Updated proposal 2/28/19 and 3/4/19.
All changes are in Orange to make it easier for you

~~2/6/19~~

Silver Valley Unified School District
35320 Daggett-Yermo Road
Yermo, CA 92398
(760) 254-2916 office, (760) 254-2091 fax

Dear Robert,
Thank you for the consideration of allowing Mijac Alarm the opportunity to become part of the Silver Valley security team. In business since 1971 right here in San Bernardino County, Mijac Alarm has grown to become one of the top 100 largest security companies out of over 15,000 nationwide. Small enough to be flexible, quick and responsive but also large enough to have a depth of the bench on all technical levels, Mijac Alarm prides itself in our 'big brother' approach of taking care of our customers.

We currently have over 6,000 monitored customers throughout the Inland Empire including Burglar Alarms, Fire Alarm, Water Flow, Access Control electronic locks and CCTV Video Surveillance systems.

Should you wish to chat with any of our satisfied customers that are similar to the Silver Valley Unified School District please let me know and I will track down a contact name and number for you. Other similar school districts include:

Bonita Unified School District,
Chaffey Joint Union High School
Cardon Arbor View School
Upland USD
Chaffey Unified School District
Foothill Country Day School
Central School District
Chino Valley School District
SBCO schools

We hope after reviewing our proposal you wish to move forward to get your systems up and running 100%.

Yours for better security,

Steve Sopkin
President

Jon McNamara
Salesrep

Outline of some of the issues include:

Currently there are 4-5 fire alarm systems in trouble which means that a broken wire exists, a short to ground on some of the wiring, a dirty device that will not work or the absence of a device which is supposed to be connected to the system.

All commercial fire alarm systems in the State of California are required to be tested at least 4 times a year per NFPA 72. From our investigation it appears the fire systems are currently out of compliance with this directive.

As stated in our previous discussion we believe

1. Burg panels should be replaced for the following reasons
    a. Consistency for employees using them to make it less stressful, easier and less false alarm prone since they will be familiar with the alarm system no matter which location.
    b. Our technicians will have the product on their truck when they arrive instead of having to make a return trip for service calls and increasing the billing to you.
    c. The new product features will greatly enhance your day to day with:
        i. All downloadable panels from our office for assistance from our staff
        ii. panel history for false alarms that may occur
        iii. shutting down false alarm zones due to problems right from our office
        iv. eliminating phone lines and using cellular links if possible to save you money on the phone lines currently required
        v. creating a plan to replace out of date motion sensors for better false alarm immunity
        vi. take down all old product that is not in use so future service techs do not confuse which to work on
        vii. all panels should have full signals sent to our central station to verify they are working properly, and zone descriptions are correct.
        viii. We suggest the phone app be installed on each burglar alarm panel to allow you to do the following:
            1. Arm/disarm all systems
            2. See instant reports of who is coming and going through a text via the app after hours if you would like
            3. Simple change of codes right from your desktop for all employees

2. A full fire alarm test should be completed on every fire system by testing smoke detectors and pull stations, bells and sirens in order to develop a list of 'honey-do' items for repairs
    a. Repair at T&M troubles and supervisory signal problems that are currently causing problems at 5 locations

b. Cellular radios would be installed to eliminate phone line costs where possible
c. A regular testing schedule needs to be established to bring them up to code. Per NFPA 72, fire tests are required to be done at least 4 times per year on manual pull stations, horns and strobes, any sprinkler devices currently being monitored. Any smoke detectors are required to be tested at least once per year.
d. Coming up with a plan to replace out of date smoke detectors for better false alarm immunity

3. Your current fire alarm panels are many different products, some with 'proprietary equipment' that only a handful of contractors in San Bernardino County can access. If left as is, Mijac will have to coordinate with the authorized installation company for any programming or purchase of parts as the factory only allows 2 fire alarm contractors in the County to access their software and parts inventory. Any necessary charges for third party alarm services would be rebilled to the District at cost or can be directly billed if you prefer.
4. At some point we strongly suggest upgrading these panels to all be the same using 'non-proprietary' equipment that ***ANY*** alarm company can get access to <u>instead of through a licensing program where only a handful of companies can program or purchase future product</u> (and get rid of the handcuff that are tying you to other companies currently).
5. Fire alarm panels should be gone through to ensure their integrity of zone information
    a. We discovered in at least 2 locations in which a previous technician that visited the site must have installed resistors at the incorrect location which wholly compromises the integrity of the wiring and safety of the occupants and buildings. This resistor is made to be installed at the end of the loop which allows a tiny trickle of electricity to run through the loop at all times. A break in the wire creates a trouble (no electricity is returned), while a smashed wire creates a different kind of trouble due to the panel receiving full electricity back to the panel instead of the little trickle of electricity. Either way, the bottom line is the fire alarm panel may not work as intended currently for those protection loops.

Other features should probably include the Alarm.com app for you and your key employees to better manage all the sites. Arming and disarming the burglar alarms, seeing who has entered through the use of separate codes for each employee and entering or changing codes can all be done right from your desktop through the alarm.com portal.

If possible, we suggest you request the following information from your other alarm companies (and it would probably be best if you don't mention our name. I would just say the boss asked me to gather as much information as possible).

1. Zone list for every alarm panel including both burg and fire accounts. This can either be done from their downloading software or probably best right from the central station that is monitoring them.

2. Last 12 months of signals from central station for all accounts (this will show us how many problem you have had and where they occurred).
3. Service call history for last 12 months (ask them for all the completed service tickets so we can see the problem identified and how they fixed them …. Hopefully).
4. Fire alarm testing tickets with completion reports if available.
5. If they have any completed set of fire alarm plan blueprints or submittals to the fire authority it would be extremely helpful for future upgrades, otherwise we will have to start from scratch and spend a fair amount of time finding everything.

If we are brought in as partners to Silver Valley, our plan of attack for our technicians would include the following:

- Reprogram all alarm panels to Mijac's central station for dispatch of police and fire departments.
- Wipe out all existing alarm codes and re-enter new ones for sake of accuracy and safety so past employees cannot come back. Future alarm systems will have enough capacity to hold an individual alarm entrance code for each employee so no sharing of codes will be necessary. This will allow better tracking by individual of who enters and leaves and when. This is difficult to do but probably the single most overlooked item on a security system with regards to its integrity.
- A report of all signals can be created and emailed to you each day or once a week to give you a bird's eye view of all the signals that may be transmitted.

Monitoring fees:

Burglar alarms	$35/month/site	
Cellular radio transmission	$15/month/site*	
Phone app for burg systems	$10/month/site	
Service calls and fire alarm tests for prevailing wage zone 2	~~$150/hour/man~~	**$135/hour/man**

Please review your current cost of 1 phone line at this site

Fire alarms	$45/month/site	
Service calls and fire alarm tests for prevailing wage zone 2	~~$150/hour/man~~	**$135/hour/man**
Cellular radio transmission	$30/month/site*	

Please review the current cost of 2 phone lines at this site

Trip charge for all service calls

a. Daggett-Yermo, Newberry Springs trip charge	$225/trip for 1 tech, $275/trip for 2 techs
b. Fort Irwin	$325/trip for 1 tech, $375/trip for 2 techs

Initial take-over of systems to include:

My guesstimate is it will take approximately 2 weeks to cut over the existing burg and fire systems, reprogram, find trouble spots and repair the fire systems and test everything. At $135/hour plus travel, this comes to approximately $25,000 in labor and small parts to get started, fixed and tested. This includes a few thousand for battery replacements and any other minor repairs or replacements of faulty equipment.

I strongly suggest we also incorporate the burglar alarm system upgrades as soon as possible to give you a way better understanding of who is entering your buildings, ease of code changes and simpler repairs in the short and long runs. The alarm panel and keypads would be upgraded along with any smaller devices directly connected to the burglar alarm panels to make them work properly like zone expanders, transformers and power supply relays. **All of the existing door sensors and motion detectors will be reconnected to the new panels.** If we have time, our techs will remove any older equipment no longer in use for beautification of the facility but more importantly to lessen future drama with teachers hanging balloons and other ceiling mounted devices as well as technicians not being able to identify which detector is in use. I would also stock 2 local cabinets with extra devices to ensure no problems with future service calls to help eliminate the back and forth travel time. One would be located in the Daggett area and the other in the Ft. Irwin.

If we budgeted $1000/school for the burglar alarm upgrades I think we could complete it in about a week and a half. (see recap below)

Testing of fire alarm systems:

Our best plan with other school districts has been to divide the entire system in two, test early summer and during winter vacation while students are away to lessen the burden for the teachers. It also evens out our schedule and since we are required to test the water flow every quarter, this test is also completed at this time.

The bi-annual test will take approximately 1 week for a two-man crew to complete every 6 months for approximately $10,000/bi-annual test. Any minor repairs or adjustments that can be fit in for both the burg and fire systems will be completed at that time.

At the 3-month interval, the water flow and supervisory devices on the sprinkler systems are required to be tested. With 8 sites, I estimate a day for the Daggett area and a day for Ft. Irwin provided we have access to all sites without entry delay. Should you wish, with a bit of training from our staff, this test can be performed by School staff on the off quarters or be taken care of by your 3rd party sprinkler vendor. I estimate our staff with drive time would take approximately 2 days @ $135 hour = $2000 for the water flow tests. (See recap below)

Taking into account the budget, I would suggest we develop a long-term plan to upgrade the existing fire alarm systems, so they all match over a 2 or 3 year period to lessen the upfront burden and create the consistency and methodical planning that prioritizes the long term goals of the District.

Suggestion for the district at this point moving forward.

1. Reprograming all panels to Mijac Central Station
2. Test all devices
3. Repair emergency problems mostly pertaining to Fire Alarm Systems at 4 sites
4. Daily central station report sent to District and Mijac manager outlining any activations from the previous 24 hour period

While there we will

5. Count all devices to develop a cost factor in upgrading or replacing equipment to ensure non-proprietary devices are used for long term serviceability of District by any alarm contractor without prior licensing problems

Future:

1. Budget time and expense to upgrade panels
    a. All at once
    b. Over a multi-year period using budgetary constraints
    c. Use an outside funding company in which all upgrades are completed but funded over multiple years through payments.
2. Alarm.com phone App loaded onto District Manager's phone for offsite control and connection

Recap for initial investment:	
Programing and testing of all devices throughout District	$20-$25K
Burglar alarm upgrades 10 sites x $1000	$10,000
Initial investment:	**$35,000**
Ongoing testing:	
March water flow test	$ 2,000
June fire alarm half test	$10,000
September water flow test	$ 2,000
December fire alarm half test	$10,000
Misc repairs or battery replacements guestimate during tests	$ 1,000
Ongoing testing schedule total	**$25,000/year**

Outstanding thoughts:

We have a few outstanding questions about Fort Irwin entrance availability as well as equipment selections including the Monaco system. We understand that on base communication must go through the Monaco for local dispatching of services on the fire alarm system. We are unclear if we can also install a backup cellular link to our central station to allow us more timely communication to assist you in taking care of the safety systems at the site. If possible, we recommend a second communicator be installed that reports to our central station for programing of codes and zones as well as tabulating on our suggested daily report.

Since this is a shared partnership in the schools' security and safety, we might suggest developing a short training program to allow your onsite technicians to update or replace sensors in a well thought out methodical manner with our help. That way, many of the systems parts can be updated or brought up to code without the necessary labor on our behalf.

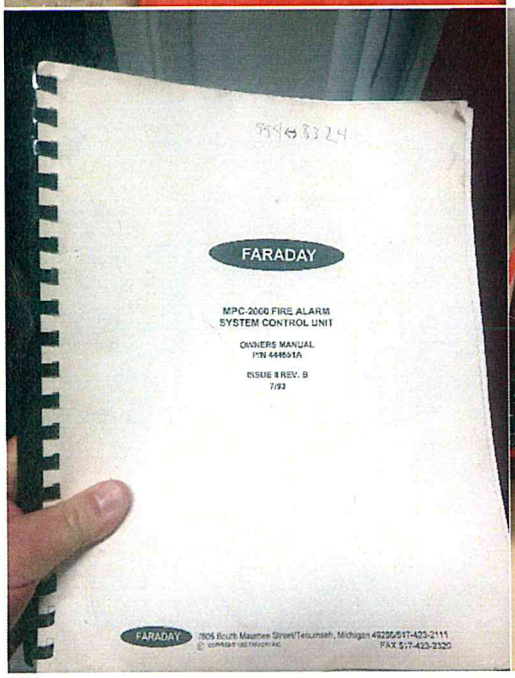
We also suggest since the location is far enough away to create a burden on our service staff, we install 2 cabinets of extra equipment that can be used at sites near Yermo and Ft. Irwin. We don't want to waste time and money driving back and forth so if well stocked from the beginning, all replacement parts can be available onsite if necessary.

We realize this is a huge undertaking that cannot be taken lightly. The security of the buildings after hours but more importantly the safety of the children during class is of the utmost concern. Without a full system sweep of the systems, regular testing schedules and replacement of outdated equipment Mijac Alarm could not entertain the new relationship with the District. We hope you find us a good partner to entrust both the buildings and the kids with Mijac Alarm.

Yours for better security,

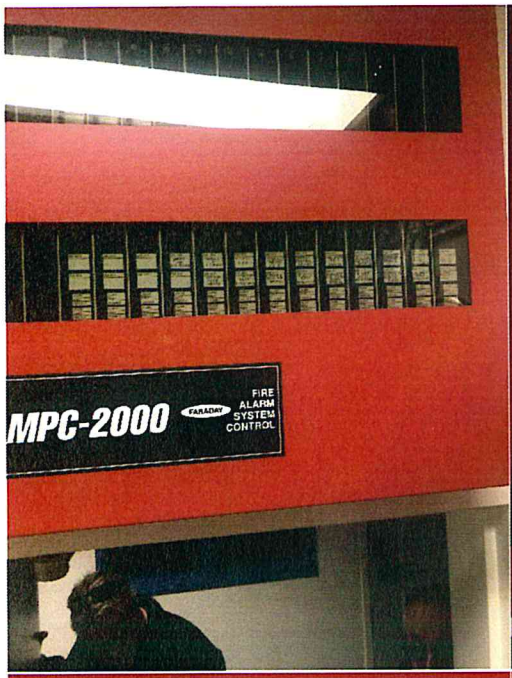
Steve Sopkin	Jon McNamara	Brian Randal
President	Security Consultant	Lead technician

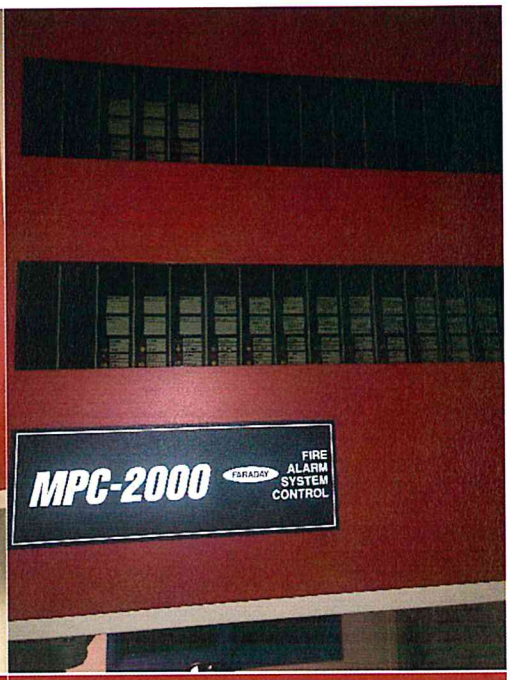
Lewis Elementary School

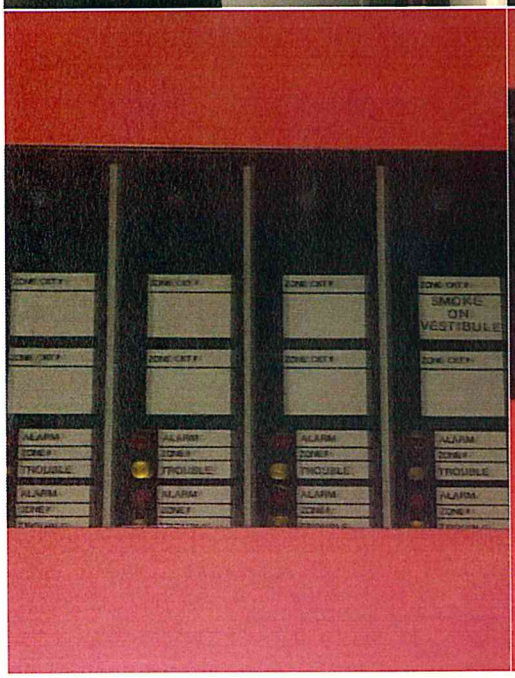


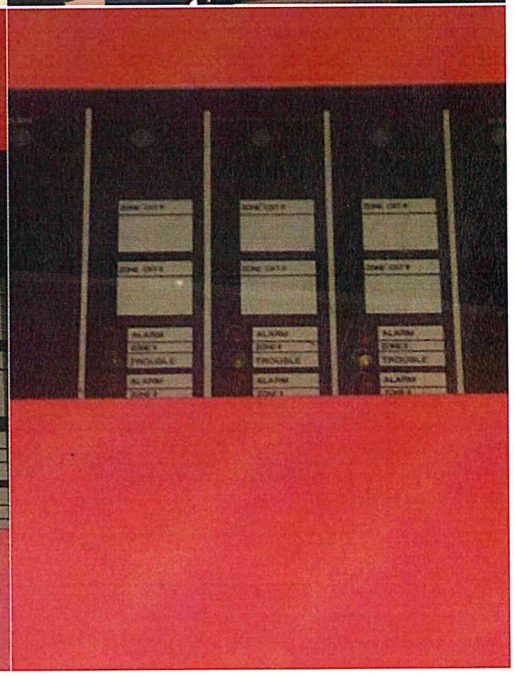
Silver Valley Unified School District

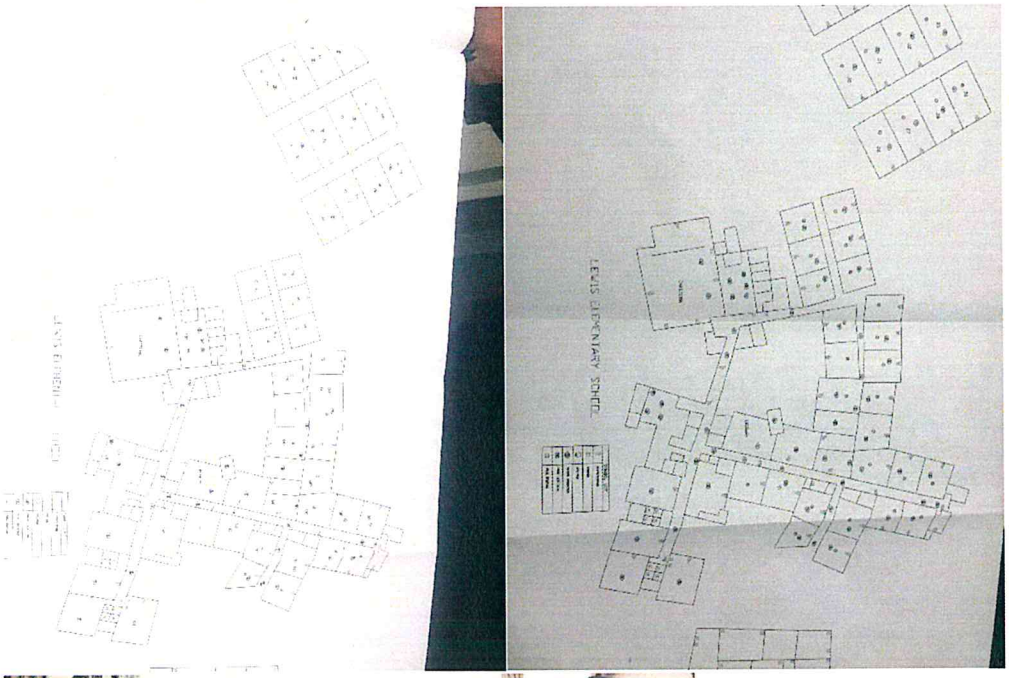
35320 Daggett-Yermo Road
Yermo, CA 92398
Phone: (760) 254-2916
Fax: (760) 254-2091

