



J M Fire Consulting

Public & Private Fire Protection Services

Mr. David Hughes, CAO
Village of Belledune
2330 Main Street
Belledune, NB
E8G 2X9

21 January, 2013

Dear David

After the receipt of a phone call from Acting Fire Marshal, Norman Thibodeau asking for my assistance regarding the Village of Belledune Fire Department. He had received a request and felt at that time it would be best to have someone independent consider making a review of the Fire Department Administration and membership in an effort to improve the morale and ultimately making the level of service better for the residence of the Community. In a further discussion with the Mayor and approved by Council I was asked if I would undertake a review of the Fire Department in an effort to make suggestions and recommendations for the operations of the department moving forward.

During the last few months 4 visits were made to the Village and countless interviews were held with municipal staff, chief officers of the fire department as well as a number of members. From these interviews and a general review of the apparatus, equipment and stations a host of items have been accumulated and are addressed in this review. All interviews were conducted in confidants and the information provided has been used to come to certain conclusions that are not directed to any one person and the assistance of all persons interviewed is greatly appreciated.

All the members of the Fire Department that were interviewed were asked the same 6 questions and based on the answers received, would possibly be asked additional questions to quantify the answers.

The 6 questions are as follows:

- Describe in our own words the overall Morale of the department?
- Years of service with the department?
- If you could change one (1) thing in the department what would it be?
- How do you find the present format for training and meetings?
- Payment system used for reimbursement of expenses and time?
- What is your input on equipment and apparatus upgrades?

The answers varied and covered a wide range of views, however there was a general theme and common feeling with most of the persons interviewed, **things have to change.**



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The overall morale of the department is down and there appears to be a host of reasons. There are several main areas that kept surfacing during discussions with the membership and they include the following.

- Lack of communications in the department and with Village Administration.
- Records and information supplied to Municipal Administration Staff from the Chief of the Department.
- Not using the proper chain of command with regards to several different matters; including but limited to, dealing with the media, handling of questionable conduct by members regarding fire apparatus operation, working with administration staff. Purchasing of equipment and use of equipment.
- Lack of Training in the **basics** and apparatus operations including Driver/ operator elements. Lack of qualified operators and class 3 licensed operators.
- Not operating as one department with regards to meetings, training sessions. Almost seems as if the 2 stations were operating as two different departments.
- Present pager system is limited, outdated and one area that should be considered for a major upgrade.
- Information regarding how changes in payments to members have been made without adequate explanations. Possible misinformation given to members to cause descent ion in the ranks.

A number of the items listed above also have an indirect impact on the overall safety to the membership, as will as the residents of the community in general.

It is not my place or will I condemn or condone the actions of any member of the fire department. My only consideration is making improvements in the department's present operations, in an effect to reverse the existing situation and make suggestions and recommend possible changes in some areas; which should have a positive impact on the operations and morale of the department going forward. Considering, what are used as common practices in the fire service as well as recommended operational protocol as they deal with fire department day to day situations, attached are a number of recommendations and comments that should be considered by Village Council and Administration staff going forward.

Best regards



J.A. Maker, Fire Protection Specialist



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Recommendations:

1. As per By-Law No. CAO 1-2009. Sections 7, 8 & 10. The Fire Chief and all other officers of the Fire Department are to report as required on any matters that relate to the day to day operations of the fire department and supply any needed information regarding said operations.
2. The Fire Department shall provide and maintain complete and accurate records on all members of the department and well as all training sessions, emergency responses, fire reports, all equipment and apparatus maintenance and any other information required by the CAO or Village Clerk and Treasurer. See recommendation 14.1 from Fire Protection Review 2001.
3. The Fire Chief is to make every effort to work with the Administration Staff and Council regarding the operation of the department and request what ever information or resources required, keeping the department members up to speed regarding any changes or developments which effect the operation of the department or the Community.
4. Overall training program of the department must be reviewed with special attention given to apparatus operation and development of driver / operators that can operate any apparatus in the department.
5. The question of two fire stations operating like to separate departments with regards to training, meetings, response to alarms and other location response matters has to be address for a host of reasons and is on of the major factors that could cause liability issues in the future.
6. Present Paging system for the membership is lacking and better and more progressive equipment is available, that can give first responders more information faster, safer and be more reliable. This is one area that must be given a high priority.
7. Safety must be the number one priority for members of the department as well as the residents of the community that they service, therefore all aspects of the fire departments operations should be carefully reviewed with the membership. Everything from turnout gear, breathing apparatus, driver training, vehicle maintenance, communications and water supplies must be reviewed, revised and updated to meet or exceed service standards.

