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Guidelines for Multi-Line Telephone Systems

State 911 Committee
P.O. Box 30634
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Introduction and Purpose of this Guide

This guide is for Multi-Line Telephone System (MLTS) owner/operators, local service providers, 911 network providers, and 911 agencies to use to better understand Michigan Public Service Commission (MPSC) Rules 484.901-484.906 (referred to in this guide as the Rules), regarding the provision of 911 service over Multi-Line Telephone Systems.

While this document provides guidance with respect to compliance with the MLTS Rules, the location and service diversity of sites utilizing Multi-Line Telephone Systems require that MLTS operators communicate with their local 911 service provider and telecommunications equipment provider to facilitate compliance with the Rules.

While this guide contains useful information, it should not be used as the definitive resource for MLTS implementation and the actual Rules, which can be found on the State's Office of Regulatory Reinvention website at: http://dmbinternet.state.mi.us/DMB/ORRDocs/AdminCode/1638_2016-030LR_AdminCode.pdf

MLTS operators may also find it beneficial to communicate with the administrator of the local jurisdiction's 911 center, also known as a Public Safety Answering Point (PSAP). A list of all the PSAPs in Michigan can be found on the State 911 Committee's website at: www.michigan.gov/snc.

What is E911 and Why is it Important?

Residents of Michigan have depended on reaching local emergency services by dialing 911 for decades. Today, the advancement of technology allows for "E911" or "Enhanced 911," which means that when 911 is dialed, the calling party's callback number and location information are delivered to the geographically appropriate Public Safety Answering Point. The delivery of caller-location information to the PSAP call-taker's screen is the feature that sets E911 apart from basic 911.

E911 technology significantly improved the ability of PSAPs to effectively deliver critical public safety and emergency response services in a timely manner. In many instances, it has proven to be a life-saving, essential emergency response tool in providing critical information when the caller is unable to verbally communicate his or her location, including when the voice call is dropped, discontinued, and cannot be reestablished.

In order to provide the specific location information for a caller, every telephone capable of dialing 911 must have an Automatic Location Information (ALI) record in the 911 database to identify the caller's specific location. Under Michigan law, the provision of an Emergency Response Location (ERL) for every telephone capable of dialing 911 on a multi-line telephone system is required by December 31, 2019. If ALI records are properly entered and maintained in the 911 database, a caller's location or ERL will display on the PSAP display, reducing response time for emergency services.

Additional note in regard to the MLTS Rules: While the direct outward dialing of 911 is not required in the Rules governing MLTS within the State of Michigan, it is required by a federal statute known as Kari's Law. This means that a MLTS must be programmed to allow the caller to dial the numbers "911" without having to dial "9" or another digit first. More information on Kari's Law can be found at: <https://www.congress.gov/115/bills/hr582/BILLS-115hr582enr.pdf>.

Why is location information so important?

There are many reasons a person calling 911 might not be able to communicate his or her specific location to the 911 dispatcher. Here are a few examples:

- Someone is choking, having a heart attack, or some other physical injury which prevents them from speaking.
- The caller is unable to talk or is fearful of speaking, for instance during a bank robbery at a branch location of a banking network.
- A person is disabled in some way that makes telephone communication difficult or impossible, such as being deaf or mute.
- The caller is a child or a visitor, and doesn't know their address/location.
- The caller cannot speak English.

These are all real – and common – situations. By automatically providing specific location information through the 911 system, the 911 dispatcher is able to immediately relay fire, police, or EMS responders to the caller's location, even when the person is unable to communicate information.

How E911 Works

To better understand the purpose of new Rules governing MLTS operators, here is an outline of how 911 calling works in general.

Let's begin with an example: Fred Smith calls 911 from his wired residential phone. The 911 dispatcher receiving the call sees the location of the caller's phone on a special computerized 911 phone screen (the 911 community calls that location information "ALI" for Automatic Location Identification). The 911 dispatcher sees something like this:

(517) 868-1212 12:23 09/17/13	Calling phone number (called ANI) and the time/date
FRED SMITH	Customer's name, as appears on the billing record
168 MAPLE AV	Fred's street address
APT 302	Fred's location information, often an apartment number
YOURCITY, MI	City and state of Fred's phone's location

Note that Fred did not enter any of this information about his phone. When his phone was installed by his phone company, his subscriber's name (FRED SMITH), his street address, city and state ("168 MAPLE AV" and "YOURCITY, MI"), and other helpful location information ("APT 302") were provided by Fred's phone company to a centralized 911 database (the "ALI Database") that is maintained as part of the centralized 911 system in Michigan.

