_____	_____
10	_____	_____	_____

LOC. #	VOLTAGE		TIME
	with	w/o	
11	_____	_____	_____
12	_____	_____	_____
13	_____	_____	_____
14	_____	_____	_____
15	_____	_____	_____
16	_____	_____	_____
17	_____	_____	_____
18	_____	_____	_____
19	_____	_____	_____
20	_____	_____	_____

Farm isolated for this portion of the testing? \_\_\_\_ (Y/N)

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# STRAY VOLTAGE INVESTIGATION

Customer: \_\_\_\_\_

Date: \_\_\_\_\_

**PRIMARY PROFILE TEST**

POLE #	POLE GND CURRENT	POLE GND RESISTANCE	POLE GND VOLTAGE	COMMENTS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

\_\_\_\_\_ *Number of grounds within the first mile toward the substation*

**NOTES:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# STRAY VOLTAGE INVESTIGATION

Customer: \_\_\_\_\_

Date: \_\_\_\_\_

END OF TEST INFORMATION

**POST-TEST SOURCE RESISTANCE**

\_\_\_\_\_ SHUNT RESISTOR

**VOLTAGE**

W Res.

W/O Res.

Primary Neutral to Reference Voltage

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ REF ROD RES.

Secondary Neutral to Reference Voltage

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ REF ROD RES.

Cow Contact Voltage

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ SOURCE RES.

Date Recorder Installed: \_\_\_\_\_

Date Recorder Removed: \_\_\_\_\_

Weather Conditions For Overnight Testing:

\_\_\_\_\_

(wind, rain, lightning, etc)

**Max Cow Contact Info:**

(At time of max. Vcc)

Recorder Serial # \_\_\_\_\_

Vcc max \_\_\_\_\_

**SVM Recorder Channel Setup Information**

Vp-ref \_\_\_\_\_

CH1 \_\_\_\_\_ to \_\_\_\_\_

Vs-ref \_\_\_\_\_

CH2 \_\_\_\_\_ to \_\_\_\_\_

Date \_\_\_\_\_

CH3 \_\_\_\_\_ to \_\_\_\_\_

Time \_\_\_\_\_

CH4 \_\_\_\_\_ to \_\_\_\_\_

**NOTES:**

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