(2)



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General Comments and Suggestions

1. Lack of discipline
2. Lack of communication and transparency
3. Lack of input
4. Lack of integrity
5. Lack of accountability
6. Lack of passion, humor and fun
7. Lack of mentors and role models

Listed are 7 Top Morale Killers, do any of these exist in your operation?

After you answer that question, how do we improve the areas that are causing the problems? Please review the attached article which should give you some sound guidance.

Supplied is a copy of an information package which was a joint effort of the Nova Scotia Fire Marshals Office and the Fire Service Association of Nova Scotia entitled Volunteer Recruitment and Retention. This has great information regarding the Volunteer Fire Service and your municipality should find the information useful for your operation.

The **Fire Protection Review** that was conducted back in 2001 for the **Village of Belledune** still has some value and should be reviewed as a resource base.

Also attached are two additional information topics that maybe useful to the Fire Department.

Apparatus Maintenance
Fire Apparatus Purchasing

Your Fire Department needs help and your Community greatly needs the service, you must work together to make these changes happen!!



By KIMBERLY ALYN, Ph.D.

Top Seven Morale Killers in Your Department

How to Make the Positive Changes Necessary to Improve Morale

Encilitating high morale in tough economic times is a real challenge for any fire service organization. I have conducted a variety of studies and surveys on fire departments all over the United States and Canada. There have been common themes in what hurts morale in career, combination and volunteer fire departments.

Take a look at these top seven morale killers and see if your department needs some improvement in any of these areas:

1. Lack of discipline. I have discovered that this is the number-one cause of low morale for many departments: having to drag around deadweight firefighters who no one will discipline. Instead of dealing with the disciplinary issues, the firefighter gets ignored, transferred or promoted. This kills morale as other firefighters wonder why they put in so much effort to do a great job. Whatever your type of department, standards must be set and everyone must be held accountable for those standards. Proper mentoring, training and coaching will alleviate the need for a lot of discipline, but there is always going to be that one person who pushes the limits and, no matter how great the leadership, is going to be a jerk. That person needs to be disciplined.

2. Lack of communication and transparency. The communication is-

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sue is prevalent in every fire service organization. There is a massive hoarding of information going on. While all information cannot be shared, you can certainly be as transparent as possible and communicate effectively as to why certain in-

TOP 7 MORALE KILLERS

- 1. Lack of discipline**
- 2. Lack of communication and transparency**
- 3. Lack of input**
- 4. Lack of integrity**
- 5. Lack of accountability**
- 6. Lack of passion, humor and fun**
- 7. Lack of mentors and role models**

formation cannot be shared. Information that can be shared needs to free-flow up, down and across the chain of command.

3. Lack of input. Many chiefs wonder why they cannot get buy-in for certain policies, change, missions or visions. Firefighters will always find it very challenging to buy into these things if they weren't allowed input. This is especially true of decisions that are made that directly affect the firefighter. Getting input throughout the organization is a key to creating buy-in. Ignoring the input of your firefighters is surefire way to kill morale.

4. Lack of integrity. Morale will take a rapid decline when you breach integrity. This is a very simple concept: do what you committed to do, when you committed to do it. Broken promises not only deteriorate morale, they also set up a pattern of distrust among the firefighters. If you have ever made the mistake of breaching integrity, the best thing you

can do is take full responsibility for it, show some humility and demonstrate a long pattern of changed behavior.

