



Safety and Operating Rules Maricopa Live Steamers Railroad Heritage Preservation Society

Ratified November 9, 2024

PREFACE

The purpose of these rules is to ensure the safe enjoyment of Maricopa Live Steamers (MLS) facilities by all members, guests, and visitors. All Engineers must pass an engineer's test annually prior to operating on the MLS track subdivisions.

CONTENTS

Section 1	IBLS WHEEL AND TURNOUT STANDARDS	3
Section 2	GENERAL	4
210.	Members, Operators, and Guests MLS Cultural Guidelines	4
220.	Equipment Operating Guidelines	4
230.	Steam Locomotive Boiler Rules	5
240.	Electric Locomotive Charging (Commercial Power Use Only)	6
Section 3	SIGNALS	6
350.	MLS Signaling System	7
Section 4	TRAINS	13
400.	Equipment	13
410.	Equipment Safety	13
Section 5	TRAIN OPERATIONS	14
510.	Personnel requirements	14
530.	Operational requirements	14
540.	Remotely Operated Locomotives	15
Section 6	PUBLIC TRAIN OPERATIONS	16
650.	Night Running Operation	17
660.	Conductors	18
670.	Stationmasters	18
Section 7	CHANGES	18

OTHER IMPORTANT DOCUMENTS

Public web site under “Forms & Documents”

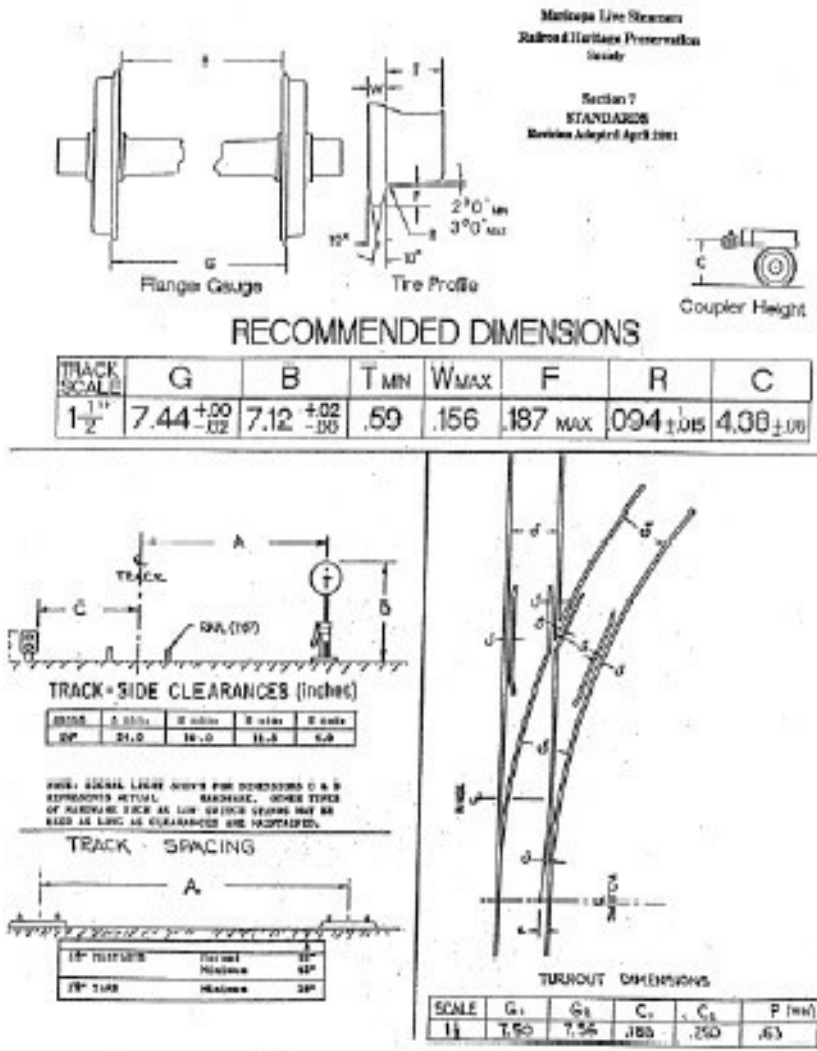
- **MLS BYLAWS**
- **MLS RULES, GUIDELINES and SCHEDULES**
- **REMOTELY OPERATED LOCOMOTIVE & CHECKLIST**
- **MLS WHEEL STANDARDS AND AXLE LOADS**
- **IBLS WHEEL STANDARDS**

