



TOP TEN DEFICIENCIES & GENERATORS

STATE FIRE MARSHAL DIVISION HEALTH CARE TEAM

MINNESOTA STATE FIRE MARSHAL DIVISION

445 Minnesota Street; Suite 145 Saint Paul, MN 55101

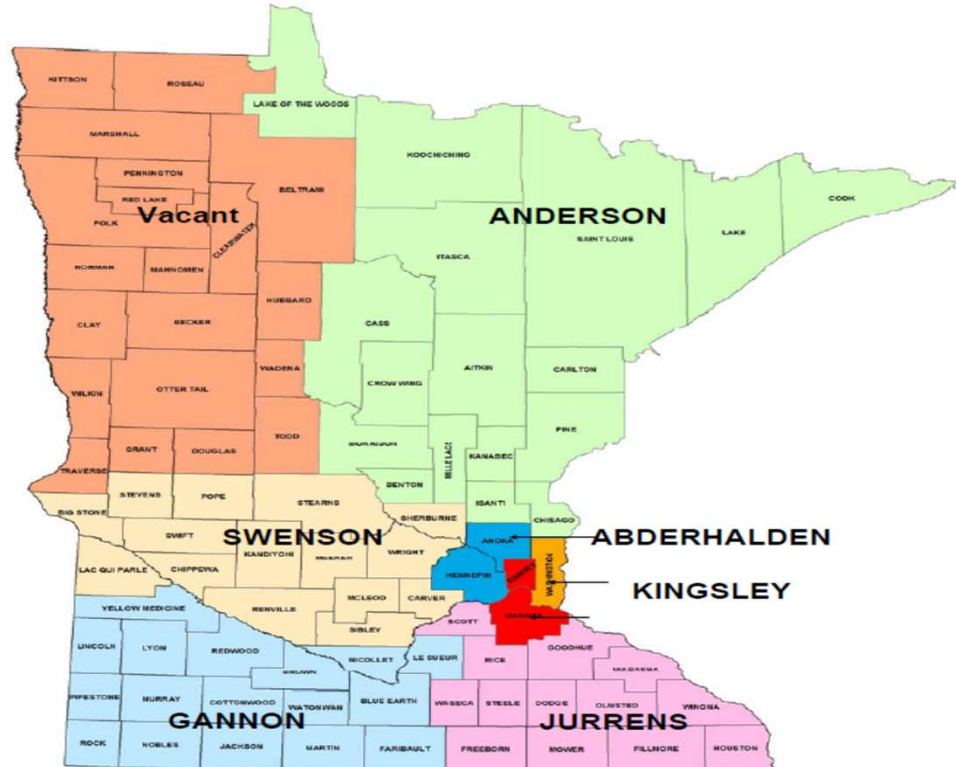
Region map



MINNESOTA STATE FIRE MARSHAL DIVISION HEALTH CARE INSPECTION REGIONS



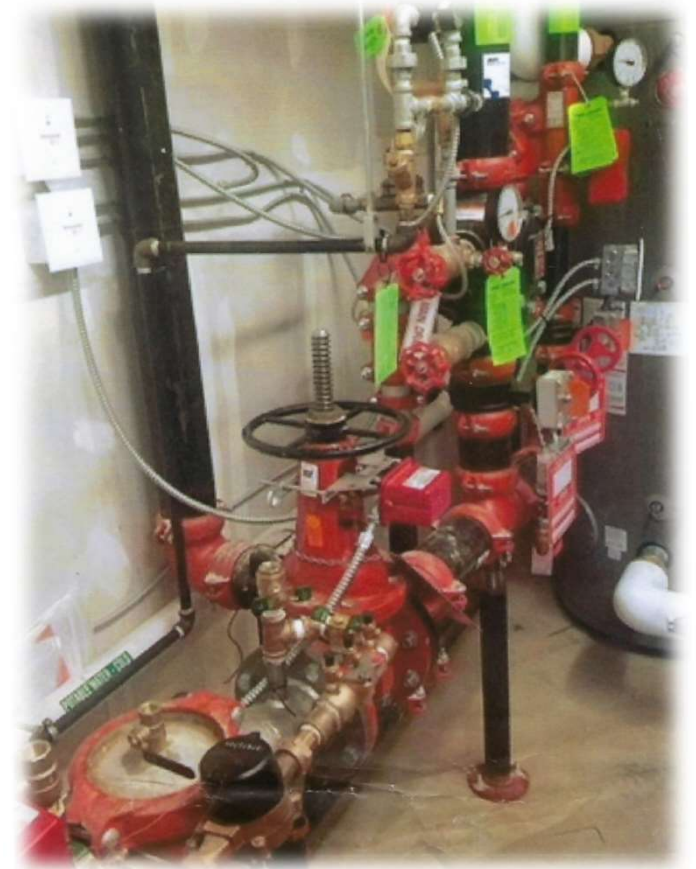
