Town of Richmond, VT

Rapid Assessment of the *Richmond Fire Department*

Performed by Doug Patey

TO START

December 2024 my daughter (A resident of Richmond, VT), contacted me with some questions about fire department operations. As the conversations moved forward and, in more depth, relative to the *Richmond Fire Department*, my concerns increased. It was evident to me that some assistance could be helpful for the town.

Doug Patey - Having started in the fire service in1978, I have moved through the ranks and finished my career in the fire service as a Fire Chief and Chief Paramedic. All the departments that I belonged to relied on volunteer (*Community Based Resource*) crews and combination departments. My technical certifications include but are not limited to the following:

> Fire Officer I, Fire Instructor I, Fire Fighter I & II, Paramedic Instructor, Rope Rescue Technician instructor, Confined Space Technician instructor, Trench Rescue Technician instructor, HAZMAT Technician & WMD Specialist, Automobile Extrication, Basic & Advanced Pumps, AVOC/EVOC, National Fire Academy programs, Command School Graduate, NIMS (100, 200, 700, 701.a, 702.a, 703.a, 704, Instructor), IANTD Public Safety Diver, Forestry S130 & S190, USCG 25 ton Master and many others. Copies of all certifications are available for review.

In the latter part of my career, I have operated as a town's project manager in the design and construction of new fire stations and existing facility upgrades. I have also worked for companies as an investigator of Fire/EMS departments for operational assessment.

I offered the *Town of Richmond, VT* a rapid assessment of the *Richmond Fire Department* as a Pro Bono (*For the public good*) service. The intent would be to acquire enough information about the current operation to develop a focus for the current and future. The hope was to review as much administration, command structure, risk management, equipment, apparatus, training, and functionality as can be done during a rapid review. Attempts will also be made to review mutual aid resources. The techniques used will be data review, interview and direct observation.

On January 13th I provided a list of documents and data that I would review with the Chief's once on site. On January 13th an initial zoom meeting was held with the Town Manager, Fire Chief and Assistant Chief. All three participants had my list during the zoom meeting.

A site visit was performed in Richmond on January 20th & 21st. On the 20th I met with the Town Manager, Fire Chief and Assistant Chief from 5:30 pm to 7:00 pm at the fire station to attempt to review the items on my list. From 7:00 pm to about 9:00 pm that night we all traveled with the department to the Bolton Fire Department for a review of Bolton's extrication equipment. On the 21st I looked for high-risk occupancies and documented my findings. On both the 20th & 21st I did spend time gathering information on the mutual aid departments.

THE CHALLENGE

There are some complicated details that need to be understood by those reading this report to better understand my findings. I will provide a bit of a "*readers digest version*" of basic firefighting conventions as I present my findings.

1. The need for a functional fire service response team to respond to perceived emergencies in a community is real and significant.
2. The myriads of challenges facing the implementation of a fire service are real and significant.
3. A community-based resource fire department is one of the most complicated balancing acts of implementation. It requires a dance on a fine line of expectations and limitations. Responders must be kept safe, consistently trained and respected. Citizens, business owners, town management, surrounding communities, and county resources must be working in concert with one another to be successful in today's resource depleted organizations.

ADMINISTRATION

The following represents the list of items I requested from the Chief's for review during my visit:

Documents to be provided

- *NFIRS annual summary reports for the last five years*
- *ISO rating*

Documents to be reviewed

- *Annual Mandatory Testing Reports*
    - i. *Hose Testing*
    - ii. *Ladder Testing*
    - iii. *SCBA Flow testing and hydrostatic test dates*
    - iv. *Apparatus pump testing*
    - v. *SCBA Air Compressor testing*
    - vi. *PPE Inspections*
- *Personnel*
    - i. *SCBA fit tests for interior ff's*
    - ii. *FF Physicals*
    - iii. *Issued equipment inventory*
- *Training*
    - i. *Personnel Qualifications*
        1. *Interior*
        2. *Driver/Operator*

3. *HAZMAT*
4. *NIMS*

ii. *Annual Department Training*

1. *Blood Borne Pathogens*
2. *Sexual Harassment*
3. *HAZMAT Refresher*

- *General Information*

i. *Policies & Procedures*
ii. *Annual Budget*
iii. *Alarm Cards/Mutual Aid Agreements*

No NFIRS reports were provided. Eventually, I was provided with access to the NFIRS account for the *Richmond Fire Department* and looked up the required information. NFIRS (National Fire Incident Reporting System) is a required, standardized report that fire departments must submit to FEMA. The Chief's did not know what the ISO rating for the town is and did not provide it. ISO is the *Insurance Services Office*. They issue a rating on how prepared a community is for fire emergencies. Insurance companies use these ratings to set property insurance rates.