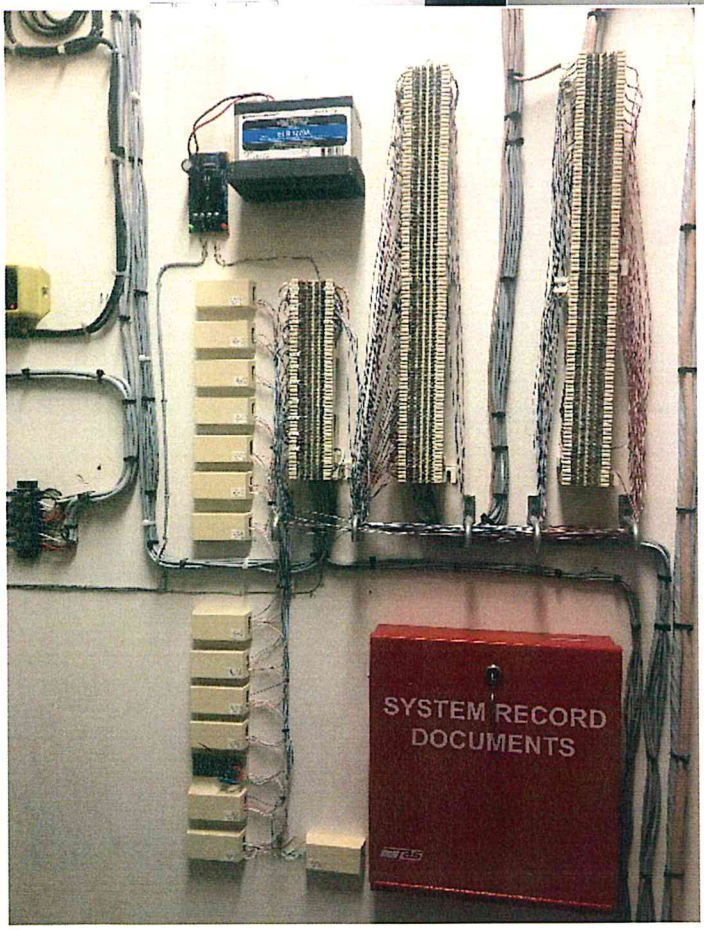

MPC-2000
FARADAY
FIRE
ALARM
SYSTEM
CONTROL


MPC-2000
FARADAY
FIRE
ALARM
SYSTEM
CONTROL

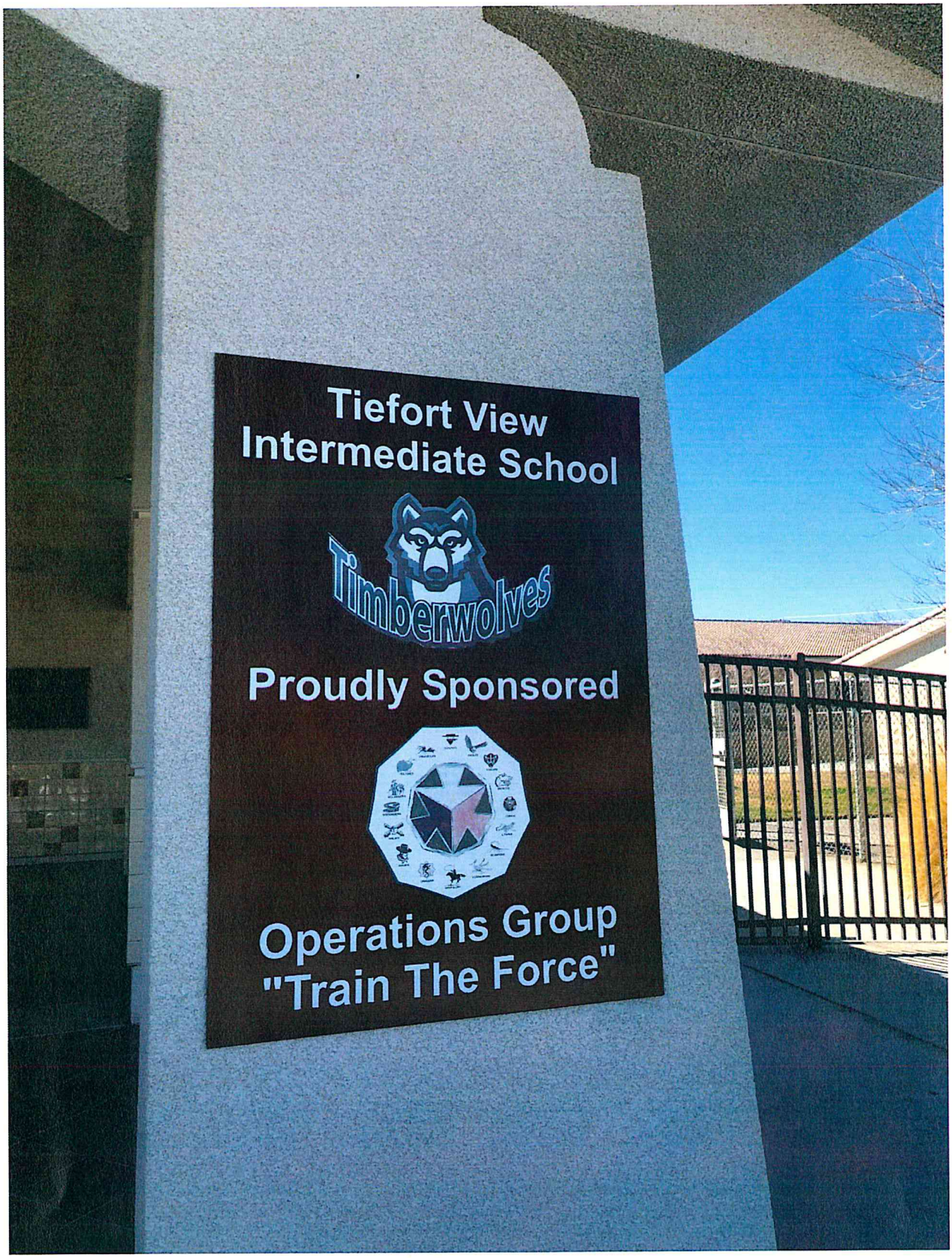

SMOKE
ON
VESTIBULE
ALARM
TROUBLE

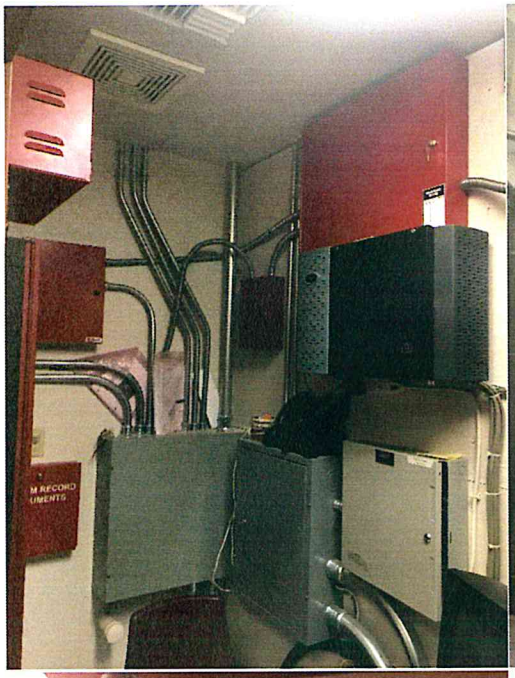

ALARM
TROUBLE

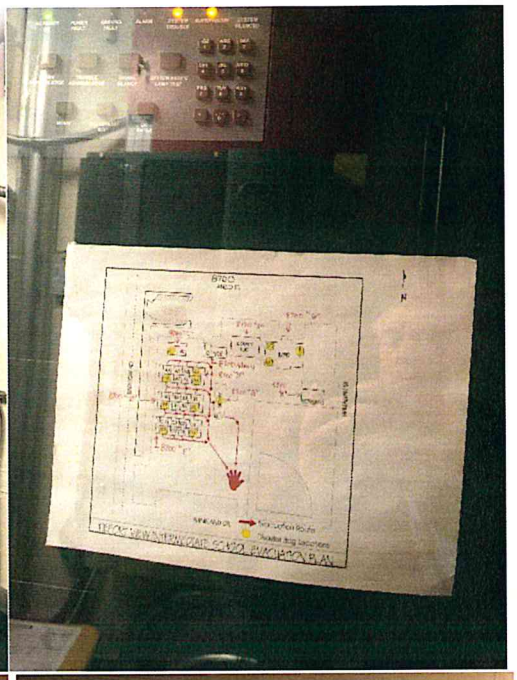

LEWIS ELEMENTARY SCHOOL

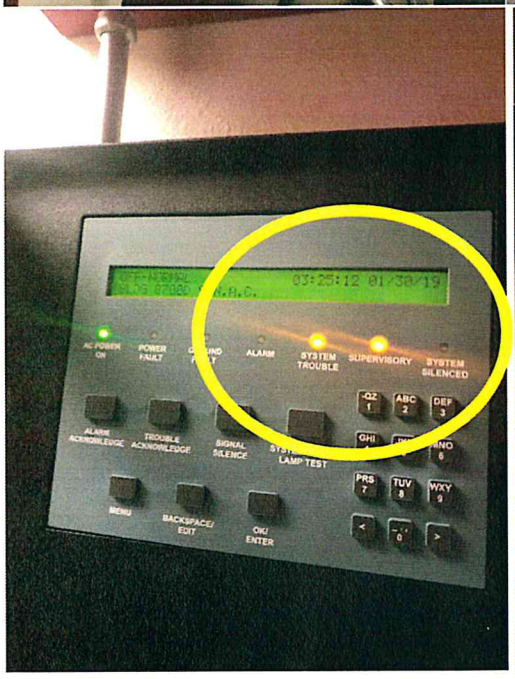

SYSTEM RECORD
DOCUMENTS

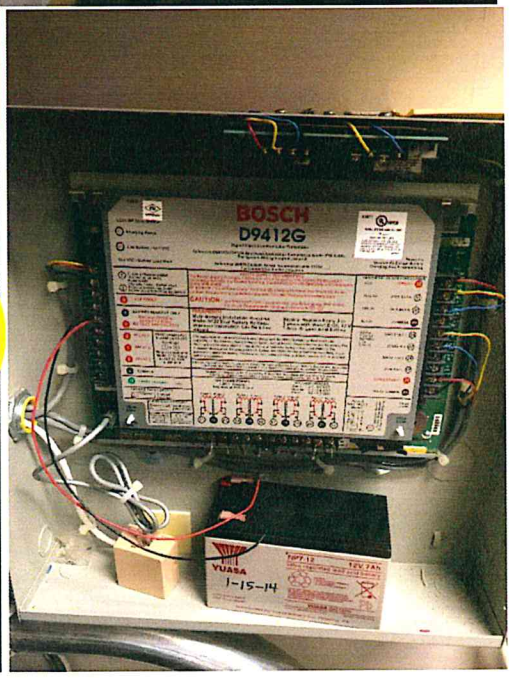
Requires immediate fix to reinstall into a larger can or take cover off of panel to ensure the control cards do not get smashed or cracked with someone trying to close the lid of the too small retrofitted can.

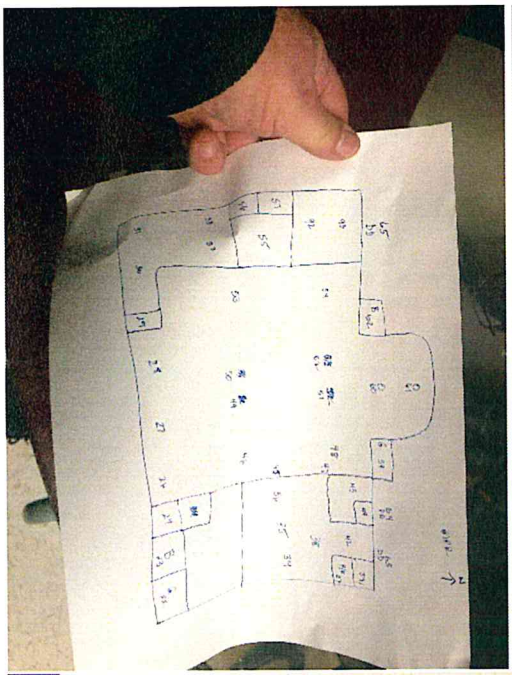

Tiefort View
Intermediate School
Timberwolves
Proudly Sponsored
Operations Group
"Train The Force"



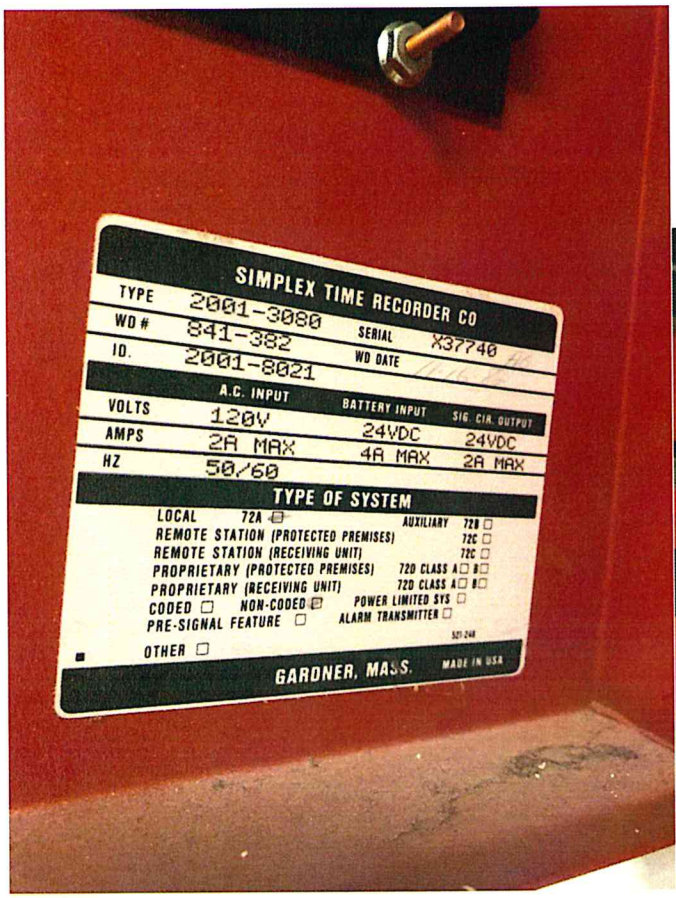



03:25:12 01/30/19
AC POWER ON
POWER FAULT
ALARM
SYSTEM TROUBLE
SUPERVISORY
SYSTEM SILENCED
ALARM ACKNOWLEDGE
TROUBLE ACKNOWLEDGE
SIGNAL SILENCE
SYSTEM LAMP TEST
MENU
BACKSPACE/ EDIT
OK/ ENTER


BOSCH
D9412G
YUASA
1-15-14

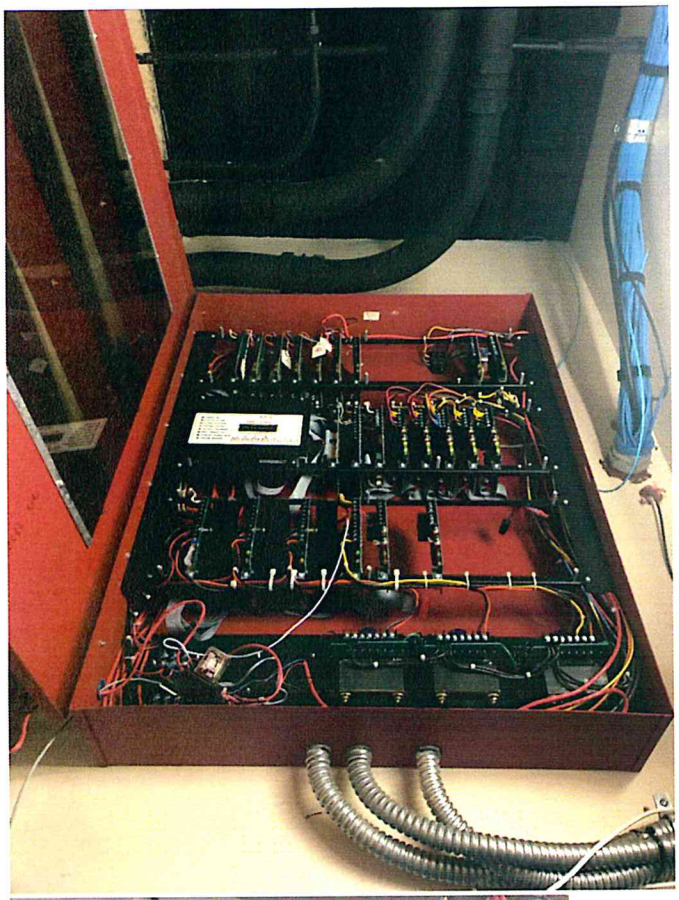


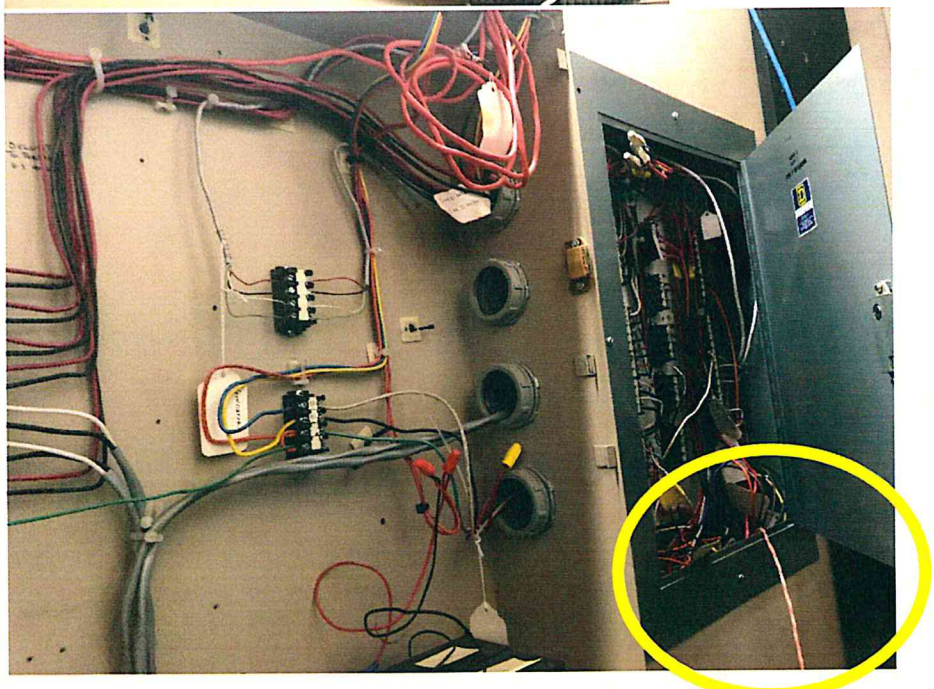

REPLACEMENT BATTERIES
1-800-334-8694
LITHONIA LIGHTING
MUST BE RECYCLED AT LOCAL RECYCLING CENTER
5/10/13
WARNING: USE OF UNAUTHORIZED PARTS VOIDS WARRANTY AND UL LISTING
5/10/13

