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1 May 2011

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Dear Laura, Marie Aimee and Jorge:

Thank you for your extraordinary hospitality during our recent visit to México. In addition to all of your efforts, we would like to thank Ricardo Noriega, Kurt Hackbarth, the staff of ProBosque, the municipal and government officials, and the many firefighters with whom we met for their availability and tireless support in making this visit a reality.

We feel privileged to have spent time with you and the firefighters in the state of México. You indeed have much to be proud of, as was evidenced by the high level of morale and enthusiasm by everyone with whom we met. We were welcomed like family and made to feel like royalty, and we will never forget the friendships made during the visit.

The trip was an important educational experience since we were able to observe so many of your operations first-hand. Inviting strangers to observe, ask questions and make recommendations is difficult yet extremely proactive. We applaud your recognition that there are challenges to be met and a willingness to work towards achieving established and emerging priorities. We're also grateful for your efforts to create a visitation schedule that provided so complete an overview of each of the professional organizations and firefighter needs throughout the Region. Although many of your operations are performed in ways that are similar to our own, we believe that there are several areas where we can learn from each other and mutually benefit.



As promised, we have summarized our observations and recommendations in the attached report. We look forward to receiving your comments and continuing this collaboration in the realization of your efforts to reduce firefighter risk, enhance civilian health and safety, and minimize property loss from fires and other emergencies.

Sincerely,

Sincerely,

A handwritten signature in black ink, appearing to read "Stephan Hittmann".

Stephan Hittmann, President, 911 FUND  
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Observations, Recommendations and Topics for Further Discussion  
following our visit  
of  
April 2011

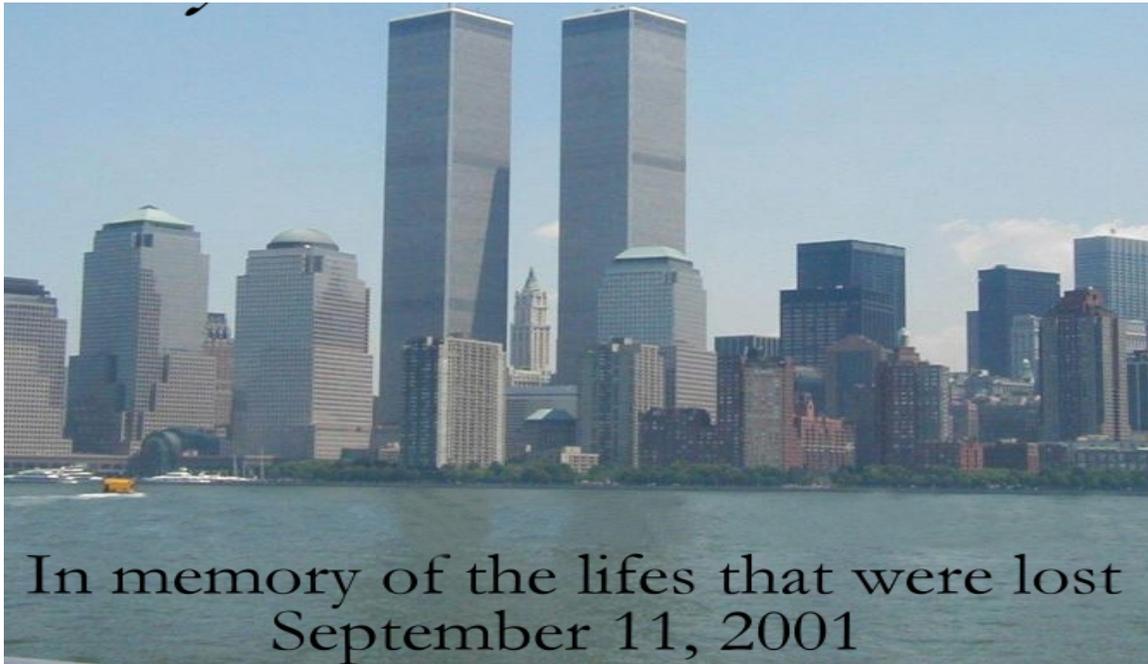


1 May 2011

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## History and Background of the 911 FUND



Created in the aftermath of the tragedy that occurred on September 11th, 2001, the 911 FUND was born from the personal, hard-won experience and first-hand knowledge of New York City firefighters and emergency personnel, all-of-whom worked on September 11th at the World Trade Center, and for countless days thereafter. As we watched brother firefighters commit their efforts, and in 343 cases their lives, to the rescue of 25,000 innocent civilians, we became convinced of the need to enhance our systems of emergency management and preparedness, and to share this understanding, along with our skills and lessons-learned, domestically and with friends and allies the world over.

Ever since September 11th, we have worked to acquire fire trucks, ambulances and related equipment, then to donate them, along with training, to fire departments, emergency responders, medical facilities, industry and others, as part of a continuing effort to build preparedness, reduce risk, enhance civilian safety, and minimize property loss from fire and other types of disasters, be they natural or man-made.

Firefighters routinely put themselves in harms way to protect the citizens of all nations. Service, solidarity, fraternity, brotherhood, and the willingness to accept risks and make sacrifices is the common bloodline of firefighters worldwide.

That said, however, our experience is that firefighters in far too many places have profound training and equipment deficiencies, yet typically assume the same risks as those taken by American firefighters. The training, equipment and/or apparatus that we donate are gifts that keep on giving, while adhering to the best principles and highest traditions of the international fire service.

Over the past nine years, the 911 FUND has donated dozens of fire trucks and/or ambulances, as well as millions of dollars of firefighting equipment, medical supplies and/or training to Argentina, Belize, Chile, Colombia, the Dominican Republic, Ecuador, El Salvador, Haiti, México, Panama, Paraguay, South Africa, etc. All of our efforts in support of the 911 FUND are voluntary and unpaid. We neither request nor accept financial contributions for the work that we do, and 100% of the apparatus, equipment and training that we provide is given free-of-charge to firefighters and emergency first responders.

### Introduction



The following report is drawn from information obtained in four areas, namely:

1. Materials provided by the Fundación Comunitaria Malinalco (FCM), ProBosque, the Policia Municipal Preventa (PMP) in Malinalco and the Mexican Embassy to the United States (in Washington DC) before and/or during our fact-finding visit in early April 2011.
2. First-hand observations while in Malinalco, Metepec, Monte Grande, Ocuilan, Villa Guerrero, Coatepec Harinas, Sultepec and neighboring communities during our visit.
3. Discussions with the leadership and staff of FCM, ProBosque, fire brigades throughout the state of México, PMP and other governmental representatives with whom we met during our visit.
4. Independent research.

The report that follows is divided into fourteen subject-specific sections. Within each section are observations, areas of concern, recommendations and/or topics for further discussion. Subsequent to these sections are Appendices included for reference and elaboration of the topics discussed.

We cannot stress strongly enough that none of the observations made or areas of concern we have identified are in any way intended as a criticism. They are, rather, a starting point upon which we hope to develop an expanding dialogue with the officials and firefighters with whom we met, those in government and industry, and with the communities you serve. As we have repeatedly said, our goal in this effort is to develop an ongoing relationship with FCM, ProBosque, the PMP, local fire brigades and the state of México, as the 911 FUND works to support your efforts to help reduce firefighter risk, enhance civilian health and safety, and minimize property loss from fires and other types of emergencies.

*section 1*

**Identification and Quantification of Risk**



FCM and ProBosque, working in collaboration with the twelve municipalities in the state of México (Almoloya de Alquisiras, Coatepec Harinas, Ixtapan de la Sal, Malinalco, Ocuilan, Sultepec, Tenancingo, Texcaltitlán, Tonatico, Villa Guerrero, Zacualpan and Zumpahuacán) have much to be proud of in their efforts to equip local firefighters, enhance emergency medical and forest fire prevention and response throughout this Region, and lay a foundation for future training in these and related areas.