5. Lack of accountability. It is incredibly frustrating for firefighters to be held accountable to a certain standard by management, and then stand by and watch management violate those standards with zero accountability. This is a huge morale killer. If you want to see morale skyrocket, you will make yourself accountable, up, down and across the chain of command. I wrote about a 360-degree evaluation in my previous column. Using that tool will help make you accountable and will raise morale.

6. Lack of passion, humor and fun. Firefighters want leaders who show passion and purpose for their jobs and in the process, have a great sense of humor. This allows people to have fun in their jobs, which is a huge morale booster. People who focus on all the things that are wrong with their jobs miss the opportunities to see all the things that are right. This type of negativity will hurt morale.

7. Lack of mentors and role models. Firefighters want to be mentored by strong role models from the day they walk through the door. Many firefighters feel there is a lack of strong role-model examples in their department and a lack of leaders who recognize what true leadership really is. This is often due to all of the items listed above.

Keeping morale up in any fire department takes strong leadership and enough humility to admit you can improve. Send out a short questionnaire to firefighters asking them how morale could be improved in your department. Those closest to the problems will always have the absolute best solutions. Take their input seriously and make the positive changes necessary to improve morale.



PREVENTIVE MAINTENANCE PROGRAM

The need for a well-planned preventive maintenance program is obvious; the effectiveness; however, will depend on such things as frequency and extent of inspection and whether or not there is a good follow-up program to eliminate problem areas. Effectiveness will also depend on the quality of the general organization and planning of the inspection program.

To maintain a good inspection program, it is generally accepted that daily, weekly and periodic maintenance schedules are required. With a well-established inspection schedule, operating problems should be reduced to a minimum. Planning for a preventive maintenance program should include some type of inspection record report form. Form should include, as a minimum, the items which are to be inspected and/or tested, the condition of the item, and what corrective action was taken to the apparatus is also needed so that the absence of any item can be readily detected. Another important item needed to permit proper inspection is a copy of the manufacturer's handbook which outlines requirements for inspection and servicing of many items.

DAILY INSPECTIONS NORMALLY SHOULD INCLUDE, AT LEAST, THE FOLLOWING AREAS:

| | |
|--|--------------------------|
| CRANKCASE OIL LEVEL | RADIATOR LEVEL |
| BELTS | ENGINE HOSES |
| WIRING | BATTERIES |
| LIGHTS AND SIGNALS | RADIO TEST |
| FUEL AND WATER TANK LEVELS | TIRES |
| PUMP GAUGES AND CONTROLS | INVENTORY |
| CONDITION OF EQUIPMENT CARRIED | CLEANLINESS OF APPARATUS |
| ANY OTHER AREAS, CONDITION NECESSARY TO HAVE DAILY OBSERVATION OR TESTS. | |

NOTE: AS GAUGES ARE ALSO SUBJECT TO FAILURE, FUEL TANK SHOULD BE TOPPED-UP DAILY AND WATER TANK LEVEL CHECKED VISUALLY.

WEEKLY INSPECTION NORMALLY INCLUDES THE DAILY INSPECTION AREAS PLUS THE FOLLOWING:

| | |
|-----------------------------------|---------------------------|
| TRANSMISSION FLUID LEVEL | DIFFERENTIAL FLUID LEVEL |
| BRAKE MASTER CYLINDER FLUID LEVEL | PUMP GEAR BOX FLUID LEVEL |
| PUMP PRIMING TANK FLUID LEVEL | ANY OTHER HYDRAULIC |
| BATTERY CABLES | RESERVOIRS IN USE |
| INSPECT ALL BREATHING APPARATUS | DRIVE SHAFT AND UNIVERSAL |
| CLEAN ALL PUMP STRAINERS | JOINTS |
| TEST ALL MOTOR DRIVEN EQUIPMENT | CHECK PUMP PACKING |
| ROAD TEST | GLANDS |

The pump should be tested in all respects with water being discharged to waste or back to the booster tank. During the pump tests, all accessories such as the priming system, pressure-regulating system, transfer valve and all pump valves and controls should be operated.