Member web site under “MLS Member Documents”

- **MLS NEW MEMBER HANDBOOK**
- **MEMBER INCIDENT PROCEDURE**
- **PASSENGER RIDING CAR INSPECTION CHECKLIST**

Section 1 IBLs WHEEL AND TURNOUT STANDARDS

Revision Adopted February 2007 (Also Refer to IBLs Document listed on previous page)



Section 2 GENERAL

210. Members, Operators, and Guests MLS Cultural Guidelines

- 210.1 No one will operate any equipment in an unsafe manner.
- 210.2 No one will operate equipment while under the influence of any substance adversely affecting the ability to safely operate that equipment.
- 210.3 No firearm or any other kind of deadly weapon is to be exhibited on MLS property.
- 210.4 Operators/engineers are responsible for the safe operation of their equipment.
- 210.5 All members and guests are responsible to help keep MLS facilities neat and orderly. Members are to dispose of their waste in the proper receptacles or take it with them when they leave. **UNDER NO CIRCUMSTANCES ARE ANY OILS, FUELS, OR SOLVENTS TO BE Poured ON THE GROUND OR PLACED IN WASTE RECEPTACLES AT MLS FACILITIES.**

220. Equipment Operating Guidelines

- 220.1 Equipment at MLS facilities will conform to MLS standards and will be sufficiently quiet so as to permit normal conversation immediately adjacent to such equipment.
- 220.2 Moving powered equipment will be equipped with an audible warning device loud enough to permit safe operation.
- 220.3 Members and guests will ensure that all MLS equipment they use is properly cared for and stored after use.
 - 220.3.1 All transfer tables will only be operated by MLS members or their guests 13 years and older. Safety signs are posted on all transfer tables to remind operators of the rules.
- 220.4 Members are liable for any damage to MLS equipment and/or facilities caused by their negligence/abuse and are liable for all associated repair costs. Specific action will be determined by a majority vote of those present at a legally held BoD meeting.
- 220.5 MLS owned equipment will not be removed from the MLS facilities without prior approval of the BoD or the President.
- 220.6 All MLS powered equipment must abide by rule 532.