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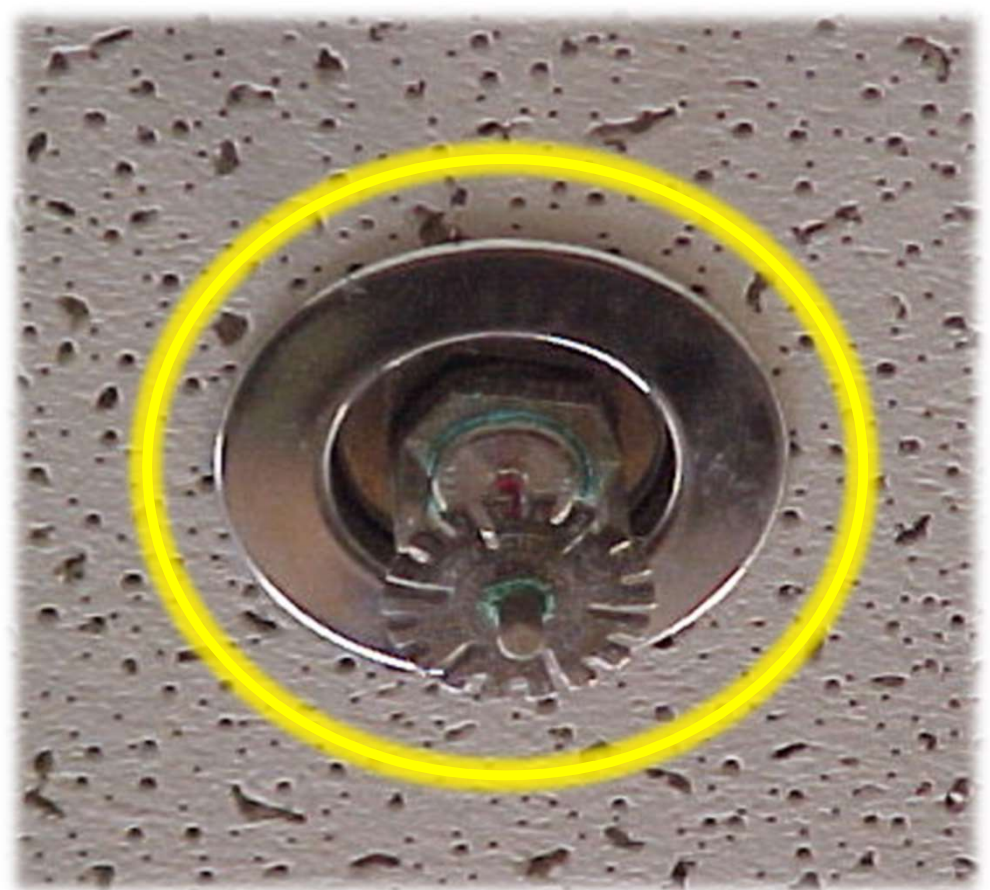
K353 SPRINKLER SYSTEM MAINTENANCE & TESTING

CITED 91 TIMES

- **QUARTERLY DRAIN TESTS (PRV AND BACKFLOW PREVENTER)**
- **ANNUAL TESTS WITHIN 365 DAYS**
- **SUPPLY OF READY STOCK HEADS BASED ON TOTAL NUMBER INSTALLED, TEMPERATURE, AND RESPONSE TYPE.**