Richmond Fire Department Annual Call Volume:

2014 – 145 **2015** – 143 **2016** – 164 **2017** – 157 **2018** – 163 **2019** – 170

2020 – 154 **2021** – 146 **2022** – 216 **2023** – 226 **2024** – 240

I am not sure why there was such a jump in call volume starting in 2022. It may have been an effect of the required NFIRS reporting.

Documentation of hose testing, ladder testing, SCBA flow tests, apparatus pump testing, and fit testing for interior qualified ff's was provided for the recent history. Per the Chief, the SCBA air compressor was recently installed and tested. No documentation of the inspection of Personnel Protective Equipment (PPE) was provided.

Documentation of FF physicals was not provided. No Issued Equipment Inventory was provided.

No personal qualifications files were provided. No Annual Department training documentation was provided.

No policies and procedures could be provided. Annual Budget was not provided.

No alarm cards could be provided. No current mutual aid agreements were provided. A county wide general mutual aid agreement from 2011 was provided.

Per the Chief, all interior ff's have an annual physical. No documentation was provided. Non interior ff's are not required by the department to have a physical. It was not clear if a new member is required to have an initial physical.

An unsigned/undated "draft" of fire department bylaws was found on the Town's website. I must note that the draft bylaws outlined an application process that included a process of popular vote by the members to

approve an applicant. It is unlikely that this is an approved town hiring process. If bylaws are to exist, they must align with the town's policies and procedures.

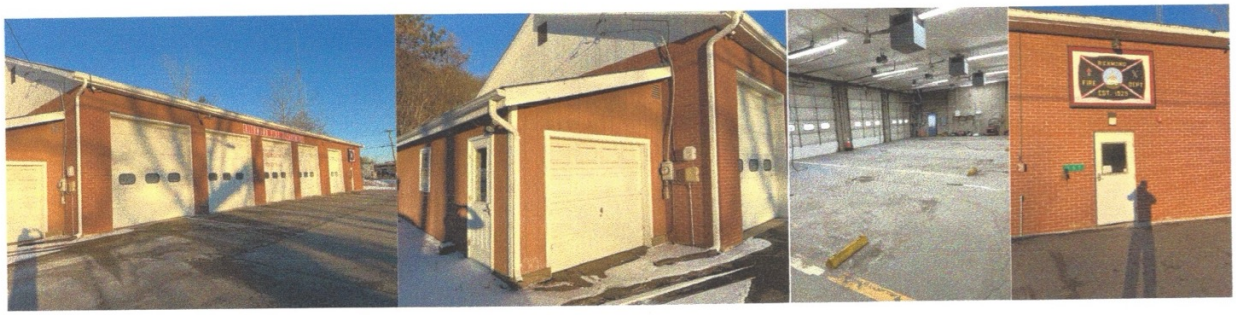
No properly formatted training documents were provided.

No HAZCOM program is in place for the fire department facility as part of the "OSHA Right to Know" requirements.

FACILITY

The *Richmond Fire Department* operates out of one station located at 357 East Main St. The station appears to be in reasonable shape. The electrical service appears to have been removed from its supports during the construction of the wooden addition or during the replacement of the roof. It needs to be resecured by an electrician as it is currently against code and is a hazard. In addition to the fire apparatus there is an antique fire truck stored in the facility.

After my site visit, I found that a detailed facility assessment was performed in 2017/2018 by Bread Loaf Architects, Planners and Builders. There was a list of important recommendations provided for the fire department facility. This list should be reviewed and the status of recommendations noted, especially those related to Life Safety violations. The document can be found on the *Town of Richmond* website.



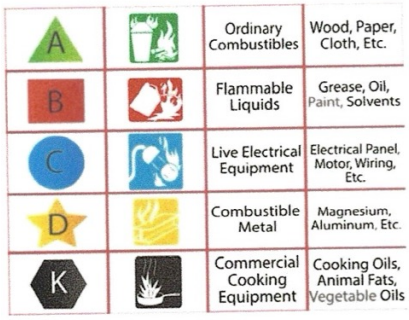
APPARATUS

The department has five apparatus. They all appear to be in reasonable condition based on a single walk around the station. The apparatus appears to be adequately equipped. I was surprised to find three sets of hydraulic extrication tools of varying age, spread across several apparatus.