230. **Steam Locomotive Boiler Rules**

- 230.1 Boilers must be certified as having passed an annual hydrostatic test to 50% above their normal working pressure. New steel boilers will be tested to 100% above their normal working pressure.
- 230.2 Have two safety valves set to operate within 5 psi of each other.
- 230.3 Have the bottom of the water level gauge glass set at least ¼” above the top of the crown sheet.
- 230.4 Have the ability to immediately shut off the heat source.
- 230.5 Have at least two methods of putting water into the boiler while under pressure, at least one of which must function while a moveable engine is stationary.
- 230.6 Incorporate an ash pan and a working spark arrestor if burning solid fuel.
- 230.7 Ashes from solid fuel locomotives will not be discharged in station areas except under emergency conditions. Cleanup is the responsibility of the individual discharging the ashes.
- 230.8 Steam locomotives will be operated so as to prevent anyone from being burned or having their clothing soiled by steam from cylinder cocks, blow down valves, whistles, or other steam emitters. **BLOW DOWN VALVES ARE NOT TO BE OPENED IN STATION AREAS.**
- 230.9 Steam locomotives must adhere to the Maricopa County Fire Ban Restriction policy. The BoD has developed the following rules to ensure compliance with the fire ban. A yellow sign will be mounted in the steaming bays when the ban is in effect. Each steam locomotive will have the following.
 - 230.9.1 Each steam locomotive will carry a fire extinguisher. Fire extinguisher options are: one 5 lb. ABC, or two 2½ lb. ABC, or one 2½ gal. pressure water extinguisher.
 - 230.9.2 Smoke stack spark arrestor screen mesh size will be not be larger than .125” (1/8”). This can be checked by using a 1/8” drill or equivalent. Incorporate an ash pan and a working spark arrestor if burning solid fuel.
 - 230.9.3 Each engineer is responsible for emptying the ash pan in MLS steel ash dump areas located around the steaming bays. After the ash dumping, water must be applied to the ashes. **No Exceptions!!!**
- 231. Steam boilers belonging to MLS members having documented verification of a successful, valid hydrostatic inspection will be issued a tag of conformance for its operation during the meet.
- 232. Steam boilers belonging to non-members having test certificates issued by other recognized live steam organizations within the past twelve (12) months will be accepted as valid by the MLS. Steam boilers belonging to non-members that require inspection for an MLS meet will, upon successful inspection, be issued a certificate that will be valid only for the duration of the meet. A tag of conformance will be issued for operation during the meet. No steam boiler will be allowed to operate at an MLS meet without showing a tag of conformance.

240. Electric Locomotive Charging (Commercial Power Use Only)

- 241. MLS safety guidelines will be followed when charging any electric locomotive.
- 242. Overnight charging is allowed with a maximum time limit of 24 hours from the time the connection is made to an electrical outlet. In certain emergency situations, an additional 24-hourr. time period will be allowed to disconnect the power extension cord. Disconnected cords are **NOT** allowed to remain on the ground. They must be coiled and stored for future use. If you cannot disconnect within the timeframe, contact an MLS member to perform this task for you.
- 243. Power connection cords must be UL approved and only be connected to a GFI outlet or standard outlet with a GFI breaker installed in the electrical box. Additionally, power cords must be 14 ga. for less than 50 ft. from outlet to charger and 12 ga. for 50-100 ft.
- 244. Under **NO** circumstances are power extension cords allowed to cross any transfer tracks within the MLS yard areas.
- 245. Any violations of these guidelines will be reported to the BoD for corrective action.

Section 3 SIGNALS

- 310. Hand signals may be given with one arm with a hand, a flag, or a light as follows. The arm should start above shoulder height and should be swung over the track and perpendicular to it. The signaler should face the engineer unless they are moving.
 - 311. PROCEED Raised or lowered vertically.
 - 312. REDUCE SPEED Held horizontal with short up and down motions.
 - 313. STOP Swung at arm's length down to as low as possible. Any object waved violently on or near the track.
 - 314. WASHOUT Swung violently at arm's length down to as low as possible and across the legs. Used to signal emergency stop.
 - 315. BACK-UP Swung vertically in circles clockwise or counterclockwise.
- 320. Engine whistle signals. o = short blast, > = long blast.
 - 321. o Apply brakes. Stop.
 - 322. oo Proceed. Answer to any signal not otherwise provided for.
 - 323. ooo When standing, back up.
 - 324. oooo Call for signals.
 - 325. >> Release brakes and proceed.
 - 326. >>>> Flagman, return to the train.
 - 327. >>o> Approaching public crossing, tunnel, area of restricted visibility, or another train.
 - 328. ooooooo (multiple short blasts) Warning to people or animals on the track. General alarm.
 - 329. >>>>>> (prolonged blast) Approaching a station.

