

Spectator

2014 Field Problem

The Blue Granite Mine is an underground, single level, aggregate, room and pillar operation. The mine has two adits that are used as the only entrance and exit. Presently the mine is developing twin development drifts to begin a new mining panel.

The granite that is being mined is relatively stable, with spot bolting and mechanical supports being used where needed. Some diagonal north-south oriented faults have been noted in the development area of the mine. The joint system provides pathways for water inflow.

The southern portal is used for exhaust and a secondary escape way, with the primary being the northern fresh air intake portal. Mine ventilation is provided by a non-reversible fan located in the fresh air intake portal. Fresh air is pushed into the mine from north to south. Fresh air is drawn into the development drift **SE1** with a 50 horse power fan attached to the roof, and pushed out **SE2** into the downstream air flow, eventually being vented out the south portal. There has never been methane detected in the mine, and there are no known gas, oil wells or other underground mines in the area.

The mine operates three 8-hr shifts per day. There are normally 41 miners plus a shift supervisor working underground, but other company personal and various contractors may be underground at any given time. The tag board is located at the north portal, and the mine generally has good compliance with tagging in and out.

Monday at about 2:30 AM the shift supervisor smelled and saw smoke near the development entrance. He was unable to enter the area, so he ordered a mine evacuation without further delay. He and 34 miners were able to successfully evacuate the mine. 7 miners are unaccounted for and are presumed to be in the development area. At this time, both underground mine power and the main ventilation fan are left on, and are under guard.

The onsite rescue team has explored the area to the development entrance, and has established a fresh air base.

There is a fully equipped mine rescue team ready to be your team's backup, and another team will be sent in to replace you after 90 minutes. If your team is willing, we would like you to give us a damage report; extinguish or seal any fires; account for all missing miners; bring any live miners to the surface; and explore and map the two development drifts. All materials needed to work this problem are located in the mine and are identified with placards.

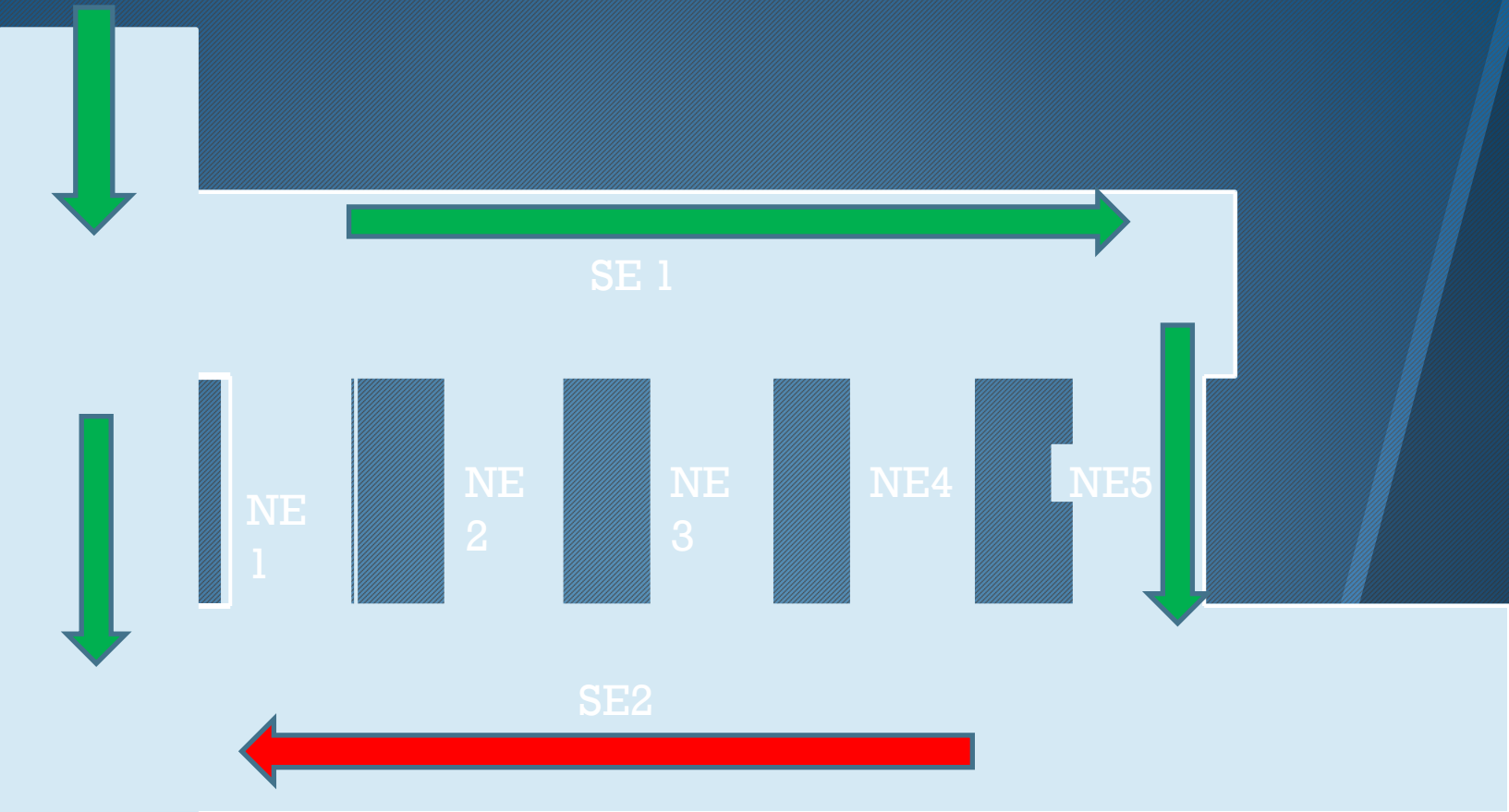
Good luck.

