

**POST INCIDENT ANALYSIS: GLENMONT RAIL YARD
INJURED PERSON
INCIDENT # 0049650
MAY 6TH 2011**

REPORT PREPARED BY:

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EXECUTIVE SUMMARY

On May 5th, 2011 a single ambulance response was dispatched for a reported injured person in the administrative building of the METRO Rail Yard in Glenmont. On arrival they were informed that the patient was not in the building but was on a train in the Yard. They reacted to this information in two ways:

1. They made their way to the patient by the most direct route (even though that required stepping over third rail segments)
2. They made a call for additional resources: a medic unit and a ladder truck.

An engine in the area, hearing the request for assistance, added themselves to the call. Based on the information transmitted on 7-Bravo the ECC Supervisor order the assignment upgraded to a MET/ALS assignment, the basic response plan for non-fire ALS incidents reported in a METRO Right-of-Way (ROW).

This should have been a minor incident where fire/rescue located, packaged and transported a single patient with a minor injury. It became, however, a situation where more than one rescuer was unnecessarily placed in great danger because the incident was in a METRO Rail Yard and we did not provide basic safety measures.

This post incident analysis examines six main pathologies of failure:

1. A failure of situational awareness
2. A failure to exercise crew resource management
3. A failure to recognize rate of expansion
4. A failure to initiate command
5. A failure to communicate
6. A failure of discipline

And from those six pathologies derives two critical lessons that are applicable across the full range of fire/rescue incidents:

1. A call isn't always what it is dispatched as; it is what you find on arrival.
2. You can get in over your head very quickly and must always consider who is going to throw you the proverbial lifeline after you are in over your head.

This document examines the six main pathologies of failure in order to isolate solutions for future improvement.

**POST INCIDENT ANALYSIS: GLEMONT YARD INCIDENT
INC# 0049650 5 MAY 2011**

INCIDENT TIMELINE

TIME	STATUS	UNIT(S)	NOTES
1140	DSP	A742E	<ul style="list-style-type: none"> • 7 MIN FROM DISPATCH TO ON SCENE
1142	ENR	A742E	
1147	ONS	A742E	<ul style="list-style-type: none"> • 5 MIN FROM ON SCENE TO REQUEST FOR ASSISTANCE
1152	DSP	AT718 M742B	
1153	ENR	AT718	<ul style="list-style-type: none"> • 7 MIN FROM ON SCENE TO APPROPRIATE RESOURCES DISPATCHED
1154	ASST	E718	
1155	ONS	AT718	<ul style="list-style-type: none"> • 13 MIN FROM ON SCENE TO CHIEF OFFICER ARRIVES AND COMMAND IS FUNCTIONAL
1155	ENR	M742B	
1155	DSP	T725 AT719 RS742B M742 RD2 BC704 Rail	<ul style="list-style-type: none"> • 40 MIN FROM ON SCENE TO PATIENT IS TRANSPORTED
1156	ENR	BC701(for BC704)	
1156	ENR	AT719	
1157	ENR	T725	
1157	ENR	RS742B	
1157	ONS	E718	
1157	ASST	C705D	
	ENR	M742	
1159			
1200	ONS	RS742B	
1201	ONS	M742B	
1202		C742 (Assumes Command)	
1202	ONS	T725	
1202	ONS	AT719	
1204	AOR	T725	
1205	AOR	C705D	
1205	AOR	M742	
1227	TRNS	M742B ET/MEDSTAR/52YOF BURN TO WRIST	

A failure of situational awareness

The United States Coast Guard (USCG) offers an informative document explaining [situational awareness](#) SA¹. While it is beyond the scope of this document to go into too much detail situational awareness is a critical part of what we do as a fire/rescue service on a daily basis. The USCG defines SA as:

Situational Awareness is the ability to identify, process, and comprehend the critical elements of information about what is happening to the team with regards to the mission. More simply, it's knowing what is going on around you.

It is apparent that we lost SA at the METRO Yard because we did not behave as though the hazards of an active rail yard were real. Our training teaches us the hazards but we entered a ROW without confirming for ourselves that third rail power was down. We did not wear the proper attire. We carried a metal stretcher over multiple third rail segments and we used a collector shoe as a step up into a train. Any one of these safety items is serious in its own right but in combination make the threat of imminent death very real. And in combination they suggest that we were not able to “*process and comprehend the critical elements of information.*” It is not a stretch to say that someone could have died. So where was the SA lost and what sorts of strategies can we use to recognize SA loss in future?