- 330. Communicating signals given by the conductor.
 - 331. oo When standing, proceed. When running, stop.
 - 332. ooo When standing, back up. When running, stop at the next station.
 - 333. oooo When running, reduce speed.
 - 334. ooooooo (multiple short blasts) Emergency.
- 340. Color signals, lights, or flags. They may appear as hand signals, electronic signals, or fixed signals (board beside the track).
 - 341. GREEN Proceed. On the front of a locomotive, indicates another section of the same train is following.
 - 342. YELLOW Proceed at reduced speed. Prepare to stop at the next signal.
 - 343. RED Stop.
 - 344. BLUE Equipment must not be moved or coupled to. They may only be removed by the person who put it there.
 - 345. WHITE On the front of a locomotive indicates that the train is an extra or second section.

350. MLS Signaling System

- 351. These signal rules apply to the following subdivisions: Pottsville, Bobberg, Werner, and Far Flung. Arntchoo and Serpentine subdivisions are un-signaled. The Serpentine subdivision has special operating instructions different from the other subdivision. See rule 367 for reference. See rule 365 for Adobe City operation within yard limits under control of AJ Tower.
- 352. When the signal system is OFF, all subdivisions are dark territory. Proceed at a speed that will allow you to stop in half the distance to an obstruction or another train. When the signal system is ON, the below listed rules apply.
- 353. All stop signals on the Adobe Western RR are ABSOLUTE and must not be passed (with exceptions). See the following rules listed below for exceptions regarding signal operation on the RR.
- 354. When you encounter a signal with two signal heads, the top signal designates the main line and the lower signal designates the diverging main line route. The possible aspects are defined in the following rules.
- 355. Where there are more than two signal heads, each signal head indicates condition of each diverging route. The possible aspects are defined in the following rules for Adobe yard limit rules.
- 356. Maximum authorized speed on mainline is 5 MPH. See rule 532.
- 357. Maximum authorized speed in yard limits is 3 MPH. See rule 532.
- 358. Maximum authorized speed thru turnouts is 3 MPH. See rule 532.

Aspect

Indication

Single Head

Double Head

359.



Clear: Proceed authorized speed.

360.



Approach: Proceed prepared to stop at next signal.

361.

N/A



Diverging Approach: Proceed on diverging route not exceeding authorized speed through turnout prepared to stop at next signal.

362.



Stop: Do not pass signal unless authorized by dispatcher (if on duty) or stationmaster (if on duty). If neither is on duty, wait for a period of one minute and proceed at a speed that will allow you to stop in half the distance to an obstruction or another train.

363.



N/A

Stop: (Flashing Red) Proceed with caution when it is safe to do so.

364.



Stop: Do not pass signal unless authorized by dispatcher (if on duty) or stationmaster (if on duty). If neither is on duty wait for a period of one minute and proceed at a speed that will allow you to stop in half the distance to an obstruction or another train.

365. **The following rules apply within the yard limits of Adobe City.**

365.1 Aspect with multiple head signals
(Which Way Junction)

Indication



Proceed at authorized speed on route 1.



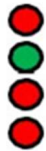
Proceed at authorized speed on route 2.



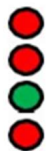
Stop. Select route 1, route 2, route 3, or route 4.



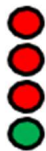
Proceed at authorized speed on route 1.



Proceed at authorized speed on route 2.



Proceed at authorized speed on route 3.




Proceed at authorized speed on route 4.

365.2 Station Track Select
signal


 Stop. Select arrival track in Adobe City station.

 Track 1 Stop.

 Track 1 Proceed. Prepare to stop at next signal on track 1.


 Track 2 Stop.

 Track 2 Proceed. Prepare to stop at next signal on track 2.

 Track 3 Stop.

 Track 3 Proceed. Prepare to stop at next signal on track 3.

 Track 4 Stop.

 Track 4 Proceed. Prepare to stop at next signal on track 4.

366. Special operating rules for Adobe Western RR

All signs/flags/boards to be over track or on right hand side of track unless designated otherwise.

Signage:

Any sign displaying the word "STOP" regardless of the shape of the sign.