NOTE: If truck has ignition key, it should be permanently fixed in place.

PERIODIC INSPECTION WOULD INCLUDE AREAS REQUIRING INSPECTION AT DIFFERING INTERVALS WHICH COULD BE SIX MONTHS, THREE MONTHS, ANNUALLY, ETC. AND SHOULD INCLUDE THE FOLLOWING AREAS:

| | |
|--|--------------------------|
| ENGINE OIL CHANGE | SERVICE TEST |
| CLEANING OR REPLACING OF AIR FILTER | OIL FILTER CHANGE |
| SERVICING OR CHANGING SPARK PLUGS | INSPECT FUEL SYSTEM |
| INJECTOR SYSTEM (DIESEL) | LUBRICATION OF CHASSIS & |
| REMOVE, INSPECT & RELOAD ALL HOSE | VARIOUS COMPONENTS |
| PRESSURE TEST OF ALL FIRE HOSE | |
| DURING FREEZING WEATHER TAKE PRECAUTIONS, TO PREVENT FREEZING OF THE PUMP, INSTALL HEAT SHIELD, DRAIN BOOSTER REELS, PUMP, VALVES AND OTHER LINES. | |

NOTE: Reference should be made to the Manufacturer's Handbook for areas requiring periodic servicing.

It is appreciated with fully volunteer departments that daily inspections may be difficult to achieve. It is felt, however, that at least weekly preventive maintenance inspections are feasible, and should include the daily and the weekly inspection at the same time. As most failures appear to result from lack of use and/or inspection. It is of the utmost importance that all apparatus be inspected at least weekly and that inspection includes operation of the pump, the transfer valve, the pressure regulating device, the priming system and the complete revolution of all valves and controls, and a road test. Such pump tests can be done in any weather by using a booster of 38-mm (1 1/2") line discharging back into the booster tank.

SERVICE TEST

These tests will be valuable in assessing the effectiveness of the preventative maintenance program and are generally conducted to show the physical condition of a pumper and its reasonable pumping capacity after the unit has been in service for some time. Such tests should be conducted from draft annually and after extensive repairs.

When regular and systematic tests of apparatus are not made, defects often exist which may continue unsuspected for considerable periods of time, and become manifest under the stress of a large fire when the engine is called upon to deliver its full rated capacity at a good working pressure. In addition, regular engine tests are a most valuable drill to engine crews.

Prior to the pumping test, a dry vacuum test should be conducted. Standard test results require the development of 75 kPa (22") of vacuum in the pump and two 3 m (10-foot) lengths of suction hose, with a drop of not more than 34 kPa (10") in 10 minutes. Standard test results are desirable, but results in the area of a drop of 34 kPa (10") in 5 minutes is not considered critical and pump should perform in this condition. However, it is an indication that pump tightness is deteriorating and repairs are required.

In conducting the pump service test, the pumper should be run for a period of 20 minutes delivering rated capacity against a net pressure of 1 000 kPa (150 psi) and 10 minutes of delivering 50% of rated capacity against a net pump pressure of 1 700 kPa (250 psi). Details of service test procedures and equipment required are contained in Fire Underwriters Survey Fire Streams Tables and Testing Data Booklet, or IFSTA Manuals as well as the NFPA Handbook

SUMMARY

With today's cost of repairing and replacing apparatus. It is disturbing to note that all too frequently, this equipment is permitted to deteriorate, through apparent lack of maintenance to a point that replacement is being considered in some instances as soon as ten years following purchase. With many other units found to require major repairs with the fire departments being unaware that such unserviceabilities exist. It is obvious that an effective preventive maintenance program is urgently needed in all municipalities, whether the fire department is large or small, paid or volunteers - the need is uniform.

