

Operations Challenge Safety Event 2013

Situation:

While a facility crew is working, one of the workers collapses inside a manhole. The coworker is found at the bottom of a (confined space) lift station unconscious. It is suspected that he/she has been overcome with an unknown gas or lack of oxygen. The in-plant rescue team is immediately called to the scene.

As soon as the team arrives, another person has a heart attack (**when the stopwatch starts**) a separate rescue effort **begins immediately**. The heart attack victim (#2) is unconscious, the designated first responder **calls 911 emergency services immediately** and directly after, the rescuer begins rendering aid the heart attack victim (as per step #12). Once the rescuer has completed step #12 (a. through o.), the rescuer will place his/her lock and tag on the gang hasp. At this point the rescuer may assist the rest of the team.

Directions:

Four-minute equipment check: The team will be allowed onto the platform to check all competition equipment and supplies for four minutes prior to the actual start of the event. Part of the four minute check will include pre-adjusting harnesses including the victims harness. The head judge will inform the team captain when the four minutes are completed. *At this time, all team members must immediately move to their starting area. If all equipment problems have not been resolved by this time, they will be addressed with the team in starting position.* A delay at this point is cause for a penalty. Judges will not answer team questions during the four-minute inspection time or during the event. All questions will be answered on Wednesday during the pre-competition meeting. This is done to assure all teams receive the same instructions.

One team member will demonstrate the powering on and initial testing of the Scott Protégé gas meter during this time, by completing the following steps:

- a. Attach hose to bottom of pump
- b. Press and **HOLD** the right button until “**RELEASE**” appears on screen
- c. Verbalize “**GAS METER ON**”
- d. Allow unit to finish power on self-test
- e. When screen reads “**Block Pump**” use your thumb to block the end of hose and verbalize “**BLOCKING PUMP**”
- f. When screen reads “**Clear Pump**” release the hose and verbalize “**PUMP CLEAR**”
- g. Remove hose from gas meter and neatly coil hose
- h. At the conclusion of the equipment check, the gas monitor should be left in the **ON** position and placed within the equipment area

No equipment can be pre-assembled prior to the start. If anything has been pre-assembled, the head judge will instruct the team to disassemble the equipment prior to starting. If there is still pre-time left, then no penalty will be assessed, however, if the four-minutes have been used up, a penalty of excessive pre-check will be assessed. All equipment must be placed back behind the line in the equipment storage area at the end of the four-minute equipment check.

The team captain will notify the head judge as to which team member is the designated attendant for the initial lockout/tag out. All printed and signed names of the entrant and qualified person may be made on the permit at this time; names must be legible. **Fill out the lockout tag.** To avoid subjectivity, the judges will verify legible handwriting at this time. The power for the gas detector and blower will be left in the off position. The designated heart attack victim rescuer will be given a choice of L or XL latex gloves during the four minute check. The gloves can be placed in the pocket but must be behind the designated line.

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At the end of the four-minute time all team members must immediately move to the starting area.