It is our belief that SA was lost, secondary to the slowly evolving nature of the incident. “It was just an injured person.” As far as clues for recognizing the loss of SA, again the USCG has done the work for us. Refer to following clues that you might be losing SA:

1. Confusion or gut feeling. *In the words of one unit officer on the incident, “...I knew something wasn't right.”*
2. No one watching or looking for hazards.
3. Use of improper procedures.
4. Departure from regulations.
5. Failure to meet planned targets.
6. Unresolved discrepancies.
7. Ambiguity.
8. Fixation or preoccupation

The key to making these eight points work is to employ crew resource management. If you feel SA is being lost you have a moral duty to speak up and make someone aware, that is what crew resource management is.

A failure to exercise crew resource management

Crew resource management (CRM) has received a lukewarm reception at the station level of fire/rescue operations. The primary complaint is that it violates the local decision making authority of unit officers. This opinion demonstrates an inadequate understanding of CRM. Day-to-day the message we send is "I am in charge I don't need you to think, I need you to do." The message we should be sending is everyone is responsible for assuring positive outcomes.

Organizationally we work hard to teach and profess the tenets of CRM but it gets washed out at the station and task level. At least one participant at the scene of this incident when asked, "Did you ever feel like things were getting out of control and if so did you do anything to fix that why or why not?" replied "Yes, but I was not in a position to fix what happened." If our tactical level actors were fully vested in the notions of crew resource management they might have been more empowered to speak out. We are all in the position to fix what is happening.

CRM only works under two conditions:

1. Someone realizes that something is wrong **AND**
2. That someone feels empowered to do something about it

On this incident it was not immediately clear to all participants that something was wrong, and for those few for whom it was clear they did not feel empowered to speak up. This is not strange. It is common for the ideas of organizational leaders to be at odd with the reality of day-to-day operations.

A common complaint/concern voiced in the field is that the Chief Officers micro-manage incidents. This may very well be a vicious circle where failed safety practices, missing SA, and ineffective CRM lead to poor outcomes which leads incident commanders to involve themselves more intimately on task level decisions, which leads people to stop thinking, which leads to failed safety practices, missing SA, and ineffective CRM. Only effective training can break this cycle.

A recommendation is that all future METRO training move beyond the basics of policies, procedures, and the endless expansion of technical information and begin to concentrate on decision making strategies and processes. It appears that decision making is the point from which at least a portion of the failures stem. As Jennifer Thackaberry noted about "safety cultures" in wildland fires, "..., firefighters felt that attitudes toward safety rules was the number one problem area to address. They felt that the best solution to that problem was to *develop a thinking* culture to replace the existing method of managing safety by emphasizing rules."²

A failure to recognize rate of expansion

In retrospect it is easy to put the pieces together and point out what went wrong. That takes no particular talent. The penetrating question is, "Was the information about the risk available to the crews at the time they were making decisions and was it present in ways that allowed crews to access and process the risk?" There were some who realized that things were not going well, but they struggled to gain control. One unit officer remarked, "I felt I could not get control, and was trying to gain control. I was trying to do a good size up, as this was one of the few things that would stop the misinformation we were getting."

We believe that no small part of the overall failure of the incident was the failure to recognize the rate of expansion of the incident. Five minutes passed from the time the first unit arrived on the scene until the first request for assistance was made. It was another two minutes before the additional help was on the way. Seven minutes is a long time to "do nothing." With each passing minute the pressure to "do something, anything" grows even when there are not sufficient people on scene to do anything properly.

By the time the patient was transported 40 minutes had passed, the incident escalated at least 3 different times and some bad things happened. If this had been a METRO box and all the units were dispatched at once perhaps the mindsets would have been different. This time people were in trouble, in the middle of a third rail minefield, before it ever occurred to them that something was wrong. We did what we always do, park the unit, take the bed to the patient, and take the patient to the hospital but this time things got out of hand quickly.

Our recommendation is that our organizational discussion of risk analysis be extended beyond the scope of working fires, to include special operations events, with less focus on the nuts and bolts of technical information and more focus on decision making processes, SA and practical applications of CRM. This indoctrination process should be as intense and as closely monitored as the fire based risk management program just recently finished.