While current staffing, forest fire prevention and response protocols in the Region emanate from a combination of perceived need and historical experience, they are impacted by complex political and economic factors. In the current configuration:

- ProBosque provides basic firefighting equipment and deploys ten-man brigades of full and part-time paid firefighters who respond to forest fires on a Region-wide basis.
- The twelve municipalities supplement ProBosque personnel in their reliance on local volunteers who assist in fighting forest fires.
- The PMP in Malinalco provide basic medical supplies and emergency medical services (EMS) by four paid "paramedics." While the length or content of the training provided to these paramedics remains unclear, our understanding is that they work in two-man

teams on 24-hour tours of duty, respond to emergencies in Malinalco's only ambulance and perform diverse responsibilities including first aid, emergency medical response, pre-hospital care and related Civil Defense responsibilities in response to vehicle accidents, gas leaks, house fires, etc.

- FCM has supported these efforts by providing essential protective clothing for ProBosque personnel, community education and a range of other essential services.

While this configuration has accomplished a great deal, we believe that a more formalized structure is needed to address local and Regional needs. For the 911 FUND to maximize the assistance it can provide, a consensus must be reached among these municipalities, ProBosque, FCM and PMP as to their immediate need and the future allocation of resources. Such a consensus should be in alignment with the risks that exist, available staffing, resources and other Regional realities.

That said, the state of México has everything one would expect from a Region covering so large a geographic area that ranges from suburban to acutely rural environments, and includes numerous potentially high-hazard environments, which appropriately are of concern to everyone involved.

Located in the center of the country, most of the state of México consists of the Toluca Valley, with the eastern panhandle mostly defined by the Chalco Valley. With a territory of 22,499.95km<sup>2</sup>, the state surrounds the Federal District of México City on three sides (west, north and east), and is divided into five natural regions (the Volcanoes of the Valley of México, the hills and plains in the north, the western mountains, the Balsas Depression and the mountains and valleys in the southeast). The state's geography varies deeply, with the eastern portion dominated by the Sierra Nevada (with the Popocatepetl and Iztaccíhuatl volcanoes), the western portion dominated by the Federal District (with peaks such as Cerro de la Bufa and Monte de las Cruces), the southern portion dominated by the Toluca Valley, the northern portion with the Nevado de Toluca volcano, and the northwest portion dominated by the Sierra de San Andrés Timiplan.

Most of the state's rock and soil formation is of volcanic origin, there are three river basins (the Lerma, the Balsas and the Pánuco), a temperate moist climate throughout, and over 600,000 hectares in mixed pine forests.

Malinalco alone has 30,000 residents in an area of 186.28km<sup>2</sup>. In addition to its 35 archeological sites (Las Caritas, Los Diablitos, El Coyotito, Cerro de los Idolos, etc.), the Temple and ex-monastery of the Divino Salvador and the Doctor Luis Mario Schneider University Museum, arguably its most famous site is the famed village of Chalma that attracts millions of pilgrims and tourists each year.

The PMP in Malinalco have but one type II ambulance, staffed by the paramedics referred to earlier, with a second ambulance assigned to the Region's only hospital. ***Two ambulances are seriously inadequate for so large a geographic area***, since they are routinely unavailable when committed to a prior emergency, are transporting accident victims the long distances to the hospital, or are out-of-service for repairs. Given its topography, numerous

vehicle accidents and bus rollovers (with upwards of 30 victims) are not uncommon. Malinalco also suffers from hundreds of forest fires per year, in addition to other fires caused by faulty electrical equipment, neglect of candles and fireworks, and other reasons. Wedged between the Trans-Mexican Volcanic Belt and the Sierra Norte, volcanic eruptions in and around Malinalco are also ever present, and response capabilities to these and other emergencies are seriously limited by a shortage of equipment, apparatus, lack of training and limited personnel resources.

Given the prevalence of the natural and man-made disasters described above, any discussion of multi-hazard emergency and response planning must include pre-disaster mitigation (PDM) planning which, while a topic of interest, appeared to be lacking and is an important topic for future development. As it relates to any type of disaster, while it may be difficult to calculate "damages avoided," PDM planning results in significant net benefits to everyone involved by reducing future losses and hazard-related expenditures.

While excellent work is underway in coordinating emergency response to disasters that have previously occurred and will undoubtedly occur in the future, we see the need to formalize these activities by developing a plan to prevent (where possible) and cope with the effect of larger scale disasters, and to promote and coordinate actions in public institutions, municipalities and the private sector to enhance prevention, mitigation, response and rehabilitation within those communities potentially affected by any emergency.

It's impossible to create an exhaustive list of everything that could be done to prepare for a disaster, but preparing to the best of our abilities makes virtually any disaster far less devastating. We believe, therefore, that it's imperative for the state of México to continue building its capacity to preserve, maintain and reconstitute its ability to function under the threat or occurrence of *any* disaster that has the ability to disrupt life as it is known.

Recognizing that leadership is never put more strongly to the test than in a crisis situation where the objectives are immediate and so are the results, we applaud the recognition that complacency is not an option, and that denial could be deadly. That said, local municipalities, under the guidance of ProBosque, need to think about emergency management, and the cascading effects resulting there from, by focusing their combined efforts on strengthening their mitigation, preparedness, response and recovery abilities, while becoming sensitive to the subsequent chain reaction that occurs post-event.

We recommend, therefore, that ProBosque undertake a full-blown risk-based review of the hazards facing the Region. Once completed, such a review would form the basis for long-term all-hazards strategic planning. By identifying current and potential risks within the Region, ProBosque and others would be better able to develop a continuity of operations plan that should include:

- Evaluation of the effectiveness of current prevention programs and response capabilities, and development of standards, policies and procedures to address both prevention and intervention.
- Determination of resource requirements needed to meet current and prospective needs.

- Initiation of multi-year planning whereby emergency and response planning on the local level works seamlessly with national response protocols, with the society-at-large being educated in disaster prevention, response and recovery.
- Affirmation that these are living protocols to be periodically updated as need and experience dictate.

As ProBosque has grown and expanded its services, so too must it expand and diversify the skills of all firefighters, be they paid or volunteer. Advancing public safety through fire prevention, investigation and education, skills enhancements are needed in the following areas:

- Firefighting (both wild land and structural)
- Medical emergencies
- Fire prevention (inspection, education, enforcement and evacuation)
- Fire investigation (arson, cause/origin, intelligence, law enforcement and site security)
- Transportation incidents (land, air, rail and water)
- Catastrophic weather events (floods, earthquakes, severe climate changes, etc.)
- Special events planning and response (especially where large numbers of people are in attendance, with the added threat of mass casualties, which makes these events take on a whole new dimension and makes them no longer routine)

In addition, we recommend that ProBosque, FCM, PMP and these municipalities (hereinafter referred to as "the parties to this report") look to:

- Improve Emergency Response Operations by:
  - Enhancing their overall preparedness to respond to fires, emergencies and disasters.
  - Implementing initiatives to improve overall system performance, operational coordination, resource deployment and service delivery of pre-hospital emergency medical care.
  - Developing a system to provide incident commanders with on-scene critical information, enhance emergency response and provide a safer operational environment.
  - Extending and enhancing training for new recruits.
  - Developing training initiatives to ensure the maintenance and sustainability of core competencies and newly acquired specialized skills for all firefighters.
  - Developing a continuity of operations plan that in the event of an emergency or threat of an emergency, ensures the continuation and uninterrupted delivery of critical services to the public as well as to other agencies and local organizations.
- Strengthen Management and Organizational Development by:
  - Implementing a performance management system for mission-critical functions.
  - Developing rank-specific training for officers.
  - Developing a Region-wide communication strategy utilizing available and relatively inexpensive technologies.