- 1) Team members will start behind the designated starting line
- 2) The team captain will start the event by yelling, "Start"
- 3) One team member will immediately proceed to call 911 and rescue the heart attack victim. **This team member cannot assist in any other part of the event until step 12 (a-o) is complete. After step 12 (a-o) is completed, their lock and tag will be placed on the gang hasp.**
- 4) The entry person will put on full body harnesses.
- 5) One team member will simulate turning on the gas detector and will then test the manhole atmosphere for 30 seconds using a gas detector and provided stopwatch.
 - a. Attach hose to bottom of pump
 - b. Verbalize "**GAS METER ON**"
 - c. Use your thumb to block the end of hose and verbalize "**BLOCKING PUMP**"
 - d. Release the hose and verbalize "**PUMP CLEAR**"
 - e. Insert the hose into the confined space, making sure that the hose is inserted to a point between the two black marks
 - f. Begin monitoring the space for 30 seconds
 - g. At the end of 30 seconds, record gas readings on your form and verbalize "**GAS READINGS GOOD**"
 - h. Remove the hose from the unit
 - i. Attach gas monitor to entrant. Unit must be attached to either the entrant's harness or another area outside the entrant's uniform. **THE MONITOR CANNOT BE PLACED IN A POCKET OR INSIDE THE SHIRT.**
 - j. At the conclusion of the event, the gas monitor should still be attached to the entrant and left in the **ON** position.
- 6) One team member will place the electrical safety switch in the off or disconnected position.
- 7) The Designated Attendant will be the first person to lockout the disconnect switch by using the gang hasp and **their red colored lock** and tag. Each additional team member will place their lock and tag on the gang hasp. *Note: No one will enter the manhole until all three locks for the team members that are conducting the confined space rescue are locked and tagged on the hasp. The heart attack rescuer must place their lock and tag on the hasp after steps a through o in section #12 have been complete.* At the end of the event, the disconnect will remain locked and tagged out. Each team member will maintain custody of their key and have it at the end of the event to turn into the head judge.
- 8) The qualified person will fill out the confined space entry permit. The only entries required on the permit during the timed event are acceptable (safe entry levels) readings for oxygen, combustible gas and hydrogen sulfide.
- 9) The Reid Gantry will be assembled (steps a-i below) and raised to the correct level (highest level). All four wheels of the gantry must be locked and the entry person must be attached to the fall protection device (SRL) before the manhole safety cover is removed.
 - a. Remove bolts from both ends of gantry
 - b. Raise gantry to highest position
 - c. Install winch bracket on one end using bolts/Install remaining bolts on other end
 - d. Install winch on bracket
 - e. Install cable roller on winch end of gantry
 - f. Position winch cable trolley in center of gantry
 - g. Place winch cable over roller and position on trolley
 - h. Position SRL trolley next to winch cable trolley
 - i. Attach SRL to trolley using "D" ring

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- 10) Remove the manhole safety cover.
- 11) Install the blower saddle vent into the manhole; attach the 90-degree fitting to the saddle. Place the blower 5-ft from the manhole and attach the blower hose to the 90-degree fitting. Turn the blower on.
- 12) The fourth person (designated heart attack rescuer) will **immediately** find that a co-worker has collapsed from a heart attack and is unconscious. This person will call 911 emergency services. The mechanics gloves will be taken off and replaced with disposable latex gloves. The Airway Breathing and Circulation will be assessed first (A.B.C.). The victim's pulse will be checked for 10 seconds. The AED Trainer unit will be used to start the victim's heart (half CPR mannequin). The AED will prompt "Begin CPR" that is when the 60 compressions will be administered (count out each compression 1-30 two times) after the two sets of 30 compressions (60 total), emergency services will be assumed to arrive, then the AED is to be restored in the same condition as it was when started. The AED will be left next to the mannequin.

Disclaimer these procedures were developed and written for the Operations Challenge Safety Event only. Please see your local American Heart Association and Red Cross for the exact CPR and AED national protocol or the protocol for your local area. We are not giving breaths at this time for sanitary reasons.*

- a. Using the phone, the designated heart attack victim rescuer will dial 911, and yell out 911 emergency services has been called.
 - b. Mechanics gloves will be removed and disposable latex glove will be used
 - c. Tilt head for airway, check victim for breathing (5 seconds counted out while looking at chest to see rise and fall) and a pulse (place two fingers over carotid artery, 10 seconds counted out, none will be found)
 - d. After the pulse is checked, the AED cover will be opened up
 - e. The electrodes will be plugged in and the two paddles be placed properly on the victim
 - f. The remote will be plugged into both the AED and Remote
 - g. Using the on/off button turn the AED unit on
 - h. Once the unit prompts "Connect Electrodes"
 - i. Using the remote-press the paddle button or the top right button on the remote
 - j. The rescuer will administer the AED using the prompts from the AED unit
 - k. One simulated shock will be given from the AED Trainer
 - l. After the one shock is administered (it will prompt for CPR to begin),
 - m. Give the victim 60 compressions (2 sets of thirty), while giving the compressions count out 1- 30, *note: each compression must be deep enough to create the click noise in the mannequin.
 - n. After the 60 compressions, it will be assumed the victim has recovered and emergency services have arrived. *(We will also assume that the emergency personnel will have their own AED unit with paddles, in real life the paddles would stay on the victim).*
 - o. Turn the AED unit off. Disconnect the paddles, place plastic cover back over the paddles and put the paddles back into the storage pouch. Put the storage pouch back into the cover of the AED unit. Close lid and shut snaps. Disconnect the remote and wind the cord up neatly, use the wire tie to keep the remote cord wound up. The AED will be stored next to the victim behind the designated line. See pictures.
 - p. After the AED is put away and the initial regulation gloves have been put back on the rescuer, he/she will place lock and tag on the gang hasp. *Note* the rescuer must place their lock and tag on the gang hasp before assisting in any other part of the event.*
- 13) Entrant will be lowered into the manhole on the work seat using the Salalift 2 winch. **The work seat will be raised to a height above the platform floor before the entrant can get on or off the work seat.**