TEAM INSTRUCTIONS

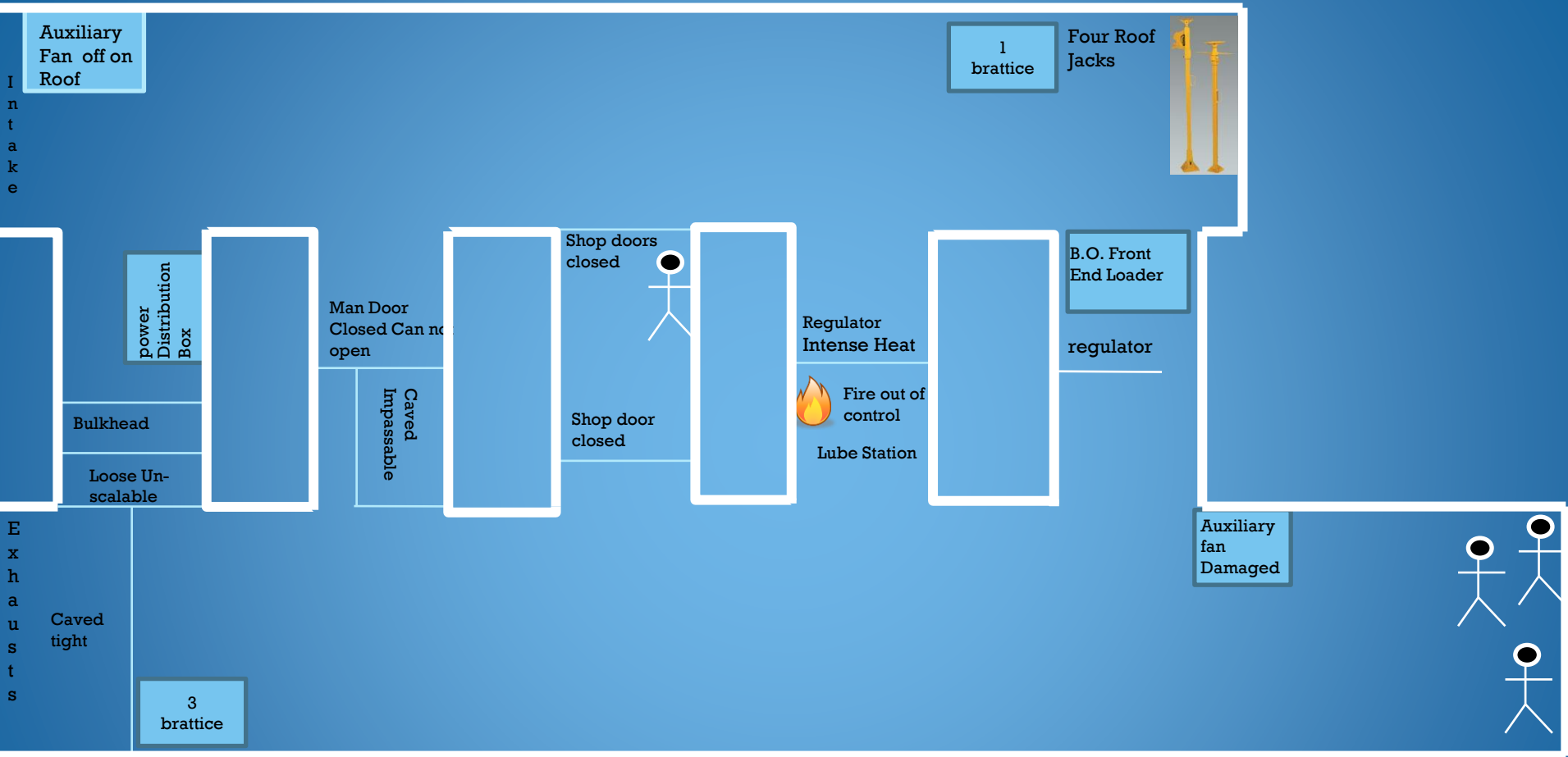
1. Extinguish or seal any fires
2. Account for up to 7 missing miners
3. Bring any live miners to the FAB
4. Explore and map all accessible areas of the mine

FRESH AIR BASE INSTRUCTIONS

- Only one attendant or alternate will be allowed to assist at the fresh air base. This person can assist the team and answer any questions the team may ask. However, this person cannot physically assist the team beyond the fresh air base.
- The fresh air base attendant and mine rescue team alternate are not allowed to speak to anyone during the working of the problem except their team members and the mine manager.
- The fresh air base attendant will maintain voice communications with the team utilizing a portable, hard wire system. The assistant may listen in with a separate headset. The assistant will be able to interact with the team only when they are at the fresh air base.
- The teams will not be allowed to physically compare the team map with the fresh air base map. When teams are at the FAB, the map man and FAB attendant will not make changes (edits) to their maps. **DO NOT HAVE WRITING INSTRUMENTS IN YOUR HANDS AT FAB.**



Engineered Ventilation



Problem



Team Stop 1: The teams will arrive at FA Base, the number 1 judge will read the scenario. They will prepare to explore, place on their apparatus and complete a team check. They will then find the exhaust drift caved tight, and enter into the intake air drift, mapping the fan, power center and bulk head.