- Improve Fire Prevention and Fire Safety Education by:
  - Enhancing and developing additional fire prevention and educational outreach programs to make communities safer.
  - Implementing new safety requirements and evacuation plans in case of major emergencies.
  - Integrating fire prevention with community safety education programs and expanding the message to include other safety topics.

## *section 2*

### Training

It's our understanding that while firefighters working for ProBosque participate in a formal (albeit limited) training program, volunteer firefighters from the surrounding municipalities receive even less training. It's urgent, therefore, that expanded training be introduced to reinforce current and build new skills. Didactic and hands-on instruction in fire prevention, firefighting, in responding to events involving hazardous materials, in special operations, leadership training, instructor development, pre-hospital care, etc., all need to be expanded.

As it relates to leadership training, increased familiarity is needed with the Incident Command System (ICS). ICS is a standardized on-scene emergency management protocol designed to allow its users to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries. While ICS training is incremental and there are different ICS courses (level 100, 200, 300 and 400), the good news is that much of this material is now available in Spanish. In addition, organizations like the National Fire Protection Association (NFPA) and the National Wildfire Coordinating Group (NWCG) have additional wild land course material available in Spanish as well, at little or no cost. The US government, through organizations like the United States Agency for International Development (USAID), has also made safety information on EMS, PPE, SCBA and a range of other wild land topics available in Spanish.

Integral to the above is an understanding of the National Fire Danger Rating System (NFDRS), which helps estimate current fire danger for a specific area based on fuels, topography and weather, commonly called the "fire triangle." The NFDRS rates the potential growth and behavior of forest fires, which serves as a guide for initiating pre-suppression activities as well as the appropriate level of initial response to a reported fire, while linking an organization's readiness level to the fire problems of the day.

An understanding of ICS, the operation of the NWCG, the NFDRS, access to relevant portions of material in Spanish, and how these and other topics are infused in courses adapted to Regional needs are important issues to be covered.

In this regard, we suggest introducing these and other topics through:

### **In-Service Training:**

Repeatedly told that additional training was needed, we see pre-service training, in-service training, refresher training, multi-unit drills (cross-brigade and cross-municipality) and large-scale exercises as a critical need that must be addressed.

Skills must be maintained through a combination of practical experience, classroom, hands-on and refresher training. Firefighters must be proficient at assessing a situation, formulating an intervention plan and implementing that plan within minutes, if not seconds. If a plan is less effective than hoped for, and/or if other variables are introduced (e.g., embers ignite ancillary fires in less accessible locations), firefighters must quickly know it, change direction and return to work. These skills can only be learned by training and practical experience, or it will cost people their lives.

We understand full well that in most cases, volunteer firefighters are often employed in their communities, on farms, etc., and are called upon as needed to perform firefighting duties. That being the case, creative ways should be developed to bring instructional resources to the municipalities, and to bring volunteer firefighters to ProBosque for training whenever possible.

In addition, *all* firefighters should be required to participate in mandatory in-service and refresher training on a periodic basis on topics to include size-up, fire attack, search and rescue, ICS, etc. This is especially true for firefighters who respond to fires on an infrequent basis, as well as for those who (for medical or other reasons) have been "off-line" for an extended period.

Training must be ongoing, repetitious and as realistic as possible, without compromising safety. Since firefighting is often chaotic, especially when working in an unfamiliar environment, skills must be second nature. Important also is the need for brutally honest brigade-based reviews of each incident to assess the "lessons-learned" from interventions, then to adapt accordingly.

We encourage the parties to this report and every firefighter on an individual basis to adopt the credo of the New York City Fire Academy, displayed in large letters and which says with irrevocable conviction above its entranceway: *"Let No Man's Ghost Return To Say His Training Let Him Down!"*

### **Basic and Specialized Training:**

While the ultimate goal of fire departments worldwide is largely the same, it appears as if some of the methods used by ProBosque differ from those used by volunteer firefighters in the state of México to achieve these goals. We recommend, therefore, that standardized training be given in the following areas:

- Firefighter Removal: Firefighter safety is an extremely important topic. Removal techniques for injured firefighters are an essential area to be stressed since a "down firefighter" may be the result of a medical condition, and/or a fire-related injury.
- Special Operations: Breaking and breaching, collapse operations, heavy rigging, shoring and cribbing, torch operations, trench rescue and void search.
- Miscellaneous Topics: Communication on the fire ground, hoselays, monitoring of firefighters during operations, ropes and knots, search techniques, MCI's, SCBA procedures, physical fitness, etc. All of these require minimal equipment and must be mastered before any emphasis can be placed on advanced training.

### **Drills and Progress Reports:**

There appears to be no tracking or evaluation mechanism to demonstrate the skills mastered by new recruits. Progress reports and ongoing drills should be mandated for new firefighters for at least their first year of service. These drills should review operations at fires, tool usage, strategies and tactics, etc., and ProBosque, for their own use, as well as the local municipalities, should:

- Publish a (daily or periodic) drill schedule to ensure that skills learned are maintained.
- Introduce an Annual Training Day where firefighters return for refresher training.
- Have the ability to mandate training when new equipment, apparatus, policies or procedures are introduced.

### **Officer Training:**

Officer training is needed for newly promoted officers. Training in officers' roles and responsibilities, in administrative and operational matters, decision-making, problem solving, in-unit training, etc., are required of officers everywhere, and should be introduced as an ongoing part of the training they receive.

An important component of officer training and responsibility is the need for an in-depth understanding of ICS, since the accountability or ICS currently in place is vague at best. The first step in accountability and the use of ICS is to ensure that everyone speaks a common language and understands the command structure. Second should be a simple rostering of brigades and volunteers with this information provided to incident commanders at the fire scene.

Incident Command (IC) and safety coordination, particularly during an emergency, coupled with the strategies and tactics required to successfully manage a dynamic fire or other type of emergency must be developed, and several senior personnel expressed the need for skill development in this area. Understanding and comfortably working with IC and ICS is critical if all parties are to have appropriately trained officers capable of meeting the ever-increasing operational demands placed upon them. Effective role-related training is essential when maintaining operational capability and ensuring the health and safety of firefighters and other emergency service personnel.

Concern was also expressed that officers at the Tactical and Strategic Command level need additional training to maintain competence in this area. While admittedly a serious challenge given the diverse responsibilities of leadership, is the need to integrate current and aspiring officers while meeting current and future demands. It is *strongly* recommended, therefore, that an assessment of ProBosque's ICS capability be undertaken, with additional training introduced to improve operational leadership at all command levels.

Officer training at all command levels is critical to the maintenance of effective risk assessment, decision-making, planning, objective setting, prioritizing and reviewing the practical outcomes of emergency interventions. Officers must have a clear understanding of their roles and responsibilities at incidents, together with an understanding of ICS principles and how to safely maximize personnel and other resources during a major emergency.

### **Instructor Development:**

Akin to the logic that a good teacher doesn't necessarily make a good principal, a good firefighter doesn't necessarily make a good instructor. That said, instructor development should be introduced. How to teach the adult learner, developing questioning techniques, giving lectures, demonstrating skills, encouraging interactive activities, etc., are important skills to be learned, and correlate directly with instructional outcomes.

Excellent training is nothing without an excellent trainer. Trainers must be confident in their skills, words and their body language, the effect of which is to help persuade participants to trust both the instructor and the material being presented. Instructor development designed to teach training skills is especially important for those who are called upon to develop and conduct training on an occasional basis.

To maximize the number of firefighters who participate in future training, we also suggest that future training be delivered in a train-the-trainer format, thereby increasing the instructional pool while enhancing the skills of ProBosque and municipal firefighters to "hand down" the skills they are taught to the various brigades and municipalities.

### **Instructor and Course Evaluations:**

Instructor and course evaluations (completed anonymously and submitted to ProBosque for review and follow-up) should be introduced to ensure that instructors are performing well, materials are being effectively taught, and courses provide meaningful information in response to ongoing needs and priorities (see Appendix B for a sample Course/Instructor Evaluation).