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- 14) When the entry person enters the manhole, a third team member will continually monitor the fall protection lines until entry person is out of the manhole.
- 15) The entry person will put a full body harness on the victim.
- 16) After the full body harness is on the victim and properly adjusted, the entry person will remove the winch hook from the work seat and attach the winch hook to the center "D" ring on the victim's harness.
- 17) The victim will be raised gently out of the manhole while the entrant will assist in guiding the victim from below. The entry person **CANNOT** lift the victim.
- 18) Another team member will lift the victim using the winch.
- 19) Two team members will carry the victim to the chair in the designated area and begin the decontamination process. Do not drag the victim; all body parts must be off the ground (floor of the platform) while moving the victim to the chair. Activate the shower by pulling the shower handle to its furthest position downward. The body harness will remain on the victim.
- 20) The team member tending the fall protection system will assist in bringing up the entrant with the use of the work seat and the Salalift winch.
- 21) Team members will disassemble and store all equipment **behind the line in the equipment storage area**. The Reid Gantry must be fully disassembled; **place the bolts back into holes. The winch cable must be within the length of the weight and hook**. The full body harness will remain on the entry person. Time will end when all team members cross the finish line and the team captain raises his/her hands above their heads and shouts "Stop."
- 22) All team members will stay in the start/finish area until released by the judges. Judges will collect the entry permit, stopwatch, harness, gas detector and lockout keys. Once the team has been released, they will leave the competition area. The captain will be escorted to a waiting area for review of the event with the head judge.

Safety

The manhole opening will be protected with a safety cover before a team accesses the platform. It must not be removed until the Gantry is fully assembled, placed over the manhole, and the entrant is completely and properly in the harness and attached to the SRL that are fully attached to the Gantry. The cover must be reinstalled on the manhole opening as soon as the entrant has been removed from the manhole and before the Gantry is removed from the manhole opening.

Atmosphere Tester

Turn the meter on first; follow the procedures outlined in Step 5 (a-i). With one end of the hose attached to the meter, place the other end of the hose into the manhole. **There will be two marks on the hose. One should be through the manhole (under the platform floor), with the other mark above the manhole rim (above the platform floor)**. Once in this position, the 30-second test will begin. The team member using the meter must remain with the meter and keep track of their time. Once the initial test is completed, remove the hose from the manhole and from the meter. The gas meter must enter the manhole with the entrant. It must remain in the confined space until the entrant is removed from the manhole. **A stopwatch will be provided to each team; this is for the team to time the 30-second atmosphere test.**

Blower Placement

The blower must be placed 5 ft from the rim of the manhole prior to entry. There will be a square drawn around the perimeter of the manhole to allow the teams to correctly locate the blower. The blower may be placed at any point outside the square the team wishes. The blower power cord will not be plugged in, but the switch **must be turned on and left on.**

Permit

The only entries required on the permit during the event are acceptable readings for oxygen, combustible gas and hydrogen sulfide. These three entries must be made after the 30 second test and before anyone breaks the plane of the manhole. Do not wait for the readings on the gas

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meter. Any acceptable reading (considered safe for entry by OSHA) may be entered on the permit after the 30-second test. Readings will be written to the tenth. Example oxygen of 20 PPM will be written 20.0 PPM. Only one entrant may be listed on the permit and allowed to enter the manhole. **Gloves may be removed from the hands of the person completing the permit and only while he/she is entering information on the permit.**

Victim's Harness

It will be up to each individual team to check or adjust the victim's harness for proper fit by the team during the four minute check. The full body harness on the victim should be installed to insure proper care and retrieval of the victim.