Auxiliary
Fan off on
Roof

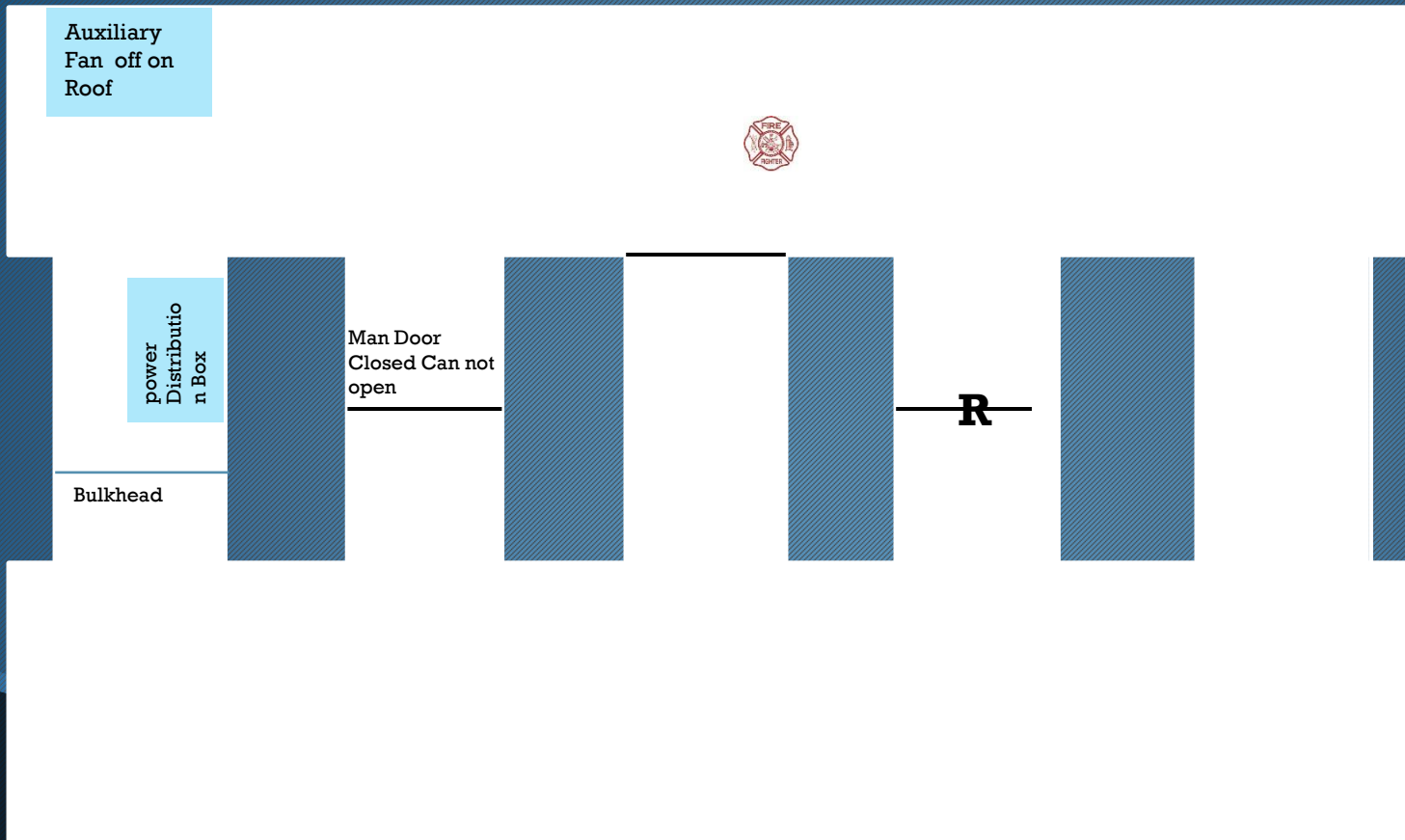


power
Distributio
n Box

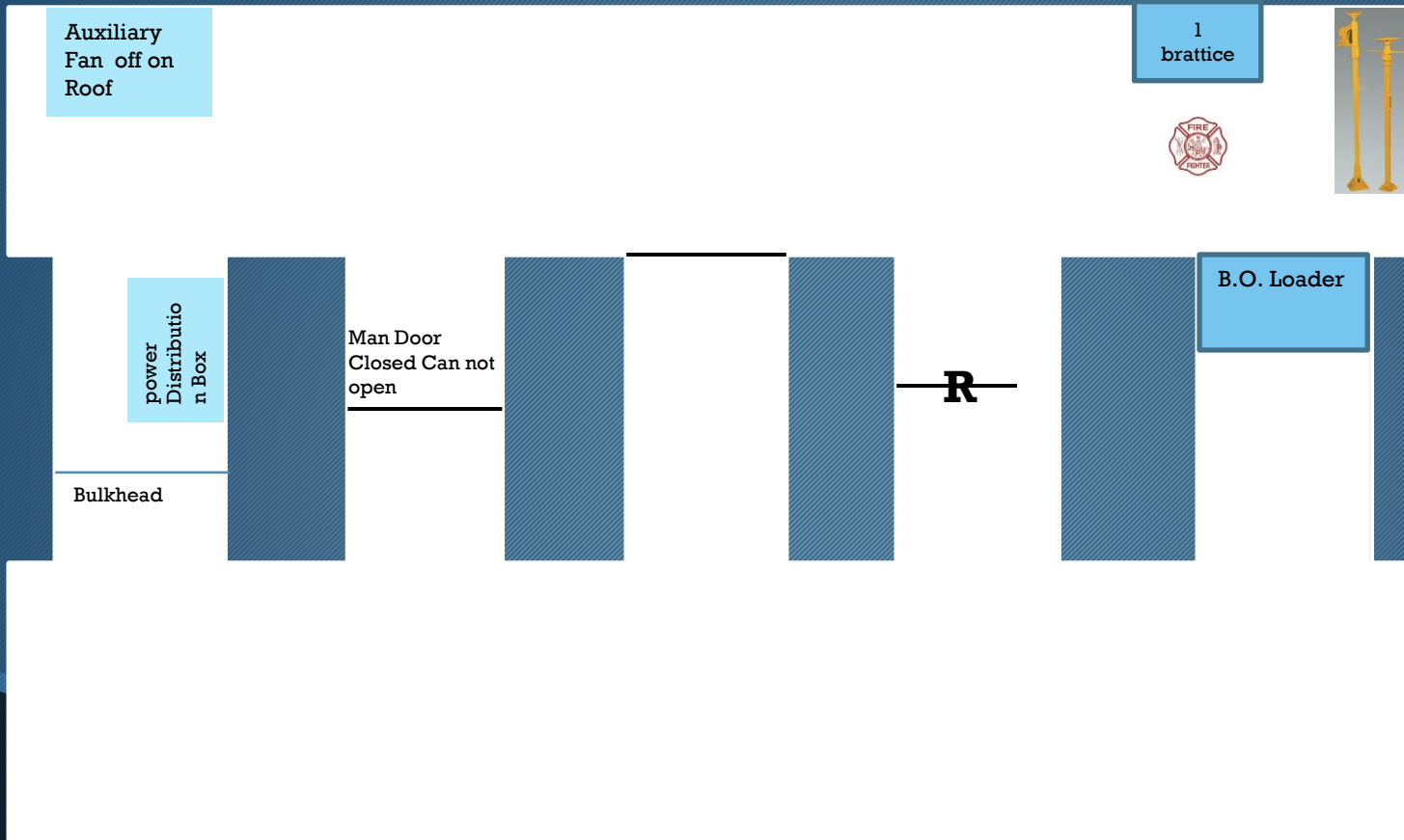
Man Door
Closed Can not
open

Bulkhead

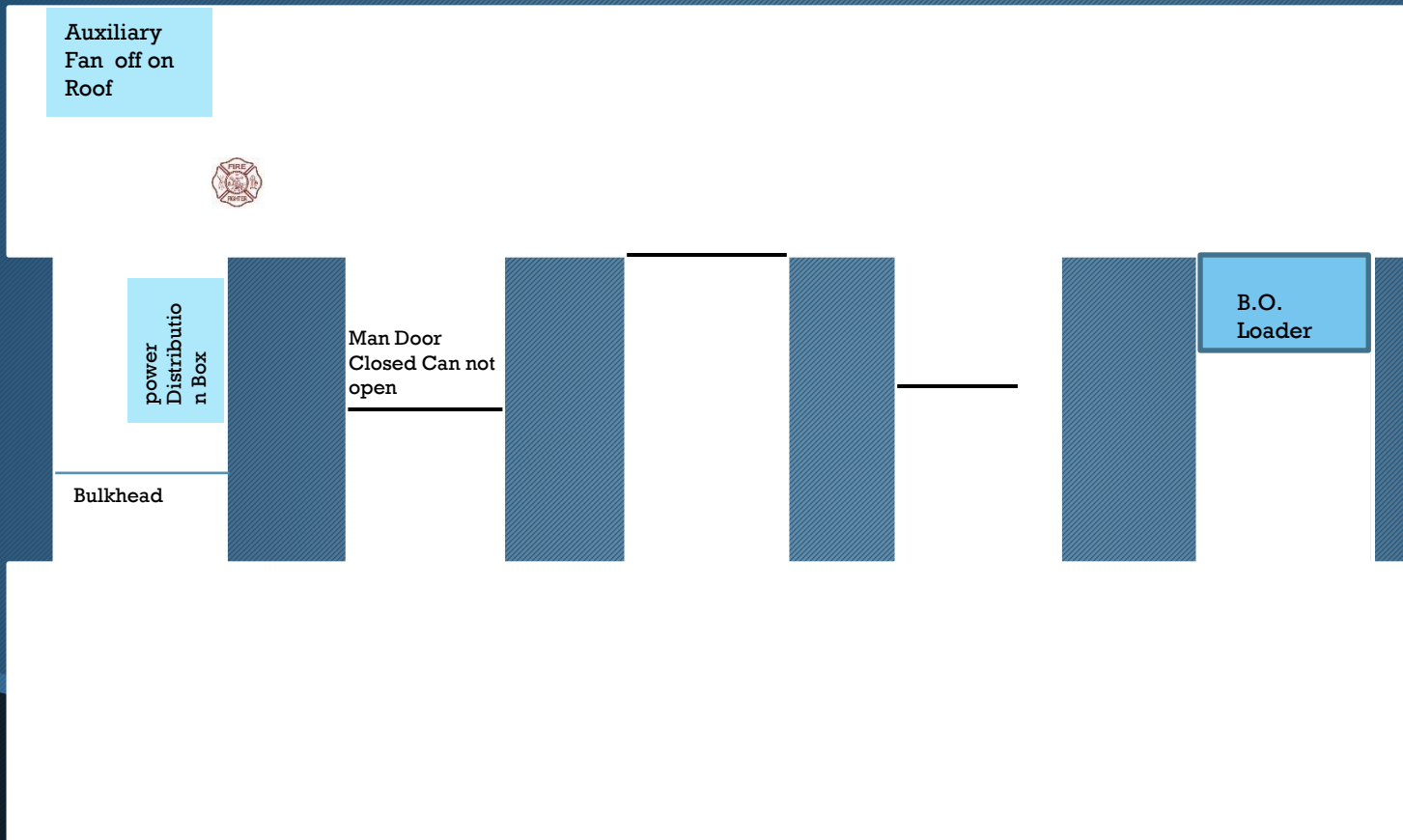
Team Stop 2: Entering intersection NE2 the team enters heavy smoke, and must count off and take their gas readings. They will travel into NE 2 and they will encounter a man door. The door is closed, and cannot be opened. They then return to the main drift to continue