The cause of failure of the pumps to operate properly during service tests usually fall into one or more of the following areas:

- (A) FAILURE TO TRANSFER VALVE ON MULTI-STAGE PUMP MANY ARE FOUND TO BE SEIZED IN EITHER THE PARALLEL OR SERIES SETTING, OR THE OPERATING LINKAGE IS DAMAGED.
- (B) FAILURE OF PRESSURE REGULATING DEVICE TO OPERATE PROPERLY. PRESSURE RELIEF VALVES AT TIMES SEIZE IN THE OPEN OR PARTIALLY OPEN POSITION AND MAY BE SUBJECT TO SEVERE FLUCTUATIONS.
- (C) EXCESSIVE VACUUM LEAKS DUE MAINLY TO DRIED OUT PACKING GLANDS AND GASKETS.
- (D) POORLY TUNED ENGINES.

Considering that most failures are due to one or more of the above causes, it is evident that the root cause of failure is lack of an adequate preventive maintenance program.

It is considered reasonable and necessary that all apparatus be inspected and tested "ON THE FLOOR" at least weekly, even in fully volunteer departments, and that deficiencies be rectified without delay.

Such a program should include at least full operation of the pump, the transfer valve where employed, the pressure regulating device, the priming system, operation of all valves and controls, a road test, etc. Such pump checks can be done in the station in winter temperatures by pumping from and discharging water back into the booster tank.

SPECIAL NOTE

It appears that with fire apparatus, the term "LACK OF USE IS ABUSE" is a fact. Apparatus that is frequently used either at fires or in training is usually found to be in better condition than apparatus that is used infrequently, even though there may be frequent visual inspections. A pump that sits dry for most of the winter cannot be expected to operate well in the spring.

THIS INFORMATION WAS PREPARED BY J M FIRE CONSULTING AS A GUIDE TO RECOMMENDED PRACTICE AND IS BASED ON INFORMATION OBTAINED FROM SEVERAL SOURCES INCLUDING, NFPA FIRE PROTECTION HANDBOOK, IFSTA PUBLICATION APPARATUS PRACTICES AND APPARATUS MANUFACTURES GUIDELINES. IT IS NOT INTENDED AS STANDARD, BUT IS FOR USE AS AN INFORMATION PACKAGE FOR FIRE DEPARTMENTS LOOKING TO SET-UP OR IMPROVE APPARATUS MAINTENANCE IN THERE DEPARTMENT.

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GUIDE TO FIRE APPARATUS PURCHASING

INTRODUCTION

The purpose of this information is to provide assistance to Fire Chief's, Firefighters, fire departments and Municipalities who are planning to purchase a new or used piece of fire apparatus. Depending on the size of the particular department involved this may be an exercise, which is only performed every ten to fifteen years. Furthermore, it may be the first time for some fire departments with reference to purchasing of new fire apparatus.

DO WE NEED NEW FIRE APPARATUS?

This is the first question that must be answered, do we need the new pumper, pumper/tanker, ladder truck, etc., or do we purchase a used piece of fire apparatus, or do we not bother buying a piece of fire apparatus at all. These are the fundamental questions that any fire department or municipality must consider before purchasing a piece of fire apparatus. After the determination is made that the vehicle is required then comes the point- how much are we willing to spend, and what are the needs that must be met by this piece of apparatus. It has been the experience of this office that on numerous occasions there has been a lack of forethought with reference to purchasing apparatus. What ends up happening is what started out as a good plan with the best of intentions; may cost the fire department, the municipalities, and the tax payers more than what they bargained for or a unit which in some cases is inadequate, and does not meet the needs associated with the fire department and the municipality. The first steps that should be considered are as follows:

- A. Apparatus life expectancy.
- B. Replacement considerations.
- C. Response capabilities.
- D. Upgrading apparatus to meet expanding responsibilities.

These are the four basic items, which must be considered when acquiring new or used fire apparatus.