Of special note is that the phone company is responsible for entering and submitting Fred's street address and city name. When the company submits this information, the information provided must be an address and city that can be found on the Master Street Addressing Guide (MSAG). The MSAG is a list of street names and permissible numbers entered into the 911 system database.

Because of this, when Fred dials 911 from his residential phone, the 911 telephone switching equipment can look up Fred's location information from the ALI database using Fred's calling phone number as the lookup key.

Here is how the process works with a MLTS that does not provide emergency location information: Melissa Smith, Fred's wife, works at Acme Motors, a large company with a MLTS or PBX phone system that provides phone service for several buildings that are in a clustered building complex. Melissa calls 911 from the extension in her cubicle, which is located on the third story of a secondary building known as Building B at 100 Main Rd, Michigan. Without MLTS compliant information, the location information presented to 911 dispatchers can be much less useful, not useful at all, and sometimes downright misleading. Prior to enacting the provisions of MPSC Rule 484, the 911 dispatcher often saw something like this:

(517) 868-4000 12:23 09/17/13

ACME MOTORS

100 MAIN RD

YOURCITY, MI

Main MLTS/PBX phone number (not Melissa's extension)

Customer's Name as appears on their billing record

Street Address of the MLTS/PBX switch location (which is not necessarily Melissa's actual location address)

The Location field is empty

This is the city of the PBX (not Melissa's workplace)

When Melissa makes a 911 call from her work extension, the 911 dispatcher may have no information where Melissa is located, or could be led to believe that she is at 100 MAIN RD. In many of these situations, the 911 dispatcher often receives a location that is in another building, far away from where the caller is actually located. In extreme examples, there could be 2,000 phones in 10 different buildings in 3 cities that are connected to one MLTS/PBX switch, and the ALI is always identified as 100 MAIN RD, rather than the caller's actual address.

What is a Multi-Line Telephone System?

A MLTS or Private Branch Exchange (PBX) Telephone System, is a telephone system comprised of common control units, telephones, and controls providing local telephone service to multiple end-users. Specifically, a MLTS consists of a computerized telephone "switch," typically managed by technical staff or vendors. It is often located in a particular room or closet, and connects to dozens, hundreds, or thousands of "extension" phones located in offices, rooms, workspaces, classrooms, or other locations. The central switch is typically connected to outside "trunk" lines to a local telephone central office, allowing callers on the extension phones to make outside calls.

MLTS includes VoIP, as well as network and premises-based systems such as Centrex, PBX, and hybrid key telephone systems. Multi-line Telephone Systems are frequently used by institutions and businesses such as: government agencies, banks, hotels, health care systems, and schools.

How Do the MPSC Rules Impact MLTS Users?

Prior to the adoption of the MLTS Rules, there was a glaring gap in E911 safety protection. Specifically, the large segment of E911 end-users using a MLTS did not enjoy the same level of E911 safety protections as small business and residential systems. As illustrated above, when the individual called 911 from a multi-line telephone system prior to the adoption of the Rules, that system often relayed only the physical street address of the facility's main building (or, alternatively, the address of the building in which the MLTS is located), but did not provide more specific information about where the individual calling 911 was actually physically located (such as a building number, floor number, or room number).

Emergency response delays and tragedies have resulted when emergency callers have been unable to provide a specific location within a large building or complex to the 911 dispatcher, either because they are unaware of their exact location or because they are physically unable to convey the information. The

provisions of the Rules will ensure that the 911 dispatchers at Michigan’s PSAPs receive accurate location information so emergency responders will not be delayed while trying to find the emergency caller in need.

The regulations require that MLTS operators provide a sufficiently precise indication of a caller’s location so emergency response services may be dispatched to the specific location of the device. The MLTS operator is also required to provide a call back number. This means the PSAP, that receives the 911 call from the MLTS, will be able to call back to the location from which the 911 call was placed if needed. The MLTS is also required to provide a specific Emergency Response Location (ERL).

An ERL is a specific location to which emergency response services may be dispatched and can be easily located by emergency responders in a reasonable amount of time. Under the MLTS Rules, the MLTS operator must provide an ERL, which will be discussed in further detail in this guide. The ERL and 911 call routing may vary depending upon the size of the area, type of MLTS operator, and building configuration.

Under the Rules, Acme Motors’ MLTS would provide more specific information, like the example below:

(517) 868-4109 12:23 09/17/09	Melissa’s actual callback number, direct to Melissa’s phone
ACME MOTORS	Customer’s Name, as appears on billing record
100 MAIN RD - BUILDING B	Actual Street Address of Melissa’s work location
FLR 3, NW CORNR	Physical location of Melissa’s phone
YOURCITY, MI	City and State of Melissa’s work location

Do the Rules Apply to Me?