exploration. They come across the shop door flush with the rib. They knock and receive **no answer**.



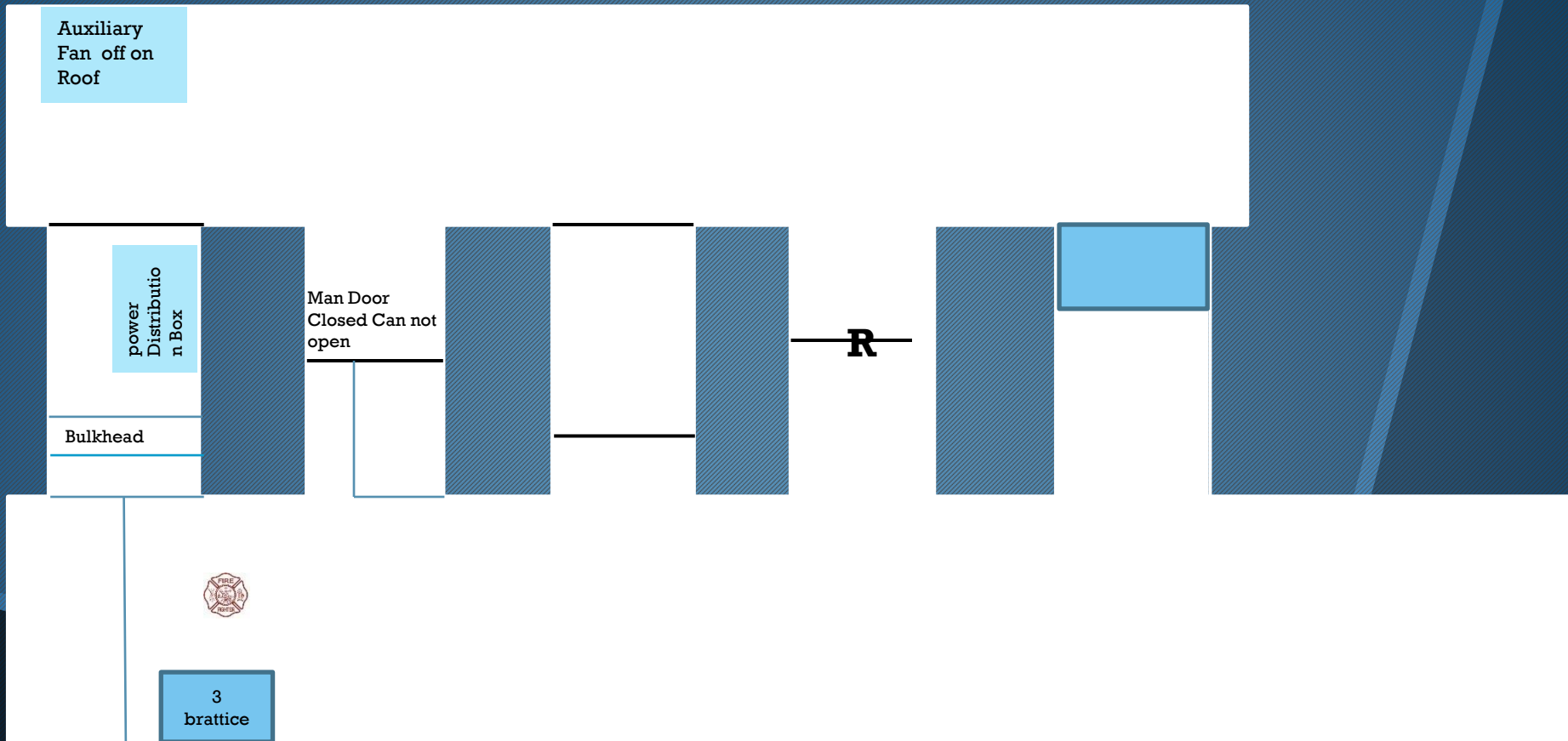
Team Stop 3: The team will continue to explore into the mine, checking for loose and taking gas readings. They should travel into NE4 and find a regulator, and intense heat. They will verbally tell the judges they are ensuring the regulator for the intense heat. Fire extinguishers will be in effective. They will then continue towards the face.