FIRE SPRINKLER HEAD CLEANLINESS AND CORROSION



K712 FIRE DRILLS

CITED 79 TIMES

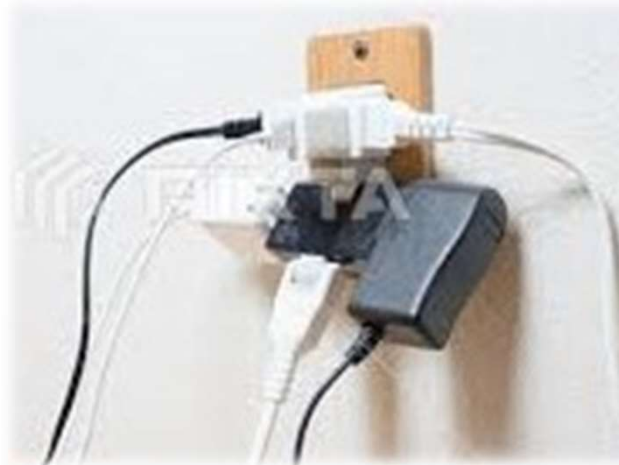
- **VARIED TIMES AND CONDITIONS**
- **EACH SHIFT MUST HAVE:**
 - 4 DRILLS PER YEAR
 - 1 PER QUARTER
- **DOCUMENTS FILLED OUT COMPLETELY**
- **ACKNOWLEDGE RECEIPT OF SIGNAL**
- **NAME OF WHO CONDUCTED THE DRILL**



K918 ELECTRICAL EQUIPMENT POWER / EXTENSION CORDS

CITED 57 TIMES

- **MOST COMMONLY CITED PROBLEMS INCLUDE:**
 - **APPLIANCES PLUGGED INTO POWER STRIPS**
 - **MULTI-PLUG ADAPTORS**
 - **EXTENSION CORDS**



Electrical Receptacle Testing

- **Question of the day:**

What is the regulation for testing the retention force on electrical outlets?

- According to section 6.3.3.2.4 of the NFPA 99-2012,
- Retention force of the grounding blade of the receptacle shall be not less than (4-oz).
- The physical integrity must be confirmed by a visual inspection;
- Verification grounding circuit
- The correct polarity of the hot and neutral connections of each receptacle must be confirmed.

Electrical Receptacle Testing

- Hospital grade that are located at patient beds locations and in locations where deep sedation or general anesthesia is administered.
- Nursing homes do not have patients, they have residents.

K345 FIRE ALARM SYSTEM

CITED 48 TIMES

ALARM SYSTEM NEEDS TO BE TESTED SEMI-ANNUALLY

- **YOU NEED A COPY OF THE MOST CURRENT FIRE ALARM TEST REPORT.**
- **YOU NEED A COPY OF THE LAST SENSITIVITY TEST THAT WAS COMPLETED.**
- **QUESTION IS, CAN YOU DISPOSE OF TESTING / INSPECTION DOCUMENTS OLDER THAN 3 YEARS?**
 - **BEST PRACTICE TO RETAIN FOR LIFE OF THE SYSTEM.**



K923 O2 CYLINDERS AND CONTAINMENT STORAGE

CITED 40 TIMES



K761 MAINTENANCE, INSPECTION & TESTING-DOORS

CITED 38 TIMES

Annual Inspection of Swinging Fire Door Assemblies

Name of Property: _____

Fire Door Assembly Location: _____

Special Locking Arrangement?: _____

Number of Leafs: _____ Fire Rating of Each Leaf: _____ Fire Rating of Frame: _____

Rating of Barrier: _____ Purpose of Rated Barrier: _____

Automatic or Manual Operator?: _____ Hold-open Device?: _____

Inspected By: _____ Affiliation: _____

| Inspection Activity: | Yes | No | N/A | Comments |
|---|-----|----|-----|----------|
| 1. Is the door and frame free from holes and breaks in all surfaces? | | | | |
| 2. Are all the glazing, vision light frames and glazing beads intact and securely fastened? | | | | |
| 3. Are the doors, hinges, frame, hardware and threshold secure, aligned and in working order with no visible signs of damage? | | | | |
| 4. Is the door free from missing or broken parts? | | | | |

K761 MAINTENANCE, INSPECTION & TESTING-DOORS

| | | | | |
|---|--|--|--|--|
| 5. Is the clearance from the door edge to the frame no more than 1/8 inch? | | | | |
| 6. Is the door undercut no more than 3/4 inch? | | | | |
| 7. Does the active door leaf completely close when operated from the full open position? | | | | |
| 8. Does the inactive leaf close before the active leaf when a coordinator is used? | | | | |
| 9. Does the latching hardware operate and secure the door in the closed position? | | | | |
| 10. Is the door assembly free from any auxiliary hardware items which could interfere with its operation? | | | | |
| 11. Is the door free from any modifications since it was originally installed? | | | | |
| 12. If gasketing and edge seals are installed, have they been verified for integrity and operation? | | | | |
| 13. Is 95% of the surface of the door free from signage? | | | | |

All "No" answers must be fully explained.