One of the apparatus, had stored, in a cabinet, a hose appliance that is designed for rapid deployment of a high water flow by a single crew member and then to be able to operate with no one attending it. Without this device a 2 ½" handline would require three to five crew to deploy it and at least two crew to remain while operating it. This device is called a *Blitzfire* as manufactured by *Task Force Tips*. The basic model costs about $3,500. The *Blitzfire* can flow up to 500 gpm safely vs 250 gpm on a standard nozzle 2 ½" hose. I wouldn't want a "*first in*" apparatus to not have a *Blitzfire* type device preconnected and mounted. Stored unconnected in a compartment where I found it defeats its purpose and value. A functional review of equipment inventory and deployment process is desperately needed.

Firefighting apparatus obviously play a huge role in a departments efforts. There are tools, equipment and techniques that can provide crews the greatest return on effort expended. One of the more disappointing moments of this review was the discussion of firefighting foam on apparatus. When I asked the Chief's if they utilized "*foam*" for fires. I was told "NO". I asked why not and was told "*the poison*". When I asked if they were referring to class "A" or "B" foam they didn't know the difference. At this point, I didn't dare ask how they would extinguish a Class B fire if they had one.

Fire Fighting foam application is taught in the most basic fire fighter curriculum. Please bear with me as I try to explain a complicated but really important issue. The three basic types of fire are Class A (Ordinary Combustible Material fueled fire such as paper, wood, foam, etc.), Class B (Flammable Liquid fueled fire such as diesel, kerosene, grease, etc.), Class C (Electrical fueled fire).



There are different types of foam agents that are used to extinguish each of the classes of fire. Class A foam is a product that is injected into a fire pump and discharged with water through the hoses or even just added to a pressurized water based fire extinguisher. Water is used for Class A fires because of its ability to take away heat to extinguish the fire. Water alone is about 20% efficient at taking away heat. Which means 80% of the water applied is running off to no effect. Class A foam is an antisurfactant, much like a concentrated dawn dish detergent and does not contain *forever chemicals*. The soapy water/foam helps break the surface tension of a combustible material to allow more water to be absorbed and then more heat taken away. Fighting fire with water and Class A foam increases the efficiency of the solution from 20% to 80%. Hence, only 20% of the water is running off to no effect. When the fire truck shows up to suppress a fire the 1,000 gallons of tank water is now as effective as 1,600 gallons just by using Class A foam. *Bolton Fire Department* uses Class A foam as do many other departments around the world.

Class B foam is used for extinguishing burning liquid fires. Class B foam is applied with water but at a much higher concentration than Class A foam (3-6% vs 0.03%). The Class B foam is often referred to as AFFF (**A**queous **F**ilm **F**orming **F**oam). Because Class B foam is hydrophobic it will not mix with the burning liquid so it just floats on top of it. When properly applied to a burning liquid fire Class B foam creates a foam blanket on top of the burning liquid which eliminates oxygen getting to the fire so it goes out. It has been determined that some of the older Class B foam products have contained *Forever Chemicals*. Class B foam manufacturers have changed the ingredients and now Class B foam is readily available without *Forever Chemicals*. Water alone cannot suppress a Class B fire. Think about pouring water on a grease fire, very dangerous.

There are now firefighting foam products that not only work on Class A & B fires but are also effective on Lithium battery fires. One such foam product is, *F-500* which is referred to as an *Encapsulator Agent Foam*. The

industry is making changes to keep up with the needs of fire departments. Departments need to take advantage of the current tools, equipment, and techniques that make sense for their community's needs.

QUALIFICATIONS

All members of a fire department must have verifiable qualifications to perform various functions. Back in the 1970's we fought fire essentially with brute force and no real certifications. Many firefighters, lots of water, freelancing, and general mayhem to put out a fire. Eventually the fires would go out. In today's world no department has an abundance of crews available. This makes it even more important that each member can contribute to the team success but being well trained and well-practiced. A huge reliance is also placed on equally qualified mutual aid assistance to help ensure an adequate, safe and predictable response. This is a bilateral reliance that provides for a seamless integration.