APPARATUS TYPES AND FEATURES

In the fire service today there are a number of different types, sizes and uses of fire apparatus. They range from quick response units to hundred foot aerial platforms equipped with major pumps. Costs of apparatus range from \$75,000. to \$1,000,000. As you can see, there is a wide range of apparatus to meet a multitude of needs and responsibilities. There are some basic guidelines, which must be addressed when acquiring any piece of fire apparatus. These guidelines are as follows:

SAFETY CONCERNS

This is a cornerstone of effective fire apparatus and should be paramount in any fire apparatus acquisition. Safety does not only include the personnel operating the apparatus traveling to and from fire scenes on the apparatus but safety to the general public on the working capabilities of any piece of fire apparatus. For example, overloaded and under-powered fire apparatus put undue risk to all that come in contact with this piece of apparatus. Furthermore the life expectancy of the unit is in jeopardy because of a number of factors including increased fatigue on unit components, powertrain, braking systems, suspension the list goes on and on. Therefore, one must be very careful not to exceed the recommended gross vehicle weight of any piece of fire apparatus. By its nature, fire apparatus is expected to work under extreme conditions, in all weather, expected to exceed posted speed limits and have a life expectancy of between fifteen and twenty years without conducting major repairs to the body, chassis and pump components. Therefore, if a piece of fire apparatus is purchased and does not meet or exceed minimum requirements in all likelihood, the unit life expectancy will be shortened significantly. It is always our recommendation that apparatus meet or exceed the minimum requirements set forth in National Fire Protection Associations Standards and/or Underwriters Laboratories of Canada Standards with reference to the construction and design of mobile fire apparatus.

GETTING STARTED

One of the first things that have to be established is the need, and then who will formulate the specifications. It is a good practice to form an apparatus committee. This committee would be made up of members of the fire department and possibly some outside assistance from other concerned parties. With a directive from the fire department detailing the needs and requirements for the particular piece of apparatus to be acquired, this committee would set forth in developing a specification for the design and construction of this piece of apparatus. It would be recommended that departments review apparatus from other fire departments solicit information from fire apparatus manufacturers as well as reviewing fire apparatus at conferences, conventions etc.

Be careful of "Greeks bearing gifts". This is an old proverb that still holds true today, and what this means is if a deal sounds too good to be true, it probably is. When conducting reviews of new apparatus in other fire departments, remember to take comments with reference to the construction of the vehicle, its performance etc., with a grain of salt. There are not too many Fire Chiefs who are so humble as to tell you that they designed, to use the old expression, a "Lemon", and may inadvertently send you down the garden path. Another avenue of concern is an apparatus manufacturer, who may not always paint a true picture of the performance and design criteria that went into a particular piece of apparatus that your department may be considering. Consider the old terminology of "**Buyer Beware**".

Once the committee has decided on the design, the needs and to a lesser extent the wants of a particular departments piece of fire apparatus, then establish a ballpark figure of the price that you are willing to spend. Remember it is the fire departments, or the municipalities funds that you are using to acquire this piece of apparatus, spend them wisely. Consider this scenario, is it more prudent to ensure that the apparatus has proper suspension, horsepower, drivetrain and equipment afforded on the unit than how well it looks traveling through your municipal streets during a parade. It should be obvious which is more important. Too many times items such as the size of an engine have been reduced affecting the overall performance of the vehicle to ensure that the unit is equipped with chrome wheels and chrome bumpers and items such as that which will not improve or provide effective fire fighting capabilities.