A failure to initiate command

In MCFRS the expectations are abundantly clear regarding initiating the command sequence for structure fires subsequently this process happens seamlessly on a daily basis. We must do better for other types of incidents. There is not doubt that an early and strong command presence can have a positive impact on incident operations even if the tactical application of the command function are less than adequate.

Firefighters and unit officers who are operating should consider establishing command if any of the following, rail specific, circumstances are present:

- There are multiple patients
- Any part of the train has left the tracks
- Any personnel must enter the ROW for any reason for any period of time
- Anytime there is more than one “major” piece of apparatus assigned to the call
- Anytime communications are difficult
- Anytime what you hear, see, or think just doesn’t feel right.

Further, unit officers should avoid “piecemeal solutions to incidents.” A good rule of thumb for rail incidents is that if the incident involves any human presence in the ROW the minimum assignment needed is a METRO Task Force. This compliment of apparatus allows key positions for incident control to be managed, even on simple calls where the patient only has a broken wrist.

Some examples of key positions to be filled:

- Incident Commander
- Incident Safety Officer
- Liaison Officer (with METRO OCC or Yard Master)
- Entry Control/Accountability Officer (someone to control access to and from the hazard area)

Finally, by establishing command we create our best chance to have one person who is able to develop an understanding of what is happening where (SA) without becoming overcome with task saturation. Someone should have taken command before the Chiefs arrived and upgraded to level 2 command. The situation dictated as much.

A failure to communicate

There was never a point during this event when an uninvolved, objective outside party listening on the radio could have ever known what was happening or who was where. We often use the metaphorical association of “painting a picture” to explain our expectations about incident communications, however, with incident communications there is not a single artist painting but rather a diverse group of individual actors with individual, often geographically dispersed assignments, none of whom can “paint the picture” because none of them has access to all of the information to paint it with.

Note some of the following statements from unit officers [*emphasis added*]:

- From the information I gathered, CAD, radio transmissions, **I assumed** it was a patient who got electrocuted by the 3rd rail.
- **I expected** that a Division would be established and communication between command and only one officer (at the patient).
- I attempted to broadcast but the transmission was stepped over.
- In hind sight, I could have suggested or established a Division at the location of the patient....because no one else had.

Effective communications requires that messages are coded by the sender, sent by the sender, received by the receiver and decoded by the receiver. The failure of this incident was not in sending and receiving –the physical radio infrastructure worked as designed and where it did not work well there are procedures in place for managing using FDTA- The problem was with the encoding and decoding. There was chatter on the radio but it did not “*communicate.*”

A recommendation is that future discussions about communication begin to shed the picture painting metaphor in exchange for the narrative explanation model. The narrative explanation model requires the user to:

- 1. Tell the story of what you see**
- 2. Tell what you plan to do about it**
- 3. Tell what you need to make your plan work**
- 4. Update everyone on your progress and/or changes**

A failure of discipline

It is true that multiple personnel from multiple units acted without direction from their unit officer, in capacities that were not assigned and in locations that were not known.

Operational discipline means being where you are assigned to be and being there with the people who you should be with, doing the things that you should be doing. Anything else is dangerous and creates an opportunity for disaster.

At multiple points on this incident personnel followed the direction of METRO employees, whether it was direction on where to park, or a simple, "Follow me, I will take you to the Yard Master." It cannot be denied that the METRO employees are generally quite knowledgeable about how to navigate the hazards of THEIR work environment but they are not familiar with our SOPs. We must follow our rules and compare what they say against what we know we should be doing.

Once we failed to go to the Yard Tower, opting instead to meet the Yard Master at the incident scene, we lost a single point of contact in the Tower. Once we followed the METRO employee and drove our EMS unit 200 yards down a gravel road along the ROW we put ourselves in the position where walking over rails was the quickest way to the patient. Perhaps these missteps were an aberration but once we accept any aberration they all become more likely.

All personnel but unit officers especially must stop thinking about themselves as individuals and/or their units as distinct entities but rather begin to think about things in terms of the team or the incident. Once people start thinking in terms of the team it becomes obvious that they cannot engage without the whole team being present, or without, at the very least, knowing where their subordinates and teammates are and what they are doing.

