Emergency Mine Evacuation
Emergency Temporary Standard Compliance Guide, Volume 2
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Training

Q1. Does the SCSR training need to be underground or can it be in a classroom?

A. There is no requirement that the SCSR training be conducted underground. However, to provide a realistic learning environment, we encourage operators to conduct this training in an underground environment. We believe that conducting donning and transferring training in the miners' work environment enhances the training.

Q2. Can a miner be rotated out at the section to receive hands-on SCSR training, or do all miners need to be trained about the same time?

A. Yes. Miners can be rotated one at a time to receive the hands-on portion of the drill.

Q3. When would you be required to train a new employee? During his tour or could he be trained when the quarterly training is due?

A. All new employees must receive donning and transferring training as outlined in new and experienced miner training under Part 48. In addition, the locations of lifelines and SCSR storage locations must be included in this training as part of the course on *Mine map; escapeways; emergency evacuation; barricading*. As part of the course *Introduction to the work environment*, all newly hired miners will be shown where all SCSR storage, lifelines, and emergency escapeways are located. In addition, new miners must participate in the next scheduled drill at the mine.

Q4. If I have two different types of SCSRs, must I train on both?

A. Yes. The ETS requires training on donning and transferring of all types of self-rescue devices at the mine. This procedure requires opening and donning the first self-rescue device, opening the second device, transferring to, and donning the second device.

Q5. An employee who missed quarterly training, when would the employee's training be required?

A. The miner must receive the training required in the drill as soon as practical, upon returning to work, but no later than the next scheduled drill at the mine.

Q6. Can I receive credit from one of the quarterly drills for the SCSR training, if I receive the SCSR training and transferring requirements during Annual Refresher training?

A. No. All miners must receive their SCSR training as part of the quarterly drills. Only miners who do not receive the quarterly drills must receive SCSR training during Annual Refresher training. These will usually be independent contractors, who may not routinely work at a mine and consequently may not participate in the quarterly drills.

Q7. Will mines be allowed to change their training plans and Program of Instruction Plans after hearings or revisions in the ETS?

A. Yes. Operators may submit changes to their plans at any time. If significant changes are made to the ETS requiring further modifications, reasonable time will be allowed for making these changes.

Q8. Are miners required to walk the escapeway rather than use mechanized transportation during the drills required by § 75.1502?

A. MSHA encourages miners performing these drills to familiarize themselves with the escapeways that they may need to safely evacuate the mine. There is no specific requirement that this drill must be accomplished by walking. There may be unique escapeway conditions that require hands-on experience in order for the miner to locate stored SCSRs and lifelines and to traverse unique characteristics of the escapeways, including ladders, mandoors, airlocks, and overcasts. Miners should be prepared to safely evacuate a mine without the use of mechanized transportation.

Q9. Are scenarios required to be submitted with the Program of Instruction (§ 75.1502)?

A. Yes. Paragraph 75.1502(a)(1)(ii) requires that scenarios be part of the Program of Instruction. Therefore, scenarios must be submitted to comply with the ETS.

Q10. If so, how many scenarios are required? The template pages have five blanks. Do we have to come up with five different scenarios for each?

A. Scenarios should be developed based on the size and complexity of the mine, and hazards likely to be encountered. Mines that are more complex will have more scenarios than less complex mines. At a minimum, operators must develop at least one scenario each for fire, explosion, gas inundation, and water inundation emergencies, for a minimum of four emergencies. The purpose is to develop enough scenarios, each having a number of complex elements so that:

(1) all areas of the mine where a type of emergency could plausibly occur are represented, and/or

(2) known and plausible unique challenges and difficulties that miners may encounter during an evacuation are covered.

District managers will evaluate programs of instruction on a mine-specific basis, to determine if they contain an adequate number of complex scenarios to effectively train miners on emergency situations that could occur in individual mines.

Q11. Are all four scenarios required to be used each drill? Or can we use one scenario for each drill and then alternate scenarios for different drills?

A. One scenario can be used for each drill conducted. At a minimum, each miner should be trained in the four types of scenarios at least once every 12 months. This can be accomplished by cycling through each scenario type when conducting subsequent drills. Frequency of training will be evaluated by the District Managers in the process of reviewing programs of instruction for approval.

Q12. When is it advisable for a miner to don a self-rescue device?

A. A miner should don a self-rescue device when smoke, odor, fire, or any contaminated atmosphere is encountered. Miners are encouraged to don self-rescue devices at the first indication of their exposure to a toxic or irrespirable atmosphere. Mine operators are encouraged to provide air quality detectors so that miners will be able to better identify hazardous atmospheres.