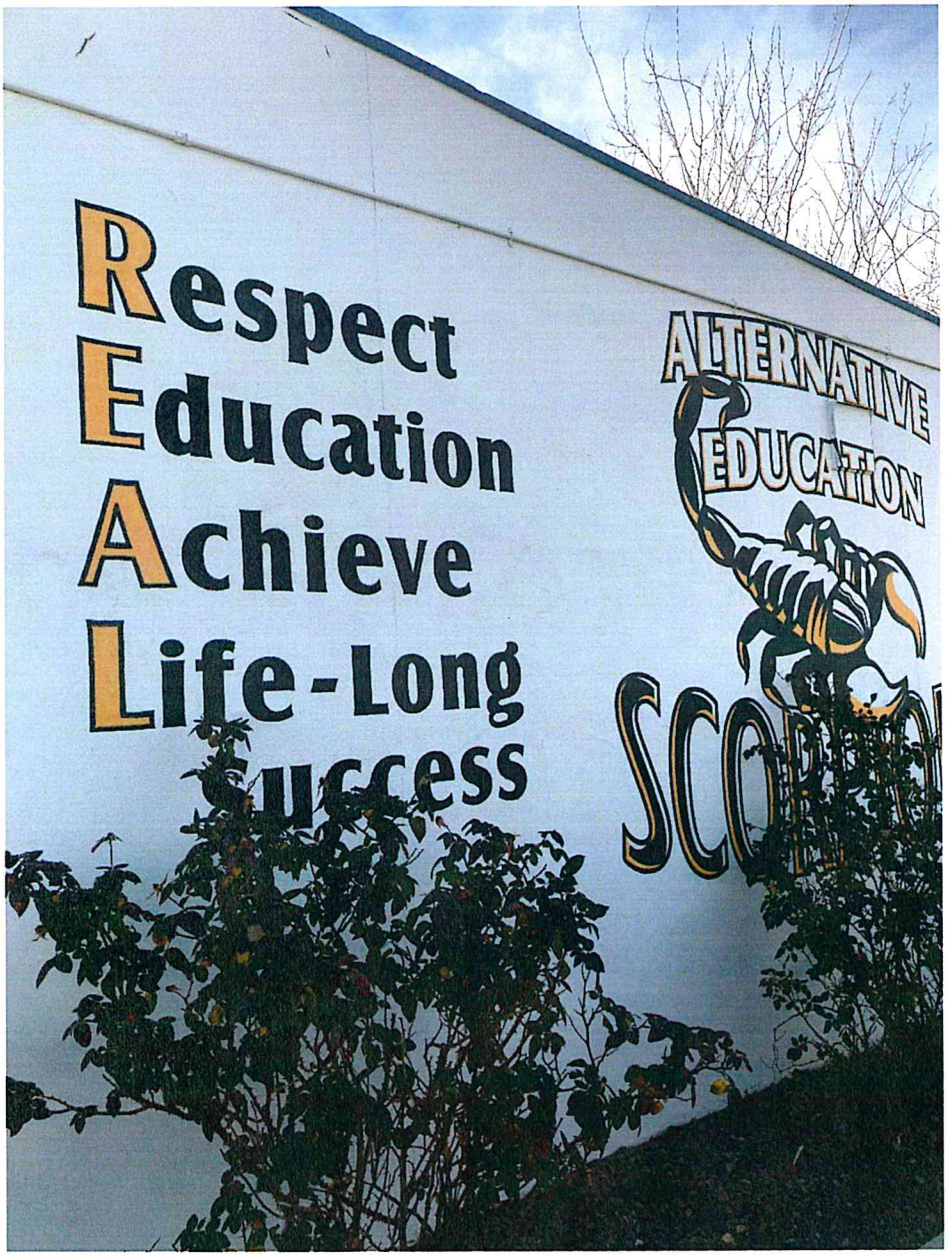

SIMPLEX TIME RECORDER CO
TYPE 2001-3080
WD # 841-382
SERIAL X37740
ID. 2001-8021
WD DATE
A.C. INPUT
BATTERY INPUT
SIG. CIR. OUTPUT
VOLTS 120V
AMPS 2A MAX 24VDC 24VDC
HZ 50/60 4A MAX 2A MAX
TYPE OF SYSTEM
LOCAL 72A
AUXILIARY 72B
REMOTE STATION (PROTECTED PREMISES) 72C
REMOTE STATION (RECEIVING UNIT) 72C
PROPRIETARY (PROTECTED PREMISES) 72D CLASS A B
PROPRIETARY (RECEIVING UNIT) 72D CLASS A B
CODED NON-CODED
POWER LIMITED SYS
PRE-SIGNAL FEATURE
ALARM TRANSMITTER
OTHER
GARDNER, MASS.
MADE IN USA