Even with the understanding that most firefighters are volunteers, ProBosque should introduce annual firefighter and officer performance evaluations to ensure that personnel are meeting acceptable standards. Thereafter, it is the responsibility of ProBosque's leadership to ensure that performance evaluations are conducted in a fair and dispassionate manner, and become one of several factors when considering an individual for promotion.

*section 3*  
**Apparatus**



ProBosque has a single fire truck, pictured above, which we saw the very last day of our trip at ProBosque headquarters. Although the truck is approximately three years old, its use has been quite limited and its been driven very few miles. The hose on the truck was new; the truck didn't have much of a hose complement; it had only one nozzle; and it was lacking hose clamps, wyes, tees or other hardware commonly found on pumpers in the US.

ProBosque indicated they're scheduled to receive additional trucks in the future, contingent upon funding, but no timeframe for their purchase or anticipated delivery was given. We see the acquisition of additional apparatus as essential, which is an area where we hope we can help.

In addition to fire trucks, among the apparatus that was absent but is very much needed are firefighting bulldozers, especially those with enclosed cabs with SCBA/SABA capability. Also needed are bulldozer tenders and possibly other types of support vehicles, such as backhoes or front-end loaders.

**Apparatus and Equipment Maintenance:**

Firefighters should be expected to perform regular apparatus and equipment maintenance, the effect of which is to enhance general preparedness while helping ProBosque and the surrounding communities in their efforts to protect the public, and the lives of firefighters.

**Apparatus Procurement:**

It's our belief that apparatus procurement should be collaborative and proactive. That said, the types of incidents and emergency scenarios that firefighters are trained to deal with must correlate with the type of apparatus available to them.

A study should be undertaken to determine the recommended number and types of fire trucks needed, as well as what their specific functions should be. Brush trucks, water tankers, pick-up trucks or ATVs equipped with skid units (see [Appendix C](#)), bulldozers, front-end loaders, support vehicles, etc., their response areas, lifespan, replacement schedules, etc., are all factors to be considered. We also recommend that a tracking system be instituted to ensure that ProBosque and the surrounding communities know the location and availability of apparatus at all times, with spare apparatus strategically placed in areas known to have the greatest workload.

*section 4*  
**Tools and Equipment**



Based on our observations and what we were told, it is clear that firefighters have minimal firefighting equipment and even less first aid equipment, few hand tools (axes, rounded point shovels, brush rakes, Pulaski's, McCloud's, drip torches, etc.), virtually no Personal Protective Equipment (PPE), eye protection, radios for communication on the fire ground, Indian or other wild land fire packs to carry water and safety gear, portable brush pumps or water tanks, jerry cans for fuel transport, fire blankets, come along tools, etc. While there is always an interest in going "high tech" in terms of the tools and equipment thought to be needed (e.g., Kestrel electronic wind and weather instruments), our sense was that "low tech" hand tools (such as those mentioned above) would be adequate and require very little maintenance.

Another major concern was the limited ability to hydrate firefighters on the fire ground, given the general unavailability of backpack hydration systems. To stay healthy, the human body must be adequately hydrated. While the optimum quantity of fluid to be consumed by firefighters varies based on an individual's physical condition, the local weather, terrain, equipment being used, etc., a good rule of thumb is that firefighters should drink 1 to 2 cups (240 to 480 ml) of water, juice or sport drink before beginning work, take regular fluid

breaks while on duty, and consume at least 1 quart (0.95 liters) of fluid per hour.

We see the acquisition of additional tools and equipment, the need to constantly hydrate firefighters and the lack of water on the fire line as major concerns, which are areas where we hope to be of help,

## *section 5* **Operations**



Several notable strengths that we observed include the strength and depth of the leadership team within ProBosque, their commitment to firefighter safety, to a culture of working in close collaboration with the different municipalities and community organizations, an established system of both paid and volunteer fire brigades, an established communication system (albeit limited), use of fire lookout towers, and of greatest significance are the many dedicated, competent and experienced personnel with whom we met.

From an operational standpoint, however, there are several challenges facing ProBosque and the surrounding communities that must be discussed. Some of these challenges are created by a general lack of accountability on the fire ground, others are organizational in nature in terms of the informality with which communities respond to fires, and some reflect the age-old fire service tradition that "this is the way we've always done it."

Specific weaknesses that we observed include:

- Limited information and predictive services about the weather. (ProBosque's positive relationships with other organizations should be expanded to include national and local weather forecasting organizations, with weather forecasters invited to fire behavior training to increase knowledge on both sides and enhance communication.)
- Limited predictive services for intermediate and advanced fire behavior, including calculations of fuel moisture monitoring.

- Limited training in IC, firefighter safety, survival training, strategy and tactics, equipment maintenance, engine and pump operations, use of water as a firefighting tool, emergency first aid, etc.
- Basic fire control, which consists of constructing fire lines by hand and using direct and indirect control tactics, including the use of fire to remove unburned fuel between fire lines and the fire. The current lack of basic fire control results in considerable effort being spent on containing fires, as opposed to extinguishing fires.
- Command and control.
- Fire investigation.

Operational emphasis for firefighters should be to provide them with a safer and more effective work environment. Using predictive tools is one step to achieving this goal, and facilitating a cooperative relationship between ProBosque and weather forecasters will provide better information for firefighters and improved strategies and tactics when fighting forest fires.

Firefighter safety can also be improved through an enhanced understanding of the 10 Standard Firefighting Orders, 18 Watchout Situations, and the Downhill Checklist, important for firefighter safety when fighting wild land fires, all of which are defined in *Appendix D*.

#### *section 6* **Water Supply**

In addition to a general lack of drinking water for firefighters, another significant concern was the lack of water available on the fire line. Having repeatedly been told by firefighters that they are unable to extinguish fires, it appears as if firefighters can only use water as a tactical control method to minimize or prevent fire spread. That said, access to water to extinguish fires is not fully considered, and we see the need to develop procedures regarding how best to utilize water in whatever quantity is available.

Strategically located water supply can be provided by rain water collection systems, portable or prepositioned UPF Rotoplas-type water storage tanks, municipal water tankers brought to an area near the fire ground, etc., which can help address this problem. Other inexpensive options include portable water tanks, above ground pools, fixed storage tanks including fuel tanks buried in high fire danger areas, folding water tanks or flexible framing arrangements that can quickly create temporary water containment systems. Folding water tanks and flexible framing systems are easy to assemble, don't require extensive grading or surface preparation, and provide water storage for hundreds or thousands of gallons for firefighting operations.

Water is an important tool for firefighters. We suggest, therefore, that at least one brigade be trained in engine and hoselay operations on a test/pilot basis. We could train this brigade and operationalize this approach during an upcoming training, and if interest exists in this approach thereafter, we could train others.

Limited access to a dedicated water supply for firefighters on the fire ground is a serious problem. From a Regional growth perspective, this problem will not get better on its own, and if left untreated, has great potential for civilian and firefighter loss of life.

*section 7*

**Dispatch, Communications and the need for an EOC**

A number of challenges are prevalent in this area, not the least of which is the fact that limited if any redundant or fallback control facilities could be activated during a major emergency. This being the case, we recommend:

**Dispatch and Communications:**

We encourage the adoption of a 911, 999 or other three-digit number dedicated exclusively for emergency calls, with the same number accessible from either a landline or a cell phone. Operators receiving these calls should:

- Be able to quickly ascertain the nature of the emergency.
- Route the call to the appropriate municipality.
- Stay on the line with the caller (e.g., if a child is calling) until help arrives.
- Be trained in emergency management protocols and be able to coach callers in basic first aid, CPR or related procedures.
- Have access to mapping and topographic information.

While we acknowledge that creating a system such as this brings new responsibilities and creates training, management and administrative issues, we believe that the benefits of such a system far outweigh these concerns.