Q13. Have materials been developed to help train miners to transfer from one SCSR to another?

A. MSHA and NIOSH are working on efficient methods to transfer from one SCSR to another. Training material will be developed and distributed in the near future.

Immediate Notification

Q14. Do unplanned roof falls that occur above the anchorage zone and do not result in any injury have to be reported to MSHA within 15 minutes? Many of these falls are discovered during weekly examinations and may have occurred up to one week prior to discovery.

A. An "Accident" as defined in 30 CFR 50.2(h) must be reported.
Thus, unplanned roof falls per paragraph 50.2(h)(8) must be reported. Accidents

must be reported at once without delay and within 15 minutes upon determination of the occurrence. This permits a reasonable time for you to make that determination. What is reasonable is based on the circumstances. It may be reasonable for you to make the determination based on a weekly examination and not before, particularly if the roof fall occurred in an area where persons do not normally go.

Q15. Should I report an accident to MSHA as soon as I have reasonable knowledge that it occurred or should I wait until I have had a chance to determine exactly where the accident occurred, who was involved in the accident, etc? Will I be penalized if I report what may be a serious accident and then determine that it was not as serious as initially thought?

A. Accidents, as defined in 30 CFR 50.2(h), must be reported. It is important that MSHA be notified to commence preparations for response. Your notification to the agency would relay what you do know and your basis. This would include any information that you do have regarding time, place, cause, nature, severity, people affected, and initial mine response. From this conversation with you, the agency can determine what additional information, if any, is necessary. More importantly, the Agency can determine what additional emergency response resources are needed, if any. Otherwise, to delay notification to get all the precise facts may frustrate critical remedial or rescue efforts where time is of the essence. Good faith reporting of accidents is not penalized.

<u>Lifelines</u>

Q16. What color of reflective tape is acceptable? Could the tape be different colors depending on which escapeway the lifeline is in?

A. The ETS does not specify the color of the reflective material. The mine operator may use any color reflective material for the lifelines.

Q17. After installing a commercially available lifeline system, we measured 107 feet between two directional indicator cones, is this acceptable? Reflective tape was spaced 28 feet apart on part of a lifeline, is this acceptable?

A. Yes, both of these measured distances are acceptable. Reasonable differences in the required spacing are acceptable. The manufacturing process for these lifelines may include some variation from the specified spacing. Stretching of the rope during and after installation could also alter spacing. These variations should not impede the ability of miners to evacuate the mine during an emergency.

Q18. Our mine has our fresh water line along the mine secondary escapeway route. We have contacted a vendor and he can provide cones that will attach to the water line for directional purposes. The water line is located along the mine roof line, reachable by our employees as they walk along this entry. If we attach the cones at required intervals, attach reflective tape at required intervals, and train our employees accordingly, can this be designated as our secondary escapeway lifeline?

A. As this question is stated, this alternative is acceptable since the rule allows for other equivalent devices. A water pipe that is hung near the mine roof would possibly be up in the worst smoke and is not recommended (see the next question). Practical alternatives to meet the purpose of the standard are acceptable.

Q19. Are there any criteria on how and where the lifeline should be hung in the escapeways?

A. The manufacturers recommend that lifelines be hung no higher than waist high during use. When evacuating through smoke, the smoke would be denser near the roof making it harder to locate the lifeline if it were to be hung near the roof. The lifelines should be hung away from energized trolley wires or high voltage cables and in such a way to protect them as much as possible from damage from equipment movement. Various break-away straps and clips that allow the release of the lifeline with a sharp tug or pull during use may be used to hang the lifelines up out of the way of equipment. The rule specifically states that the lifelines must be located in a manner so miners can escape effectively.

Q20. Could the lifeline be hung from roof bolts near the mine roof on break-away straps or ties?

A. Yes, see answer to question 19.

Q21. What if the lifeline must go through a door or airlock? How is the lifeline to be hung?

A. MSHA recommends that doors and airlocks be avoided in escapeways. Many doors are hard to navigate under normal conditions. Imagine trying to efficiently move a crew of anxious miners through a small door in thick smoke while they are wearing SCSRs with the bags inflated and cannot speak due to the mouthpieces. If doors cannot be avoided, the lifeline should be secured to the stopping on either side of the door. Escapeway drills must include physical passage through the door(s) where doors can not be avoided. Provisions to count the persons who make it through each door and how to deal with any missing persons should be addressed. MSHA recommends that full length doors be used when possible, instead of mandoors in these critical escapeways.

Q22. Can the lifeline be hung from high voltage lines?