MPC-2000
FAHRADAY
FIRE ALARM SYSTEM CONTROL
HI DESERT ALARM
&
FIRE SPRINKLERS
245-8600

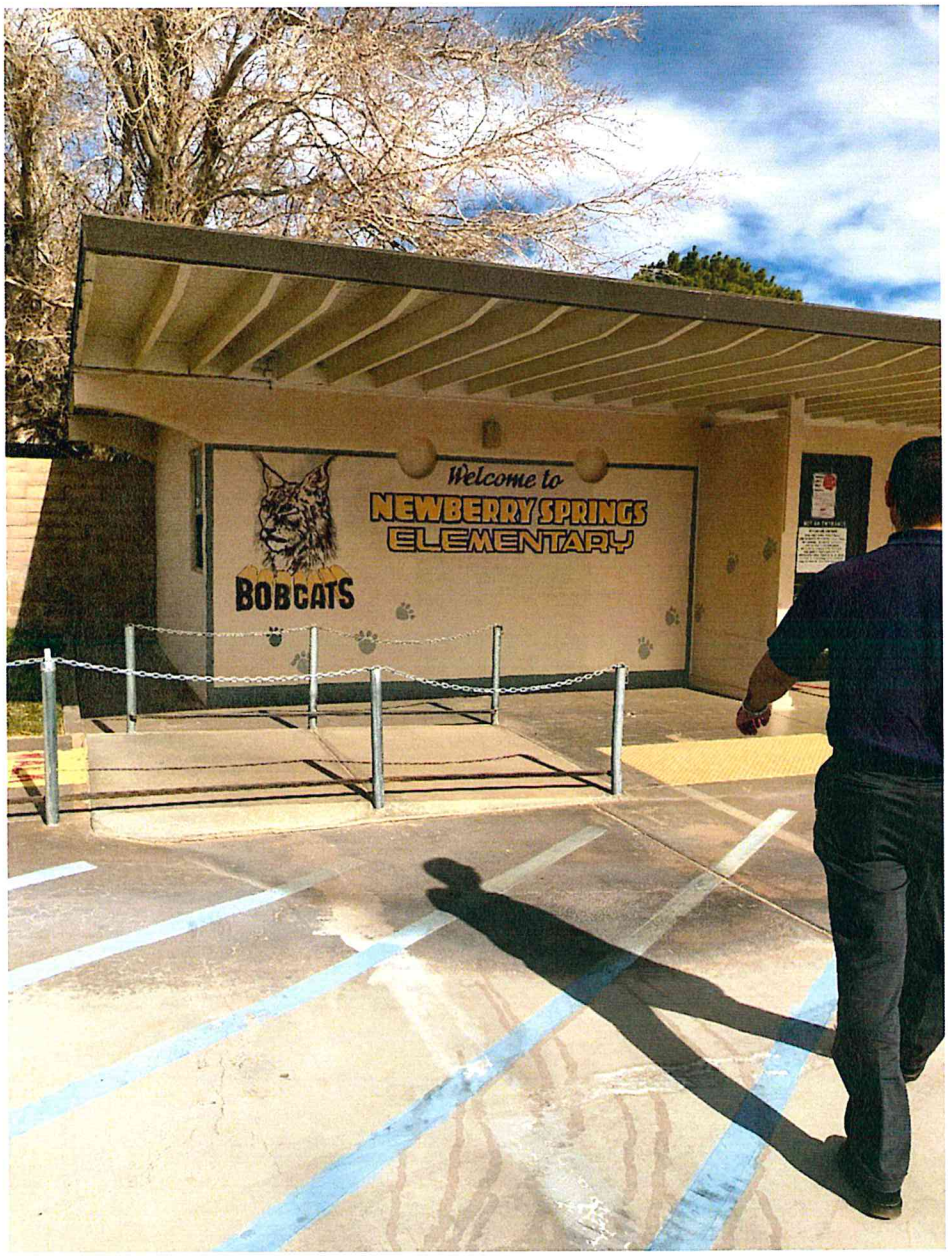
MIJAC ALARM
YOUR BEST DEFENSE

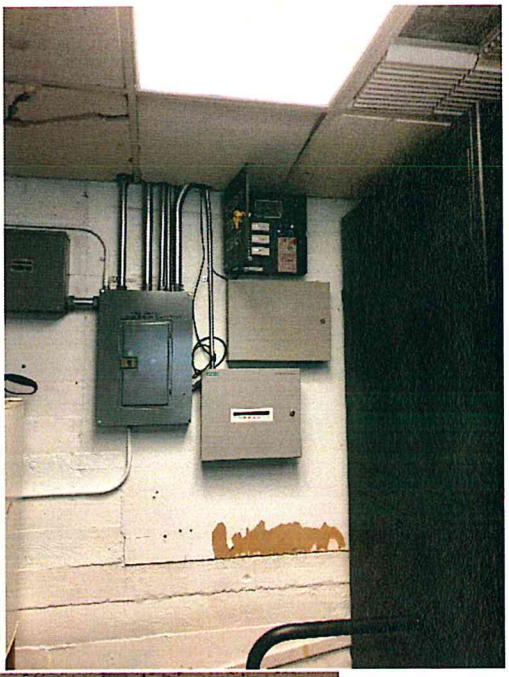


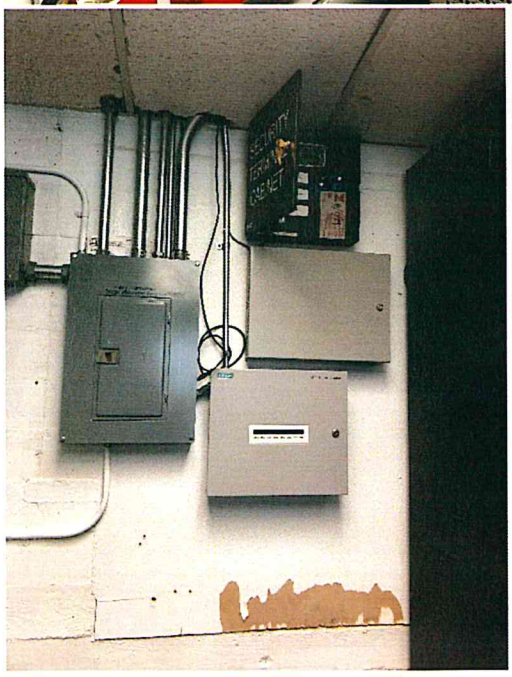


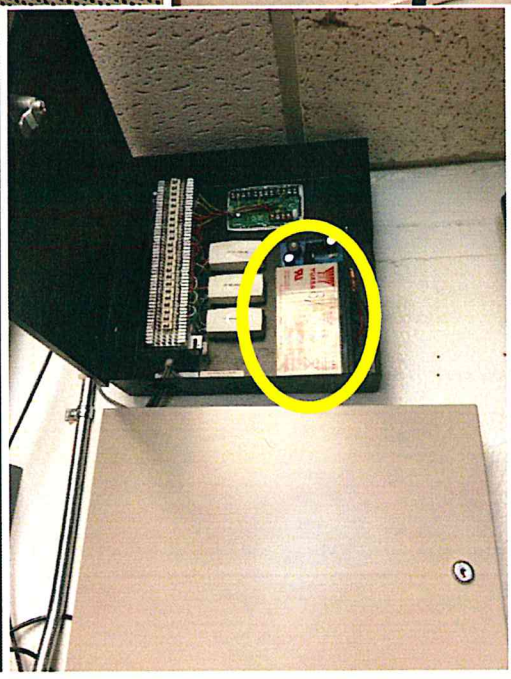

Respect
Education
Achieve
Life-Long
ALTERNATIVE
EDUCATION


SYSTEM RECORD
DOCUMENTS
FIRE


Welcome to
NEWBERRY SPRINGS
ELEMENTARY
BOBCATS

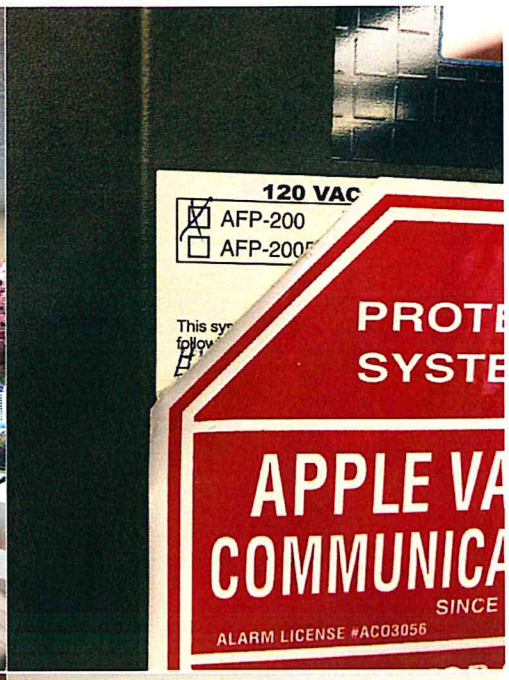




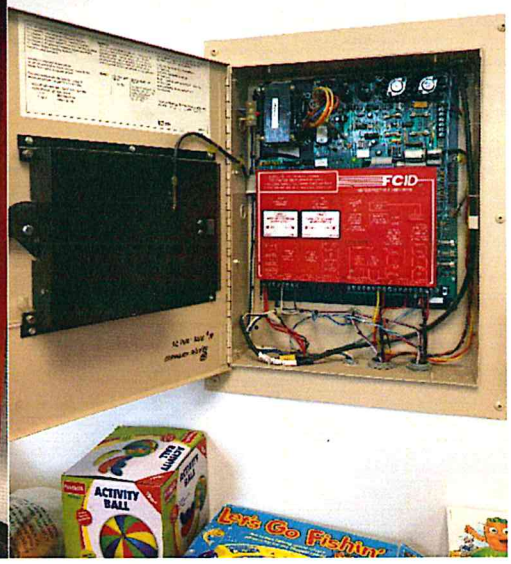


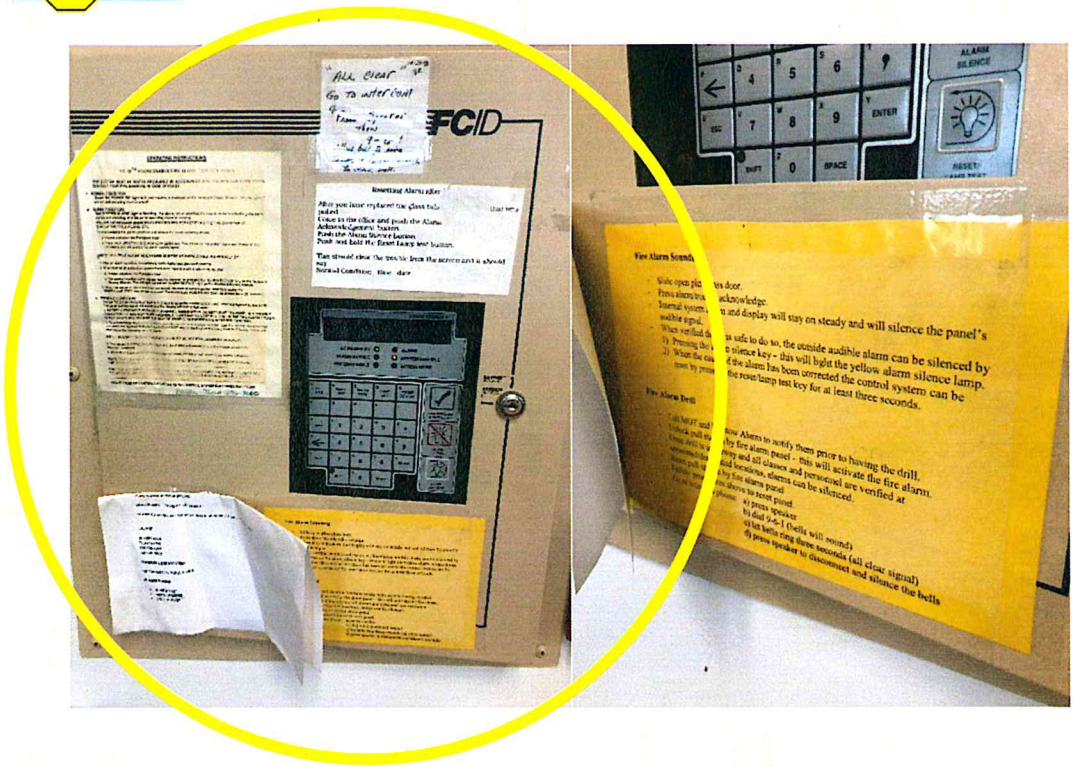

YERMO SCHOOL
HOME OF THE EAGLES
TK-5 AWARDS
FEB 8
FEB 15TH AND 18TH
NO SCHOOL

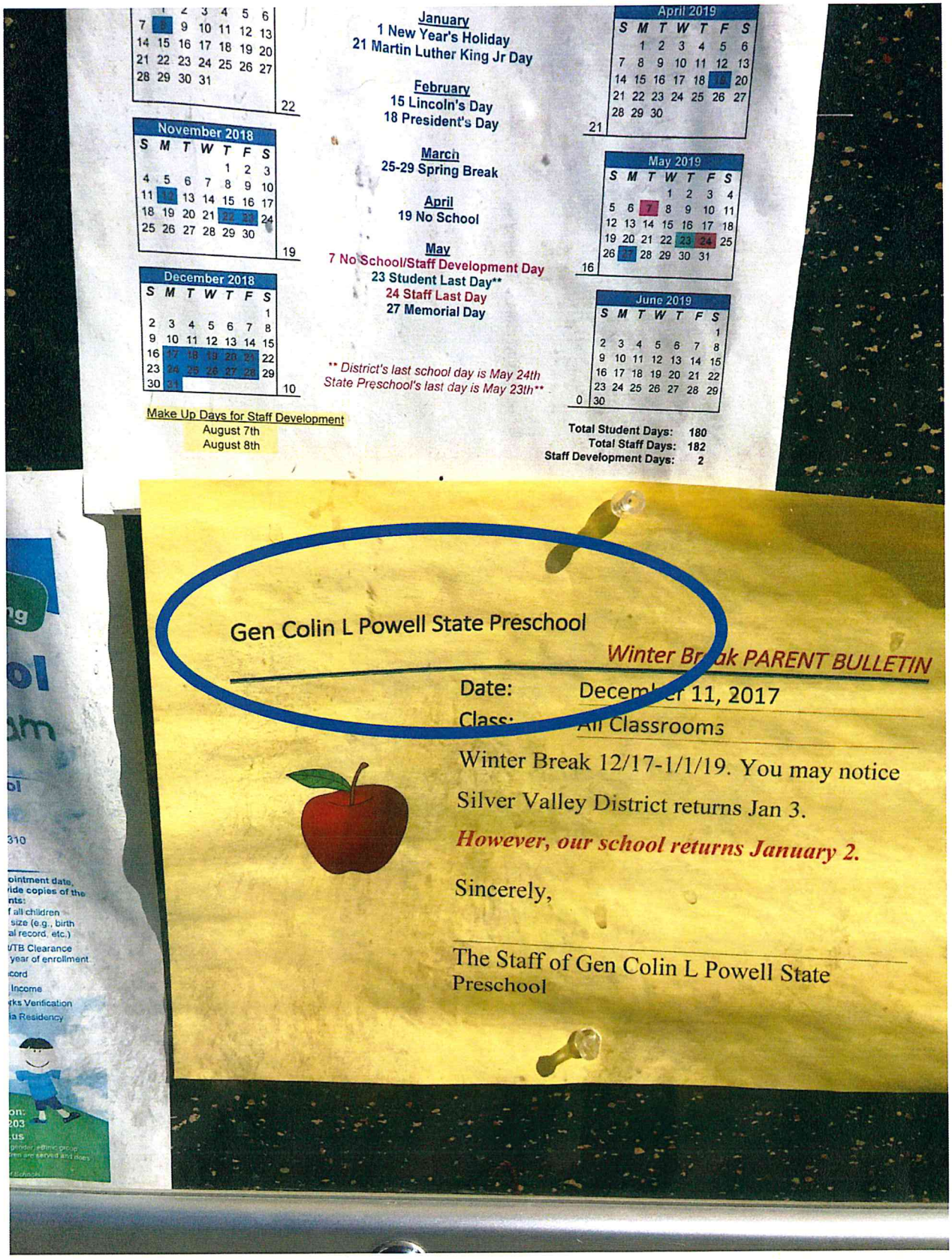

SYSTEM RECORD
DOCUMENTS
I CAN'T
ADULT
TODAY


120 VAC
AFP-200
APPLE VA
COMMUNICA
SINCE
ALARM LICENSE #ACO3056


BOSCH


FCID
ACTIVITY
BALL


All clear
Go to interior
FCID
Resetting Alarm after
ALARM SILENCE
ENTER
SPACE
RESET/
Fire Alarm Sounds
acknowledge.
and display will stay on steady and will silence the panel's
is safe to do so, the outside audible alarm can be silenced by
silence key - this will light the yellow alarm silence lamp.
the alarm has been corrected the control system can be
the reset/lamp test key for at least three seconds.
Fire Alarm Drill
low Alarm to notify them prior to having the drill.
by fire alarm panel - this will activate the fire alarm.
ity and all alarms and personnel are verified at
ild horns/strobes, alarms can be silenced.
by fire alarm panel
ons above to reset panel
phone: a) press speaker
b) dial 9-0-1 (bells will sound)
c) let bells ring three seconds (all clear signal)
d) press speaker to disconnect and silence the bells



7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
22

November 2018
S M T W T F S
1 2 3
4 5 6 7 8 9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30
19

December 2018
S M T W T F S
1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
10

Make Up Days for Staff Development
August 7th
August 8th

January
1 New Year's Holiday
21 Martin Luther King Jr Day

February
15 Lincoln's Day
18 President's Day

March
25-29 Spring Break

April
19 No School

May
7 No School/Staff Development Day
23 Student Last Day**
24 Staff Last Day
27 Memorial Day

** District's last school day is May 24th
State Preschool's last day is May 23th**

April 2019
S M T W T F S
1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30
21

May 2019
S M T W T F S
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31
16

June 2019
S M T W T F S
1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
0 30

Total Student Days: 180
Total Staff Days: 182
Staff Development Days: 2

Gen Colin L Powell State Preschool

Winter Break PARENT BULLETIN

Date: December 11, 2017

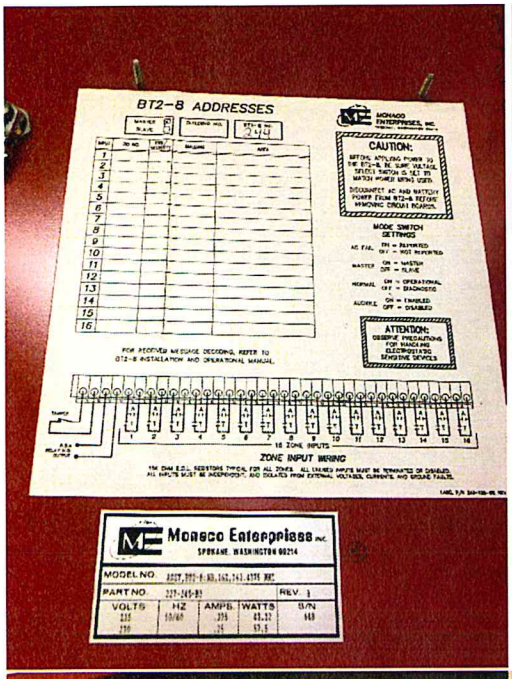
Class: All Classrooms

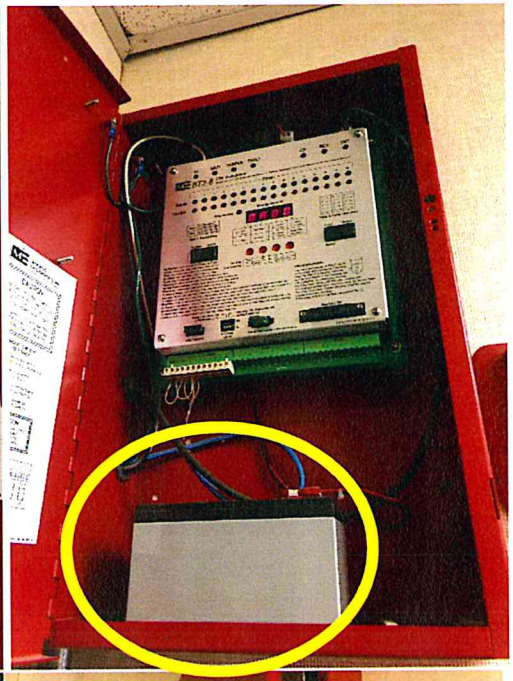
Winter Break 12/17-1/1/19. You may notice Silver Valley District returns Jan 3.

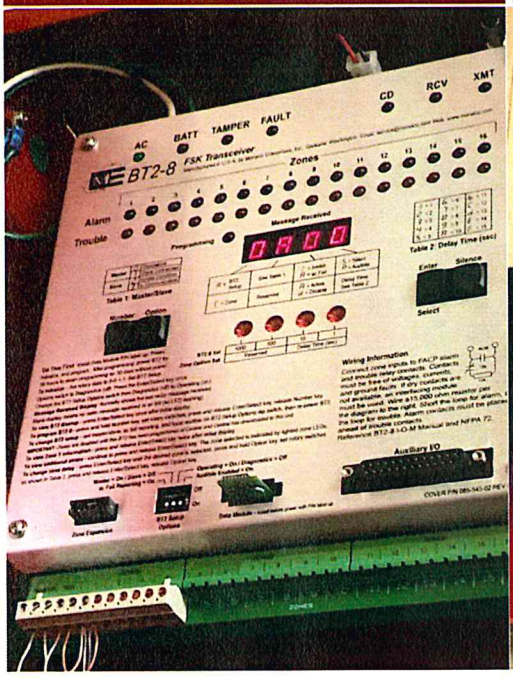
However, our school returns January 2.

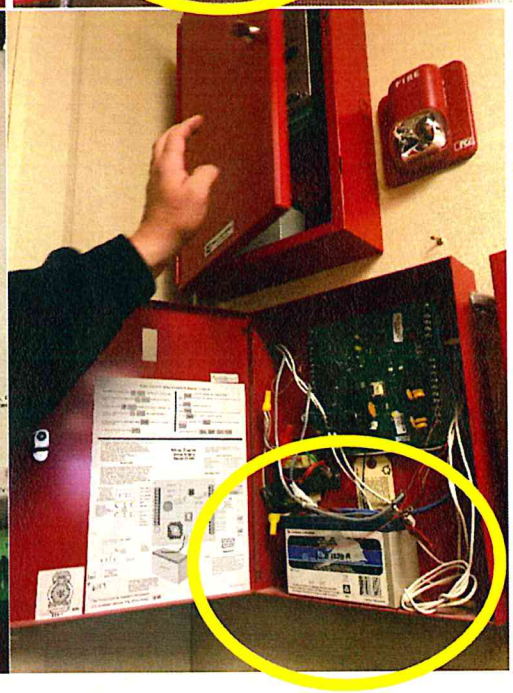
Sincerely,

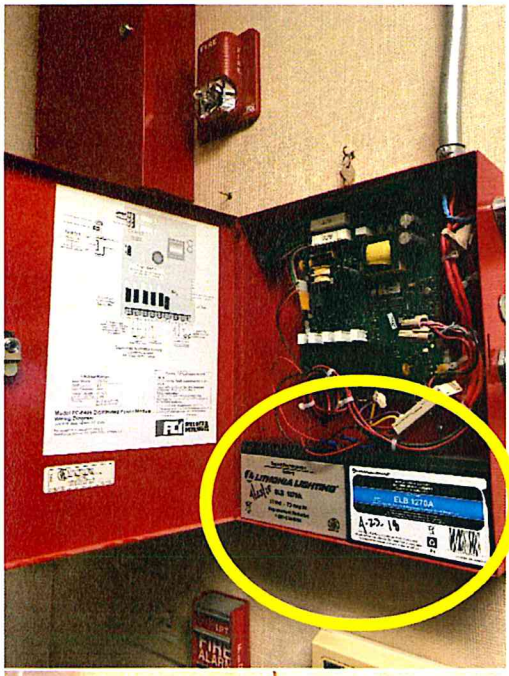
The Staff of Gen Colin L Powell State Preschool


BT2-8 ADDRESSES
MONACO ENTERPRISES, INC.
CAUTION:
MODE SWITCH SETTINGS
ATTENTION:
ZONE INPUT WIRING
16 ZONE INPUTS
Monaco Enterprises Inc.
SPOKANE, WASHINGTON 99214
MODEL NO.
PART NO.
REV.
VOLTS
HZ
AMPS
WATTS
S/N



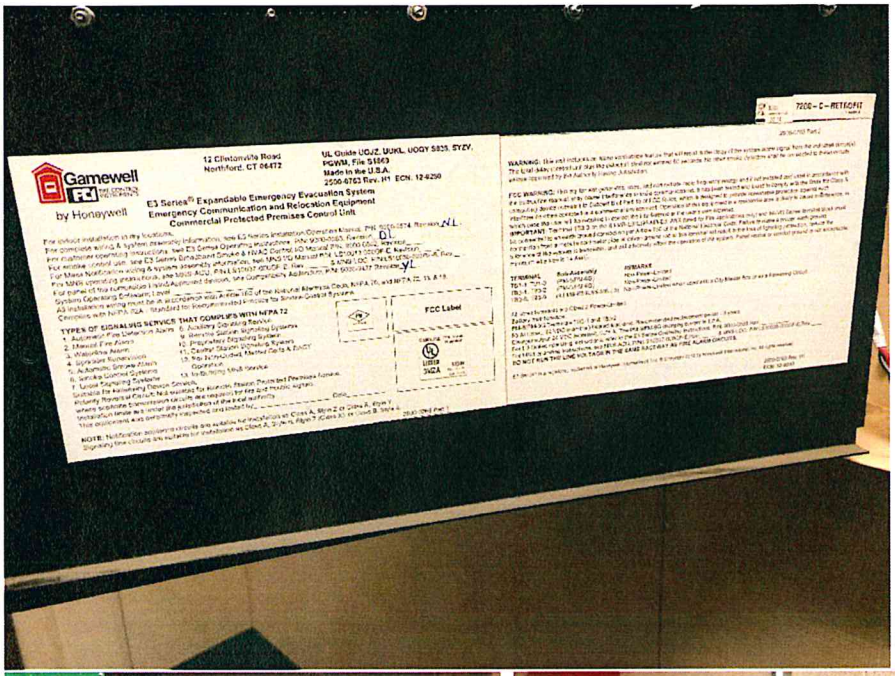

AC
BATT
TAMPER
FAULT
GD
RCV
XMT
BT2-8
FSK Transceiver
Zones
Alarm
Trouble
Message Received
Table 1 Master/Slave
Table 2 Delay Time (sec)
Enter
Silence
Select
Wiring Information
Auxiliary I/O

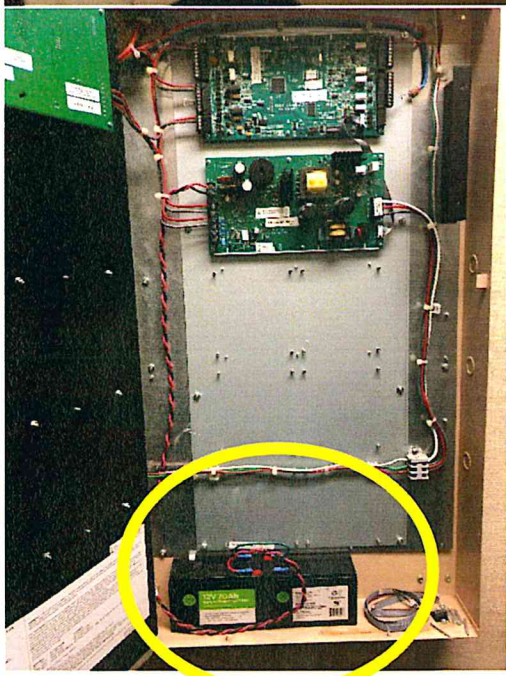

FIRE


ELB 1270A


SYSTEM RECORD
DOCUMENTS


System Normal
COLIN POWELL
AC POWER ON
POWER FAULT
GROUND FAULT
ALARM
SYSTEM TROUBLE
SUPERVISORY
SYSTEM SILENCED
ALARM ACKNOWLEDGE
TROUBLE ACKNOWLEDGE
SIGNAL SILENCE
SYSTEM RESET/ LAMP TEST
MENU
BACKSPACE/ EDIT
OK/ ENTER


Gamewell FCI
by Honeywell
12 Clintonville Road
Northford, CT 06472
UL Guide UOJZ, UUKL, UOGY 5825, SYZV,
PGWM, File S1563
Made in the U.S.A.
2500-6763 Rev. H1 ECN: 12-6250
E3 Series® Expandable Emergency Evacuation System
Emergency Communication and Relocation Equipment
Commercial Protected Premises Control Unit
FCC Label
TYPES OF SIGNALING SERVICE THAT COMPLIES WITH NFPA 72
WARNING:
FCC WARNING:
IMPORTANT:
NOTE: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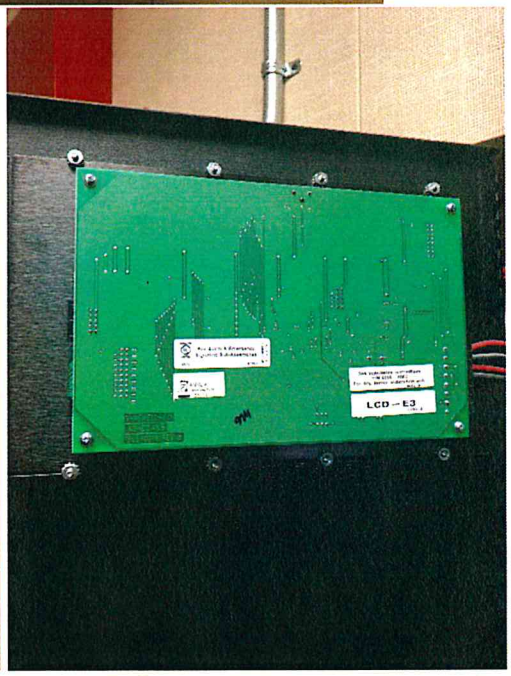
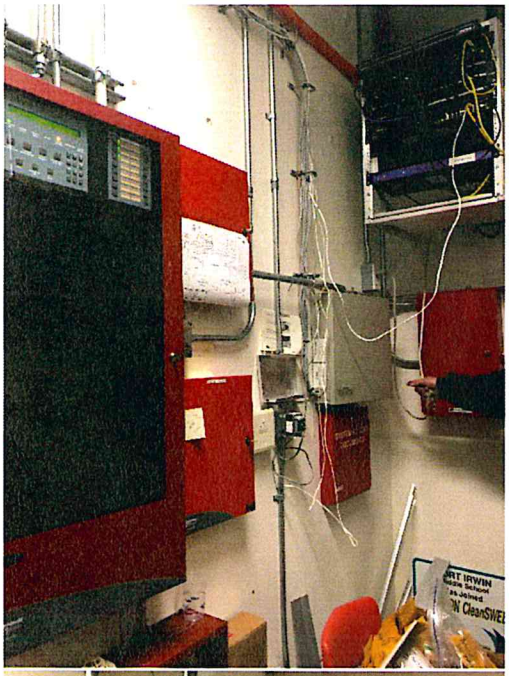
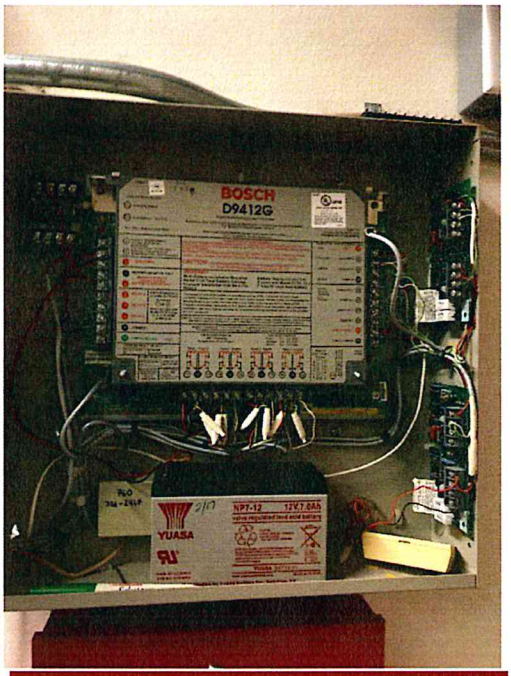
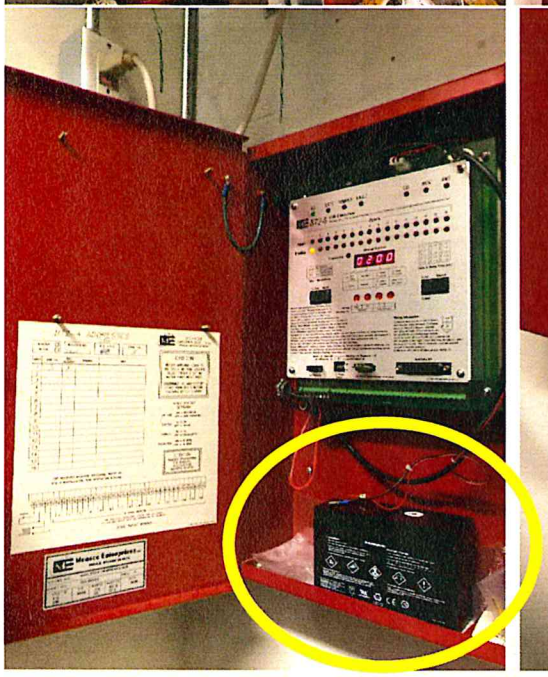