Any sign displaying the word "SLOW" or yellow board, yellow flag, or any device of any shape painted yellow placed adjacent to the track.

Red board, red flag, or any device of any shape painted red placed adjacent to the track. Any violent action indicating with or without flag that the train should stop.

LED switch position indicator

SEMAPHORE SIGNAL:

Semaphore arm or flag in the upright vertical position or displaying a green light (at night)

Semaphore arm or flag in the middle diagonal position (a 45 degree angle) or displaying a yellow signal (at night)

Semaphore arm or flag in the down, horizontal position, or displaying a red light (at night)

Semaphore arm or flag in any other position, displaying no light, or in motion

Indication

Stop: Proceed when it is safe to do so at authorized speed.

Slow: Reduce speed to be able to stop within half the distance to the obstruction or another train. Speed not to exceed three miles per hour.

Stop: Do not pass without authorization of MoW supervisor or MLS representative.

Vertical line: Indicates that the turnout is lined for the straight route.

Diagonal line: Indicates that the turnout is lined for the diverging route.

Clear to proceed

Proceed with caution prepared to stop at next signal.

STOP: Do not pass without dispatcher or stationmaster approval or if none are on duty stop and proceed after it is safe to do so prepared to stop short of any obstruction or train going the opposite direction.

STOP: to be treated as a red signal as stated above.

367. There are no signals on the Serpentine subdivision. It is a train-to-train, radio-controlled railroad. All trains must use BoD designated FRS frequency at all times when on the Serpentine subdivision.

Section 4 TRAINS

400. Equipment

401. During periods of limited visibility, trains will have a white light showing to the front and a red light showing to the rear. Steam engines will also have the water glass and steam pressure gauge illuminated by a fixed light source. All lights will be bright enough to permit the safe operation of the train.
402. Except in case of emergency, all maintenance and major servicing of engines/trains will be done on sidings, in steaming bay areas, or in switch yard areas. Refueling with flammable liquids will not be done in station areas where the public is present.
403. Locomotives and other power units will, when appropriate, be permanently coupled to the car in or on which the engineer rides. Such coupling can either be by couplers and safety chain(s) or by drawbar with locking pins. Liquid or gas fuel cars will be similarly coupled.

410. Equipment Safety

411. No maintenance or repairs will be done to MLS owned locomotives and/or rolling stock without prior approval of the Superintendent of Operations. The Superintendent of Operations or the designated representative will be notified as soon as is practical for the need of any such maintenance or repairs.
412. Engineers will complete an operational/safety check of the locomotive/train before first use that day. When using an MLS locomotive, the engineer must also complete the log assigned to that locomotive.
413. Any regular member may declare a piece of club equipment unsafe and affix a "Bad Order" card to the equipment.
414. "Bad Order" equipment must be set out and the Superintendent of Operations or the designated representative notified as soon as practical.
415. "Bad Order" equipment may not be returned to service until released by the Superintendent of Operations or the designated representative.

Section 5 TRAIN OPERATIONS

510. Personnel requirements

511. Engineers (and conductors when used) must pass an engineer's test annually with a score of 92% or higher prior to operating on MLS track.
512. At all MLS meets, visiting engineers will be given written and/or oral instructions on the track and signal systems and basic safety prior to operating on the railroad. This briefing will be given at a scheduled safety meeting by a certified engineer.
513. Engineers will not allow anyone to ride between themselves and the controls of their engine so as to restrict their ability to control the train.
514. Engineers will be the final authority as to who may ride their train.
515. Engineers will have radio contact with the dispatcher/stationmaster during public run times and when otherwise appropriate. During public run times, engineers will make radio contact with the dispatcher/stationmaster before entering the mainline.
516. Engineers will carry a working flashlight for personal safety when operating a train at night.
517. Junior engineer as defined is any member under the age of 18.
 - 517.1 Certified engineers 13 through 17 years of age may operate a train on MLS mainline track during the time that a public train is operating on that track.
 - 517.2 Certified engineers under 13 years of age may not operate a train on MLS mainline track during the time that a public train is operating on that track.
518. When operating MLS equipment, a junior member under the age of 13 will be supervised by a certified member.