The MLTS Rules obligate operators of MLTS to route 911 calls and specific location information to the appropriate local PSAP when 911 is dialed. The Rules require “specific” location information: the location information sent to the PSAP through a MLTS indicates the precise location of the device. The specific information the MLTS operator must provide to the PSAP is determined by the type of structure or structures served by the MLTS.

What Am I? Multi-Line Telephone Operators v. Multi-Line Telephone Managers?

A **MLTS operator** is the entity responsible for ensuring that a 911 call placed from a MLTS is transmitted and received in accordance with this model, regardless of the MLTS technology used to generate the call. The MLTS operator may be the MLTS manager or a third party acting on behalf of the MLTS manager. By default, in the absence of evidence to the contrary, the entity using a MLTS (business, school, hospital etc.) is considered the MLTS operator.

The **MLTS manager** is the entity authorized to implement a MLTS (business, school, hospital etc.), either through purchase or lease of a MLTS or the purchasing of MLTS services, as the means by which to make 911 calls.

The MLTS Rules place the responsibility (and thus, the liability) on the **MLTS operator**.

Are There Exemptions Under the MLTS Rules?

Rule 4 of the MLTS Rules provide limited exemptions from the specific location identification requirements:

- the building maintains, on a 24-hour basis, an alternative method of notification and adequate means of signaling and responding to emergencies, or
- the MLTS operator is not serviced by E911.

“Alternative Method of Notification, and Adequate Means of Signaling and Responding to Emergencies” Exemption

Qualifying for this exemption means having the ability to (1) locate the emergency caller, and (2) initiate emergency response. Having an adequate means of signaling and responding to emergencies includes, but is not limited to:

- a communications system that provides the specific location of 911 calls from within the building, or
- the building is serviced with its own appropriate medical, fire, and security personnel.

Adequate operations of a private answering point operated by a non-public safety entity should include, at a minimum, training the individuals intercepting calls for assistance in accordance with applicable local emergency telecommunications requirements. Further, because private answering points serve as an adjunct to public safety response, adequate operations must provide incident reporting to the public safety emergency response centers in accordance with state or local requirements.

Locations Where E911 Service is Not Available

MLTS operators in areas without E911 service are exempt from the signaling and database maintenance regulations. Existing MLTS shall comply with the Rules as soon as it is reasonably possible after E911 service becomes available.

If a MLTS operator does not qualify for one of these exemptions, it must comply with the MLTS Rules, or be subject to the applicable penalties.

How Do I Know If I Have Adequately Complied with the MLTS Rules?

Work with Your Local 911 Center

This guide provides MLTS operators with basic guidance regarding compliance with the MLTS Rules, but because of the diversity of the locations and capabilities of MLTS across the State, it is critical that MLTS operators work directly with its local public-safety entities to ensure compliance. Local entities understand the specific needs of emergency responders in your area, and can provide specific guidance as to what level of information would be sufficient for compliance, and what level of information would be considered “best practice”.

It is strongly recommended that every MLTS operator work with its local 911 PSAP manager/director to test the ability to dial 911 from the station lines associated with its MLTS any time a MLTS has been installed or upgraded. A current list of all 911 PSAPs can be found at the State 911 Committee’s website at: www.michigan.gov/snc.

Notification of Non-Compliance

Working with your local public-safety entities is critical because those entities may provide the Michigan Public Service Commission and the State 911 Committee (SNC) with notification of a MLTS operator's non-compliance with the MLTS Rules.

If a PSAP dispatcher observes that a MLTS operator has provided inadequate information, the local PSAP may notify the MLTS operator of non-compliance with Rule 484. The PSAP should provide the operator with information regarding what must be done to comply in order to provide the MLTS users with appropriate E911 safety protections. After notification of non-compliance, the MLTS operator may be given time to comply with the Rules. The MLTS operator should coordinate with the notifying PSAP, and request confirmation that any updates made did, in fact, resolve the non-compliance issues and concerns.

Should a MLTS operator fail to comply, a PSAP should communicate the non-compliance to the MPSC and the State 911 Committee (through the State 911 Office).

What are Penalties for Non-Compliance with Rule 484?

MLTS operators in violation of Rule 484 can be assessed a fine by the Michigan Public Service Commission. This fine can range from \$500.00 to \$5,000.00 per offense.