LCD – E3

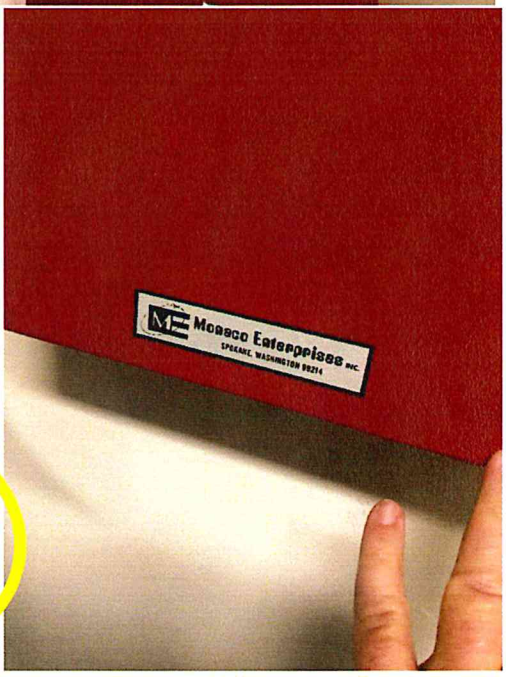

FORT IRWIN
MIDDLE SCHOOL

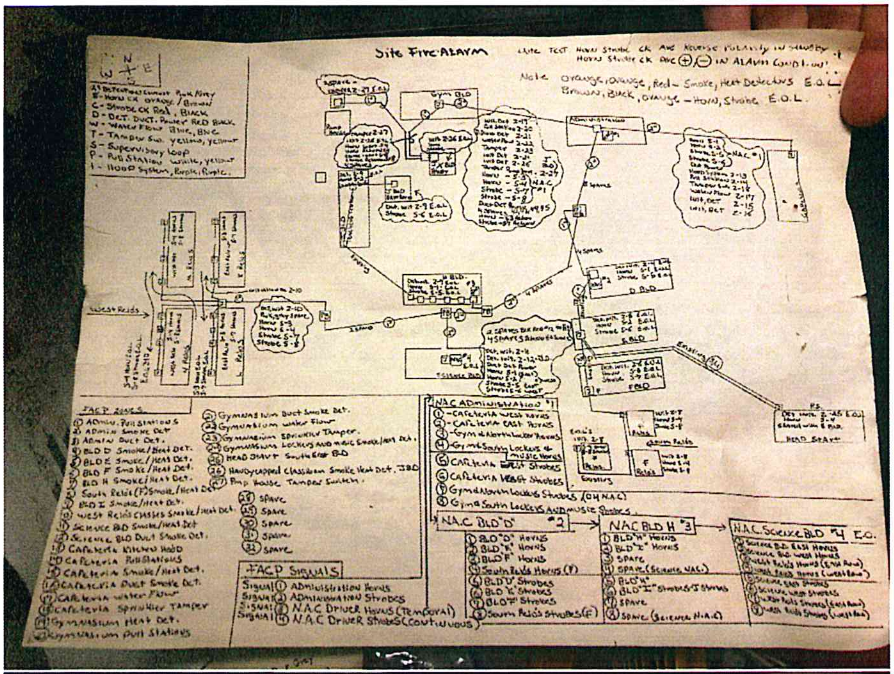
MIJAC ALARM
YOUR BEST DEFENSE

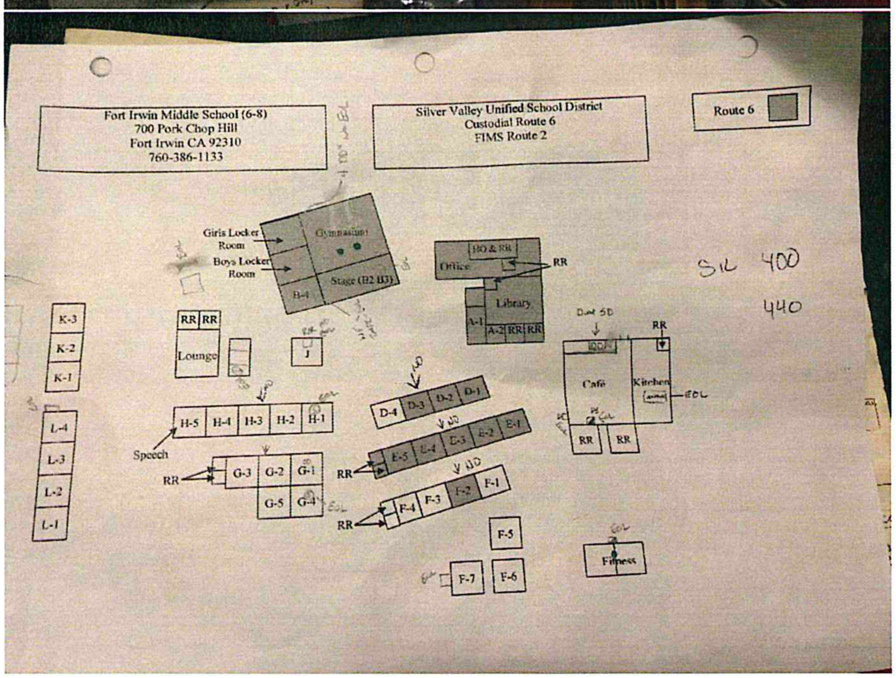









Site Fire-Alarm
FACP zones
FACP Signals
N.A.C Administration #1
N.A.C BLD "D" #2
NAC BLD H #3
N.A.C Science BLD #4
West Relo's


Fort Irwin Middle School (6-8)
700 Pork Chop Hill
Fort Irwin CA 92310
760-386-1133
Silver Valley Unified School District
Custodial Route 6
FIMS Route 2
Route 6
Girls Locker Room
Boys Locker Room
Gymnasium
Stage (B2 B3)
B-4
HO & RR
Office
RR
Library
A-1
A-2
K-3
K-2
K-1
RR
Lounge
J
H-5
H-4
H-3
H-2
H-1
Speech
G-3
G-2
G-1
G-5
G-4
D-4
D-3
D-2
D-1
E-5
E-4
E-3
E-2
E-1
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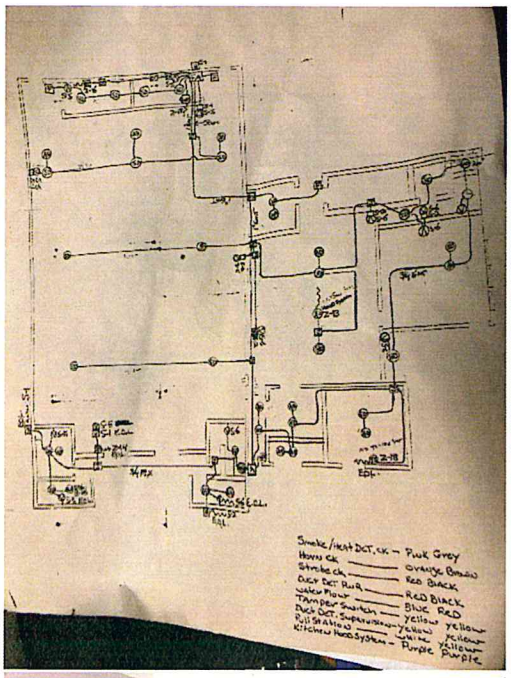
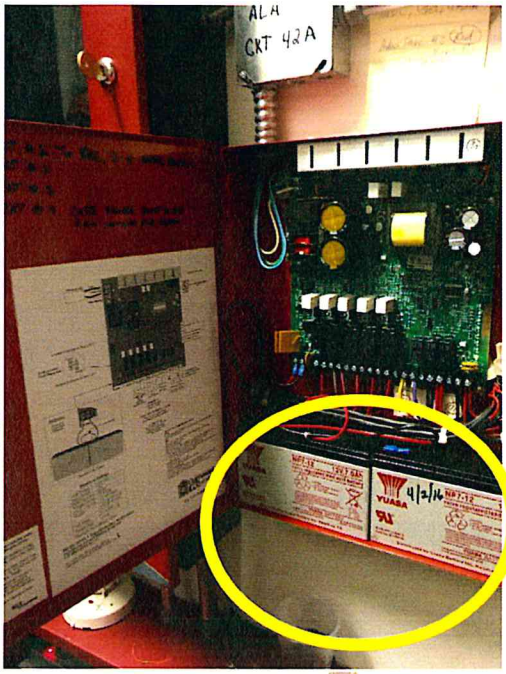
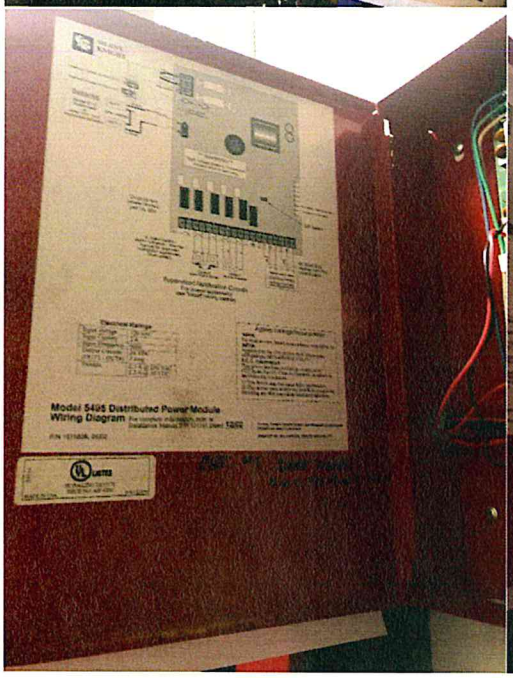
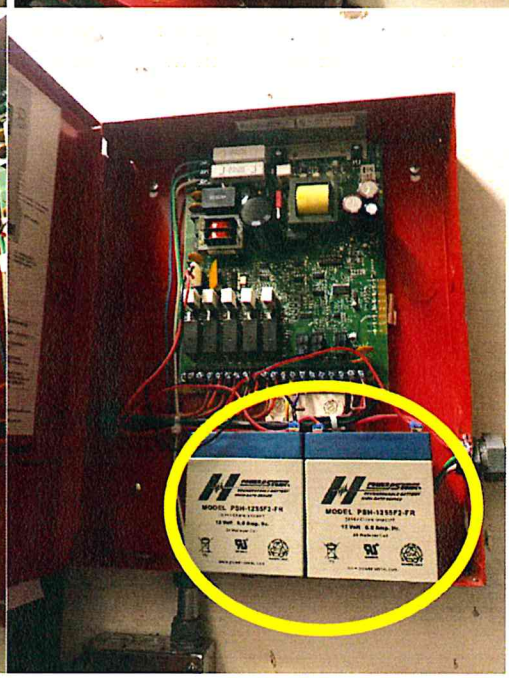
F-7
Café
Kitchen
EOL
Fitness
SIL 400
440


Smoke/Heat DCT. ck – Pink Grey
Horn ck. ——— Orange Brown
Strobe ck. ——— Red Black
Duct DCT Pull ——— Red Black
Water Flow ——— Blue Red
Tamper Switch ——— Yellow Yellow
Duct DCT-Supervisory ——— Yellow Yellow
Pull Station ——— Yellow Yellow
Kitchen Hood System – Purple Purple


ALA
CKT 42A
4/2/14

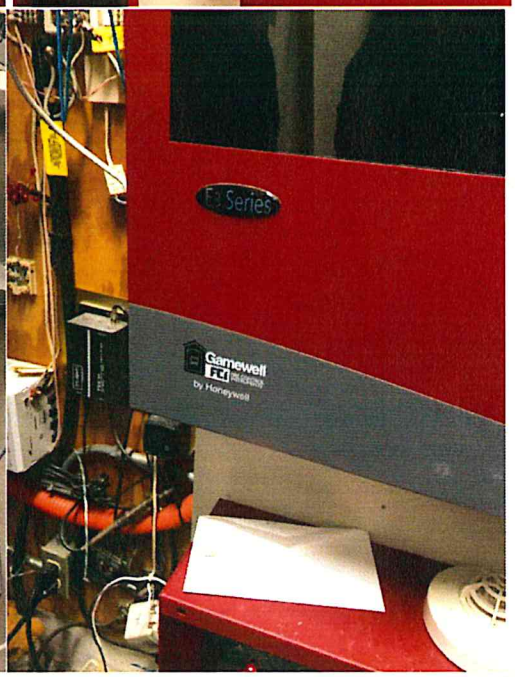

Model 5495 Distributed Power Module
Wiring Diagram


MODEL PSH-1255F2-FR
MODEL PSH-1255F2-FR


MODEL PSH-1255F2-FR
MODEL PSH-1255F2-FR

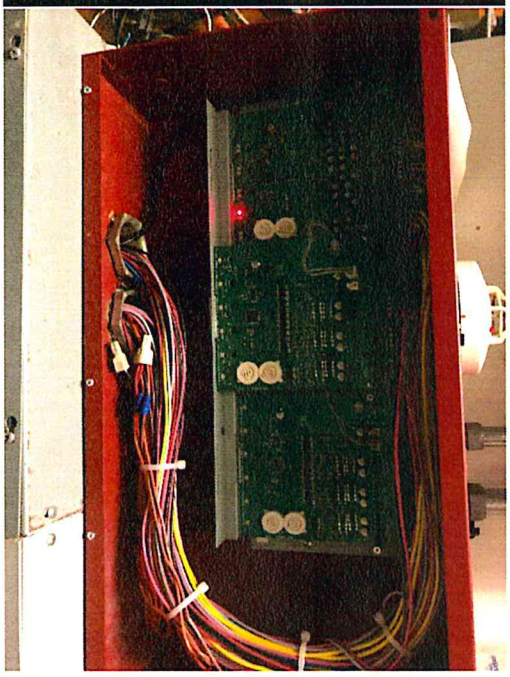

MODEL PSH-1255F2-FR
PNL
ALA
CKT 42A
SNAC #1 N1/L1/M11

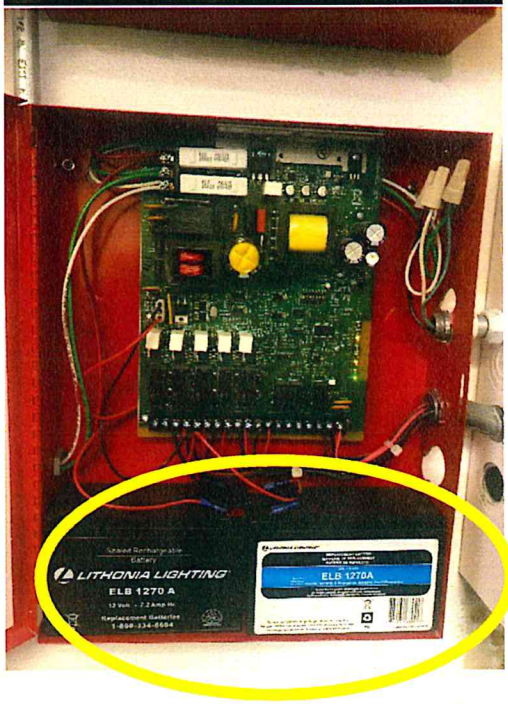

N1/L1/M13

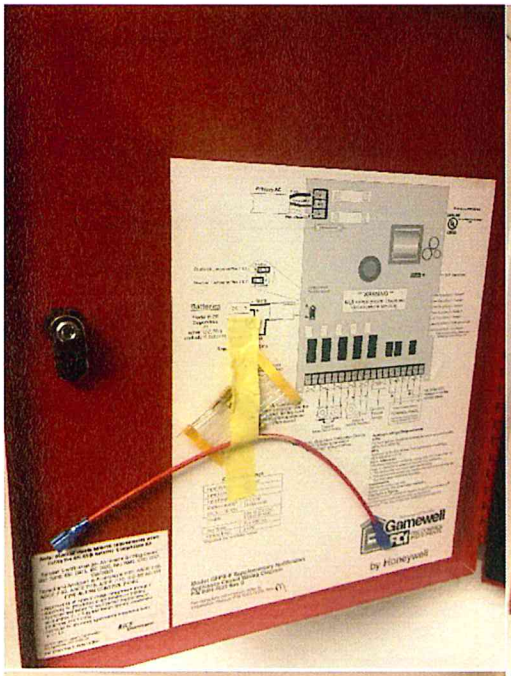

F3 Series
Gamewell
FCI
by Honeywell

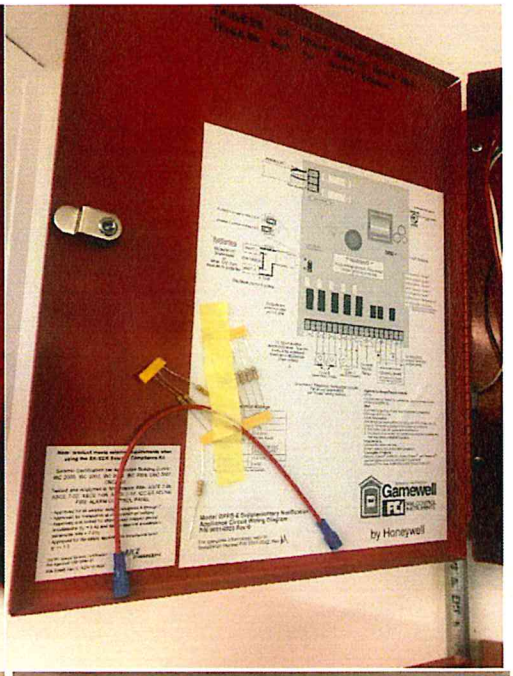

AC POWER ON
POWER FAULT
GROUND FAULT
ALARM
SYSTEM TROUBLE
SUPERVISORY
SYSTEM SILENCED
ALARM ACKNOWLEDGE
TROUBLE ACKNOWLEDGE
SYSTEM RESET/ LAMP TEST
MENU
BACKSPACE/ EDIT
OK/ ENTER

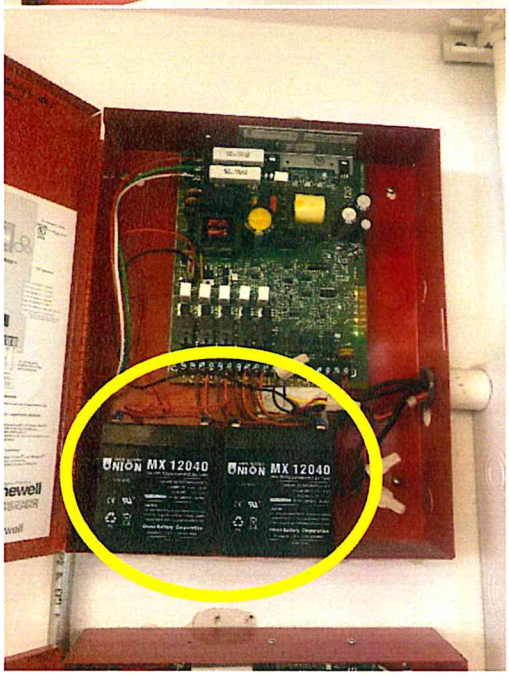

FORT IRWIN M.S.