WRITING OF SPECIFICATIONS

It is safe to say that most municipal fire Chief's and fire department members are not automotive engineers. Most do not have the qualifications or the engineering skills and expertise to actually design a motor vehicle from the ground up, especially if it is intended to operate on a public roadway! However, it is the duty of the fire department to become thoroughly familiar with the various materials, components, and building styles used in the manufacturing of modern fire apparatus. In addition the department must research the various manufacturers reputations for providing a quality product and **standing behind it after the sale.**

For these reasons, some departments use an existing manufacturer specification and modify it to meet their particular needs. This could be described as a **design specification.** The other method includes a more generic (open) specification. One of the major mistakes some fire departments make is to use specifications provided by a manufacturer as an actual bid document. The information contained in a sample specification should be used only as a guide to formulate your own bidding specifications. Keep in mind that you are the customer; you do not have to accept what is easiest for the manufacturer. When making up the specifications, avoid making them so precise (tight) that they may preclude bidding from some competitors. Being specific enough to meet your needs while allowing for deviations, will result in an acceptable specification for which vendors can fulfill the general requirements and intent.

One of the worst specification scenarios for both the purchaser and the bidder is to mix and match standard features from several manufacturers. Each has certain features that make its unit unique. You could be very disappointed with the outcome when one apparatus bidder attempts to copy another's building techniques. Do not confuse this with mixing standard component parts, which most bidders can do. In our discussions with manufacturers, they prefer what is known as a performance specification. These are normally not nearly as detailed as a design specification and allow the manufacturers latitude in their design and still meet all the requirements of the purchaser.

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One area that also must be given due consideration is the question of ethics. Is there anything unethical or immoral about assembling specifications that would provide the citizens of the community and fire department personnel with an apparatus that meets their needs? Does the Chief owe his allegiance to any apparatus dealer attempting to make a sale? The answer to both questions is NO. If the process of selecting a manufacturer is motivated by an honest evaluation of the products, quality, service, and reliability, no breach of ethics has occurred. Of course, there have been instances of unethical behavior on the part of apparatus purchasers, dealers and manufacturers. Purchasers motivated by personal gain are not only unethical but subject themselves to possible dismissal and criminal prosecution.

You might ask, if the fire department knows what it needs, why go through the bid process at all? The answer is obviously to help control the price for the apparatus and to adhere to legal and ethical guidelines. In addition, the time proven procedure, although not always perfect, enhances the probability that manufacturers will respond to future bid proposal requests. If a manufacturer were able to set a price without concern from competition from other bidders it would be like writing a blank cheque! Competitive bidding accomplishes exactly what the name implies; it makes the price somewhat competitive and reduces expectations by forcing adherence to the specifications.

OUTLINING SPECIFICATIONS

Organization is the key to writing a good, clear specification that is easy to work with. One of the best ways to keep the specification orderly is to establish a section and paragraph numbering system. The following general headings can be used in the construction section of a specification to assist in producing a clear and precise document.

Sections

1. General - Basic outline and description of the vehicle to be constructed.
2. Chassis- General description of chassis requirements.
3. Engine and Transmission- General description of type of engine & transmission requirements.
4. Signaling devices- Description of lighting etc.
5. Electrical system
6. Description of Cab
7. Description of body
8. Description of fire pump
9. Description of water tank- size, type, etc.
10. Equipment
11. Options

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Using a progressive numbering system will result in an orderly specification and eliminate the need to hunt through pages of material when looking for certain items in the spec.

In specifications many manufacturers place meaningless words that are in fact just that. For example, they include suitable, durable, dependable, first quality, highest quality, heavy duty. Common phrases include, for the fire service, best industry practices, like new, as expected for fire apparatus construction, to meet the rigors of fire service use, lifetime warranty. (Without and explicit definition of whose lifetime they are talking about). Finally the great one- "State of the Art". Most of these words and phrases are meaningless when used in apparatus specifications because they defy definition. Lets think about this, would any manufacturer state that its product is "not durable", "not first quality", "less than state of the art", or "not able to meet the rigors of fire service use"? Probably not. Any word or phrase that cannot be quantified or the level of quality not clearly defined should not be used.

SPECIFICATIONS FORMAT

Any difficult task is best handled if broken down into smaller, more manageable units. Preferably to divide a bid specification into three separate categories; General requirements, Construction Specifications, and Bid Evaluation Checklist, this format will help make the evaluation process after the bid much more orderly.