**Emergency Operations Center:**

No EOC is operational or envisioned. With limited security at ProBosque and its dispatch facilities, the communication infrastructure and its personnel are at severe risk from an unexpected event such as a fire, larger-scale natural disaster or act of terrorism, which when combined, make the current resources a very soft target.

If ProBosque or local dispatch facilities were incapacitated, emergency services throughout the Region would suffer a massive disruption. Accordingly and as a matter of some urgency, it is strongly recommended that an immediate effort be undertaken to activate a secondary facility to serve in a redundant fashion as a fallback communication, command and control center.

Once established, this facility should be tested and exercised on a regular basis to ensure that clear lines of communication and control can be quickly re-established, and that all personnel understand why, when and how the activation of the fallback facility will take place.

*section 8*  
**Fire Lookout Towers**



The use of Fire Lookout Towers should be expanded. The commitment to staffing these towers to search for wildfires is commendable. Appropriately located on the highest vantage point to maximize the viewing distance and range, the lookout can see any trace of smoke that may develop, then summon firefighters to the fire.

To assist fire lookouts in pinpointing the location of a fire, a device similar to an "Osborne Fire Finder" (pictured below) should be built to reliably direct fire crews to the location of a fire. Placed on a table at the highest point of the Lookout Tower, the system is composed of a weather-proof topographic map of the area that's oriented and centered on a horizontal table with a circular rim graduated in degrees (and fractions). Two sighting apertures are mounted above the map on opposite sides of the ring and slide around the arc.

The device is used by moving the sights until the observer can peek through the nearer sighting hole and view the cross hairs in the further sight that is aligned with the fire. The lookout notes the degrees on the graduated ring beneath the sight, thereby providing the elevation of the fire, as well as the distance and position of the fire in relation to distinctive terrain features and by use of the scale on the map.



An even superior method of identifying the location of a fire is by having two or more Lookout Towers use the intersection method to fix the precise location of the fire. Using the same map at dispatch, dispatchers can then note the location of the fire and assign firefighters as needed.

It would be extremely helpful if the lookouts assigned to Lookout Towers were also provided with high-power zoom binoculars with which to spot fires in remote locations.

*section 9*  
**Mutual Aid and Interagency Operations**



The relationship between the parties to this report, local hospitals, medical clinics, utility companies, etc., need to be expanded, the goal of which, in any emergency during which many

of the above play a role, would be to enhance firefighter and public safety. The mutual aid system should be one of seamless interoperability. To the extent that such a system doesn't fully exist, a mutual aid agreement must be developed, periodically reviewed and updated to ensure its accuracy. Developing reliable mutual aid programs is a complex and ongoing challenge, and should (at a minimum) reflect each participant's capabilities in the following areas:

- Animal health emergency support
- CBRNE detection
- Citizen preparedness and participation
- Citizen protection and evacuation
- Critical infrastructure protection
- Economic and community recovery
- Emergency public information
- Environmental health
- EOC management and operation
- Facility management
- Firefighter health and safety
- Firefighting operations and support
- Information gathering and recognition of indicators and warnings
- Interoperable communications
- Isolation and quarantine
- Mass care/prophylaxis
- Medical supplies management and distribution
- Onsite incident management
- Risk management
- Structural damage and mitigation assessment
- Triage and pre-hospital care
- Volunteer management

Formal mutual aid arrangements enable participants at all levels to coordinate preparedness activities more effectively, spread costs, pool resources, distribute risk, and thereby increase the overall return on investment. We also recommend that an ongoing program of expanded joint training, drills, large-scale exercises and strategic personnel exchange be introduced, and that familiarity with and training at major commercial sites also be initiated to enhance communication and collective preparedness. *Practice makes perfect!*

In furtherance of these efforts, ongoing coordination must also be maintained with the various PMP's throughout the Region to develop an all-hazards preparedness policy that will define the responsibilities and resources to be brought to bear in any type of emergency. A standardized set of concepts would allow for effective, efficient and collaborative incident management at all levels and at any emergency.

A unified command system should also be developed when multiple agencies are involved and incident jurisdiction has the potential of coming into play (e.g., during a major event

involving police, fire and medical personnel), or when incidents cross political or geographic jurisdictions.

*section 10*  
**Community Fire Safety**



Among the most impressive programs introduced by ProBosque is its program of fire safety education, which merits special recognition for its ingenuity and positive contributions to community well-being.

Building on its efforts to teach basic fire safety education in schools and through other activities, ProBosque has introduced risk reduction and basic preparedness into the everyday lives of a large portion of the population. Children and adults alike are being taught about fire safety, which is an invaluable tool in fire prevention.

Community fire safety activity should be a core responsibility for each firefighter, and form an important part of their daily work routine. ***Every opportunity must be taken to promote fire safety education.***

ProBosque should consider expanding these efforts by establishing local Fire Councils as another tool with which it can enhance public safety, help manage resources, sustain environment quality, create a forum to address issues of concern and serve as a focal point for sharing ideas. The relationships and cooperation that exists between ProBosque, FCM and the local municipalities is an excellent foundation for the creation of Fire Councils. We suggest that these parties, in concert with relevant government agencies, local organizations and industry representatives, actively seek out other partners (such as farmer and environmental organizations, the church, concerned citizens, etc.) to form the basis of local Fire Councils, which could then be formalized with regularly scheduled meetings.

All told, the community education programs that exist are excellent. A similar commitment should be made to addressing other needs that are of equal importance.

*A continuing investment of time and resources in fire safety is among the best investments that could be made to reduce losses from fire and other emergencies.*

*section 11*  
Fire Cadets



Among the issues discussed was the need to develop a program for Fire Cadets, and we strongly encourage this discussion to continue.

Aimed at boys and girls between 12 and 18 years of age, all Cadet activities must be closely supervised by ProBosque or brigade personnel, with Cadets required to adhere to published standards of good conduct, while developing character and leadership qualities in a friendly and professional setting. The policies and procedures of the Fire Cadet program should be developed based on past Regional experience and the desires of program stakeholders, with the program providing youth with positive adult and peer role models in a safe and supervised environment.

Uniforms should be provided, and Cadets can come together on weekends to work and train in an organized format where discipline and the essential work of firefighters is emphasized. Instructors must be supportive, enforce the rules, and insist that all participants work and learn. The focus should be on firefighting, and when old enough, Cadets should have the opportunity become volunteer firefighters in their communities, or paid firefighters with ProBosque if the opportunity was to present itself.

Providing classroom training in fire prevention and fire safety education, as well as hands-on familiarity training with the equipment and apparatus used, Fire Cadets are provided with a unique first-hand look at the essential role that firefighters play in the community, with the program serving as an important avenue for future recruitment.

#### *section 12*

### **The Need for Expanded Dialogue with Government and Industry**

Fire protection has historically been a local responsibility. While each community has both static and dynamic conditions that are unique to itself, a system of fire protection that works well in one community cannot be assumed to work equally well in another. ***Fire prevention is the key***, and without intensive and ongoing local-level planning, any system of fire protection is apt to be ill suited to local needs.

Each community must balance acceptable risks with the need for adequate fire protection and reasonable financial costs. While major emergencies could easily overwhelm the capabilities of ProBosque and the surrounding communities, as a result, detailed cooperative plans for coping with major emergencies should be developed. Effectiveness can only be improved through pre-planning, joint training, familiarity with each other's day-to-day operations and some standardization of tools, equipment and response protocols.

Even with joint planning, however, expanded coordination should involve both the national government and local industry. While fire prevention, fire suppression and fire safety education should remain the responsibility of ProBosque, the national government, local municipalities and others should work collaboratively to expand regulatory responsibilities in these areas, as well as code enforcement and financial support for the invaluable services that ProBosque performs.