Decontamination Procedures

Place the victim in the armchair below the emergency shower. Activate the shower by pulling the handle to the furthest position downward.

Heart Attack Victim Revival Using AED

The victim is unconscious and there is not a pulse

Use the ABC's

- a. Airway- Tilt the mannequins head back
- b. Breathing- look and listen for breathing (5 seconds)
- c. Circulation – Check for pulse (at least 10 seconds)

Turn on the AED (trainer unit) and follow the prompts

Place the two AED paddles on the victim correctly.

When prompted, give the victim one shock

When the prompt is given "begin CPR", begin the 2 set of thirty compressions (60 total) *Note: it will be assumed the victim's pulse and breathing has returned and emergency services have arrived.*

Turn the AED off

Remove the two paddles from the victim; put the protective plastic covers over the paddles, place back in the plastic bag in which they were removed from. Place the bag that has the paddles back inside the AED lid pocket and close the lid. Neatly wrap up the remote cord and tie with plastic (bread type tie). The AED will be in the same condition as the start of the event.

The AED and Mannequin will stay together inside the designated boxed line.

The rescuers will replace the disposable latex gloves with the regulation gloves before assisting the rest of the team.

Personal Hygiene

Do not place anything into your mouth, i.e., gas detector, pencils, pens, or straps. This will result in a penalty.

Equipment Provided for Competition:

- 16ft X 16ft platform with a 36 inch circular opening in the center of the floor.
- Full body mannequin (victim). Approx. weight 105 lbs.
- Phone to call emergency services
- One arm chair
- One clipboard
- One stopwatch
- Mounted phone
- One manhole safety cover manufactured by Safe Approach Inc.
- One General Duty Safety Switch, 100A, Square D Brand, Grainger Item 5B662
- One Gang hasp and 4 locks
- Four Lockout/Tag out Tags
- Disposable latex gloves

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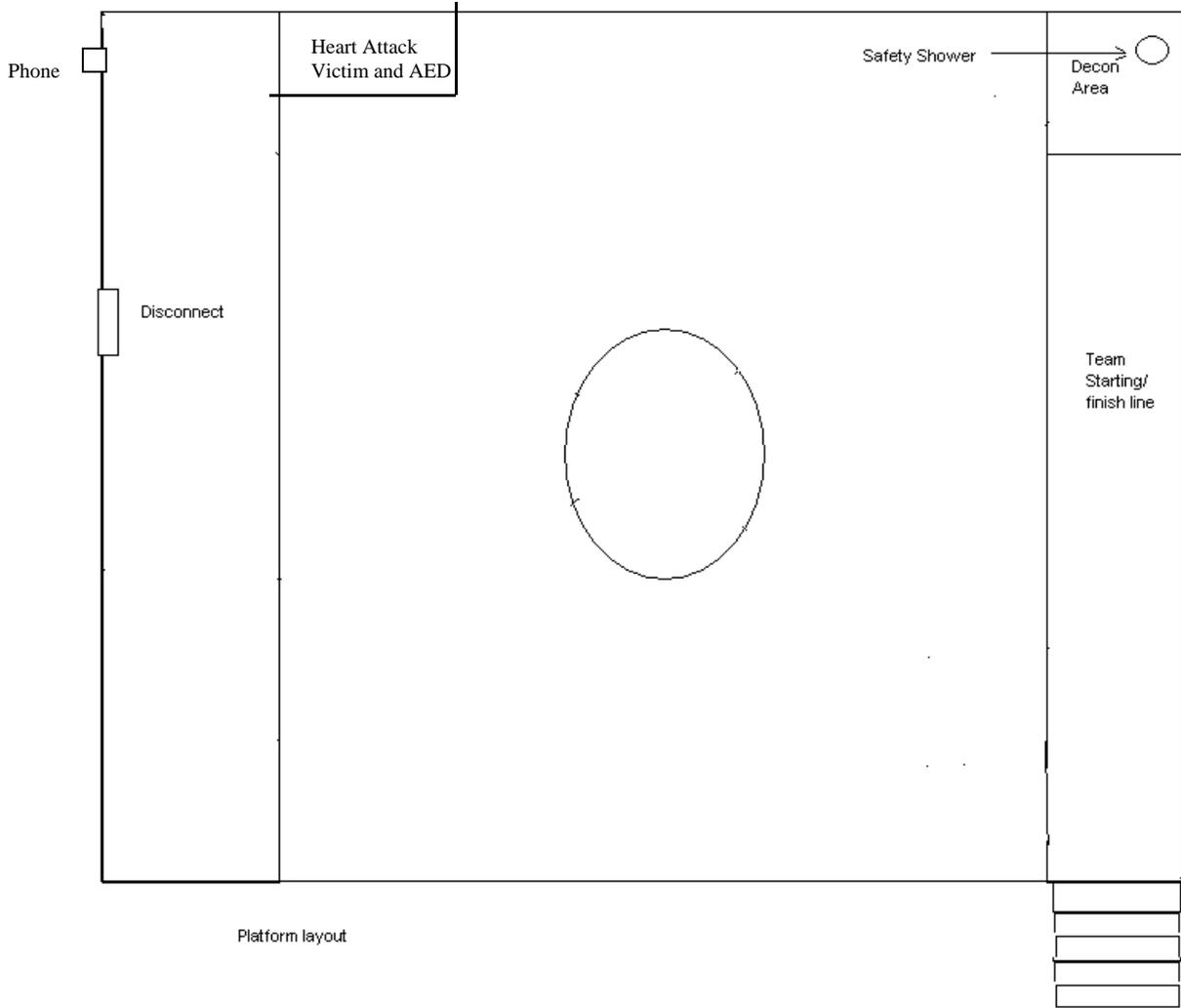
- One Scott Protégé Gas Monitor With Pump
- Reid Gantry system
- One DBI Salalift 2 winch
- One DBI Sala ultra lok SRL
- Two DBI Eoxfit Harnesses, vest style
- One DBI work seat
- One Lifepak 500T AED
- One CPR mannequin