GENERAL REQUIREMENTS

The general requirement portion of the specifications is equally as important as the construction section in evaluating an apparatus bid proposal. The information it contains allows you to better evaluate the bidder's qualifications. You should consider many items in the general requirements to lay the groundwork for the bid. One of the most important statements that should be provided with the general requirement portion of the document should state as follows:

1. Apparatus shall be constructed and equipped in accordance with ULC standard S515 and test procedures are conducted in accordance with ULC standard 822. This will provide a minimum construction guideline which all manufactures would have to follow, furthermore under general requirements would be listed- any special provisions which fall outside of the scope of minimum requirements as per the above listed standards. In the document entitled ULC standard S515 construction of automotive fire apparatus there are a number of special provisions that allow the purchaser room for change in a specification dealing with such items as excelleration, braking, gross vehicle weight, all of which can be adjusted to meet specifications as per the purchaser. Other items addressed General requirements would be as follows:

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2. Road Performance
3. Delivery and payment terms
4. Special Construction
5. Factory visits
6. Bid bond requirements
7. Proof of product liability
8. Proof of factory authority service center
9. Delivery date place penalties etc.
10. Clearly define maximum weights etc.
11. Requirements regarding training upon delivery, specifying the number of days etc.
12. Warranties with reference to body, chassis, engine, drive train, etc.

Purchasers must decide which general features are important to their particular bid. Remember that the apparatus is expected to be in service for 15 to 20 years. Therefore, reputations and qualifications of the bidder are of paramount importance in attempting to accomplish this goal. **Don't get stuck with a lemon!**

General information for fire truck testing. It is recommended that a third party pump test certificate is provided and test conducted on the apparatus prior to delivery. An alternative to this would have a test performed at sight delivery. The purpose of this is to establish that performance of the unit meet or exceed requirements and special provisions with reference to the general requirements of the construction of the vehicle. These tests normally include an operational test of the pump, road testing of the vehicle and weight testing of the vehicle. In regards to the actual testing of the vehicle, pump performance tests establish that rated capacities at rated discharge pressures are achieved and are conducted to confirm actual capabilities of the pump and drive train. Road test indicates excelleration and breaking capabilities of the apparatus in conformance with minimum requirements and/or specifications set forth by the purchaser. Weight tests are performed to ensure both proper weight distributions, overall gross vehicle weight is not exceeded and that if specified tolerances are provided as per special provisions. It should be noted that purchasers of apparatus in hilly terrain areas or that have unique requirements with reference to maneuverability, horsepower requirements, etc., Make sure that you specify the needs of your apparatus to ensure that you do not receive something that is less than satisfactory to meet your requirements.

FINAL COMMENTS

The purpose of this information is to assist fire departments that plan to purchase new or refurbished fire apparatus. It is your money, spend it wisely and use good practical application in the construction and design of fire apparatus. As stated at the beginning, none of us are engineers in the field of automotive apparatus design and requirements and therefore are not expected to know all the intricacies of apparatus design and construction. However, a sound foundation for construction is a necessity in order to ensure that you receive the best apparatus for the money spent.

For the information of anyone planning to purchase fire apparatus in the near future. You should consider a book entitled Fire Apparatus Purchasing Handbook, author William C. Peters, which is available through Fire Engineering Books, is an excellent guide to assist any fire department large or small in design requirements and assisting in the purchase of new fire apparatus etc. This book can be purchased through the Canadian Association of Fire Chiefs or Fire Engineering. Other information which is available through Underwriters Laboratories of Canada would be Standards ULC S515, ULC C822, which deals with construction and design requirements for fire apparatus, these are available through ULC in Scarborough, Ontario as well as NFPA standards 1901, 1902, 1903 & 1904, which deal with the requirements for the construction of different types of fire apparatus. Also National Fire Protection handbook has a section, which deals with fire apparatus construction. Any of these documents should be obtained by a fire department before starting down the road to purchasing new fire apparatus. ***Remember it's your money spend it wisely.***

J M Fire Consulting

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