We recognize that government alone cannot satisfy all requirements and that industry must fulfill its responsibility when it is the beneficiary of services provided by firefighters who are called upon in time of need. Firefighters are a basic form of insurance. No one likes

paying the cost for this insurance, but they deeply appreciate having it in times of emergency. *In prevention we have cure*, and our hope is to strengthen industries awareness of the risks from fire, natural disasters and/or potential acts of terrorism.

By sharing information, identifying risks, performing vulnerability assessments, developing emergency response and business continuity plans, enhancing overall readiness, implementing appropriate prevention and protection programs, and by providing increased financial support for ProBosque, industry can dramatically assist their community both by being an employer, and in helping respond to and recover from an emergency.

*section 13*

**Topics for Further Discussion / Short-Term Timetable of Proposed Activities**

We begin this section by stating what hopefully is obvious, namely, that we are prepared to elaborate on any of the information provided in this report, and/or to provide additional material on the topics discussed or other topics of interest.

As we move to expand the relationship between the parties to this report and the 911 FUND, a component of our future discussions must include the need to develop collateral relationships with:

- Airlines (such as Aero Mexicana, Amait, Interjet, Volaris and others), who could be called upon to support joint training efforts by providing transportation for 911 FUND personnel (SME's who are prepared to donate their time and expertise to provide training on the topics discussed), or for ProBosque staff and/or others to be trained in the United States or other countries.
- Domestic and international shipping companies who could be called upon to provide transportation of donated apparatus and/or equipment.
- Hotels to provide accommodations for 911 FUND personnel who come to México to provide training.

We welcome your thoughts in all of the above areas. In addition and as it relates to a specific timetable for future 911 FUND support of the parties to this report, the following is proposed:

**+/- 1 June 2011:** That recipients of this report provide a detailed response to our observations and recommendations, to include but not be limited to an identification of their future priorities and how the 911 FUND can be of assistance in your efforts to achieve these goals.

**+/- 1 July 2011:** An initial donation from the 911 FUND of one or more 40' (12-meter long) containers of medical supplies for distribution where you determine the greatest need exists (see **Appendix E** for a listing of the medical supplies and personal care items available for immediate donation). We are prepared to also include in this

container firefighting equipment (including PPE, SCBA, hose, hand tools, etc.) in keeping with the issues discussed.

+/- 1 October 2011:

A maximum of six senior firefighters (all of whom are SME's, many of whom would be Spanish-speaking, with the actual number to be determined by the subjects and number of personnel to be taught) from the US to visit the state of México to provide approximately one week of training at ProBosque and/or other locations.

Two different training models are proposed. One model would be a train-the-trainer format, and the second model would involve training an entire brigade as a single operational entity. Both models would be evaluated for their effectiveness and depending on their success, modified accordingly in future training activities.

The training we propose would include some or all of the following topics:

- For officers, managers and supervisory personnel, intensive training on developing predictive services to fight forest fires. (See Appendix F for a brief course outline on developing predictive fire behavior systems.) Training would focus on fire behavior, fire ground decision-making and situational awareness, accessing real time weather through the creation of a meteorological prediction system, firefighter survival and accountability on the fire ground, ICS, size-up, identifying potential fire ground-related risks, weighing the benefits of a chosen strategy and tactics prior to committing personnel to operate in dangerous environments, etc. Case studies of fire fatalities and serious injuries in the US would be reviewed, including lessons learned from the South Canyon fire that killed 14 firefighters. (This event combined downhill firefighting with predicted weather changes that weren't fully communicated to firefighters on the ground, which we see as being extremely relevant given the firefighting protocols we observed in the state of México.)
- Practical/operational skills and tool usage for firefighters, including progressive hoselays, mobile attack, use of and access to water (drafting, tankers, air drops, etc.), meteorological information, pump operations, tools and specialized equipment, mop-up, live fire training, etc.
- The LCES program, as well as the 10's, 18's and downhill checklist (see Appendix E), along with an overview of the importance of fire prevention and fire safety education,

awareness information on fire hazards, flammable materials, candle safety, electrical safety, the dangers of carbon monoxide, use of fire extinguishers, exit planning, etc.

- Emergency first aid, victim stabilization, tagging and packaging patients, trauma, dealing with crush injuries, etc.
- Instructor development as we move to implement a train-the-trainer model throughout the Region.
- Creating Community Emergency Response Teams (CERT), the purpose of which is to educate community residents who are **not** firefighters about disaster preparedness for hazards that may impact their community. CERT provides training in basic disaster response skills including fire safety, light search and rescue, team organization and disaster medical operations. Using the training learned in classroom settings and during exercises, CERT members support emergency response agencies by taking a more active role in emergency preparedness projects in their community by assisting within their community following an event until such time as fire, police, medical personnel and other responders become available to help.

+/- 1 January 2012: Donation of additional firefighting equipment, medical supplies, fire apparatus, ambulances and/or training, including at least one large-scale full-day simulation for senior officers from multiple agencies.

While these activities are underway, the 911 FUND, ProBosque and others can discuss future training and timelines for additional donations as we execute a Convenio that would outline the terms, conditions and formal nature of an ongoing relationship between our organizations.

As we discussed, the conditions under which the 911 FUND makes donations of equipment, apparatus and/or training are as follows:

1. Nothing that the 911 FUND donates can be sold.
2. The 911 FUND neither requests nor accepts any payment whatsoever for its services.
3. The recipient, or a sponsor, is responsible for all shipping costs for donated equipment and/or apparatus.
4. When training is provided, the recipient, or a sponsor, is responsible for airline tickets, hotel (or similar accommodations) and meals for 911 FUND instructors, as well as access to appropriate facilities in which to provide training.

*section 14*  
**Conclusion**

Much like emergency first responders the world over, the core values of ProBosque, the twelve municipalities in the state of México, the PMP, FCM and others we whom we met, include:

- **Service:** An unwavering call to protect and serve.
- **Bravery:** The ability to overcome fear through fortitude, instinct, compassion for others and training.
- **Safety:** To keep citizens free from danger by providing the best equipment and training to reduce risk to the public and its members at fires and other emergencies.
- **Honor:** The enormous commitment necessary to perform tasks that require excellence of character, inspire each other through pride, and acknowledge that every action reflects on each member of ProBosque and each of the related organizations, both past and present.
- **Dedication:** A commitment to the objectives of the mission of ProBosque, the twelve municipalities, the PMP and FCM as part of their codes of conduct in the faithful observance of duty, and calls on everyone to fulfill their obligations professionally and honestly.
- **Preparedness:** By combining all of the components of their core values, ProBosque, the twelve municipalities, the PMP and FCM maintain a constant state of readiness to meet all threats and challenges, traditional and new.

*The single greatest asset of the Republic of México continues to be its uncommonly dedicated men and women, both uniformed and civilian. We applaud your efforts to reduce firefighter risk, enhance civilian health and safety, and minimize property loss from fires and other emergencies. The 911 FUND is privileged to be of assistance.*



*Appendix A*  
**Acronyms**

ALS	Advanced Life Support
ATV	All-Terrain Vehicle
BLS	Basic Life Support
CBRNE	Chemical, Biological, Radiological, Nuclear and Explosive
CERT	Community Emergency Response Team
CPR	Cardio-Pulmonary Resuscitation
EMS	Emergency Medical Services
EOC	Emergency Operations Center
FCM	Fundación Comunitaria Malinalco
Haz-Mat	Hazardous Materials
IC	Incident Command
ICS	Incident Command System
IDLH	Immediately Dangerous to Life or Health Concentrations
LCES	Lookouts, Communication, Escape Routes and Safety Zones
MCI	Multiple Casualty Incident
NAHF	National Association of Hispanic Firefighters
NBC	Nuclear, Biological and Chemical
NFDRS	National Fire Danger Rating System
NFES	National Fire Educational Series
NFPA	National Fire Protection Association
NWCG	National Wildfire Coordinating Group
PASS	Personal Alarm Safety System
PC	Personal Computer
PDM	Pre-Disaster Mitigation
PMP	Policia Municipal Preventa
PPE	Personal Protective Equipment
ROPS	Restraint Operative Protective System
SABA	Supplied Air Breathing Apparatus
SCBA	Self-Contained Breathing Apparatus
SME	Subject Matter Expert
UPF	United Plastic Fabricating
US	United States
USAID	United States Agency for International Development
UTV	Utility Terrain Vehicle