Some Practical Considerations for MLTS Operators

The specifics regarding MLTS Rules compliance do not fall into a "one-size-fits-all" list. A MLTS operator must consider a myriad of things, not only to ensure compliance with the Rules, but to ensure the safety of the users using its MLTS. At the most basic level, a MLTS operator should ask themselves the following questions:

- When a user dials 911 from any phone in the system, will their call go to the correct dispatch center?
- When a user dials 911 from any phone in the system, will the dispatch center get the proper information needed to process the call?
- If emergency responders are dispatched, is it reasonable they will be able to find the caller if no one is there to guide them to the caller?

If the answer to any of the above questions is "no," then the chance is high that a MLTS operator is not in compliance with MLTS Rules. The MLTS operator must start exploring what it needs to do to meet the requirements of the Rule, and provide users with an environment that adequately provides for their safety in the event of an emergency.

Some Additional Planning Questions MLTS Operators Should Ask Themselves

- How many locations do I have?
- How many PSAPs does my MLTS need to access?
- Do I have remote users and can they access 911?
- Do I need to establish an internal process to ensure movement of equipment does not interfere with the provision of accurate information to 911 responders?
- How can you integrate on-site security in the response process?

- What training and certification do is needed?
- What solutions are available for a MLTS 911 response?

One Building, Single Floor

The specific location information for a one-story building with 1) its own street address, and 2) which is more than 7,000 square feet in area must provide, at a minimum:

- The building's street address.
- Device's location within the facility/premises.

Example in Practice: A one-story building with a 35,000 square foot floor plan must include location indicative of the location on the premise (i.e. NW Corner, Wing A, Central Open Work Area) in the PSAP display along with the street address.

One Building, Multiple Floors

The specific location information for a multi-story building with 1) its own street address, and 2) a total area of more than 7,000 square feet must provide, at a minimum:

- The building's street address.
- The building floor.
- Caller's location within the facility/premises.

Example in Practice: A three-story building, containing two 2,500 square foot floors and a 2,500 square foot basement floor. The total square footage is in excess of 7,000 square feet, and the Rule is applicable.

Separate Buildings, Single Floor – Common Address

The specific location information for a one-story, multi-building site served by a shared MLTS, with 1) common street address and 2) a combined total area of more than 7,000 square feet must provide, at a minimum:

- The common street address.
- A unique building identifier.
- Device's location.

Example in Practice: A one-story, four-building, three-acre building site where each building has 3,000 square feet on a single floor. The specific caller's location within the facility/premises must be provided along with the common address, the specific building identifier for each building, and the device's location within that building.

Separate Buildings, Multiple Floors – Common Address

The specific location information for a multi-story, multi-building site served by a shared MLTS, with 1) a common street address and 2) a combined total area greater than 7,000 square feet must provide, at a minimum:

- The common street address.
- A unique building identifier.
- The building floor.
- Device's location.

Example in Practice: A three-building campus on two acres, with two three-story buildings and one two-story building, where each building has a 3,000 square foot floor plan on each floor. The specific device's location and floor within the facility/premises must be provided along with the common address and the specific building identifier for each building.

Separate Buildings, Single Floor – Separate Addresses

The specific location information for multiple single-story buildings served by a shared MLTS, with different street addresses and a combined total area of more than 7,000 square feet must provide, at a minimum:

- The address of the building/facility the call is being made from.
- A unique building identifier.
- Caller's location.

Example in Practice: A four-building, single story, three-acre building site, where each building is individually addressed and has 2,000 square feet on each floor. The specific caller's location within the facility/premises must be provided along with the individual building's address, and the caller's location within that building.

Separate Buildings – Separate Addresses in Separate Responder Jurisdictions Served by Multiple 911 Centers.

The precise location information and routing information for any multi-building MLTS in which the buildings are located in different jurisdictions served by different PSAPs must be provided. This means that 911 calls may need to be routed to different PSAPs based on the location of the originating call and provide at a minimum:

- 911 call routing to the proper PSAP for the jurisdiction serving the building that the call is being made from.
- The street address of that building.
- A unique building identifier (if applicable).
- The building floor (if applicable).
- Device's location within building.

Example in practice: A primary bank with eight branch locations in three different municipalities, all are single story buildings and each branch has a 2,500 square foot floor plan. Calls must contain the location information within each branch/satellite location and the branches/satellite locations may be served by different PSAPs.