The pushback from many departments use to be, "*We are just a small volunteer department*". Let's clear the air on this issue. Fire and rescue situations don't care if the responders are big or small, community-based resource or career, professional or non-professional. How responders organize and perform on a scene is where the difference exists. An emergency scene will treat them all the same. Every individual who does this work deserves to be part of a well-trained, well-equipped, safe department that, within their capability can be a force to be reckoned with. Being professional or non-professional has nothing to do with being a career or community-based resource department.

It is critical that the limited staffing is a well-trained response team. All members need to have documented annual training to protect them and ensure a safe working environment. HAZCOM (Right to Know), Blood Borne Pathogens, Sexual Harassment, Lock-out/Tag-out, Confined Space Awareness, Fire Extinguisher training, Electrical Safety, HAZMAT first responder (minimum), Incident Command System, Accountability and several other topics are required. If a member is driving a fire apparatus, an initial training certification such as Emergency Vehicle Operator Course (EVOC) is needed. An annual refresher with documentation of practical exercise for each and every apparatus must be enforced and documented for <u>all</u> operators. For a member to be able to run into a burning building while everyone is running out (Interior Qualified) requires several levels of training, testing and of course documentation. The *State of Vermont* has standardized training for interior firefighters to meet this requirement. On top of this training a medical evaluation must be performed annually to ensure that the member is in adequate physical condition to wear a respirator and perform the duties. Once medical approval is acquired, the crew member will have a specific fit test to determine the proper size respirator to wear.

A member's level of responsibility will determine what levels of *Incident Command System* (ICS) training they will need. All members must have a base level of ICS training. This ensures that they will be able to understand the common language and ICS process. FEMA also has standards for the *National Incident Management System* (NIMS) training which not only apply to all positions in the department but also in the Town's management staff.

A properly organized incident command system is critical for safe and proper communication of strategic and tactical operations. The beauty of ICS is that it works on everything from a false alarm to a cat in a tree, to a multiple alarm event. A proper ICS system is expandable and contractable. Its management parameter is that no one position in the ICS will communicate to more than three to five other positions. This is known as span of control. *This reduces mayhem.*

An accountability system is used to keep track of all people/apparatus (resources) on a scene and is integrated within the ICS. The most important function of an accountability system is to ensure the safety of members on a scene. When something goes wrong it is imperative that we can identify that everyone on the scene can be accounted for including location. To ensure that the system is used and operating appropriately *Personnel Accountability Reviews* (PAR), must be performed at intervals throughout an operation. No operation can be closed without having a PAR. The County Chief's Association that *Richmond Fire Department* belongs to has an agreed upon standard for ICS and Accountability which is the standard in the area and beyond. This allows seamless integration of all departments during mutual aid responses.

Per the Chief and Asst. Chief they choose not to use the established standards. Some equipment exists but no ICS/Accountability system is utilized by the *Richmond Fire Department*. When I asked the Chief's how they perform a PAR they had no idea what I was referring to. A PAR is a **P**ersonnel **A**ccountability **R**eview which is the acid test of a properly managed ICS/accountability system. A PAR is performed by the incident commander over the radio. The Chiefs have told me that they have not completed any of the required NIMS training.

FUNCTION

Members of a community need to gain an understanding of the functions of the fire department. Based on that understanding the community can then establish appropriate expectations for the fire department.

When we think about fire department functions we seem to often put fire suppression at the top of a list. The reality is we need to categorize all the functions with a bit more detail. Fire suppression should be looked at more as a low frequency, high impact event. A call for a lift assist for EMS would be a high frequency, low impact event. A motor vehicle accident would likely be a medium frequency with a range from low to high impact event. This detail helps us structure the response team and equipment deployment.

With all the tools and equipment available to the fire service selections need to be made appropriately. Enhancing the safety of responders, durability, greatest efficiency and other traits must be considered. Lighting systems are a great example for equipment evaluation. Does it make sense to have several crew setup a generator, extend extension cords and lighting appliances? The lights are placed on the ground and shine in your eyes when you walk towards them. Or should a lighting system be installed up high on an apparatus? Should the operator of the apparatus be able to flip a switch and light the scene? Scene lighting needs to be seamless to ensure adequate light for night scenes. Lights must be deployed as quickly as possible at the onset

of an event and should require a minimum amount of crew to setup. Inadequate lighting on a scene is a large contributor to injuries of crews. Seems to me that having the apparatus operator flip a switch to immediately illuminate a scene with no other effort makes sense.