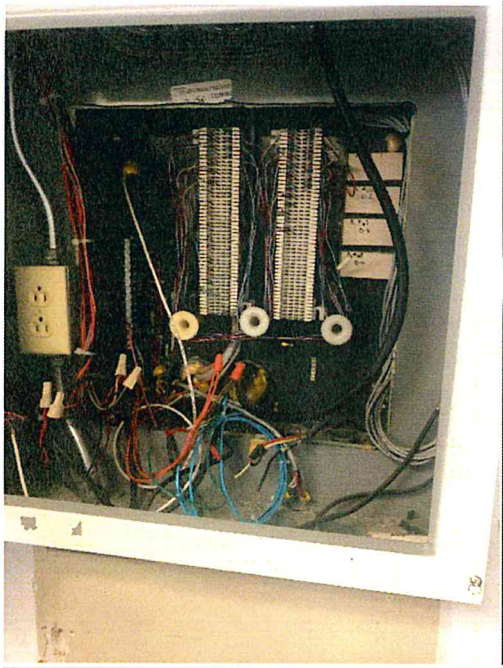


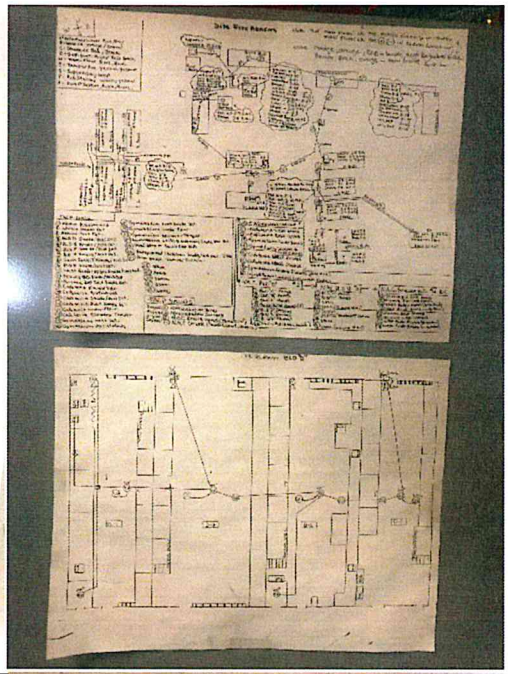

LITHONIA LIGHTING
ELB 1270 A
ELB 1270A

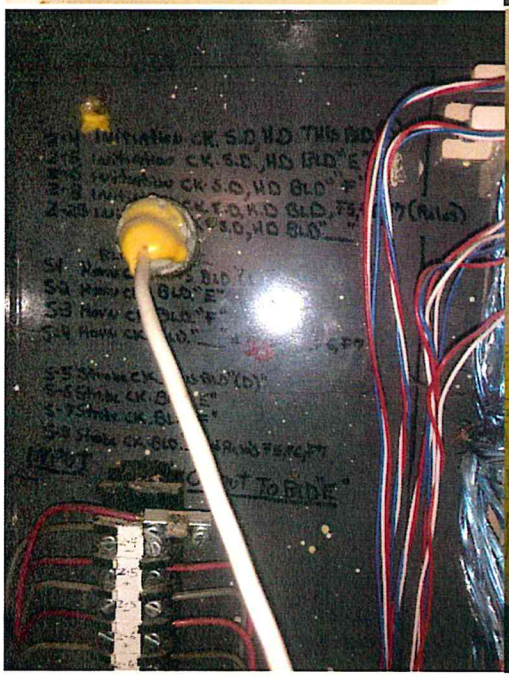

Gamewell
by Honeywell

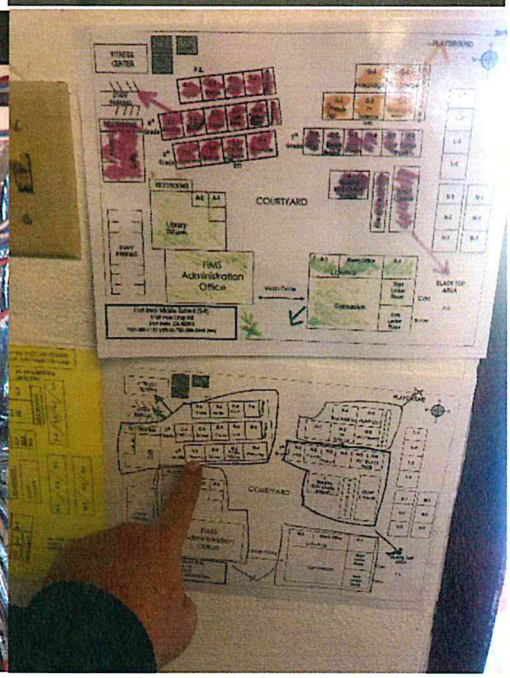

Gamewell
by Honeywell

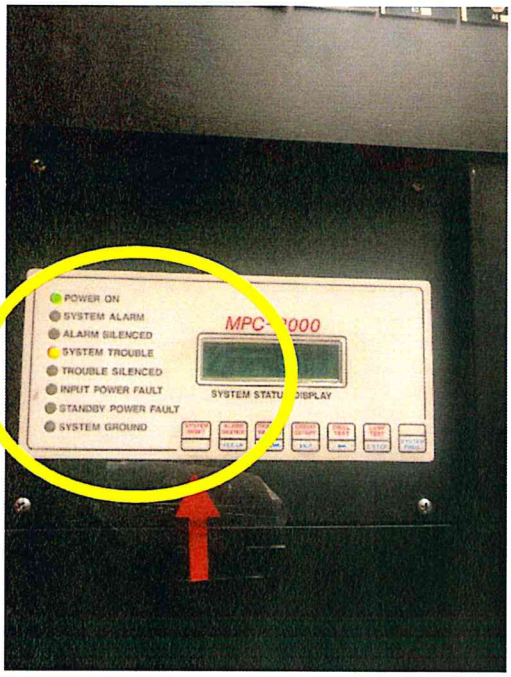

UNION MX 12040
UNION MX 12040

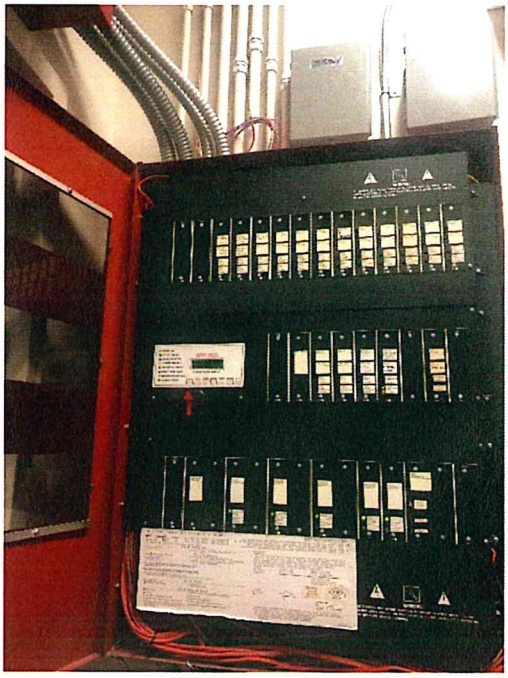







COURTYARD
FIMS
Administration
Office


POWER ON
SYSTEM ALARM
ALARM SILENCED
SYSTEM TROUBLE
TROUBLE SILENCED
INPUT POWER FAULT
STANDBY POWER FAULT
SYSTEM GROUND



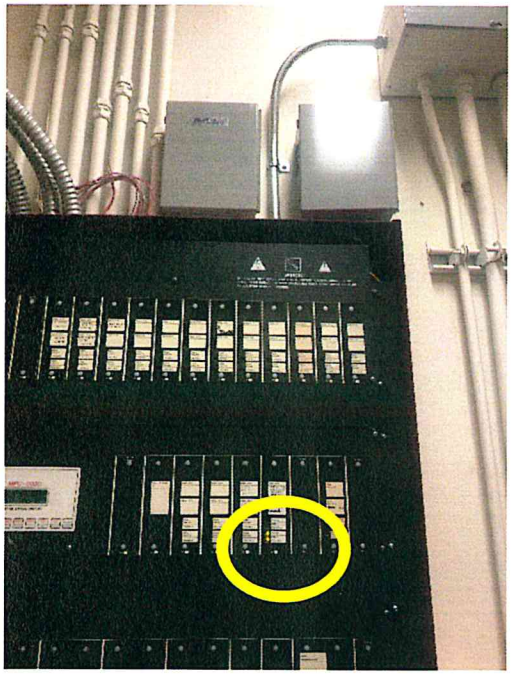


Table 14.3.1 Visual Inspection

Component	Initial Acceptance	Periodic Frequency	Method	Reference
1. All equipment	X	Annual	Ensure there are no changes that affect equipment performance. Inspect for building modifications, occupancy changes, changes in environmental conditions, device location, physical obstructions, device orientation, physical damage, and degree of cleanliness.	14.3.4
2. Control equipment:				
(a) Fire alarm systems monitored for alarm, supervisory, and trouble signals			Verify a system normal condition.	
(1) Fuses	X	Annual		
(2) Interfaced equipment	X	Annual		
(3) Lamps and LEDs	X	Annual		
(4) Primary (main) power supply	X	Annual		
(5) Trouble signals	X	Semiannual		
(b) Fire alarm systems unmonitored for alarm, supervisory, and trouble signals			Verify a system normal condition.	
(1) Fuses	X	Weekly		
(2) Interfaced equipment	X	Weekly		
(3) Lamps and LEDs	X	Weekly		
(4) Primary (main) power supply	X	Weekly		
(5) Trouble signals	X	Weekly		
3. Reserved				
4. Supervising station alarm systems — transmitters			Verify location, physical condition, and a system normal condition.	
(a) Digital alarm communicator transmitter (DACT)	X	Annual		
(b) Digital alarm radio transmitter (DART)	X	Annual		
(c) McCulloh	X	Annual		
(d) Radio alarm transmitter (RAT)	X	Annual		
(e) All other types of communicators	X	Annual		
5. In-building fire emergency voice/alarm communications equipment	X	Semiannual	Verify location and condition.	
6. Reserved				
7. Reserved				
8. Reserved				
9. Batteries			Inspect for corrosion or leakage. Verify tightness of connections. Verify marking of the month/year of manufacture (all types).	10.6.10
(a) Lead-acid	X	Monthly	Visually inspect electrolyte level.	
(b) Nickel-cadmium	X	Semiannual		
(c) Primary (dry cell)	X	Monthly		
(d) Sealed lead-acid	X	Semiannual		
10. Reserved				

(continues)

Table 14.3.1 *Continued*

	Component	Initial Acceptance	Periodic Frequency	Method	Reference
11.	Remote annunciators	X	Semiannual	Verify location and condition.	
12.	Notification appliance circuit power extenders	X	Annual	Verify proper fuse ratings, if any. Verify that lamps and LEDs indicate normal operating status of the equipment.	10.6
13.	Remote power supplies	X	Annual	Verify proper fuse ratings, if any. Verify that lamps and LEDs indicate normal operating status of the equipment.	10.6
14.	Transient suppressors	X	Semiannual	Verify location and condition.	
15.	Reserved				
16.	Fiber-optic cable connections	X	Annual	Verify location and condition.	
17.	Initiating devices			Verify location and condition (all devices).	
	(a) Air sampling				
	(1) General	X	Semiannual	Verify that in-line filters, if any, are clean.	17.7.3.6
	(2) Sampling system piping and sampling ports	X		Verify that sampling system piping and fittings are installed properly, appear airtight, and are permanently fixed. Confirm that sampling pipe is conspicuously identified. Verify that sample ports or points are not obstructed.	17.7.3.6
	(b) Duct detectors				
	(1) General	X	Semiannual	Verify that detector is rigidly mounted. Confirm that no penetrations in a return air duct exist in the vicinity of the detector. Confirm the detector is installed so as to sample the airstream at the proper location in the duct.	17.7.5.5
	(2) Sampling tube	X		Verify proper orientation. Confirm the sampling tube protrudes into the duct in accordance with system design.	17.7.5.5
	(c) Electromechanical releasing devices	X	Semiannual		
	(d) Fire extinguishing system(s) or suppression system(s) switches	X	Semiannual		
	(e) Manual fire alarm boxes	X	Semiannual		
	(f) Heat detectors	X	Semiannual		
	(g) Radiant energy fire detectors	X	Quarterly	Verify no point requiring detection is obstructed or outside the detector's field of view.	17.8
	(h) Video image smoke and fire detectors	X	Quarterly	Verify no point requiring detection is obstructed or outside the detector's field of view.	17.7.7; 17.11.5
	(i) Smoke detectors (excluding one- and two-family dwellings)	X	Semiannual		
	(j) Projected beam smoke detectors	X	Semiannual	Verify beam path is unobstructed.	
	(k) Supervisory signal devices	X	Quarterly		
	(l) Waterflow devices	X	Quarterly		
18.	Reserved				

Table 14.3.1 *Continued*

	Component	Initial Acceptance	Periodic Frequency	Method	Reference
19.	Combination systems			Verify location and condition (all types).	
	(a) Fire extinguisher electronic monitoring device/systems	X	Semiannual		
	(b) Carbon monoxide detectors/systems	X	Semiannual		
20.	Fire alarm control interface and emergency control function interface	X	Semiannual	Verify location and condition.	
21.	Guard's tour equipment	X	Semiannual	Verify location and condition.	
22.	Notification appliances			Verify location and condition (all appliances).	
	(a) Audible appliances	X	Semiannual		
	(b) Audible textual notification appliances	X	Semiannual		
	(c) Visible appliances				
	(1) General	X	Semiannual		18.5.5
	(2) Candela rating	X		Verify that the candela rating marking agrees with the approved drawings.	18.5.5
23.	Exit marking audible notification appliances	X	Semiannual	Verify location and condition.	
24.	Reserved				
25.	Area of refuge two-way communication system	X	Annual	Verify location and condition.	
26.	Reserved				
27.	Supervising station alarm systems — receivers				
	(a) Signal receipt	X	Daily	Verify receipt of signal.	
	(b) Receivers	X	Annual	Verify location and normal condition.	
28.	Public emergency alarm reporting system transmission equipment			Verify location and condition.	
	(a) Publicly accessible alarm box	X	Semiannual		
	(b) Auxiliary box	X	Annual		
	(c) Master box				
	(1) Manual operation	X	Semiannual		
	(2) Auxiliary operation	X	Annual		
29.	Reserved				
30.	Mass notification system				
	(a) Monitored for integrity			Verify a system normal condition.	
	(1) Control equipment				
	(i) Fuses	X	Annual		
	(ii) Interfaces	X	Annual		
	(iii) Lamps/LED	X	Annual		
	(iv) Primary (main) power supply	X	Annual		
	(2) Secondary power batteries	X	Annual		
	(3) Initiating devices	X	Annual		
	(4) Notification appliances	X	Annual		

(continues)

Table 14.3.1 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method	Reference
30. Mass notification system *(continued)*				
(b) Not monitored for integrity; installed prior to adoption of the 2010 edition			Verify a system normal condition.	
(1) Control equipment				
(i) Fuses	X	Semiannual		
(ii) Interfaces	X	Semiannual		
(iii) Lamps/LED	X	Semiannual		
(iv) Primary (main) power supply	X	Semiannual		
(2) Secondary power batteries	X	Semiannual		
(3) Initiating devices	X	Semiannual		
(4) Notification appliances	X	Semiannual		
(c) Antenna	X	Annual	Verify location and condition.	
(d) Transceivers	X	Annual	Verify location and condition.	

14.3.2 Devices or equipment that is inaccessible for safety considerations (e.g., continuous process operations, energized electrical equipment, radiation, and excessive height) shall be permitted to be inspected during scheduled shutdowns if approved by the authority having jurisdiction.

14.3.3 Extended intervals shall not exceed 18 months.

14.3.4 The visual inspection shall be made to ensure that there are no changes that affect equipment performance.

14.4 Testing.

14.4.1 Initial Acceptance Testing.

14.4.1.1 All new systems shall be inspected and tested in accordance with the requirements of Chapter 14.

14.4.1.2 The authority having jurisdiction shall be notified prior to the initial acceptance test.

14.4.2* Reacceptance Testing.

14.4.2.1 When an initiating device, notification appliance, or control relay is added, it shall be functionally tested.

14.4.2.2 When an initiating device, notification appliance, or control relay is deleted, another device, appliance, or control relay on the circuit shall be operated.

14.4.2.3 When modifications or repairs to control equipment hardware are made, the control equipment shall be tested in accordance with Table 14.4.3.2, items 1(a) and 1(d).

14.4.2.4 When changes are made to site-specific software, the following shall apply:

(1) All functions known to be affected by the change, or identified by a means that indicates changes, shall be 100 percent tested.
(2) In addition, 10 percent of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, also shall be tested and correct system operation shall be verified.
(3) A revised record of completion in accordance with 7.5.6 shall be prepared to reflect these changes.

14.4.2.5 Changes to the system executive software shall require a 10 percent functional test of the system, including a test of at least one device on each input and output circuit to verify critical system functions such as notification appliances, control functions, and off-premises reporting.

14.4.3* Test Methods.

14.4.3.1* At the request of the authority having jurisdiction, the central station facility installation shall be inspected for complete information regarding the central station system, including specifications, wiring diagrams, and floor plans that have been submitted for approval prior to installation of equipment and wiring.

14.4.3.2* Systems and associated equipment shall be tested according to Table 14.4.3.2.

Table 14.4.3.2 was revised by tentative interim amendments (TIAs). See page 1.

Table 14.4.3.2 Testing

Component	Initial Acceptance	Periodic Frequency	Method
1. All equipment	X		See Table 14.3.1.
2. Control equipment and transponder			
(a) Functions	X	Annually	Verify correct receipt of alarm, supervisory, and trouble signals (inputs); operation of evacuation signals and auxiliary functions (outputs); circuit supervision, including detection of open circuits and ground faults; and power supply supervision for detection of loss of ac power and disconnection of secondary batteries.
(b) Fuses	X	Annually	Verify rating and supervision.
(c) Interfaced equipment	X	Annually	Verify integrity of single or multiple circuits providing interface between two or more control units. Test interfaced equipment connections by operating or simulating operation of the equipment being supervised. Verify signals required to be transmitted at the control unit.
(d) Lamps and LEDs	X	Annually	Illuminate lamps and LEDs.
(e) Primary (main) power supply	X	Annually	Disconnect and test all secondary (standby) power under maximum load, including all alarm appliances requiring simultaneous operation. Reconnect all secondary (standby) power at end of test. Test redundant power supplies separately.
3. Fire alarm control unit trouble signals			
(a) Audible and visual	X	Annually	Verify operation of control unit trouble signals. Verify ring-back feature for systems using a trouble-silencing switch that requires resetting.
(b) Disconnect switches	X	Annually	If control unit has disconnect or isolating switches, verify performance of intended function of each switch. Verify receipt of trouble signal when a supervised function is disconnected.
(c) Ground-fault monitoring circuit	X	Annually	If the system has a ground detection feature, verify the occurrence of ground-fault indication whenever any installation conductor is grounded.
(d) Transmission of signals to off-premises location	X	Annually	Actuate an initiating device and verify receipt of alarm signal at the off-premises location. Create a trouble condition and verify receipt of a trouble signal at the off-premises location. Actuate a supervisory device and verify receipt of a supervisory signal at the off-premises location. If a transmission carrier is capable of operation under a single- or multiple-fault condition, activate an initiating device during such fault condition and verify receipt of an alarm signal and a trouble signal at the off-premises location.
4. Supervising station alarm systems — transmission Equipment			
(a) All equipment	X	Annually	[a]Test all system functions and features in accordance with the equipment manufacturer's published instructions for correct operation in conformance with the applicable sections of Chapter 26. Except for DACT, actuate initiating device and verify receipt of the correct initiating device signal at the supervising station within 90 seconds. Upon completion of the test, restore the system to its functional operating condition. If test jacks are used, conduct the first and last tests without the use of the test jack.
(b) Digital alarm communicator transmitter (DACT)	X	Annually	Except for DACTs installed prior to adoption of the 2013 edition of NFPA 72 that are connected to a telephone line (number) that is also supervised for adverse conditions by a derived local channel, ensure connection of the DACT to two separate means of transmission. Test DACT for line seizure capability by initiating a signal while using the telephone line (primary line for DACTs using two telephone lines) for a telephone call. Ensure that the call is interrupted and that the communicator connects to the digital alarm receiver. Verify receipt of the correct signal at the supervising station. Verify each transmission attempt is completed within 90 seconds from going off-hook to on-hook.