Team Stop 4: The team will explore into the face area, finding 1 brattice, and 4 roof Jacks, that they will likely take with them. They will D & I the face, and B.O. Loader. The Loader is in operable, and blocks the entrance into NE5. Team can not cross into the lines of the loader and may not pass over it to explore, or it will be considered a team endangerment for each team member that steps into the outline.



Team Stop 5: The team must now decide how to gain entry into SE2. They can not cross over the loader without team endangerments, they can not cross into intense heat, they can not enter the shop, and the man door is not operable, or repairable. They must air lock in and break through the (wooden) bulkhead in crosscut NE1. Once through the bulkhead, they will need to support the unscalable back with the roof jacks before they can proceed.



Team Stop 6: Once through the loose, the team captain must D&I The Caved area and take all necessary gas checks. The team will find 3 brattice sets, and will likely take some along. The team will explore towards the face, and will encounter A partial cave in NE2, against the man door, the team captain must D&I the cave. There will be enough room for the captain to explore to the bulkhead of the man door so he can explore the area, D&I, and take a gas check. There is not enough room for the team.

Auxiliary
Fan off on
Roof

power
Distributio
n Box

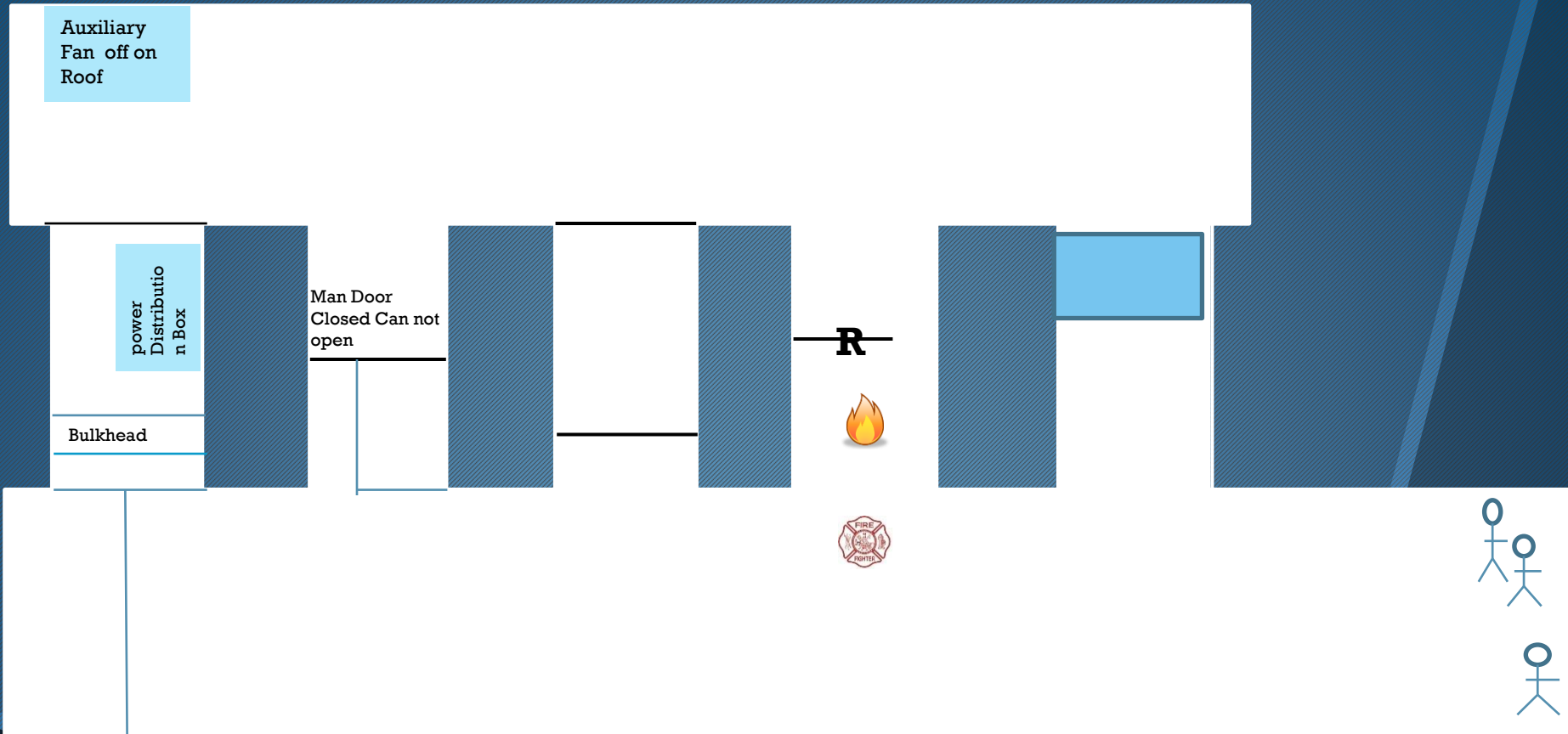
Bulkhead

Man Door
Closed Can not
open

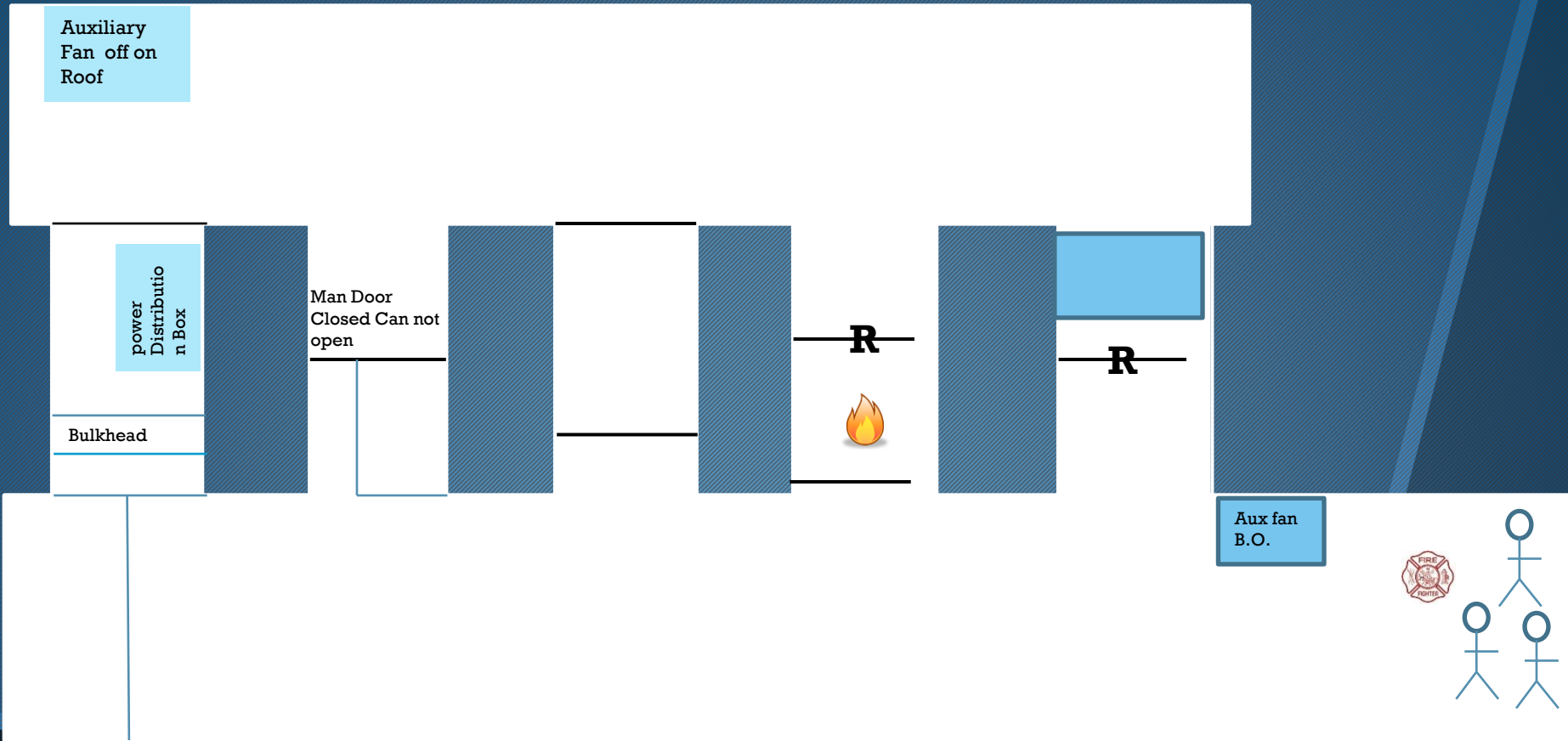
R