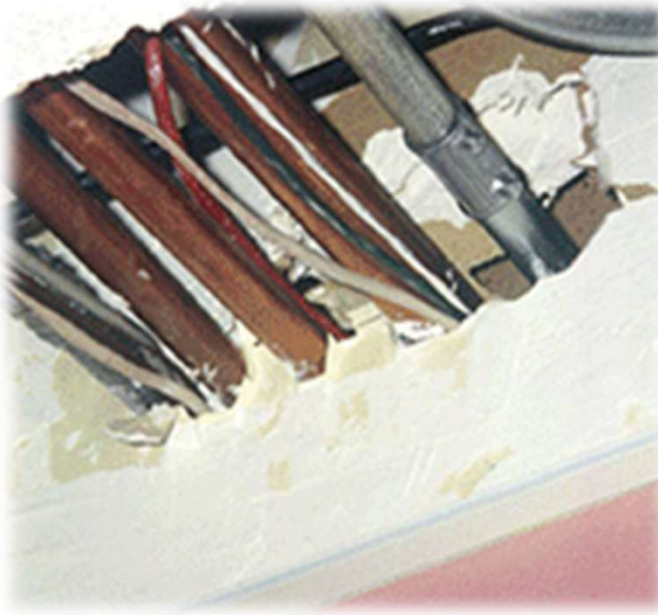
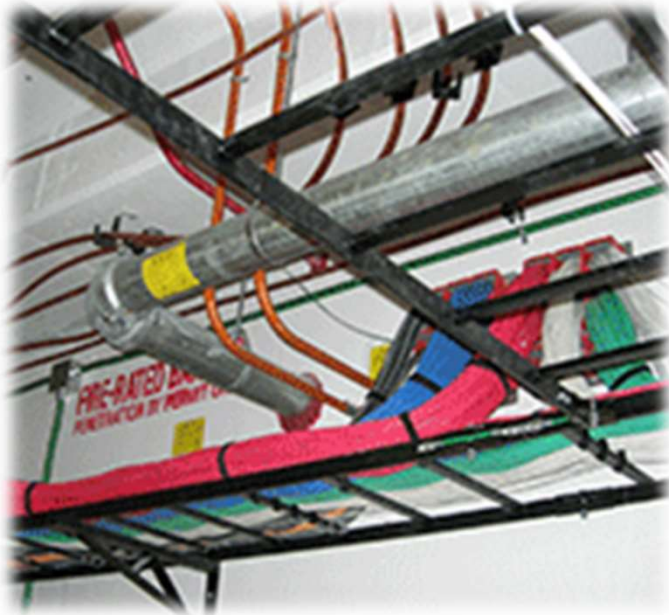
Source: NFPA 80, 2010 edition