AN ALTERNATE ENDING: or WHAT COULD HAVE HAPPENED

Ambulance 1 arrived on the scene and followed the direction of METRO employees. They parked adjacent to the rail scene and began to carry their equipment over the rails to the patient- *a patient with minor injuries who was able to walk onto the train herself despite her injury*- While stepping over the rail Provider 1 on Ambulance 1 sneezed. The sudden jerk of his body caused the stretcher to come into contact with the energized third rail.

Both Provider 1 and Provider 2 were killed instantly. Subsequently arriving units were able to locate Providers 1 and 2 by following the wispy column of smoke caused as the remnants of the stretcher mattress burned to ashes.

One member from Ladder 1 and one member from Engine 1 heard the “popping noise” and saw the arc and moved to investigate. They stepped out of the train using the same step they used to gain entry. Unfortunately the Yard Master had inadvertently returned power to the wrong third rail and the collector shoe they used as a step was now energized. The member from Ladder 1 stepped down first and was killed instantly. The member from Engine 1 was far enough away to be uninjured and called a MAYDAY. The mass of the train prevented the signal from being transmitted. Remembering his radio training he immediately switched to 7- Oscar to transmit his emergency. He was able to transmit but no other personnel on the scene had their radios set to scan. No one heard him. Frantic, he jumped off to help his friend and died as he touched the still energized body.

Reports are that it took the first Chief Officer on the scene the better part of 8 minutes to confirm the location and function of the remaining units on the incident scene, and more than 12 minutes to realize that four firefighters were dead. The rest of the assignment still was not aware that some terrible thing had already happened.

The injured employee later walked out of the train under her own power- just as she walked into it- onto the next ambulance. She was released from the hospital before units cleared the original scene.

CONCLUSIONS

It is important to remind each reader that this could have been you on any given day. Read this *Teaching Moment* with that thought in mind.

What makes this call interesting is that it started simple and evolved slowly. Our response began with a single unit on an injured person call and became the subject of a post incident analysis. We made some critical mistakes along the way and struggled to recover from them. It was “just an injured person.”

When calls start big we enter with our “game faces” on ready to engage, but when they start out small we begin by underestimating the amount of thought and the amount of energy we need to put into them. It is notoriously difficult to “catch up” when we start out by skipping steps. If we are to get better at what we do and avoid rookie mistakes we must deal with what we find before us **while** we are thinking about how the incident might expand or what steps we might be missing.

As Malcolm Gladwell noted, “The key to good decision making is not knowledge. It is understanding. We are swimming in the former. We are desperately lacking in the latter.” We believe that almost everyone operating on this call had all the knowledge they needed, the failure was in using that knowledge to understand their environment. The lack of understanding led to dangerous error. If we had polled the individuals operating at the Rail Yard before the event I am sure that they would have all been able to outline the risks inherent in Rail Yard operations.

The Risk Assessment Training that we recently completed spoke mostly to fires but the lessons do translate to other ventures, like injured persons in METRO ROWs. The patient was not critically injured, she could have stayed put for another hour and not have had any adverse outcome. No one’s life was at risk, except fire/rescue personnel.

The next time we will do better by avoiding the six pitfalls that we experienced this time:

- A failure of situational awareness
- A failure to exercise crew resource management
- A failure to recognize rate of expansion
- A failure to initiate command
- A failure to communicate
- A failure of discipline