(continues)

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
4. Supervising station alarm systems — transmission Equipment			
(b) Digital alarm communicator transmitter (DACT) *(continued)*			Disconnect the telephone line (primary line for DACTs using two telephone lines) from the DACT.
			Verify indication of the DACT trouble signal occurs at the premises fire alarm control unit within 4 minutes of detection of the fault. Verify receipt of the telephone line trouble signal at the supervising station. Restore the telephone line (primary line for DACTs using two telephone lines), reset the fire alarm control unit, and verify that the telephone line fault trouble signal returns to normal. Verify that the supervising station receives the restoral signal from the DACT.
			Disconnect the secondary means of transmission from the DACT. Verify indication of the DACT trouble signal occurs at the premises fire alarm control unit within 4 minutes of detection of the fault. Verify receipt of the secondarey means trouble signal at the supervising station. Restore the secondary means of transmission, reset the fire alarm control unit, and verify that the trouble signal returns to normal. Verify that the supervising station receives the restoral signal from the secondary transmitter.
			Cause the DACT to transmit a signal to the DACR while a fault in the telephone line (number) (primary line for DACTs using two telephone lines) is simulated. Verify utilization of the secondary communication path by the DACT to complete the transmission to the DACR.
(c) Digital alarm radio transmitter (DART)	X	Annually	Disconnect the primary telephone line. Verify transmission of a trouble signal to the supervising station by the DART occurs within 4 minutes.
(d) McCulloh transmitter	X	Annually	Actuate initiating device. Verify production of not less than three complete rounds of not less than three signal impulses each by the McCulloh transmitter.
			If end-to-end metallic continuity is present and with a balanced circuit, cause each of the following four transmission channel fault conditions in turn, and verify receipt of correct signals at the supervising station: (1) Open (2) Ground (3) Wire-to-wire short (4) Open and ground
			If end-to-end metallic continuity is not present and with a properly balanced circuit, cause each of the following three transmission channel fault conditions in turn, and verify receipt of correct signals at the supervising station: (1) Open (2) Ground (3) Wire-to-wire short
(e) Radio alarm transmitter (RAT)	X	Annually	Cause a fault between elements of the transmitting equipment. Verify indication of the fault at the protected premises, or transmission of trouble signal to the supervising station.
(f) Performance-based technologies	X	Annually	Perform tests to ensure the monitoring of integrity of the transmission technology and technology path.
			Where a single communications path is used, disconnect the communication path. Manually initiate an alarm signal transmission or allow the check-in (handshake) signal to be transmitted automatically.[b] Verify the premises unit annunciates the failure within 200 seconds of the transmission failure. Restore the communication path.
			Where multiple communication paths are used, disconnect both communication paths. Manually initiate an alarm signal transmission. Verify the premises control unit annunciates the failure within 200 seconds of the transmission failure. Restore both communication paths.
5. Emergency communications equipment			
(a) Amplifier/tone generators	X	Annually	Verify correct switching and operation of backup equipment.
(b) Call-in signal silence	X	Annually	Operate/function and verify receipt of correct visual and audible signals at control unit.
(c) Off-hook indicator (ring down)	X	Annually	Install phone set or remove phone from hook and verify receipt of signal at control unit.
(d) Phone jacks	X	Annually	Visually inspect phone jack and initiate communications path through jack.

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
(e) Phone set	X	Annually	Activate each phone set and verify correct operation.
(f) System performance	X	Annually	Operate the system with a minimum of any five handsets simultaneously. Verify voice quality and clarity.
6. Engine-driven generator	X	Monthly	If an engine-driven generator dedicated to the system is used as a required power source, verify operation of the generator in accordance with NFPA 110, *Standard for Emergency and Standby Power Systems*, by the building owner.
7. Secondary (standby) power supply[c]	X	Annually	Disconnect all primary (main) power supplies and verify the occurrence of required trouble indication for loss of primary power. Measure or verify the system's standby and alarm current demand and verify the ability of batteries to meet standby and alarm requirements using manufacturer's data. Operate general alarm systems a minimum of 5 minutes and emergency voice communications systems for a minimum of 15 minutes. Reconnect primary (main) power supply at end of test.
8. Uninterruptible power supply (UPS)	X	Annually	If a UPS system dedicated to the system is used as a required power source, verify by the building owner operation of the UPS system in accordance with NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems.*
9. Battery tests			Prior to conducting any battery testing, verify by the person conducting the test, that all system software stored in volatile memory is protected from loss.
(a) Lead-acid type			
(1) Battery replacement	X	Annually	Replace batteries in accordance with the recommendations of the alarm equipment manufacturer or when the recharged battery voltage or current falls below the manufacturer's recommendations.
(2) Charger test	X	Annually	With the batteries fully charged and connected to the charger, measure the voltage across the batteries with a voltmeter. Verify the voltage is 2.30 volts per cell ±0.02 volts at 77°F (25°C) or as specified by the equipment manufacturer.
(3) Discharge test	X	Annually	With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery.
(4) Load voltage test	X	Semiannually	With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery. Verify the battery does not fall below 2.05 volts per cell under load.
(5) Specific gravity	X	Semiannually	Measure as required the specific gravity of the liquid in the pilot cell or all of the cells. Verify the specific gravity is within the range specified by the manufacturer. Although the specified specific gravity varies from manufacturer to manufacturer, a range of 1.205–1.220 is typical for regular lead-acid batteries, while 1.240–1.260 is typical for high-performance batteries. Do not use a hydrometer that shows only a pass or fail condition of the battery and does not indicate the specific gravity, because such a reading does not give a true indication of the battery condition.
(b) Nickel-cadmium type			
(1) Battery replacement	X	Annually	Replace batteries in accordance with the recommendations of the alarm equipment manufacturer or when the recharged battery voltage or current falls below the manufacturer's recommendations.
(2) Charger test[d]	X	Annually	With the batteries fully charged and connected to the charger, place an ampere meter in series with the battery under charge. Verify the charging current is in accordance with the manufacturer's recommendations for the type of battery used. In the absence of specific information, use 1/30 to 1/25 of the battery rating.
(3) Discharge test	X	Annually	With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery.
(4) Load voltage test	X	Semiannually	With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery. Verify the float voltage for the entire battery is 1.42 volts per cell, nominal, under load. If possible, measure cells individually.

(continues)

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
9. Battery tests *(continued)*			
(c) Sealed lead-acid type			
(1) Battery replacement	X	Annually	Replace batteries in accordance with the recommendations of the alarm equipment manufacturer or when the recharged battery voltage or current falls below the manufacturer's recommendations.
(2) Charger test	X	Annually	With the batteries fully charged and connected to the charger, measure the voltage across the batteries with a voltmeter. Verify the voltage is 2.30 volts per cell ±0.02 volts at 77°F (25°C) or as specified by the equipment manufacturer.
(3) Discharge test	X	Annually	With the battery charger disconnected, load test the batteries following the manufacturer's recommendations. Verify the voltage level does not fall below the levels specified. Load testing can be by means of an artificial load equal to the full fire alarm load connected to the battery.
(4) Load voltage test	X	Semiannually	Verify the battery performs under load, in accordance with the battery manufacturer's specifications.
10. Public emergency alarm reporting system — wired system	X	Daily	Manual tests of the power supply for public reporting circuits shall be made and recorded at least once during each 24-hour period. Such tests shall include the following: (1) Current strength of each circuit. Changes in current of any circuit exceeding 10 percent shall be investigated immediately. (2) Voltage across terminals of each circuit inside of terminals of protective devices. Changes in voltage of any circuit exceeding 10 percent shall be investigated immediately. (3)[c] Voltage between ground and circuits. If this test shows a reading in excess of 50 percent of that shown in the test specified in (2), the trouble shall be immediately located and cleared. Readings in excess of 25 percent shall be given early attention. These readings shall be taken with a calibrated voltmeter of not more than 100 ohms resistance per volt. Systems in which each circuit is supplied by an independent current source (Forms 3 and 4) require tests between ground and each side of each circuit. Common current source systems (Form 2) require voltage tests between ground and each terminal of each battery and other current source. (4) Ground current reading shall be permitted in lieu of (3). If this method of testing is used, all grounds showing a current reading in excess of 5 percent of the supplied line current shall be given immediate attention. (5) Voltage across terminals of common battery on switchboard side of fuses. (6) Voltage between common battery terminals and ground. Abnormal ground readings shall be investigated immediately. Tests specified in (5) and (6) shall apply only to those systems using a common battery. If more than one common battery is used, each common battery shall be tested.
11. Remote annunciators	X	Annually	Verify the correct operation and identification of annunciators. If provided, verify the correct operation of annunciator under a fault condition.
12. Reserved			
13. Reserved			
14. Reserved			
15. Conductors — metallic			
(a) Stray voltage	X	N/A	Test all installation conductors with a volt/ohmmeter to verify that there are no stray (unwanted) voltages between installation conductors or between installation conductors and ground. Verify the maximum allowable stray voltage does not exceed 1 volt ac/dc, unless a different threshold is specified in the published manufacturer's instructions for the installed equipment.
(b) Ground faults	X	N/A	Test all installation conductors, other than those intentionally and permanently grounded, for isolation from ground per the installed equipment manufacturer's published instructions.
(c) Short-circuit faults	X	N/A	Test all installation conductors, other than those intentionally connected together, for conductor-to-conductor isolation per the published manufacturer's instructions for the installed equipment. Also test these same circuits conductor-to-ground.

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
(d) Loop resistance	X	N/A	With each initiating and indicating circuit installation conductor pair short-circuited at the far end, measure and record the resistance of each circuit. Verify that the loop resistance does not exceed the limits specified in the published manufacturer's instructions for the installed equipment.
(e) Circuit integrity	X	N/A	For initial and reacceptance testing, confirm the introduction of a fault in any circuit monitored for integrity results in a trouble indication at the fire alarm control unit. Open one connection at not less than 10 percent of the initiating devices, notification appliances and controlled devices on every initiating device circuit, notification appliance circuit, and signaling line circuit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
	N/A	Annually	For periodic testing, test each initiating device circuit, notification appliance circuit, and signaling line circuit for correct indication at the control unit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
16. Conductors — nonmetallic			
(a) Fiber optics	X	N/A	Test the fiber-optic transmission line by the use of an optical power meter or by an optical time domain reflectometer used to measure the relative power loss of the line. Test result data must meet or exceed ANSI/TIA 568-C.3, *Optical Fiber Cabling Components Standard,* related to fiber-optic lines and connection/splice losses and the control unit manufacturer's published specifications.
(b) Circuit integrity	X	N/A	For initial and reacceptance testing, confirm the introduction of a fault in any circuit monitored for integrity results in a trouble indication at the fire alarm control unit. Open one connection at not less than 10 percent of the initiating devices, notification appliances, and controlled devices on every initiating device circuit, notification appliance circuit, and signaling line circuit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
	N/A	Annually	For periodic testing, test each initiating device circuit, notification appliance circuit, and signaling line circuit for correct indication at the control unit. Confirm all circuits perform as indicated in Sections 23.5, 23.6, and 23.7.
17. Initiating devices[f]			
(a) Electromechanical releasing device			
(1) Nonrestorable-type link	X	Annually	Verify correct operation by removal of the fusible link and operation of the associated device. Lubricate any moving parts as necessary.
(2) Restorable-type link[g]	X	Annually	Verify correct operation by removal of the fusible link and operation of the associated device. Lubricate any moving parts as necessary.
(b) Fire extinguishing system(s) or suppression system(s) alarm switch	X	Annually	Operate the switch mechanically or electrically and verify receipt of signal by the fire alarm control unit.
(c) Fire–gas and other detectors	X	Annually	Test fire–gas detectors and other fire detectors as prescribed by the manufacturer and as necessary for the application.
(d) Heat detectors			
(1) Fixed-temperature, rate-of-rise, rate of compensation, restorable line, spot type (excluding pneumatic tube type)	X	Annually (see 14.4.4.5)	Perform heat test with a listed and labeled heat source or in accordance with the manufacturer's published instructions. Assure that the test method for the installed equipment does not damage the nonrestorable fixed-temperature element of a combination rate-of-rise/fixed-temperature element detector.
(2) Fixed-temperature, nonrestorable line type	X	Annually	Do not perform heat test. Test functionality mechanically and electrically. Measure and record loop resistance. Investigate changes from acceptance test.
(3) Fixed-temperature, nonrestorable spot type	X	See Method	After 15 years from initial installation, replace all devices or have 2 detectors per 100 laboratory tested. Replace the 2 detectors with new devices. If a failure occurs on any of the detectors removed, remove and test additional detectors to determine either a general problem involving faulty detectors or a localized problem involving 1 or 2 defective detectors. If detectors are tested instead of replaced, repeat tests at intervals of 5 years.
(4) Nonrestorable (general)	X	Annually	Do not perform heat tests. Test functionality mechanically and electrically.
(5) Restorable line type, pneumatic tube only	X	Annually	Perform heat tests (where test chambers are in circuit), with a listed and labeled heat source or in accordance with the manufacturer's published instructions of the detector or conduct a test with pressure pump.

(continues)

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
17. Initiating devices[f]			
(d) Heat detectors *(continued)*			
(6) Single- and multiple-station heat alarms	X	Annually	Conduct functional tests according to manufacturer's published instructions Do not test nonrestorable heat detectors with heat.
(e) Manual fire alarm boxes	X	Annually	Operate manual fire alarm boxes per the manufacturer's published instructions. Test both key-operated presignal and general alarm manual fire alarm boxes.
(f) Radiant energy fire detectors	X	Semiannually	Test flame detectors and spark/ember detectors in accordance with the manufacturer's published instructions to determine that each detector is operative. Determine flame detector and spark/ember detector sensitivity using any of the following: (1) Calibrated test method (2) Manufacturer's calibrated sensitivity test instrument (3) Listed control unit arranged for the purpose (4) Other approved calibrated sensitivity test method that is directly proportional to the input signal from a fire, consistent with the detector listing or approval If designed to be field adjustable, replace detectors found to be outside of the approved range of sensitivity or adjust to bring them into the approved range. Do not determine flame detector and spark/ember detector sensitivity using a light source that administers an unmeasured quantity of radiation at an undefined distance from the detector.
(g) Smoke detectors — functional test			
(1) In other than one- and two-family dwellings, system detectors	X	Annually	[h]Test smoke detectors in place to ensure smoke entry into the sensing chamber and an alarm response. Use smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. Other methods listed in the manufacturer's published instructions that ensure smoke entry from the protected area, through the vents, into the sensing chamber can be used.
(2) Single- and multiple-station smoke alarms connected to protected premises systems	X	Annually	Perform a functional test on all single- and multiple-station smoke alarms connected to a protected premises fire alarm system by putting the smoke alarm into an alarm condition and verifying that the protected premises system receives a supervisory signal and does not cause a fire alarm signal.
(3) System smoke detectors used in one- and two-family dwellings	X	Annually	Conduct functional tests according to manufacturer's published instructions.
(4) Air sampling	X	Annually	Test with smoke or a listed and labeled product acceptable to the manufacturer or in accordance with their published instructions. Test from the end sampling port or point on each pipe run. Verify airflow through all other ports or points.
(5) Duct type	X	Annually	In addition to the testing required in Table 14.4.3.2(g)(1) and Table 14.4.3.2(h), test duct smoke detectors that use sampling tubes to ensure that they will properly sample the airstream in the duct using a method acceptable to the manufacturer or in accordance with their published instructions.
(6) Projected beam type	X	Annually	Test the detector by introducing smoke, other aerosol, or an optical filter into the beam path.
(7) Smoke detector with built-in thermal element	X	Annually	Operate both portions of the detector independently as described for the respective devices.
(8) Smoke detectors with control output functions	X	Annually	Verify that the control capability remains operable even if all of the initiating devices connected to the same initiating device circuit or signaling line circuit are in an alarm state.
(h) Smoke detectors — sensitivity testing			
In other than one- and two-family dwellings, system detectors	N/A	See 14.4.4.3	[i]Perform any of the following tests to ensure that each smoke detector is within its listed and marked sensitivity range: (1) Calibrated test method (2) Manufacturer's calibrated sensitivity test instrument (3) Listed control equipment arranged for the purpose

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
			(4) Smoke detector/control unit arrangement whereby the detector causes a signal at the control unit when its sensitivity is outside its listed sensitivity range (5) Other calibrated sensitivity test method approved by the authority having jurisdiction
(i) Carbon monoxide detectors/carbon monoxide alarms for the purposes of fire detection	X	Annually	Test the devices in place to ensure CO entry to the sensing chamber by introduction through the vents, to the sensing chamber of listed and labeled product acceptable to the manufacturer or in accordance with their published instructions.
(j) Initiating devices, supervisory			
(1) Control valve switch	X	Annually	Operate valve and verify signal receipt to be within the first two revolutions of the handwheel or within one-fifth of the travel distance, or per the manufacturer's published instructions.
(2) High- or low-air pressure switch	X	Annually	Operate switch and verify receipt of signal is obtained where the required pressure is increased or decreased a maximum 10 psi (70 kPa) from the required pressure level.
(3) Room temperature switch	X	Annually	Operate switch and verify receipt of signal to indicate the decrease in room temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C).
(4) Water level switch	X	Annually	Operate switch and verify receipt of signal indicating the water level raised or lowered a maximum 3 in. (70 mm) from the required level within a pressure tank, or a maximum 12 in. (300 mm) from the required level of a nonpressure tank. Also verify its restoral to required level.
(5) Water temperature switch	X	Annually	Operate switch and verify receipt of signal to indicate the decrease in water temperature to 40°F (4.4°C) and its restoration to above 40°F (4.4°C).
(k) Mechanical, electrosonic, or pressure-type waterflow device	X	Semiannually	Water shall be flowed through an inspector's test connection indicating the flow of water equal to that from a single sprinkler of the smallest orifice size installed in the system for wet-pipe systems, or an alarm test bypass connection for dry-pipe, pre-action, or deluge systems in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.*
(l) Multi-sensor fire detector or multi-criteria fire detector or combination fire detector	X	Annually	Test each of the detection principles present within the detector (e.g., smoke/heat/CO, etc.) independently for the specific detection principle, regardless of the configuration status at the time of testing. Also test each detector in accordance with the published manufacturer's instructions. Test individual sensors together if the technology allows individual sensor responses to be verified. Perform tests as described for the respective devices by introduction of the physical phenomena to the sensing chamber of element, and an electronic check (magnets, analogue values, etc.) is not sufficient to comply with this requirement. Confirm the result of each sensor test through indication at the detector or control unit. Where individual sensors cannot be tested individually, test the primary sensor.[j] Record all tests and results.
18. Special hazard equipment			
(a) Abort switch (dead-man type)	X	Annually	Operate abort switch and verify correct sequence and operation.
(b) Abort switch (recycle type)	X	Annually	Operate abort switch and verify development of correct matrix with each sensor operated.
(c) Abort switch (special type)	X	Annually	Operate abort switch and verify correct sequence and operation in accordance with authority having jurisdiction. Observe sequencing as specified on as-built drawings or in system owner's manual.
(d) Cross-zone detection circuit	X	Annually	Operate one sensor or detector on each zone. Verify occurrence of correct sequence with operation of first zone and then with operation of second zone.
(e) Matrix-type circuit	X	Annually	Operate all sensors in system. Verify development of correct matrix with each sensor operated.
(f) Release solenoid circuit[k]	X	Annually	Verify operation of solenoid.
(g) Squibb release circuit	X	Annually	Use AGI flashbulb or other test light approved by the manufacturer. Verify operation of flashbulb or light.
(h) Verified, sequential, or counting zone circuit	X	Annually	Operate required sensors at a minimum of four locations in circuit. Verify correct sequence with both the first and second detector in alarm.
(i) All above devices or circuits or combinations thereof	X	Annually	Verify supervision of circuits by creating an open circuit.