*Appendix B*  
**Sample Course/Instructor Evaluation**

**EVALUACIÓN**

(A todos los estudiantes se les pide que complete un formulario de evaluación al final de cada clase y lo devuelva al instructor)

Curso Tomado: \_\_\_\_\_

Nombre del Instructor: \_\_\_\_\_

Su Rango: \_\_\_\_\_ Departamento de Bomberos: \_\_\_\_\_

Formato de Curso: Practica: \_\_\_\_\_ Sal: \_\_\_\_\_ Fuego en Vivo: \_\_\_\_\_

	<u>SI</u>	<u>NEUTRAL</u>	<u>NO</u>
1. <b>Estuvieron los objetivos del curso indica claramente:</b> Were the course objectives clearly stated:	_____	_____	_____
2. <b>El curso contribuirá a su conocimiento y habilidades?</b> Did the course contribute to your knowledge and skills?	_____	_____	_____
3. <b>En general el curso se reunió mis expectativas:</b> Overall the course met my expectations:	_____	_____	_____
4. <b>La duracion del curso fue adecuada:</b> The course length was adequate:	_____	_____	_____
5. <b>El instructor estaba bien preparado:</b> The instructor was well-prepared:	_____	_____	_____
6. <b>El instructor me hizo sentir comodo para hacer preguntas:</b> The instructor made me feel free to ask questions:	_____	_____	_____
7. <b>El instructor respondió a las preguntas delos estudiantes:</b> The instructor responded to student questions:	_____	_____	_____
8. <b>El instructor dio ejemplos claros:</b> The instructor's examples were clear:	_____	_____	_____
9. <b>El instructor pudo dar otras explicaciones cuando fue necesario:</b> The instructor was able to give alternative explanations when needed:	_____	_____	_____
10. <b>El instructor motivo a los estudiantes a participar:</b> The instructor encouraged students to participate:	_____	_____	_____
11. <b>El instructor hizo uso del tiempo eficazmente durante la clase:</b> The instructor managed class time effectively:	_____	_____	_____
12. <b>El curso fue lo que usted esperaba:</b> Was the course what you expected it to be:	_____	_____	_____
13. <b>Cree usted que este curso aumentará la capacidad de su departamento:</b> Do you think this course will increase your department's capabilities:	_____	_____	_____

14. **¿Cómo calificaría el nivel técnico de todo el material presentado:**

How would you rate the overall technical level of the material presented?

1	2	3	4	5	6	7	8	9	10
<b>demasiado simple</b>								<b>demasiado complicado</b>	
too simple								too complex	

15. **¿Cómo calificaría el instructor en las siguientes áreas:**

How would you rate the instructor in the following areas?

**Conocimientos Técnicos**

Technical Knowledge

1	2	3	4	5	6	7	8	9	10
<b>demasiado simple</b>								<b>con mucho conocimiento</b>	
too simple								very knowledgeable	

**Estilo Educativo**

Instructional Style

1	2	3	4	5	6	7	8	9	10
<b>pobre</b>									<b>excelente</b>
poor									excellent

16. **¿Qué te gusto más acerca del curso:**

What did you like most about the course?

17. **¿Qué te gusto menos acerca del curso:**

What did you like least about the course?

18. **¿Cómo podrías mejorar el curso para cumplir con tus necesidades:**

How could the course be improved to better meet your need?:

19. **¿Qué sugerencias tienes para los próximos cursos:**

What suggestions would you make for future courses?

*Appendix C*  
**Skid Units**

A Skid Unit is the common name used to refer to a light weight self-contained slip-on firefighting platform, designed for installation on vehicles such as pick-up trucks, flatbed trucks, off-road vehicles, trailers, All-Terrain Vehicles (ATV's) or Utility Terrain Vehicles (UTV's), any of which can easily be fitted with a proper size skid unit for a variety of firefighting and/or medical operations. Skids units are approximately 90" long, 48" wide, on welded steel beams and connected to the vehicle's electrical system.

Among the ATV/UTV off-road vehicles designed to carry a skid unit are the Polaris Ranger 4x4 or 6x6, Kawasaki Mule 4010, Kubota RTV 900, John Deere Gator 4x4 or 6x6, Buffalo 6x6 and many others.

There is virtually no limit to the size or performance capability of a skid unit. What is important, however, is to match the overall weight carrying capacity of the vehicle on which the skid unit is mounted for its rated cargo capacity. Fire operations can include rural field operations, forest fires and other situations in which a small, highly mobile vehicle is needed to reach the fire ground in rough or otherwise inaccessible terrain.

In their simplest form, skid units consist of a water tank and hose mounted on a self-contained platform. Skid units can be configured to hold as little as 50 gallons (200 liters) to over 200 gallons (800 liters) of water in an aluminum, steel, polypropylene or fiberglass tank. For forest fighting applications, skid units can be configured to hold axes, backpacks, bolt cutters, electric booster reels with up to 250' of 1" hose, fire extinguishers, firefighter clothing, fuel cans, gas-driven waterous pumps, gear bags, knives, lights, nozzles, radios, shovels, tool boxes, etc. For specialized applications, foam cells of various capacities can be included, as well as integrated foam injection systems to deliver Class "A" and/or "B" foam concentrates.

Skid units can perform the double duty of fighting fires and allowing rescuers to transport a medical victim out of the woods, or be configured exclusively for medical transport, like a mini-ambulance, carrying a full complement of medical gear and other fixtures like O2 holders, IV poles and designed to carry a medical attendant to accompany a patient being transported in a stokes basket or on a long board.

Given their compact and self-contained design, skid units are a versatile and cost effective tool that would be very well suited for the needs and terrain of the state of México. Pictured below are several examples of commercially available relatively inexpensive slip-on skid units. Given the skills of many of the people with whom we met, we see no reason why a locally-produced customized skid unit couldn't be built for use by ProBosque and/or the local municipalities.





## *Appendix D*

### **10 Standard Firefighting Orders, 18 Watchout Situations and the Downhill Checklist**

The original 10 Standard Firefighting Orders were developed in 1957 based on records of numerous tragic fires that occurred between 1937 and 1956. Shortly after the Standard Firefighting Orders were incorporated into firefighter training, the 18 Watchout Situations were developed. If firefighters follow the 10 Standard Firefighting Orders and are alerted to the 18 Watchout Situations, many of the risks of firefighting can be reduced.

#### **10 Standard Firefighting Orders:**

1. Keep informed on fire weather conditions and forecasts.
2. Know what your fire is doing at all times.
3. Base all actions on current and expected behavior of the fire.
4. Identify escape routes and safety zones and make them known.
5. Post lookouts when there is possible danger.
6. Be alert. Keep calm. Think clearly. Act decisively.
7. Maintain prompt communications with your forces, supervisor and adjoining forces.
8. Give clear instructions and insure they are understood.
9. Maintain control of your forces at all times.
10. Fight fire aggressively, having provided for safety first.

#### **18 Watchout Situations:**

1. Fire not scouted and sized up.
2. In country not seen in daylight.
3. Safety zones and escape routes not identified.
4. Unfamiliar with weather and local factors influencing fire behavior.
5. Uninformed on strategy, tactics or hazards.
6. Instructions and assignments not clear.
7. No communication link with crewmembers/supervisors.
8. Constructing line without safe anchor point.
9. Building fire line downhill with fire below.
10. Attempting frontal assault on fire.
11. Unburned fuel between you and the fire.
12. Cannot see main fire, not in contact with anyone who can.
13. On a hillside where rolling material can ignite fuel below.
14. Weather is getting hotter and drier.
15. Wind increases and/or changes direction.
16. Getting frequent spot fires across line.
17. Terrain and fuels make escape to safety zones difficult.
18. Taking a nap near the fire line.