Team Stop 7: The team will continue working towards the face, with the captain checking roof and rib, and they will be taking gas checks at intersections and areas explored. The team will enter the back doors of the shop, find them closed, and attempt to contact anyone inside. **They will receive no answer.** They should then D&I, map the door and continue towards the face.



Team Stop 8: The team will find the fire burning out of control in NE4. They must construct a regulator immediately, or travel to gather brattice. If the team is not working directly to regulate the fire, they shall be discounted for undue delay. They will then travel toward the face and explore NE5. They must explore behind the regulator, by the end of the problem or this will be an unexplored area. They will check roof and rib, D&I the regulator and move past the B.O. Auxiliary Fan and into the long face drift. The heavy smoke, will reduce to light smoke, since there is no air movement. At the face they will find 3 live miners, conscious but unable to speak, and very weak.



Team Stop 9: The team must now ventilate the mine, in order to walk out the three found miners in SE2, and have clear air to gain entry into the shop. With only one drift to vent and exhaust through the team must construct an air split with 2 of their remaining 3 brattice in the entry of SE. The team also must move the fresh air base to the fresh air side of SE1. This MUST be completed the fan is turned on or no air changes will occur. They must also convert the fire regulators to seals before moving air.



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Auxiliary
Fan off on
Roof



Build



Build

power
Distributio
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Man Door
Closed Can not
open