A. No, lifelines should be isolated from electrical cables and trolley wires. Emergency mine evacuations may occur prior to deenergizing these trolley wires and cables. High voltage cables must be guarded where men…pass under them [30 CFR 75.807]. Trolley wires and trolley feeder cables shall be guarded adequately and at all points where men are required to work or pass regularly under the wires [30 CFR 75.1003].

Additional Self-contained Self-Rescuers (SCSRs)

Q23. How many training units must be used to do the hands on training of SCSRs? Does the person being trained have to break open the SCSR being used to transfer to or could it be already open?

A. Two training units need to be used. The SCSR that the miner is transferring to must be closed like the one that is carried on the belt to provide realistic training.

Q24. Why can't we use the carried SCSR and the one additional SCSR required by paragraph 75.1714-4(a) to determine the first SCSR storage location?

A. We only consider one hour of travel for the storage location because in the initial stages of escape it may take more than one SCSR to reach the stored SCSR due to smoke, obstacles, etc. The additional SCSR cannot be used to determine the initial SCSR storage location. This unit provides additional oxygen in case the first SCSR malfunctions or emergency situations develop that hinder a miner's ability to reach an SCSR storage location within an hour.

Q25. How is the distance to be determined to place SCSRs in escapeways? What are the walking rates used?

A. The distance to determine where SCSRs should be placed in escapeways is found in paragraph 75.1714-4(c). There are no specific walking rates used to determine these distances; it is a physical test.

Q26. Can the chart in the Program Policy Manual (PPM) – Volume 5, 75.1714-2 - Self-Rescue Devices; Use and Location Requirements be used to determine this distance? Example: a six foot high mine, the rate would be 290 feet per minute. This would mean a miner could travel 13,050 feet in 45 minutes. Is this acceptable for determining storage locations?

A. No, the chart in the PPM should not be used for this purpose because it does not take into account the slope of the escapeway, travel conditions, or the age of the escaping miner. We recommend escape drills using the suggested method in the preamble to the ETS. The walking rate is defined by the safe heart rate as determined by the miner's age. The escape drills would be the preferred method for determining the storage locations.

Q27. Based on "The Oxygen Cost of a Mine Escape," would the following scenario be a valid test for determining the distance of an SCSR storage location? An Ocenco contains 157 liters of oxygen. If the Ocenco is used for one hour, it would provide 2.62 liters of oxygen per minute. Using the formula Heart Rate (HR) = 37 * VO_2 + 66 (VO_2 - Volume of oxygen consumed) as given in the report, a miner breathing oxygen at a rate of 2.62 liters per minute could have a heart rate of 162. This would imply that a heart rate above 135 should be appropriate using the Ocenco SCSR. If an operator determined the distance traveled in an hour by three separate miners with a heart rate not exceeding 162, would the average of these three distances be a valid determination of the distance between storage locations?

A. No. Mine operators should refer to the ETS preamble (71 FR 12264) to determine the correct heart rate method. Keep in mind that the heart rate method is only an approximation of actual oxygen utilization and prediction of corresponding heart rates; individual results may vary significantly from these models based on the genetics, level of aerobic conditioning, body type, level of anxiety, etc. The purpose of this determination is not the absolute maximum distance that the SCSR storage locations can be placed, but rather, how to supply adequate oxygen to ensure that each miner has a reasonable chance to safely evacuate the mine. We recommend a prudent approach to determine these parameters.

Q28. Could an operator determine the distance between SCSR storage locations by measuring the distance traveled by a miner with an actual SCSR? This scenario assumes the operator would choose a miner whose physical conditions reflect those of the more physically challenged miners in the mine and choose a SCSR that is at the end of its useful life when performing the test.

A. MSHA and NIOSH do not recommend performing these tests with an actual SCSR. Doing the escape test "bare-faced" puts less stress on the miner, especially if the miner is physically challenged. The distance then can easily be reduced 15% to account for the effect of the SCSR and other factors that affect the miner's ability to reach SCSR storage locations. Further, additional time should be allowed for the orderly exchange of the SCSRs in what may be a difficult environment.

If the operator chooses to use SCSRs that are at the end of their useful life, the results of the heart rate test may be inaccurate. End-of-life SCSRs may have internal degradation that shortens the usage time, based upon the amount of degradation.

Q29. How are SCSRs handled for mines that "hot seat" at the face?

A. Individual miners must still bring their SCSRs with them. Mantrips must have enough SCSRs to cover all passengers and the operator. If the mantrip leaves the section, those miners on the section must be protected by an additional SCSR. In this case, additional SCSRs must be stored on the section, because the SCSRs on the mantrip will not stay at the section.