(continues)

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
19. Combination systems			
(a) Fire extinguisher electronic monitoring device/system	X	Annually	Test communication between the device connecting the fire extinguisher electronic monitoring device/system and the fire alarm control unit to ensure proper signals are received at the fire alarm control unit and remote annunciator(s) if applicable.
(b) Carbon monoxide[l] device/system	X	Annually	Test communication between the device connecting the carbon monoxide device/system and the fire alarm control unit to ensure proper signals are received at the fire alarm control unit and remote annunciator(s) if applicable.
20. Interface equipment[m]	X	See 14.4.4.4	Test interface equipment connections by operating or simulating the equipment being supervised. Verify signals required to be transmitted are received at the control unit. Test frequency for interface equipment is the same as the frequency required by the applicable NFPA standard(s) for the equipment being supervised.
21. Guard's tour equipment	X	Annually	Test the device in accordance with the manufacturer's published instructions.
22. Alarm notification appliances			
(a) Audible[n]	X	N/A	For initial and reacceptance testing, measure sound pressure levels for signals with a sound level meter meeting ANSI S1.4a, *Specifications for Sound Level Meters,* Type 2 requirements. Measure sound pressure levels throughout the protected area to confirm that they are in compliance with Chapter 18. Set the sound level meter in accordance with ANSI S3.41, *American National Standard Audible Evacuation Signal,* using the time-weighted characteristic F (FAST).
	N/A	Annually	°For periodic testing, verify the operation of the notification appliances.
(b) Audible textual notification appliances (speakers and other appliances to convey voice messages)	X	N/A	For initial and reacceptance testing, measure sound pressure levels for signals with a sound level meter meeting ANSI S1.4a, *Specifications for Sound Level Meters,* Type 2 requirements. Measure sound pressure levels throughout the protected area to confirm that they are in compliance with Chapter 18. Set the sound level meter in accordance with ANSI S3.41, *American National Standard Audible Evacuation Signal,* using the time-weighted characteristic F (FAST). Verify audible information to be distinguishable and understandable and in compliance with 14.4.11.
	N/A	Annually	°For periodic testing, verify the operation of the notification appliances.
(c) Visible	X	N/A	Perform initial and reacceptance testing in accordance with the manufacturer's published instructions. Verify appliance locations to be per approved layout and confirm that no floor plan changes affect the approved layout. Verify that the candela rating marking agrees with the approved drawing. Confirm that each appliance flashes.
	N/A	Annually	For periodic testing, verify that each appliance flashes.
23. Exit marking audible notification appliance	X	Annually	Perform tests in accordance with manufacturer's published instructions.
24. Emergency control functions[p]	X	Annually	For initial, reacceptance, and periodic testing, verify emergency control function interface device activation. Where an emergency control function interface device is disabled or disconnected during initiating device testing, verify that the disabled or disconnected emergency control function interface device has been properly restored. [
25. Area of refuge two-way communication system	X	Annually	At a minimum, test the two-way communication system to verify operation and receipt of visual and audible signals at the transmitting and receiving unit respectively. Operate systems with more than five stations with a minimum of five stations operating simultaneously. Verify voice quality and clarity.
26. Special procedures			
(a) Alarm verification	X	Annually	Verify time delay and alarm response for smoke detector circuits identified as having alarm verification.
(b) Multiplex systems	X	Annually	Verify communications between sending and receiving units under both primary and secondary power. Verify communications between sending and receiving units under open-circuit and short-circuit trouble conditions.

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
			Verify communications between sending and receiving units in all directions where multiple communications pathways are provided. If redundant central control equipment is provided, verify switchover and all required functions and operations of secondary control equipment. Verify all system functions and features in accordance with manufacturer's published instructions.
27. Supervising station alarm systems — receiving equipment			
(a) All equipment	X	Monthly	Perform tests on all system functions and features in accordance with the equipment manufacturer's published instructions for correct operation in conformance with the applicable sections of Chapter 26. Actuate initiating device and verify receipt of the correct initiating device signal at the supervising station within 90 seconds. Upon completion of the test, restore the system to its functional operating condition. If test jacks are used, perform the first and last tests without the use of the test jack.
(b) Digital alarm communicator receiver (DACR)	X	Monthly	Disconnect each transmission means in turn from the DACR, and verify audible and visual annunciation of a trouble signal in the supervising station. Cause a signal to be transmitted on each individual incoming DACR line (path) at least once every 6 hours (24 hours for DACTs installed prior to adoption of the 2013 edition of *NFPA 72*). Verify receipt of these signals.
(c) Digital alarm radio receiver (DARR)	X	Monthly	Cause the following conditions of all DARRs on all subsidiary and repeater station receiving equipment. Verify receipt at the supervising station of correct signals for each of the following conditions: (1) AC power failure of the radio equipment (2) Receiver malfunction (3) Antenna and interconnecting cable failure (4) Indication of automatic switchover of the DARR (5) Data transmission line failure between the DARR and the supervising or subsidiary station
(d) McCulloh systems	X	Monthly	Test and record the current on each circuit at each supervising and subsidiary station under the following conditions: (1) During functional operation (2) On each side of the circuit with the receiving equipment conditioned for an open circuit Cause a single break or ground condition on each transmission channel. If such a fault prevents the functioning of the circuit, verify receipt of a trouble signal. Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station: (1) RF transmitter in use (radiating) (2) AC power failure supplying the radio equipment (3) RF receiver malfunction (4) Indication of automatic switchover
(e) Radio alarm supervising station receiver (RASSR) and radio alarm repeater station receiver (RARSR)	X	Monthly	Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station: (1) AC power failure supplying the radio equipment (2) RF receiver malfunction (3) Indication of automatic switchover, if applicable
(f) Private microwave radio systems	X	Monthly	Cause each of the following conditions at each of the supervising or subsidiary stations and all repeater station radio transmitting and receiving equipment; verify receipt of correct signals at the supervising station: (1) RF transmitter in use (radiating) (2) AC power failure supplying the radio equipment (3) RF receiver malfunction (4) Indication of automatic switchover

(continues)

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
27. Supervising station alarm systems — receiving equipment *(continued)*			
(g) Performance-based technologies	X	Monthly	Perform tests to ensure the monitoring of integrity of the transmission technology and technology path. Where a single communications path is used, disconnect the communication path. Verify that failure of the path is annunciated at the supervising station within 60 minutes of the failure (within 5 minutes for communication equipment installed prior to adoption of the 2013 edition of *NFPA 72*). Restore the communication path. Where multiple communication paths are used, disconnect both communication paths and confirm that failure of the path is annunciated at the supervising station within not more than 6 hours of the failure (within 24 hours for communication equipment installed prior to adoption of the 2013 edition of *NFPA 72*). Restore both communication paths.
28. Public emergency alarm reporting system transmission equipment			
(a) Publicly accessible alarm box	X	Semiannually	Actuate publicly accessible initiating device(s) and verify receipt of not less than three complete rounds of signal impulses. Perform this test under normal circuit conditions. If the device is equipped for open circuit operation (ground return), test it in this condition as one of the semiannual tests.
(b) Auxiliary box	X	Annually	Test each initiating circuit of the auxiliary box by actuation of a protected premises initiating device connected to that circuit. Verify receipt of not less than three complete rounds of signal impulses.
(c) Master box			
(1) Manual operation	X	Semiannually	Perform the tests prescribed for 28(a).
(2) Auxiliary operation	X	Annually	Perform the tests prescribed for 28(b).
29. Low-power radio (wireless systems)	X	N/A	The following procedures describe additional acceptance and reacceptance test methods to verify wireless protection system operation: (1) Use the manufacturer's published instructions and the as-built drawings provided by the system supplier to verify correct operation after the initial testing phase has been performed by the supplier or by the supplier's designated representative. (2) Starting from the functional operating condition, initialize the system in accordance with the manufacturer's published instructions. Confirm the alternative communications path exists between the wireless control unit and peripheral devices used to establish initiation, indication, control, and annunciation. Test the system for both alarm and trouble conditions. (3) Check batteries for all components in the system monthly unless the control unit checks all batteries and all components daily.
30. Mass notification systems			
(a) Functions	X	Annually	At a minimum, test control equipment to verify correct receipt of alarm, supervisory, and trouble signals (inputs); operation of evacuation signals and auxiliary functions (outputs); circuit supervision, including detection of open circuits and ground faults; and power supply supervision for detection of loss of ac power and disconnection of secondary batteries.
(b) Fuses	X	Annually	Verify the rating and supervision.
(c) Interfaced equipment	X	Annually	Verify integrity of single or multiple circuits providing interface between two or more control units. Test interfaced equipment connections by operating or simulating operation of the equipment being supervised. Verify signals required to be transmitted at the control unit.
(d) Lamps and LEDs	X	Annually	Illuminate lamps and LEDs.
(e) Primary (main) power supply	X	Annually	Disconnect all secondary (standby) power and test under maximum load, including all alarm appliances requiring simultaneous operation. Reconnect all secondary (standby) power at end of test. For redundant power supplies, test each separately.
(f) Audible textual notification appliances (speakers and other appliances to convey voice messages)	X	Annually	Measure sound pressure level with a sound level meter meeting ANSI S1.4a, *Specifications for Sound Level Meters*, Type 2 requirements. Measure and record levels throughout protected area. Set the sound level meter in accordance with ANSI S3.41, *American National Standard Audible Evacuation Signal*, using the time-weighted characteristic F (FAST). Record the maximum output when the audible emergency evacuation signal is on. Verify audible information to be distinguishable and understandable.

Table 14.4.3.2 *Continued*

Component	Initial Acceptance	Periodic Frequency	Method
(g) Visible	X	Annually	Perform test in accordance with manufacturer's published instructions. Verify appliance locations to be per approved layout and confirm that no floor plan changes affect the approved layout. Verify that the candela rating marking agrees with the approved drawing. Confirm that each appliance flashes.
(h) Control unit functions and no diagnostic failures are indicated	X	Annually	Review event log file and verify that the correct events were logged. Review system diagnostic log file; correct deficiencies noted in file. Delete unneeded log files. Delete unneeded error files. Verify that sufficient free disk space is available. Verify unobstructed flow of cooling air is available. Change/clean filters, cooling fans, and intake vents.
(i) Control unit reset	X	Annually	Power down the central control unit computer and restart it.
(j) Control unit security	X	Annually	If remote control software is loaded onto the system, verify that it is disabled to prevent unauthorized system access.
(k) Audible/visible functional test	X	Annually	Send out an alert to a diverse set of predesignated receiving devices and confirm receipt. Include at least one of each type of receiving device.
(l) Software backup	X	Annually	Make full system software backup. Rotate backups based on accepted practice at site.
(m) Secondary power test	X	Annually	Disconnect ac power. Verify the ac power failure alarm status on central control equipment. With ac power disconnected, verify battery voltage under load.
(n) Wireless signals	X	Annually	Check forward/reflected radio power is within specifications.
(o) Antenna	X	Annually	Check forward/reflected radio power is within specifications. Verify solid electrical connections with no observable corrosion.
(p) Transceivers	X	Annually	Verify proper operation and mounting is not compromised.

[a]Some transmission equipment (such as but not limited to cable modems, fiber-optic interface nodes, and VoIP interfaces) are typically powered by the building's electrical system using a standby power supply that does not meet the requirements of this Code. This is intended to ensure that the testing authority verifies full standby power as required by Chapter 10. Additionally, refer to Table 14.4.3.2, Items 7 through 9 for secondary power supply testing.

[b]The automatic transmission of the check-in (handshake) signal can take up to 60 minutes to occur.

[c]See Table 14.4.3.2, Item 4(a) for the testing of transmission equipment.

[d]Example: 4000 mAh × 1/25 = 160 mA charging current at 77°F (25°C).

[e]The voltmeter sensitivity has been changed from 1000 ohms per volt to 100 ohms per volt so that the false ground readings (caused by induced voltages) are minimized.

[f]Initiating devices such as smoke detectors used for elevator recall, closing dampers, or releasing doors held in the open position that are permitted by the Code *(see* NFPA *101, Life Safety Code, 9.6.3)* to initiate supervisory signals at the fire alarm control unit (FACU) should be tested at the same frequency (annual) as those devices when they are generating an alarm signal. They are not supervisory devices, but they initiate a supervisory signal at the FACU.

[g]Fusible thermal link detectors are commonly used to close fire doors and fire dampers. They are actuated by the presence of external heat, which causes a solder element in the link to fuse, or by an electric thermal device, which, when energized, generates heat within the body of the link, causing the link to fuse and separate.

[h]Note, it is customary for the manufacturer of the smoke detector to test a particular product from an aerosol provider to determine acceptability for use in smoke entry testing of their smoke detector/ smoke alarm. Magnets are not acceptable for smoke entry tests.

[i] There are some detectors that use magnets as a manufacturer's calibrated sensitivity test instrument.

[j]For example, it might not be possible to individually test the heat sensor in a thermally enhanced smoke detector.

[k]Manufacturer's instructions should be consulted to ensure a proper operational test. No suppression gas or agent is expected to be discharged during the test of the solenoid. See Test Plan of 14.2.10.

[l]Testing of CO device should be done to the requirements of NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment.*

[m]A monitor module installed on an interface device is not considered a supervisory device and therefore not subject to the quarterly testing frequency requirement. Test frequencies for interface devices should be in accordance with the applicable standard. For example, fire pump controller alarms such as phase reversal are required to be tested annually. If a monitor module is installed to identify phase reversal on the fire alarm control panel, it is not necessary to test for phase reversal four times a year.

[n]Chapter 18 would require 15 dB over average ambient sound for public mode spaces. Sometimes the ambient sound levels are different from what the design was based upon. Private operating mode would require 10 dB over average ambient at the location of the device.

[o]Where building, system, or occupancy changes have been observed, the owner should be notified of the changes. New devices might need to be installed and tested per the initial acceptance testing criteria.

[p]See A.14.4.3.2, and Table 14.4.3.2, Item 24.

14.4.3.3 Video image smoke and flame detectors shall be inspected, tested, and maintained in accordance with the manufacturer's published instructions.

Paragraph 14.4.3.4 was added by a tentative interim amendment (TIA). See page 1.

14.4.3.4 Gas detectors shall be inspected, tested, and maintained in accordance with manufacturers' published instructions.

14.4.4* Testing Frequency. Unless otherwise permitted by other sections of this Code, testing shall be performed in accordance with the schedules in Table 14.4.3.2 or more often if required by the authority having jurisdiction.

14.4.4.1 Devices or equipment that are inaccessible for safety considerations (e.g., continuous process operations, energized electrical equipment, radiation, and excessive height) shall be permitted to be tested during scheduled shutdowns if approved by the authority having jurisdiction. Extended intervals shall not exceed 18 months.

14.4.4.2 If automatic testing is performed at least weekly by a remotely monitored fire alarm control unit specifically listed for the application, the manual testing frequency shall be permitted to be extended to annually. Table 14.4.3.2 shall apply.

14.4.4.3* In other than one- and two-family dwellings, sensitivity of smoke detectors shall be tested in accordance with 14.4.4.3.1 through 14.4.4.3.7.

14.4.4.3.1 Sensitivity shall be checked within 1 year after installation.

14.4.4.3.2 Sensitivity shall be checked every alternate year thereafter unless otherwise permitted by compliance with 14.4.4.3.3.

14.4.4.3.3 After the second required calibration test, if sensitivity tests indicate that the device has remained within its listed and marked sensitivity range (or 4 percent obscuration light gray smoke, if not marked), the length of time between calibration tests shall be permitted to be extended to a maximum of 5 years.

14.4.4.3.3.1 If the frequency is extended, records of nuisance alarms and subsequent trends of these alarms shall be maintained.

14.4.4.3.3.2 In zones or in areas where nuisance alarms show any increase over the previous year, calibration tests shall be performed.

14.4.4.3.4 To ensure that each smoke detector is within its listed and marked sensitivity range, it shall be tested using any of the following methods:

(1) Calibrated test method
(2) Manufacturer's calibrated sensitivity test instrument
(3) Listed control equipment arranged for the purpose
(4) Smoke detector/fire alarm control unit arrangement whereby the detector causes a signal at the fire alarm control unit where its sensitivity is outside its listed sensitivity range
(5) Other calibrated sensitivity test methods approved by the authority having jurisdiction

14.4.4.3.5 Unless otherwise permitted by 14.4.4.3.6, smoke detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or be replaced.

14.4.4.3.6 Smoke detectors listed as field adjustable shall be permitted to either be adjusted within the listed and marked sensitivity range, cleaned, and recalibrated, or be replaced.

14.4.4.3.7 The detector sensitivity shall not be tested or measured using any device that administers an unmeasured concentration of smoke or other aerosol into the detector or smoke alarm.

14.4.4.4 Test frequency of interfaced equipment shall be the same as specified by the applicable NFPA standards for the equipment being supervised.

14.4.4.5 Restorable fixed-temperature, spot-type heat detectors shall be tested in accordance with 14.4.4.5.1 through 14.4.4.5.4.

14.4.4.5.1 Two or more detectors shall be tested on each initiating circuit annually.

14.4.4.5.2 Different detectors shall be tested each year.

14.4.4.5.3 Test records shall be kept by the building owner specifying which detectors have been tested.

14.4.4.5.4 Within 5 years, each detector shall have been tested.

14.4.4.6* Circuit and pathway testing of each monitored circuit or pathway shall be conducted with initial acceptance or reacceptance testing to verify signals are indicated at the control unit for each of the abnormal conditions specified in Sections 23.5 through 23.7.

Paragraph 14.4.5 was revised by a tentative interim amendment. (TIA). See page 1.

14.4.5 Single- and Multiple-Station Smoke Alarms. Smoke alarms and all connected appliances shall be inspected and tested in accordance with the manufacturer's published instructions at least monthly. The responsibility for maintenance and testing shall be in accordance with 14.2.3. (SIG-HOU)

14.4.6 Household Fire Alarm Systems.

14.4.6.1 Testing. Household fire alarm systems shall be tested by a qualified service technician at least annually according to the methods of Table 14.4.3.2. The installing contractor shall be required to provide this information in writing to the customer upon completion of the system installation. To the extent that the fire alarm system is monitored offsite, the supervising station contractor shall provide notice of this requirement to the customer on a yearly basis. (SIG-HOU)

14.4.6.2 Maintenance. Maintenance of household fire alarm systems shall be conducted according to the manufacturer's published instructions. (SIG-HOU)

14.4.7 Replacement of Smoke Alarms in One- and Two-Family Dwellings.

14.4.7.1 Unless otherwise recommended by the manufacturer's published instructions, single- and multiple-station smoke alarms installed in one- and two-family dwellings shall be replaced when they fail to respond to operability tests but shall not remain in service longer than 10 years from the date of manufacture. (SIG-HOU)

14.4.7.2* Combination smoke/carbon monoxide alarms shall be replaced when the end-of-life signal activates or 10 years from the date of manufacture, whichever comes first. (SIG-HOU)