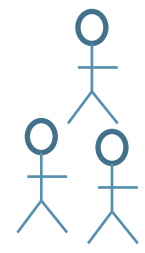
Seal



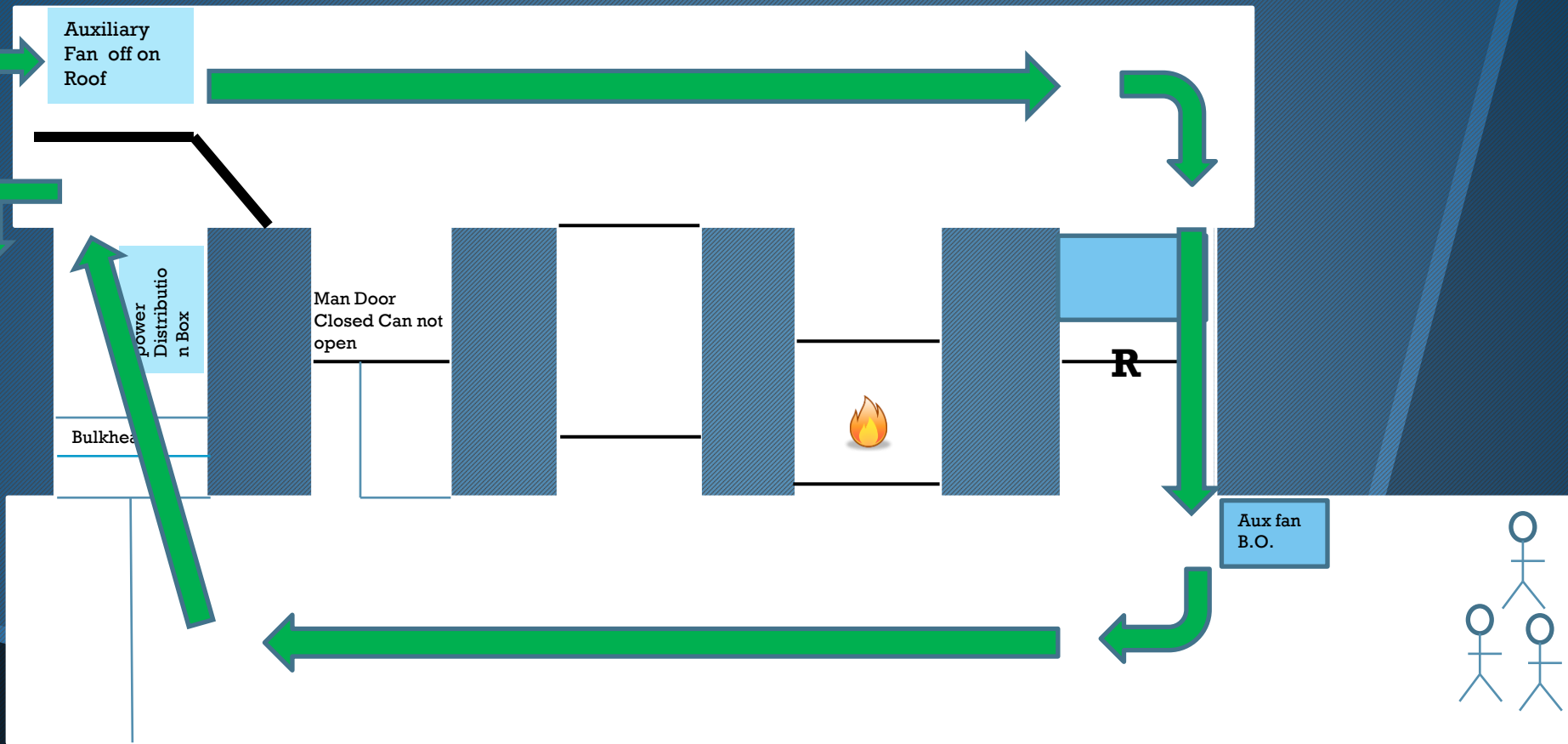
Seal

R

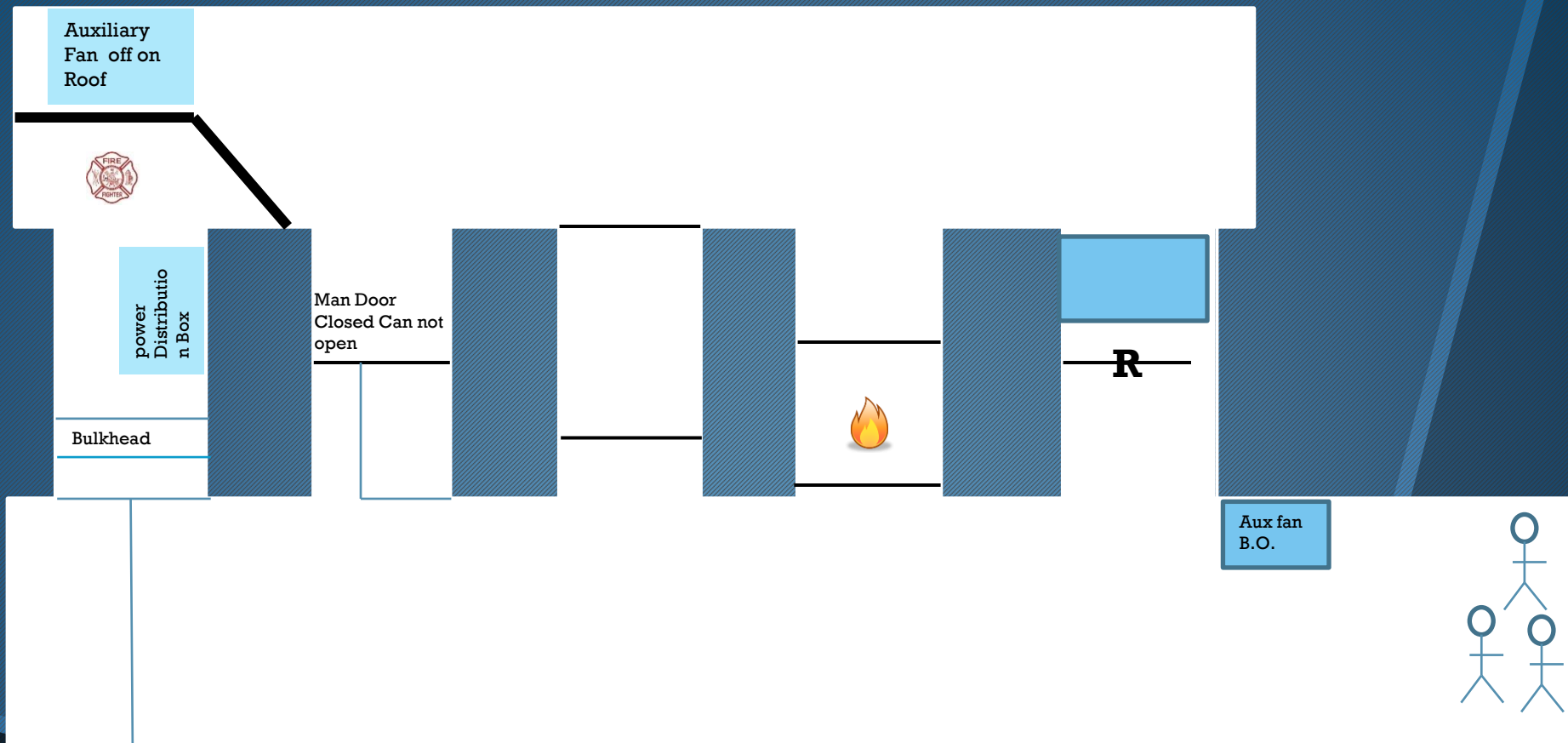
Aux fan
B.O.



