

Animal Contact Locations (1)

Farm _____

Date _____

Address _____

Personnel _____

Shunt resistor value. $R_{SHUNT} =$ Ω

Time: a.m. / p.m.

#	Animal Contact Location	Voltage		Probable Current
	Description	V_{OC}	V_{SHUNT}	V_{SHUNT} / R_{SHUNT}
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

See farm diagram for locations. (V_{OC} is without shunt resistor)

Alternate Location Adjustment Factor (2)

For 72 hour continuous recording.

Farm _____

Date _____

Address _____

Personnel _____

It may be necessary to establish an alternate animal contact measurement point at an adjacent location out of the path of normal animal or equipment flow.

This sheet establishes an adjustment factor to compare the desired location voltage and current with that of the alternate measurement location.

Set the actual floor contact device at the desired animal contact location and using a digital hand held voltmeter measure the open circuit voltage (V_{OC}) and the voltage across a nominal 500 ohm shunt resistor. The measurement will be taken between the animal contact point and the floor contact device.

Shunt resistor value with hand held voltmeter

$R_{SHUNT} =$ Ω

Record voltage measurements at the desired animal contact location:

Voltages measured: $V_{OC} =$ $V_{SHUNT} =$

Set the floor contact device at the alternate location where it will remain for the complete 72 hour recording. Using the same hand held voltmeter, make the following voltage measurements between the animal contact point and the floor device.

$V_{OC\ ALT} =$ $V_{SHUNT\ ALT} =$

Adjustment Factor (AF): Valid When $V_{OC} = V_{OC\ ALT}$

Adjustment Factor (AF) = $V_{SHUNT} \div V_{SHUNT\ ALT} =$

Second Investigation (3)

Farm _____ Date _____

Address _____

Personnel _____

Second Investigation: MPSC Rule (2)(2)

From 72 hour continuous recording of one-minute averaged voltage, the highest animal contact voltage (AcV) was:

Highest animal contact voltage
(Animal contact test voltage) $AcVt_{ALT} =$

Time highest animal contact voltage occurred
Date = Time: a.m. / p.m.

Primary to reference voltage at that same time
(Primary NEV test voltage) $NpEVt =$

If alternate floor contact location was chosen, enter value of adjustment factor (AF).
 $AF =$

If alternate floor contact location was chosen, multiply animal contact voltage ($AcVt_{ALT}$) by the adjustment factor (AF) to determine the highest probably animal contact voltage (AcV).

$AcV = AcVt_{ALT} \times AF$ $AcV =$

Value of shunt resistor used for 72 hour recording. $R_{SHUNT} =$ Ω

Determine animal contact current (AcC) from all sources using Ohm's law. Divide the corrected value of animal contact voltage (AcV) by the value of the shunt resistor (R_{SHUNT}).

Animal contact current from all sources:

$AcC = AcV \div R_{SHUNT}$ $AcC =$ A

$AcC \times 1000 =$ mA

Is animal contact current from all sources equal to or greater than 2.0 mA?
_____ Yes _____ No

Temporary Load Test (4)

Farm _____ Date _____

Address _____

Personnel _____

Distribution line description _____
 (diagram on back side of sheet)

Farm Service _____

Load applied : kW

Estimated typical farm load
 3-phase kW 1-phase kW

If practical measure typical farm load

Time: a.m. / p.m.

Service Drop			
A	B	C	N

Temporary Load Test (Complete test in 30 seconds. Two sets of readings suggested.)

If voltage recorder is used, set recorder to 10 second average interval.

Date: Start Time: a.m. / p.m. End Time: a.m. / p.m.

Test	Voltages			Current	
	NpEV		AcV	A	B
Ambient Load					
Farm power Off					
Temporary load On					
Temporary load Off					
Farm power Off					
Temporary load On					
Temporary load Off					

Utility Contribution to Animal Contact Current (5)

Farm _____

Date _____

Address _____

Personnel _____

Shunt resistor value used for temporary load test.

$R_{SHUNT} =$ Ω

From 72 hour continuous recording of one-minute averaged voltage, the highest animal contact voltage (AcV) was:

Date and time highest animal contact voltage occurred:

Date =

Time =

Primary to reference voltage at that same time:
(Primary NEV test voltage)

NpEvt =

Following voltages are taken from temporary load test:

Animal contact voltage with all farm load off:

AcVo =

Primary NEV with all farm load off:

NpEVo =

Animal contact voltage with temporary load on:

AcVtemp =

Primary NEV with temporary load on:

NpEVtemp =

Calculate utility contribution to animal contact voltage (AcVu). See MPSC Stray Voltage Rule 7(3)(g)(i).
Note: Multiply AcVtemp and AcVo by the adjustment factor (AF) before inserting into equation.

$$A_c V_u = \frac{N_p E V_t - N_p E V_o}{N_p E V_{temp} - N_p E V_o} \times (A_c V_{temp} - A_c V_o) + A_c V_o \quad A_c V_u = \text{} \text{ V}$$

Calculate utility contribution to animal contact current (AcCu). See MPSC Stray Voltage Rule 7(3)(h).

$$A_c C_u = \frac{A_c V_u}{R_{shunt}}$$

AcCu = A

AcCu x 1000 = mA

Is the utility contribution to animal contact current (AcCu) equal or greater than 1.0 mA?

_____ Yes _____ No