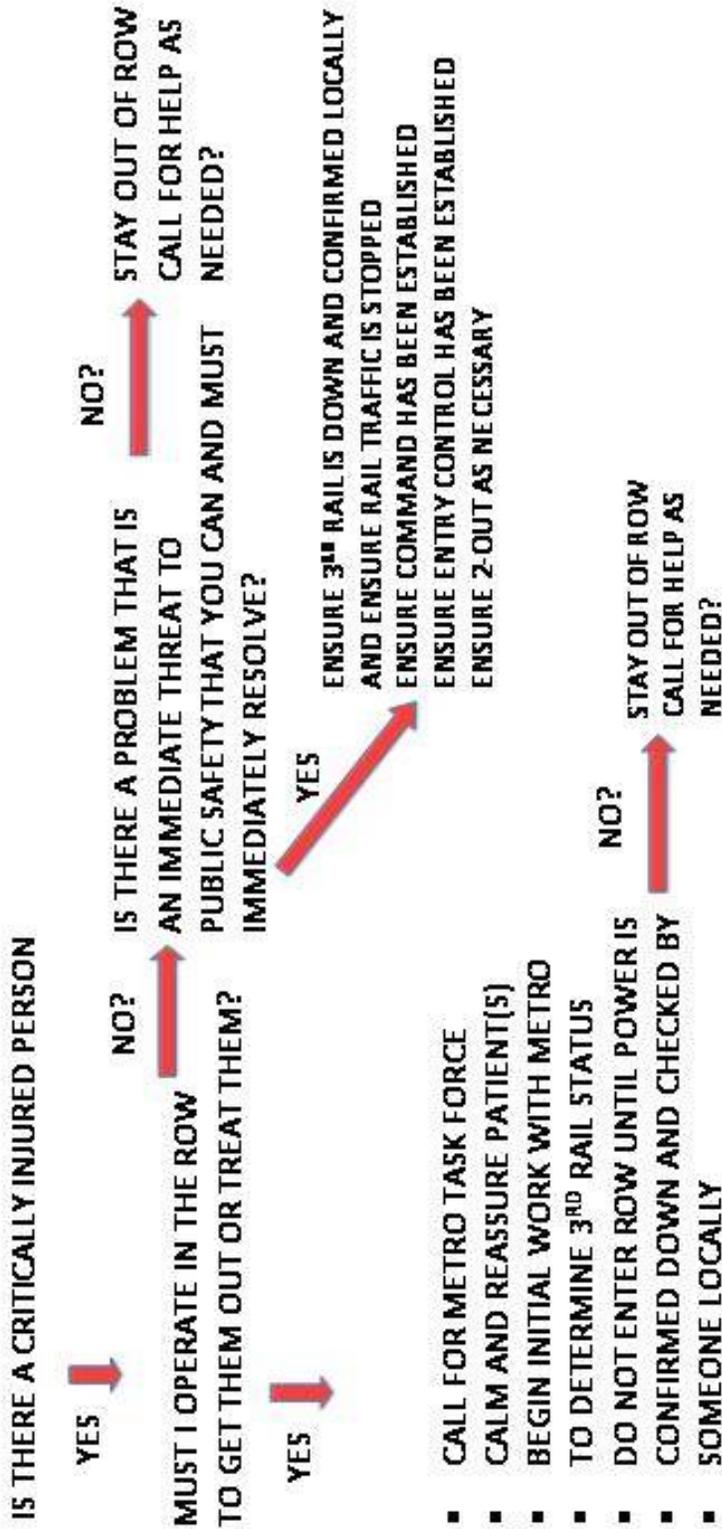
High Risk/Low Frequency = SLOW DOWN.

REFERENCES

- 1 <http://www.uscg.mil/auxiliary/training/tct/chap5.pdf>
- 2 Jennifer Anne Thackaberry. **Firefighting Safety "Discursive Opening" and Closing in Organisational Self-Study: Culture as Trap and Tool in Wildland Firefighting Safety.** *Management Communication Quarterly* 2004; 17; 319

APPENDIX A- A THOUGHT PROCESS SCHEMATIC FOR RAIL INCIDENTS

SUGGESTED THOUGHT PROCESS FOR RAIL INCIDENTS



APPENDIX B: A BULLETED LIST OF NOTED CRITICAL ERRORS

1. Wearing shorts in and/or around the ROW. (*The presence of multiple scene hazards demands the protection of long pants.*)
2. Personnel not wearing reflective vests (*The vest make you more visible and are necessary when operating in or near the ROW*)
3. Failure to engage the Yard Master in a way that enhanced crew safety (*the Yard Master left the tower to investigate. The unit assigned to the tower went to the tower, asked for the Yard Master because that is what we teach, "go see the Yard Master." We should now teach, "go to the tower" regardless of where the Yard Master is because there will be someone there to interact with.*)
4. Units crossing third rail not confirmed down with local testing . (*Sure METRO employees told them the third rail was down but we must always confirm this locally before entering the ROW.*)
5. Failure to place WSADs with personnel in ROW (*Though it can be argued that fire/rescue never need to be in the ROW, they were, and because they were WSADs and local testing are necessary*)
6. Failure to initiate the command sequence early.
7. Units using collector/pick up shoe as a step
8. Failure of crew integrity and accountability