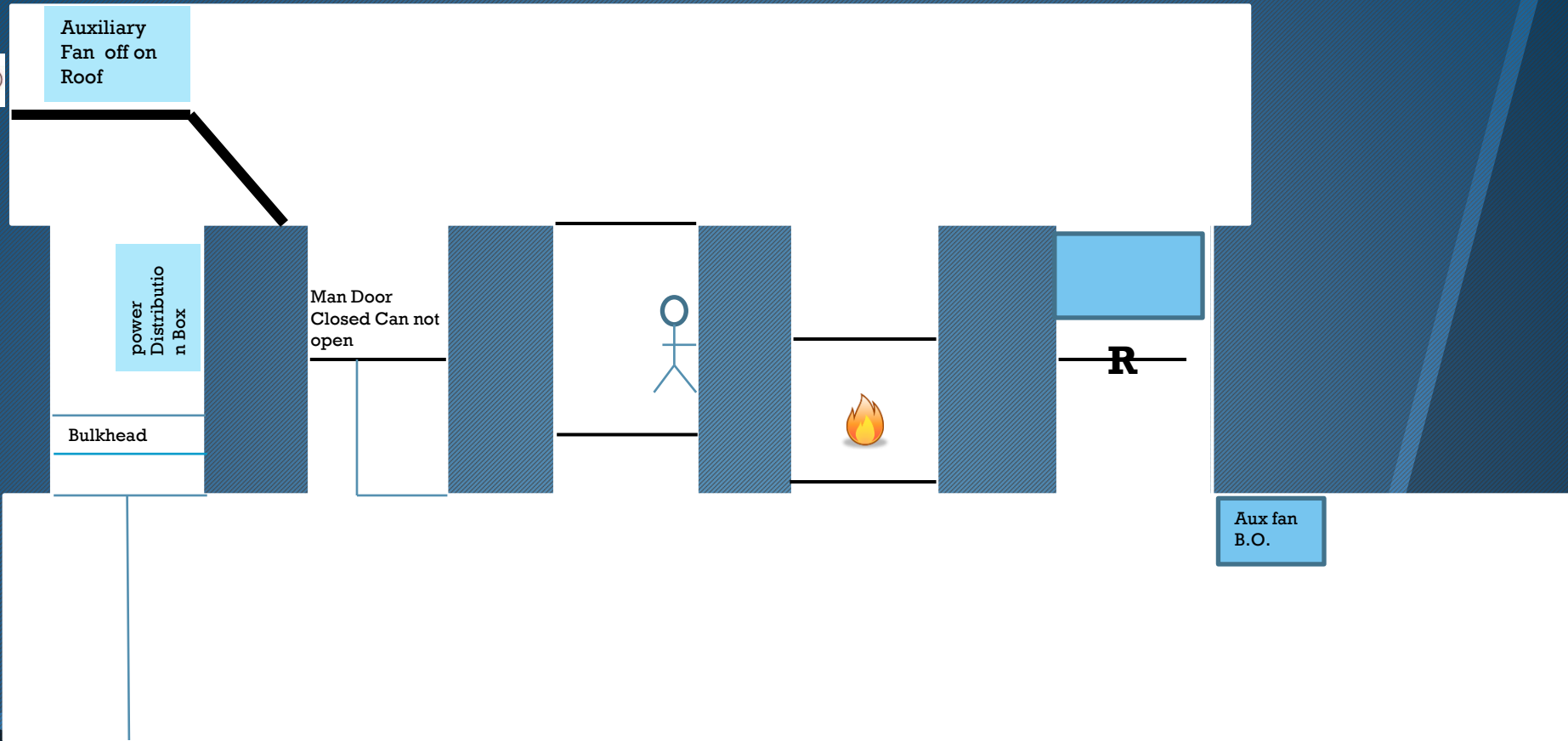
F
A



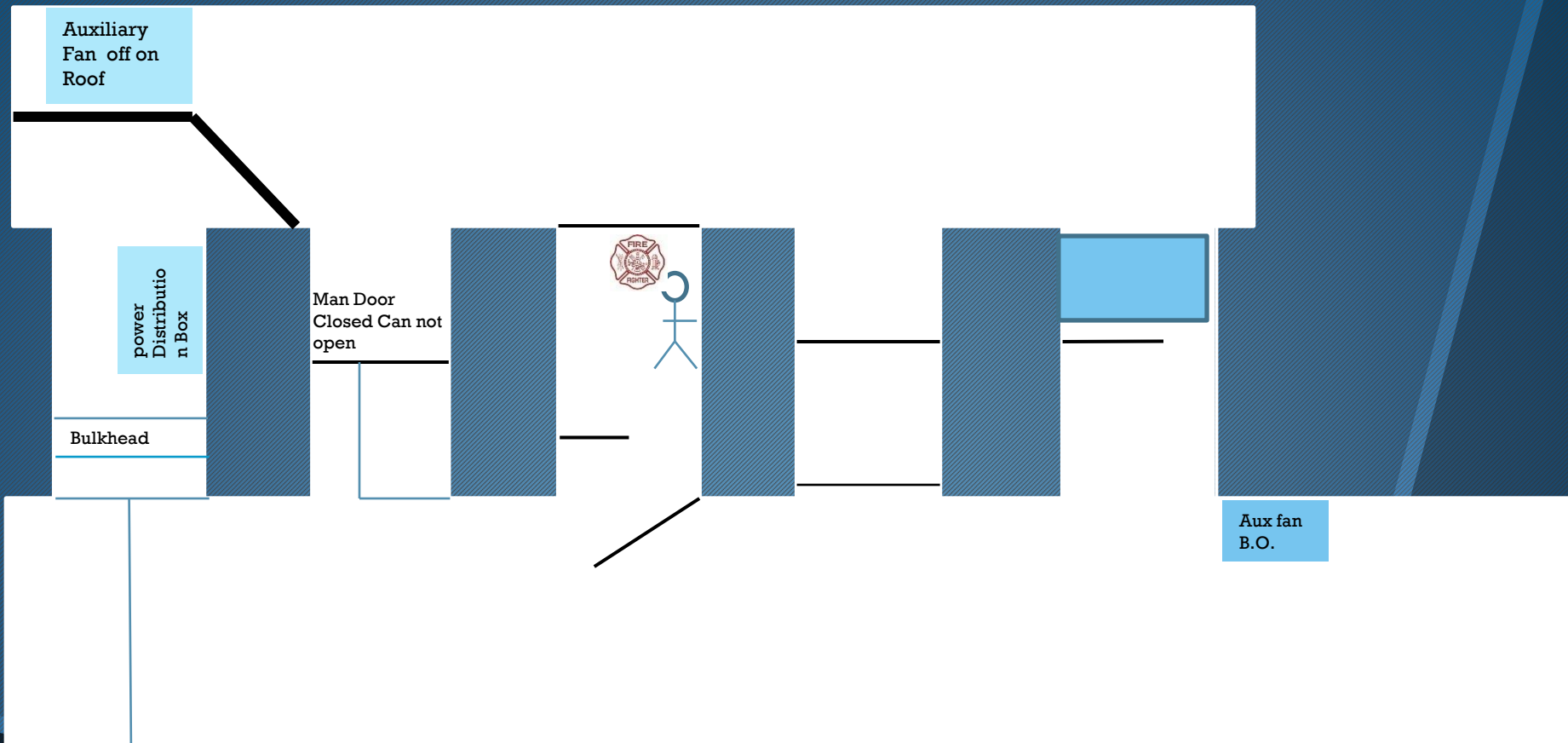
The team can now turn the auxiliary fan on, and clear air will course through SE1 and through the regulator in NE5, back through SE2 into the air split and out of the development area. All gas placards will be turned to clear air, except for the light smoke placard in the face of SE2 with the 3 live miners.



Team Stop 10: The team must now travel directly to the face of SE2, taking gas readings at all intersections following the ventilation change. They can walk out the 3 miners. There will still be light smoke in the face, the air is no worse then what has been supporting the miners so the teams can walk them out into fresh air **WITHOUT** a wing curtain.



Team Stop 11: With the 3 miners turned over to officials at the fresh air base, the team must now re-enter the mine to complete exploration of the shop. They must gain entry through SE2 so there is enough pillar to build an air lock with the single brattice they have available. When they arrive at the shop door they must use a wing curtain to flush contaminated air out from in front of the door. They must build an air lock, since they do not know the effects of a ventilation change inside the shop, and enter. Here they will find 1 miner with burns to his hands and arms (below the elbow). The team will need to assess the miner, and treat the burns. The captain can D&I FPA.



Team Stop 12: The team will take the injured miner to the fresh air base, and turn him over to officials. With **ALL AREAS EXPLORED, MINERS BROUGHT TO SAFETY, and the FIRE SEALED**, the team has completed the problem, and stops the clock.