Special Note: It is very important when buildings are located in different response jurisdictions/municipalities that the MLTS operator makes advance contact with the PSAP manager/director for the location the primary MLTS switch is located. In some cases, PSAPs dispatch for a number of jurisdictions and the calls will only need to be routed to a single PSAP. In other cases, calls may need to be routed to different PSAPs serving different jurisdictions and this may require additional configuration and testing.

Additional Considerations:

Why Can Remote Workers Present Issues for MLTS E911 Compliance?

IP phone systems enable increased flexibility for users to work from anywhere with an Internet connection. While this can be a popular feature with organizations and users alike, it can create challenges when it comes to E911. Specifically, knowing where the caller is located and the PSAP to which an emergency call should be routed can be less straightforward. E911 regulations require that organizations providing remote workers with access to their IP phone system must still provide them with reliable E911 service, regardless of where they are located.

Another concern that arises when contemplating E911 support for remote workers is provisioning their locations. Even though they are located off-site, their locations must still be validated and provisioned, and they cannot be automatically tracked like on-premises users.

How Does the Common Practice of Moving Telephone Equipment Between Work Stations Impact MLTS E911 Compliance?

Large organizations with IP telephony deployments often take advantage of phone mobility features, allowing users to move about on the network and log in and out of IP phones on the fly. However, each time a user logs in or out of a different phone, or moves their phone to a different location, the new location associated to the user must be updated in an E911 database. Updating the locations of IP phones may be done manually, but MLTS operators should be mindful this approach can be error-prone, time consuming, costly, and administratively intensive. It might be worthwhile to explore E911 solutions that automatically update such information.

Particularly High Risk MLTS Environments

PSAPs have reported that many of the most dangerous problems occur when MLTS operators fail to provide accurate caller location in certain “high risk” environments.

- Multiple or remote buildings and locations with one address served by one central/host MLTS, which serves as the location/address stored in the 911 database;
- Multiple or remote buildings and locations in different responder jurisdictions with one address served by one central/host MLTS, which serves as the location/address stored in the 911 database;

- Assisted living or medical facilities with a phone in each living unit or patient room, but with only the main address and front desk provisioned in the 911 database;
- Sites that use a MLTS, but do not provide on-site notification that a 911 call was made; in this situation, the 24/7 attendant or security is unable to assist the PSAP during call-back to the 'main line' number provided;
- Sites that use a MLTS, but do not have an on-site or 24/7 operator to answer a PSAP call-back to the 'main line' number provided.

Buildings, driveways, points of emergency access, internal signage, and workspace locations should always be properly marked, visible, and understandable.

Building address numbers, building identifiers, interior coding, offices, work areas, cubicles, building zones and wings, rooms, and other location identifiers should be included and in a format that can be easily understood by 911 and the emergency responders.

Additional note in regard to the MLTS Rules: As previously stated, while not required in the Rules governing MLTS within the State of Michigan it is however, required by a federal statute known as Kari's Law. This means that a MLTS must be programed to allow the caller to dial the numbers "911" without having to dial "9" or another digit first. More information on Kari's Law can be found at:

<https://www.congress.gov/115/bills/hr582/BILLS-115hr582enr.pdf>.

A complete glossary of terms by the National Emergency Number Association can be found at:

https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-ADM-000.22-2018_FINAL_2.pdf

A copy of the Multi-Line Telephone Systems Rules can be found at:

http://dmbinternet.state.mi.us/DMB/ORRDocs/AdminCode/1638_2016-030LR_AdminCode.pdf

Dear MLTS owner/operator,

The list below is not an all-inclusive, but a collection of firms we found through research that may be able to assist with the deployment of MLTS 911 functionality toward compliance with the Michigan MLTS Rules. The State 911 Committee is not providing this list as a referral source, but as a starting point in seeking assistance in the deployment of MLTS 911 compliance. Neither the State of Michigan nor the State 911 Committee are endorsing the individual companies on this list.

PS ALI Reference List

Independent Emergency Services (IES)



Phone: 320-234-5241

www.ies911.com

West Corporation



Mary Boyd

Director - External Affairs

Phone: 810-388-1911

www.west.com/safety-services/

RedSky Technologies, Inc.



333 N. Michigan Avenue
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Chicago, IL 60601-4009
Phone: 312-432-4300
Cell: 312-432-4320
info@redskytech.com

WEB redskyE911.com

BLOG blog.redskye911.com/e911-watch

TWITTER twitter.com/redskyE911

FACEBOOK facebook.com/RedSkyTechnologies

YOUTUBE youtube.com/RedSkyTechnologies

Michigan Collegiate Telecommunications Association (MiCTA)

For Public Institutions - public sector and non-profits only

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