Q30. What about the outby storage locations when "hot seat" changes are made at the face?

A. A sufficient number of SCSRs are required to be stored in both the primary and the alternate escapeways to provide sufficient oxygen for evacuation for all persons in the mine. Since both crews would be at the face during the "hot seat" changes, SCSRs for both crews must be stored outby if it takes longer than one hour to evacuate the mine.

Q31. How are SCSRs handled for outby workers? How about workers walking bleeder systems or long weekly aircourses?

A. Outby miners at a specific location must have additional SCSRs that are readily accessible. These SCSRs may be stored in a portable box that is near the work location or may be stored on a mantrip or piece of mobile equipment that is parked near the work location. It is critical to notify these miners where the additional SCSRs are stored and how to travel from their work stations to the escapeways.

Examiners conducting weekly examinations present a problem for additional SCSR availability. MSHA does not require any miner to carry more than one SCSR except during an actual evacuation. MSHA is soliciting comments on storage locations that are readily accessible to pumpers, outby crews, and examiners. Until this issue is resolved, MSHA will assist mine operators in developing SCSR storage plans to provide additional SCSRs for these miners. Mine operators are asked to consult with these miners (e.g., examiners, pumpers) to determine where to store additional SCSRs that would help these persons evacuate the mine. It is imperative that these miners thoroughly inspect their SCSR at the start of their shift or before entering these remote locations.

Q32. What is the maximum distance the "additional" SCSRs can be from the workers?

A. There is no specific distance specified in the standard. The additional SCSRs must be readily accessible during an evacuation.

Q33. I have a longwall section that is operating under an SCSR storage plan (as required by § 75.1714-2) with SCSRs stored on both the headgate and tailgate sides of the wall. Do I have to provide an additional SCSR for each person on the section on both the headgate and the tailgate storage locations?

A. No. Paragraph 75.1714-4(a) only requires one additional SCSR for each person in the mine. The operator may choose to store some of these additional SCSRs near the tailgate and some near the headgate.

Q34. If escapeways are adjacent entries, can a suitable storage box/cabinet be constructed with doors accessible from both sides, and be used so that SCSRs are able to be obtained from either escapeway?

A. No. The regulation requires SCSRs to be stored in both the primary and the alternate escapeway. In addition, stored SCSRs can explode or catch fire if exposed to excessive heat. The materials used to construct an SCSR storage box/cabinet may not be suitable for construction materials that are required for permanent ventilation controls [30 CFR § 75.333(e)], due to the potentially explosive nature of SCSRs. All SCSRs must be stored in an environment that does not exceed the manufacturers' recommendations, for example: the maximum storage temperature is 130° F for the CSE SR-100, 140° F for the Ocenco M-20, and 100° F for the MSA Portal Pack. It is unlikely that a storage box between the escapeways could maintain these storage temperatures if exposed to an active mine fire on either side or withstand the force of an explosion.

Q35. The ETS requires an SCSR for the miner along with an additional SCSR available in the work location (2 units). If we are in the mine a sufficient distance, that is over the one hour travel time to the surface, will we be required to have a SCSR for the miner (1 unit), an additional SCSR(second unit) for the miner, and two additional SCSRs for the mine, one in the intake escapeway (3rd unit) and one in the secondary escapeway (4th unit) which would be four units for each miner or will the two units the miner has be sufficient and we would not need the additional storage along the escapeways?

A. Four SCSRs would be required. The extra SCSR on the section or work location may be needed to get the miner to the first outby SCSR storage location. It also serves as a backup SCSR in case any of the SCSRs malfunction or additional time is needed to traverse potential impediments to escape, such as thick smoke.

Q36. What should the reflective signs required by 30 CFR § 75.1714-4(e) say?

A. The sign must read "SELF-RESCUERS."

Q37. What should the directional signs required by 30 CFR § 75.1714-4(e) say?

A. In addition to "SELF-RESCUERS", the directional signs should have an arrow pointing to the stored SCSRs.

Q38. Are self-luminescent or radio-luminescent signs acceptable under 30 CFR § 75.1714-4(e)?

A. Yes, as long as they are functionally equivalent to reflective signs.

Q39. Are strobe lights acceptable in lieu of the reflective signs required by 30 CFR 75.1714-4(e)?

A. No, the reflective signs are still required because strobes may malfunction.

Q40. If strobe lights are used, in addition to reflective signs, do they need to be permissible?

A. Yes, the strobe units must be approved under 30 CFR part 18.