Suppression of fire is regulated by the science of the Fire Triangle. The three components of this triangle are fuel, oxygen and heat. If you remove any one of them the fire will go out. In general, a combustible material fire in your house, car or barn is extinguished with water. Sometimes referred to as "*put the wet stuff on the red stuff*". We are using the water to remove the heat and make the fire go out Fighting these fires is the "*Battle of the BTU*". (British Thermal Units is a measure of heat). By applying water on fire, we want the water to convert to steam on contact with the fire to take away the BTU's (heat). Water alone, applied to a fire, is about 20% efficient at taking away heat. The application of water is measured in *gallons per minute* (gpm). A small handline fire hose is typically 1 ¾" and flows about a 150 gpm with a typical fire nozzle. A large handline fire hose is typically 2 ½" and flows 200-250 gpm with a typical fire nozzle. The big deck guns typically mounted on the top of fire apparatus flow 1,000 gpm and more.

The application rate of the water is everything in the "*Battle of the BTU*". Consider a typical summer fire pit going and you also have a five-gallon bucket of water. Would five gallons of water put the fire out? If you used a plant hand sprayer and kept filling it from the bucket and eventually spraying all five gallons of water on the fire it will probably not go out. If you pick up the full bucket of water and dump it on the fire it will be substantially extinguished. *The application rate of water is everything!*

Extrication equipment must be deployed as a concise, risk balanced response and not shotgun out amongst numerous response vehicles. There are several very qualified members of the department who, if given the opportunity, I'm confident, would certainly help rethink the deployment strategy.

COMMUNITY RISK REDUCTION

As part of *Community Risk Reduction* (CRR) a Fire Department needs to engage in Fire Prevention activities (preparedness and mitigation). The best-known form of preparedness activities is the annual fire prevention week activities. This education activity often includes educating the public about such things as "*Smoke Detector Activation Response*", "*Get Out and Stay Out*", "*Stop, Drop, and Roll*", "*Exit Drills in the Home*" (EDITH), 9-1-1 activation and several other curriculums based on age-appropriate lessons.

The next aspect of CRR is mitigation via inspections and preplans. Inspections and preplans are based on *National Fire Protection Association* (NFPA) 101 Life Safety Code, NFPA 1Fire Protection Code and IBC (International Building Code). The Life Safety and Fire Protection codes are reactionary codes. They were only created to address something that went wrong. A very sad example is the Coconut Grove nightclub in Boston, MA on November 28, 1942 when the interior of a nightclub could be decorated with highly flammable

materials and inadequate exits. The rules for "Places of Assembly" really changed, thankfully, after this event, to protect citizens.

The fire department may not be the authority having jurisdiction for Life Safety inspections in Richmond, however they need to be familiar with the requirements of the code in order to not be oblivious to high-risk situations. Knowledge of the codes is also very important with the development of preplans. Preplans are developed by the fire department to ensure an efficient response to high-risk occupancies. These include but are not limited to supermarkets, large multi-use commercial occupancies and historically significant structures.

The efforts of fire prevention are critical to reducing risk for citizens and responders. The performance of general inspections for the development of fire department preplans is critical. None have been done for the community despite the glaring high risk hazards.

During my site visit I noted the mixed-use commercial buildings, constructed end to end on Bridge Street. From the front of the building (Alpha Side) there are three stories of windows, on the left end (Bravo Side) of the building and rear (Charlie Side) of the building there appears to be four plus stories of access needed. *Richmond Fire Department* does not have a ladder truck, however, mutual aid companies with an aerial will be coming when called. The response of an aerial to Richmond will take some time especially if it is not part of a preplan and associated alarm card. Before the aerial arrives on scene does the *Richmond Fire Department* have adequate ground ladders that can reach these windows if a victim is hanging out of them? Have they trained in facilitating a rescue from all around the building? There is no evidence that they have.

Once the department gets the proper size ground ladder they will need to train on it. They will need to ensure that any overhead dangers are identified that could restrict the throwing of a multi-section ground ladder. They must be able to ensure proper ladder footing if on a pitched surface. This is all part of a preplan. Preplans are critical in providing risk assessment and prior proper planning for this potential high-risk response.