Signature: _____ Date: _____ Work Order #: _____

K372 SMOKE BARRIERS

CITED 37 TIMES

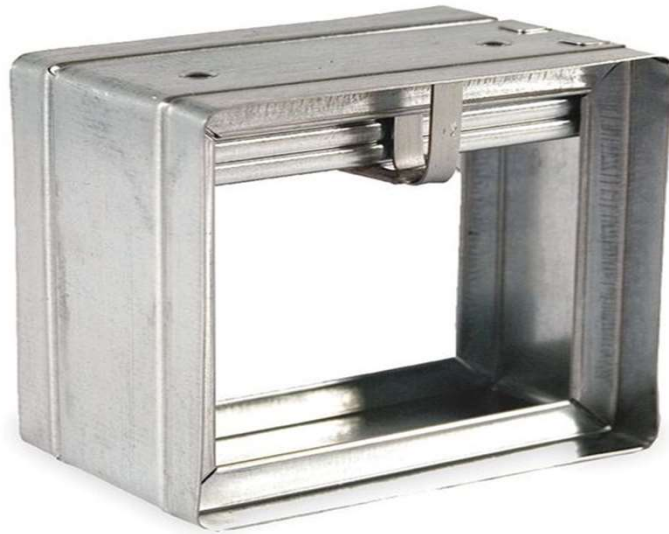
FIRE STOPPING



K521 FIRE DAMPER TESTING

CITED 37 TIMES

- 4 YRS. - HEALTH CARE FACILITIES
- 6 YRS. - HOSPITALS



K351 FIRE SPRINKLER SYSTEM INSTALLATION

CITED 33 TIMES



K918 ESSENTIAL ELECTRICAL SYSTEMS

CITED 48 TIMES



LIGHT FOR EMERGENCY GENERATORS



QUESTION:

IS IT ACCEPTABLE TO USE A FLASHLIGHT AS THE EMERGENCY LIGHT?

NFPA 110-13 7.3.3* THE INTENSITY OF ILLUMINATION IN THE SEPARATE BUILDING OR ROOM HOUSING THE **EPS** EQUIPMENT FOR **LEVEL 1** SYSTEM SHALL BE **32 LUX (30 FT. CANDLES)**, UNLESS OTHERWISE SPECIFIED BY THE **AHJ**

LIGHT FOR EMERGENCY GENERATORS



QUESTION - CONT.

A MAG LIGHT WITH 2AA BATTERIES HAS 15.2 LUMEN AND 2952 PEAK CANDLE POWER (FROM WEB SITE)

THE AHJ IS CMS

- **CMS IS REQUIRING BATTERY OPERATED LIGHTING**

THE EXCEPTION TO THAT SECTION DOES NOT REQUIRE EMERGENCY LIGHTING OF THE GENSET IF IT IS OUTSIDE AND NON-OCCUPIABLE. (NFPA 110-12 7.3.1)

EMERGENCY GENERATOR LIGHTING

QUESTION:

- IS THE FACILITY'S TRANSFER SWITCH REQUIRED TO BE LIGHTED BY BATTERY OPERATED EMERGENCY LIGHTING?
- THE TRANSFER SWITCH IS CONSIDERED EPSS.
- THE EPS IS REQUIRED TO HAVE LIGHTING - NOT THE EPSS.

NFPA 110

ROUTINE MAINTENANCE AND OPERATIONAL TESTING SHALL BE BASED ON:

- **MANUFACTURER'S RECOMMENDED INSTRUCTIONS**
- **INSTRUCTION MANUALS**
- **MINIMUM REQUIREMENTS OF NFPA 110 CHAPTER 8**
- **THE AUTHORITY HAVING JURISDICTION**

CONSIDERATION SHALL BE GIVEN TO TEMPORARILY PROVIDING AN ALTERNATE SOURCE WHEN THE EMERGENCY GENERATOR IS OUT OF SERVICE

GENERATOR TESTING

- **A SCHEDULED TEST UNDER LOAD AT LEAST MONTHLY**
- **SHALL INCLUDE A COMPLETE SIMULATED COLD START AND AUTOMATIC AND MANUAL TRANSFER OF EES**
- **THE TESTS SHALL BE CONDUCTED BY COMPETENT PERSONNEL**
- **THE TESTS ARE NEEDED TO KEEP THE MACHINES READY TO FUNCTION AND, IN ADDITION, SERVE TO DETECT CAUSES OF MALFUNCTION AND TO TRAIN PERSONNEL IN OPERATING PROCEDURES**

WRITTEN RECORD

SHALL INCLUDE:

- THE DATE OF SERVICE
- THE NAME OF THE SERVICING TECHNICIAN
- A SUMMARY OF CONDITIONS NOTED
- A DETAILED DESCRIPTION OF ANY CONDITIONS REQUIRING CORRECTION AND WHAT CORRECTIVE ACTION WAS TAKEN
- TESTING OF ANY REPAIR AS RECOMMENDED BY MANUFACTURER
- RECORDS SHALL BE KEPT ON THE PREMISES
- BE AVAILABLE FOR INSPECTION BY THE FIRE CODE OFFICIAL

EMERGENCY GENERATOR INSPECTIONS (IN CODE APPENDIX)