530. Operational requirements

531. All trains will be operated by or under the direct supervision of a certified engineer. The supervising engineer will either be on the train and able to take control of it or close enough beside the train to give verbal instructions and otherwise assist as necessary.
532. All trains must be operated at a safe speed and NOT to exceed 5 MPH and be able to safely stop in an emergency. Also, train speed in yard limits and thru turnouts should **NOT** exceed 3 MPH.
533. Train crews will use appropriate signals when operating their trains.
534. All mainline switches will be left in their normal, operational position.
535. When a dispatcher is on duty, all trains operating in an un-sigaled area must have radio contact with the dispatcher or be a second section to a train that has such radio contact.
536. The dispatcher on duty will be responsible for ensuring an orderly traffic flow in the Adobe City station area, in un-sigaled areas of the railroad, and over the entire railroad in general.

537. In the event of signal failure, dispatchers will be prepared to maintain traffic flow over the entire railroad by radio.
538. With the addition of longer spurs in the yards, it is possible to have two trains sharing one spur. In this situation, the back train operator may move the front train blocking it. Then the back train operator is to return the front train to its original position.

540. Remotely Operated Locomotives

541. In order to operate remote controlled (RC) equipment at the MLS, the equipment must first pass an RC compliance test administered by a member of the safety committee OR otherwise appointed personnel (see: “MLS Remotely Operated Locomotives & Checklist” located under the Forms and Documents > MLS Documents tab on the MLS website)
542. In the event of signal loss, remote control equipment must come to a complete stop in a time and distance that is reasonable and prudent.
543. The engineer of any remote-control equipment will maintain visual contact with the end of the train that is in the direction of travel at all times.
544. The operator will not be more than 165 feet (one mile post) from the equipment while it is in motion.
545. When operating a train, either tethered or wireless, the operator/engineer when leaving the engineer's seat will disable or otherwise secure the train so that it may not move.
546. When on the train, the engineer will ride behind the locomotive in the normal engineer position.
547. No one will knowingly or intently interfere with the normal operation of any equipment.

Section 6 PUBLIC TRAIN OPERATIONS

610. All trains carrying the public will consist of only MLS and/or member equipment certified by the Superintendent of Operations.
615. All trains will be equipped with a whistle/horn, radios for the engineer and conductor, and red flag and/or a flashlight.
620. Riding cars carrying the public will:
 621. be securely coupled to the satisfaction of the safety committee.
 622. have seating installed so as to facilitate safety.
 623. have bolsters that provide 3 or 4-point suspension.
 624. have trucks that provide safe, stable operation.
 625. have safety chains or drawbars between all riding cars.
630. General operational requirements for public train runs and public night / holiday lights runs.
 631. Trains carrying the public will be operated only by a certified engineer with a certified conductor aboard.
 - 631.1 No engineer under the age of 18 years will operate a public train.
 632. Maximum speed when operating public trains is determined by electronic or other means approved by the safety committee. See rule 532
 633. Both stationmasters and train crews will ensure that the public receives a BoD approved safety briefing before leaving the station and does not take anything aboard the train that may create an unsafe condition.
 634. The number of public riding cars in a public train will be limited to a maximum of seven (7). Train crews may shorten the train as deemed necessary to ensure safety.
 - 634.5 Public riding car occupancy will not exceed six (6) persons and the total passenger weight will not exceed 900 lbs.
 635. Public riding cars will be placed behind the engine or engineer's riding car with the conductor's riding car directly behind the last public riding car.
 636. One unoccupied caboose may be placed behind the conductor's car.
 637. The public will, under normal circumstances, be loaded/unloaded only at designated station areas.
 638. All riders on regular public trains must be capable of walking to, boarding, and exiting from riding cars under their own ability.
 639. Individuals who do not safely fit in or on riding cars will not be carried as public passengers.
640. Dispatchers will be certified as being capable of doing their job as determined by the Superintendent of Tower.
 641. During public runs, first aid kits will be made available to the public as needed in designated station areas and on the train. (8/05)