Equipment Provided by Teams

Teams will be required to supply and wear, as appropriate, the following:

1. Steel-toed shoes ANSI rating Z41-PT99
2. Hardhats meeting ANSI standard ANSI Z89.1-2003 Type I or II (bump hats are not acceptable)
3. Safety glasses/goggles ANSI rating Z87.1-2003
4. Leather gloves, mechanics gloves. Baseball, Golf gloves. **Gloves with fingertips removed or holes in the glove are not acceptable.**
5. Pencil or pen to write on confined space permits

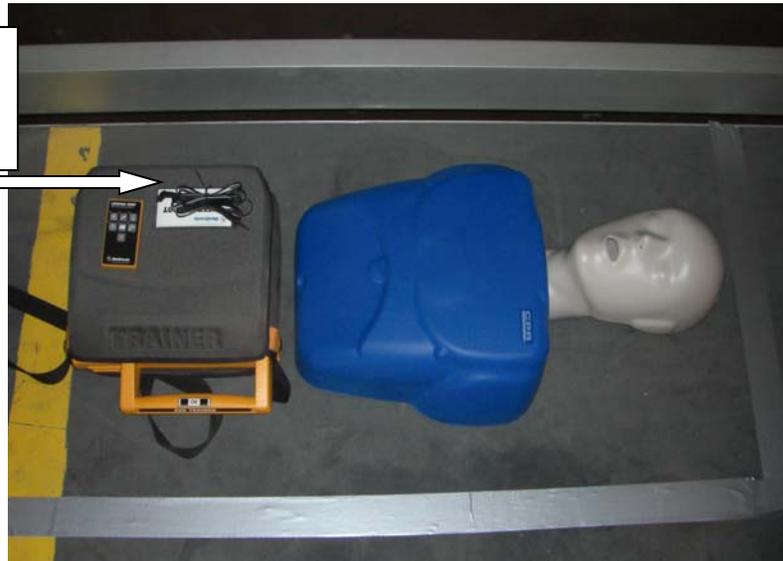
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Pictures: This first picture is what the victim and AED should look like at the beginning and end of the event. The mannequin and AED can be placed in any direction as long as they are behind the designated boxed line.

Note*
The cord for the remote is neatly wound and tied with a wire tie.



Paddles must have plastic cover on them put in the plastic pouch (the pouch does not have to be sealed) and be placed into the pocket inside the AED lid.