Having performed a walk around, exterior inspection the following items were noted and documented:

1. Commercial dumpsters are placed adjacent to rear (Charlie side) egress structures that are constructed of combustible materials.
2. The two-story rear (Charlie side) fire escape passes in front of and over windows. In the event of a fire in the building, fire and smoke coming out of the windows would prevent the fire escape from serving as an emergency egress.
3. There are major rear (Charlie side) decks and stairs that are constructed of combustible materials and are unprotected.
4. At the rear (Charlie side) of the four-story building there is a fire escape that passes in front of and above windows which in the event of a fire could make the fire escape useless for those attempting to escape from the third and fourth levels. The structural condition of the fire escape is also very questionable.
5. At the rear (Charlie side) of the four-story building there are numerous unprotected propane tanks that are located below the fire escape. These tanks are directly exposed to commercial vehicle traffic passing the very narrow, rear driveway to empty the dumpsters etc.

6. At the rear (Charlie side) of the four-story section of the building there is an exterior door, one level above the driveway, that is blocked by an iron grate. Hopefully, from the interior of the building this door is marked as "*not an exit*".
7. At the gas station end of the block (Delta side) there is a fire department connection (FDC). In the event of a fire the fire department must connect a fire pump to this connection to feed the sprinkler system. This FDC is not properly marked and is obstructed by trash. It is unclear if only the first building is covered by a sprinkler system.

When I asked the Chief's about the above buildings, they did not have any details on the sprinkler system and the extent of its coverage. Nor did they know of any vertical shaft protection in stairwells to prevent the chimney effect of fire and smoke between the floors. They believed that there have been penetrations in the fire walls that have not been fire stopped. They have not performed an inspection of the buildings to develop a preplan or mitigate hazards. I was told that a group of firefighters attempted to start the development of a preplan for these buildings, but it was not supported by the Chiefs and the project died.

This block of buildings, as they are now, has high potential for a conflagration scenario with major impact on life and safety if a fire occurs. Life safety inspections are very straight forward and can be used to develop a plan of correction. This plan can be phased and focused on dealing with the highest impact corrections first (Low hanging fruit). As a Chief, I would not sleep well with that potential in my community until I had a handle on the issues and a solid preplan that all members are trained on. Someone needs to take responsibility for protecting the community from a potential disaster.

RECRUITMENT

First and foremost, recruitment will only work if the organization shows professionalism and respect for potential crew members. The topic of recruitment opens up so many opportunities for communicating to the public on how cool it can be to be on the Fire Department. Illuminating professionalism, showing respect for members time, dynamic training options, terrific helmets and turnout gear! Who could resist? The marketing of the department is a real thing. There may be a community member that wants to help with the fire department but is limited to assisting with social media. Sounds like a great opportunity to me. Establish junior programs. Educate today for future responders.

SUMMARY

The *Richmond Fire Department* is currently an organization with an aggressive autocratic management style. Overall, the administration lacks documentation, knowledge of current standards, practices and techniques. *How can an effective fire apparatus be designed, purchased and equipped when the leaders do not know the basics of firefighting?*

There is no sign of any planning efforts to reduce risk and mitigate hazards. This will negatively affect future responses. The safety of the crews needs to be paramount. Teamwork, training, preplanning and practice must become standard. Use of an Incident Command and Accountability system to manage every response is imperative.

Mutual aid departments are ready, willing and able to help and work with the *Richmond Fire Department*. Training opportunities with neighboring departments alone could nurture and mentor appropriate change and standardization for the crews. The *Richmond Fire department* needs to rise to the standards of practice to have value within the mutual aid response network.

Creating the ability to evaluate the operations of the department from within is integral to quality improvement. This was clearly missed after the recent major structure fire that the town had. No *After Action Review* was held with all the departments involved to discuss what went well and what can be improved upon. Issues like water tankers on the wrong radio frequency for the water supply officer to properly communicate to them. What is the tanker shuttle radio frequency? Should sand trucks be on the alarm of fire to ensure winter roads are passable? If these issues are not discussed they will never be improved upon. *Prior proper planning prevents poor performance.*

There is so much untapped talent in the ranks that should be used effectively. Professionals working in a community-based resource department want to be involved and not just told what to do. They have so much to offer. A team management style is more appropriate for this organization than the current autocratic style. To ensure the longevity of the *Richmond Fire Department* changes need to be made. Members want to belong to a department that treats them professionally and with respect. Dynamic management styles need to be adopted. The administration must establish proper documentation, SOG's, preplans, training, qualifications and equipment for the safety and well-being of the crews and residents of the community.