- **PRIME MOVER (ENGINE)**
- **GENERAL INSPECTION**
- **FUEL**
- **CHECK FUEL TANK LEVEL**
- **INSPECT FOR AND REMOVE WATER IN FUEL**
- **INSPECT FLOAT SWITCH**
- **INSPECT TRANSFER PUMP OPERATION**
- **INSPECT SOLENOID VALVE OPERATION**
- **INSPECT FLEXIBLE HOSES AND CONNECTIONS**

EMERGENCY GENERATOR INSPECTIONS

- **LUBRICATION OIL**
- **CHECK OIL LEVEL**
- **CHECK OIL HEATER**
- **COOLING SYSTEM**
- **CHECK COOLANT LEVEL**
- **CHECK ADEQUATE COOLING WATER TO HEAT EXCHANGER**
- **CHECK ADEQUATE FRESH AIR THROUGH RADIATOR**
- **INSPECT WATER PUMP**
- **INSPECT FLEXIBLE HOSES AND CONNECTIONS**
- **EXHAUST**
- **INSPECT AND CHECK FOR LEAKAGE**
- **CHECK DRAIN CONDENSATION (TRAP)**

EMERGENCY GENERATOR INSPECTIONS

- **BATTERIES**
- **CHECK ELECTROLYTE LEVEL IF NOT MAINTENANCE FREE**

- **ELECTRICAL SYSTEM**
- **GENERAL INSPECTION**

- **INSPECT AND CLEAN GENERAL CONDITION OF EPSS**
- **CHECK FOR VIBRATION, LEAKAGE, NOISE, TEMPERATURE OR DETERIORATION**

- **INSPECT AND CLEAN SERVICE ROOM**
- **CHECK THAT SYSTEM IS IN AUTOMATIC CONDITION**

STORAGE BATTERIES

- **USED IN LEVEL 1 AND LEVEL 2 SYSTEMS SHALL BE:**
 - **INSPECTED AT INTERVALS OF NOT MORE THAN 7 DAYS (INCLUDING ELECTROLYTE)**
 - **MAINTAINED IN FULL COMPLIANCE WITH MANUFACTURER'S SPECIFICATIONS**
 - **DEFECTIVE BATTERIES SHALL BE REPLACED IMMEDIATELY UPON DISCOVERY OF DEFECTS**

EMERGENCY GENERATOR INSPECTIONS

- **MONTHLY IN ADDITION TO WEEKLY**
- **INSPECT FAN BELT**
- **INSPECT AND CLEAN BATTERY CASE**
- **INSPECT CHARGE AND RATE**
- **INSPECT EQUALIZE CHARGER**
- **INSPECT ALTERNATOR BELT**
- **INSPECT GOVERNOR OIL LEVEL AND LINKAGE**

EMERGENCY GENERATOR TESTING PER NFPA 110 8.4

MONTHLY

- **RUN AT LEAST 30 MINUTES UNDER LOAD**
- **UNDER OPERATING TEMPERATURE CONDITIONS AND NOT LESS THAN 30% OF THE EPS NAMEPLATE RATING OR (DIESEL)**
- **LOADING THAT MAINTAINS THE MINIMUM EXHAUST TEMP. RECOMMENDED BY THE MANUFACTURER (DIESEL)**
- **DIESEL-POWERED EPS THAT CANNOT ACHIEVE 30% LOADS MONTHLY CAN CONDUCT AN ANNUAL LOAD TEST WHERE THEY MUST ACHIEVE 50% LOAD FOR 30 CONTINUOUS MINUTES AND 75% FOR 60 CONTINUOUS MINUTES, WITH NO LESS THAN 90 CONTINUOUS MINUTES.**

EMERGENCY GENERATOR TESTING

- **DOCUMENT**
- **DATE**
- **NAME OF STAFF CONDUCTING TEST**
- **START TIME**
- **TIME TO TAKE OVER LOAD (10 SECONDS MAX)**
- **GAUGE READINGS INCLUDING**
- **ENGINE TEMP, OIL PRESSURE, AMPS**
- **STOP TIME**
- **TOTAL ELAPSED TIME**
- **PERCENT OF GENERATOR LOAD CAPACITY DURING OPERATION**
 - THIS IS NOT THE PERCENTAGE OF BUILDING POWERED BY GENERATOR