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WEAT 2013 Safety Event	
Confined Space Entry Work Permit	
A. Site Information: PLEASE PRINT	
Confined Space Id. Number:	
Team name:	
Designated Entry Team Leader:	
Designated Team Attendant:	
Description of work to be performed:	
B. Protective And Emergency Equipment Needed	
Yes	No
Gloves <input checked="" type="checkbox"/>	
Boots <input checked="" type="checkbox"/>	
Harness/Reid Gantry System <input checked="" type="checkbox"/>	
Atmospheric Tester <input checked="" type="checkbox"/>	
Blower <input checked="" type="checkbox"/>	
Hard Hat/Coveralls <input checked="" type="checkbox"/>	
Ventilated/Purged <input checked="" type="checkbox"/>	
C. Atmospheric Tests	
Explosive Gases	LEL
Oxygen	%
H ₂ S (Hydrogen Sulfide)	PPM
CO (Carbon Monoxide)	PPM
(Note: if alarm sounds vent space for 15 minutes with power ventilator and retest. If alarm sounds again continue to ventilate and retest until atmosphere meets allowable limits)	
Test accomplished by:	
D. Sign Off	
Entrant Signature:	
Entrant Signature:	
Attendant's Signature:	

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Judging Criteria

Safety Judges will stop competitors from competing if any unsafe actions are detected until corrections are made **Time will not stop, and judges will not identify the safety issue for the team.**

Description of Penalties
Excessive pre-check time
Second false start
Start not called out
Harness straps (leg, shoulder) not properly connected or properly adjusted
Not demonstrating meter test during four minutes
Not turning on Gas Detector
Inserting gas detector hose in manhole improperly
Not performing atmosphere testing
Not performing atmosphere testing for 30 seconds
Reading recorded on permit before 30 second testing period ends
Breaking the plane of the manhole before the 30 second test is done
Gas detector leaves the confined space before entrant exits the space
No team member monitoring the confined space
Gantry system not set up properly
Gantry system not disassembled
Gas meter placed into a pocket or shirt
Entry person not hooked to SRL before manhole safety cover is removed
Manhole cover removed before gantry system is over manhole
Harness not properly attached to SRL
Gantry system not centered over manhole
Blower not used
Blower not out of the perimeter square
Blower saddle not used
Blower 90° not used
Blower switch not on
Entrant not fully in work seat before being raised/lowered
Work seat not removed from winch to raise victim
All team members will start in the starting area. A penalty will be assessed to any team member who is standing outside that area, i.e., decontamination area.
Team member in the hole lifting victim
Throwing seat down to team member in the confined space
Moving victim in a manner that would injure a person
Dragging or Throwing the victim
Victim not in decontamination area
Attendant not monitoring entrant
Safety shower not Activated
Safe Approach cover not on manhole before gantry system is moved
Improper lifting technique used
Equipment not disassembled at end of event

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Any pin that is broken off or not attached at the end of the event
Equipment not properly stored at end of event
Equipment on or beyond the line
Cable not completely wound or over tight on winch or bird nested
Damaging the cable due to misuse or abuse
Jumping into the manhole
Throwing/dropping/ abusing tools or equipment
Team members PPE not on during the event (except for writing on CS permit)
Hard hat not on head any time during the event (5 second rule exceeded)
Injuring a Judge
Injuring a team member
Lockout tag not signed/dated/losing a key to a lock
Designated attendant was not the first person to place lock on gang hasp
Team did not notify the head judge who is the designated attendant
Any individual team member did not lock out gang hasp
Entry was made without three locks, locked on gang hasp
Rescuer did not call 911 Emergency Services
Not tilting the victims head back to open airway
Not checking for breathing or chest to rise and fall for 5 seconds or longer
Failure to check pulse
Not counting out the to 10 while taking the heart attack victims pulse
Failure to check pulse properly by placing two fingers over the carotid artery
Not placing the AED paddles in the correct position on the victim
Not shocking victim
Not turning off the AED Unit before storing it
Not giving full depth chest compression
Not counting out to two sets of thirty or giving the full 60 compressions
Plastic cover not placed over AED paddles
Paddles not put back inside the AED lid pocket
AED remote cord not would up or without the tie wrap at the end of the event
Heart attack rescuer not using disposable gloves
Not replacing disposable gloves with regulation gloves or locking out before helping team with the rest of the event