642. There will be no servicing of locomotives or trains at a station that takes longer than the time required to unload and load passengers.
643. If the engineer is not at the controls of the locomotive, the engineer will secure the train by:
 - 643.1 ensuring that the parking brake is set; or
 - 643.2 turning off the gas motor and ensure the train is secured from motion using an acceptable means to keep the train from moving; or
 - 643.3 having another qualified engineer take control of the train until such time as the original engineer can resume control of the train.

650. **Night Running Operation**

- 650.1 When a train needs to stop, the conductor will signal the train behind them (about 40' to 50' behind) with a flashlight until train behind them sees the conductor's train before helping with train.
 - 650.2 Conductor needs to keep contact with station master on VHF.
 - 650.3 Steam trains need to have a fireman to assist with checking out track ahead and signals.
 - 650.5 Do not run red lights. This keeps train spacing at a safe distance.
 - 650.3 Limit the size of the night run trains to five (5) riding cars, engineer's car, and conductor's car. If running a steam engine, you will need a propane car behind the tender.
 - 650.4 Each conductor will have a flashlight capable of making the side of the train visible for inspection and must be on at all times while train is in motion watching for riders' feet outside the perimeter of the car or riders turning around on the seat. The conductor must constantly be scanning the train for hazards to the riders' safety.
 - 650.5 Each train will have electronic warning devices for conductor to notify the engineer of a hazard.
 - 650.6 If a rider's feet are dragging or a rider is turning around, the conductor will immediately notify engineer to stop the train, and the conductor will politely ask the rider to follow the rules.
 - 650.6 The riding cars will have TWO lights under the seats to illuminate the riding platform where the riders' feet are.
 - 650.7 Riders will not bring items onto trains, e.g., chairs, ice chests, or strollers. A gondola may be provided in the consist for such items.
651. If fireworks go off while the train is in motion, the engineer will stop the train and remain stopped until fireworks stop.
 652. The stationmaster will be responsible to see that riders get a safety briefing either verbally or by video. See rule 633
 - 652.1 Part of the briefing will be if the train is stopped for derailment, that all persons stay next to the train and not walk away from the train.
 653. The stationmaster or gate attendant will ensure all riders have signed a Maricopa County Liability waiver before boarding a train.

660. **Conductors**

- 661. Must also pass the engineer's test annually prior to working on a public train. See 512
- 662. Will be responsible for monitoring safe operating conditions and for notifying the engineer when unsafe conditions arise.
- 663. Will have available a whistle, a radio, and, as appropriate, either a light or red flag.
- 664. Must also have radio contact with the dispatcher/stationmaster when working on a public train. (8/05)
- 665. Will assist stationmasters with loading/unloading as needed.

670. **Stationmasters**

- 671. Will be responsible for train movement in station areas, will minimize congestion and delays there, and will be responsible for ensuring an orderly traffic flow in the station and tower areas when a dispatcher is not on duty.
- 672. Will be responsible for activity in station areas to include the safe loading/unloading of passengers and safeguarding MLS property.
- 673. Will have available a whistle, a radio, and, as appropriate, either a light or red flag.
- 674. Will be responsible for recording the number of public passengers each run.

Section 7 CHANGES

CHANGES OR REVISIONS to these rules will be presented at a lawfully held general membership meeting and adopted by a majority of the votes cast by members present at a subsequent general membership meeting. Notification of such proposed changes and/or revisions will be published in an official MLS publication prior to final action being taken.