EMERGENCY GENERATOR TESTING

- Question: there a standard that says we need to write the start and stop time on our monthly generator load test for 30 minutes?
- Answer: section 8.4.2 of NFPA 110-2010 states yes

SPECIAL TOOLS AND SPARE PARTS NFPA 110 8.2

- **SPECIAL TOOLS AND TESTING DEVICES FOR ROUTINE MAINTENANCE SHALL BE AVAILABLE**
- **REPLACEMENT PARTS IDENTIFIED BY EXPERIENCE AS HIGH MORTALITY ITEMS SHALL BE MAINTAINED IN A SECURE LOCATION(S) ON THE PREMISES**
- **CONSIDERATION SHALL BE GIVEN TO STOCKING SPARE PARTS, RECOMMENDED BY THE MANUFACTURER**

TRANSFER SWITCHES

- **TRANSFER SWITCHES SHALL BE INSPECTED, TESTED, AND HAVE A MAINTENANCE SCHEDULE**
- **TRANSFER SWITCHES SHALL BE MAINTAINED FREE FROM ACCUMULATED DUST AND DIRT**
- **INSPECTION SHALL INCLUDE EXAMINATION OF THE TRANSFER SWITCH CONTACTS FOR EVIDENCE OF DETERIORATION**



TRANSFER SWITCHES - INSPECTIONS

NFPA 110 8.3.5

SHALL INCLUDE:

- **CHECKING OF CONNECTIONS**
- **INSPECTION FOR EVIDENCE OF OVERHEATING**
- **INSPECTION FOR EVIDENCE OF EXCESSIVE CONTACT EROSION**
- **REMOVAL OF DUST AND DIRT**
- **REPLACEMENT OF CONTACTS WHEN REQUIRED**

TRANSFER SWITCHES - TESTING

- **TRANSFER SWITCHES SHALL BE OPERATED MONTHLY**
- **SWITCHES ELECTRICALLY OPERATED FROM AUTO TO ON AND BACK TO AUTO POSITIONS**
- **MAIN BREAKERS AND FEEDER BREAKERS TESTED ANNUALLY WITH EPS OFF**

MANUALS PER NFPA 110 8.2

TWO SETS OF INSTRUCTION MANUALS SHALL BE SUPPLIED AND SHALL CONTAIN THE FOLLOWING:

- **A DETAILED EXPLANATION OF THE EPSS'S OPERATION**
- **INSTRUCTIONS FOR ROUTINE MAINTENANCE**
- **INSTRUCTIONS FOR REPAIR OF THE EPS AND THE EPSS**
- **AN ILLUSTRATED PARTS LIST AND PART NUMBERS**
- **ILLUSTRATED AND SCHEMATIC DRAWINGS OF ELECTRICAL WIRING INCLUDING OPERATING AND SAFETY DEVICES, CONTROL PANELS, INSTRUMENTATION, AND ANNUNCIATORS**

MANUALS

FOR LEVEL 1 SYSTEMS:

- **INSTRUCTION MANUALS SHALL BE KEPT IN A SECURE, CONVENIENT LOCATION**
- **ONE SET NEAR THE EQUIPMENT**
- **THE OTHER IN A SEPARATE LOCATION**

EMERGENCY SHUT DOWN BUTTON PER NFPA 110 5.6.5.6

K918: OBSERVATION DURING THE INSPECTION REVEALED THERE IS NO EMERGENCY STOP BUTTON LOCATED REMOTELY FROM THE PRIME MOVER.

- **ALL INSTALLATIONS SHALL HAVE A REMOTE MANUAL STOP STATION**
 - **TO PREVENT INADVERTENT OR UNINTENTIONAL OPERATION LOCATED**
 - **OUTSIDE THE ROOM HOUSING THE PRIME MOVER, WHERE SO INSTALLED**
 - **OR ELSEWHERE ON THE PREMISES WHERE THE PRIME MOVER IS LOCATED OUTSIDE THE BUILDING.**

COVID 19 ISSUES

1. Testing of Fire Alarm and Fire Sprinkler systems
2. Fire drills
3. Confine area's



Questions

Website: <https://sfm.dps.mn.gov>



Thank you

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