#### **Downhill Checklist:**

Downhill fire line construction is hazardous in steep terrain, fast-burning fuels, or rapidly changing weather. Downhill fire line construction should not be attempted unless there is no tactical alternative. When building a downhill fire line, the following is required:

- Crew supervisor(s) and fire line overhead will discuss assignments prior to committing

crew(s). Responsible overhead individual will stay with resources until the job is completed.

- Decision will be made after proposed fire line has been scouted by supervisor(s) of involved crew(s).
- LCES will be coordinated for all personnel involved.
  - Crew supervisor(s) is in direct contact with lookout who can see the fire.
  - Communication is established between all crews.
  - Ensure rapid access to safety zone(s) in case fire crosses below crew(s).
- Direct attack will be used whenever possible; if not possible, the fire line should be completed between anchor points before being fired out.
- Fire line will not lie in or adjacent to a chute or chimney.
- Starting point will be anchored for crew(s) building fire line down from the top.
- Bottom of the fire will be monitored; if the potential exists for the fire to spread, action will be taken to secure the fire edge.

References: Incident Response Pocket Guide, published by NFES 1077, January 2010 (<http://www.nwccg.gov/pms/pubs/nfes1077/nfes1077.pdf>)

*Appendix E*  
**Proposed Contents of 40' (12-meter long) Containers of Medical Supplies and  
Firefighting Equipment**



Similar to our March 2011 donation of a 40' container (12-meter long) container of medical supplies and firefighting equipment to Cd. Juarez in México, the 911 FUND is prepared to commit up to ten 40' (12-meter long) containers of surgical and ambulatory medical supplies to the state of México under the conditions listed below.

The medical supplies that form the contents of each container are valued at roughly \$400,000 apiece, and a detailed inventory of each container would be provided to you for customs purposes.

As it relates to the medical supplies being donated, all of these supplies are new, in their original cartons and packed on pallets. No medications, chemical, flammable, combustible or hazardous materials are included, and each 40' (12-meter long) container holds approximately 22 pallets of medical supplies.

The following medical supplies and personal care items are available for immediate donation:

- Pulse oximeters, stethoscopes, heart rate monitors, defibrillators and thermometers
- Blood pressure cuffs and glucose meters
- Nebulizers and nebulizer kits
- Gauze, bandages, sutures, insulin syringes, tongue depressors and cotton tipped applicators
- Fluid resistant gloves and Isopropyl alcohol
- Suction catheter kits, pen needles and cannulas
- Sharps collectors and biohazard bags
- Cervical collars, and all types of supports (lumbar, elbow, wrist, ankle, athletic, etc.)
- Urostomy bags and drainable pouches

- Midwife kits and feeding pump sets
- Tracheostomy care kits
- Irrigation trays
- Wheelchairs, walkers, crutches, canes, transport chairs, transfer benches and backboards
- Surgical blades, gowns, cap, masks, wipes, etc.
- IV tubing and stopcocks
- Incontinence underpads, disposable adult briefs and folding commodes
- Safety rails for beds, pillow wedges, bedpans, basins and sitz baths
- Surgi-foam, ice packs, heating pads, pedal exercisers and bubble humidifiers
- Toothbrushes, toothpaste and Poligrip/denture cleaner
- Shaving cream, men's and women's razors, soap, shampoo and Q-tips
- Baby wash, Desitin baby cream, baby lotion, diapers, wipes, bottles and pacifiers
- Toilet and facial tissue

As it relates to the firefighting equipment (tools, hose, PPE, etc.) being donated and included in these containers, this equipment may or may not be new, but wherever equipment is used, it is in excellent working condition.

The 911 FUND makes these donations under the following conditions:

1. The 911 FUND neither requests nor accepts any payment whatsoever for the donations that we make.
2. None of the medical supplies donated can be sold, with the complete contents of the medical supplies in each container to be donated to a medical facility, not-for-profit organization and/or to the PMP in Malinalco to offset costs they are incurring for supplies they are purchasing.
3. None of the firefighting equipment donated can be sold, with all of the firefighting equipment in each container to be donated to ProBosque and/or brigades in the local municipalities to offset costs they are incurring for equipment they are purchasing.
4. The recipient, or a sponsor, is responsible for all shipping costs for the container(s) from our warehouse to the recipient(s).
5. The recipient(s), or a sponsor, is responsible to pay \$2,500 per container for "warehouse costs," which are the labor and equipment costs to sort the medical supplies for each donation, load and inventory each pallet, then load each container for shipment.

*Appendix F*  
**Course Outline for Developing Predictive Fire Behavior Systems**

**Objective:**

To provide ProBosque with the tools needed to predict fire behavior, with an emphasis on determining when weather and fuel conditions exist that could lead to hazardous fire behavior conditions. Use of these predictive tools improves firefighter safety and provides for more effective firefighting strategy and tactics.

**Introduction:**

At the present time, ProBosque has neither predictive tools nor systems to determine potential wild land or vegetation fire behavior. They do, however, have an experienced and dedicated staff with individual expertise gained through years of practical experience. While limited weather forecasting does exist, it's limited in distribution and provides only basic forecasting, including temperature highs, lows and wind information. No fuel moisture monitoring or real time weather information is available to firefighters.

Within the US wild land community, extensive fire behavior training is routinely provided in several class levels, each lasting one week or longer. There are also several fire behavior prediction models in use, including the Behave Program, the National Fire Danger Rating System (NFDRS) and FARSITE, each of which is used for a different purpose, as outlined below:

- The Behave Program is a PC-based program that describes fire behavior, fire effects and the fire environment, typically used as a planning tool for specific projects such as prescribed burns.
- NFDRS is a discrete training program used nationwide as a managerial and operational tool to predict fire danger. Dispatch levels, fire suppression strategy and tactics, and fire prevention strategies (signs, media alerts, patrols, etc.) are often determined by the NFDRS model. Proper interpretation of data available through NFDRS requires historical information and knowledge of fuel types and fire behavior in specific areas if one is to properly interpret program outputs.
- FARSITE is a fire growth model that includes information on topography, fuels and weather, typically used on active fires.

Since ProBosque does receive limited weather forecasting information and has excellent relationships with government and other agencies, we recommend that it develop a cooperative fire weather program applicable throughout the state of México. The first step in making this a reality is to train weather forecasters and ProBosque personnel in fire behavior so there is a mutual understanding of what is needed. The weather agency may even have automated weather stations which can assist ProBosque. While there will be an immediate benefit with any training provided (training will teach firefighters to measure relative humidity and then interpret the resultant fire behavior), it will take several years of data collection and interpretation to adjust the models to meet local conditions. Managers and supervisors should be the initial group to be trained, the outcome of which should be the development a framework for a future system. At the conclusion of the first

training, the recipients of this training should be close to the level of advanced fire behavior and oriented to the Behave Program. Using the Behave Program will then provide them with the tools to establish a system of weather and fuel moisture monitoring to begin predicting fire behavior.

Suggested Training:

Targeting a small group of ProBosque managers and supervisors, along with at least one meteorologist, provide an accelerated course in basic through advanced fire behavior. By the end of the course, participants should be able to:

1. Understand and be able to quantify the basic factors affecting fire behavior including:
  - Terrain
  - Fuel types
  - Fuel moistures
  - Wind speed
  - Wind direction
  - Temperature
  - Relative humidity
2. Understand how these factors affect fire behavior.
3. Utilize the Behave Program to quantify fire behavior forecasts including:
  - The potential that a source will ignite receptive fuels
  - The potential a fire has to grow into a large devastating fire
  - The resistance of a fire to control
  - The potential for spot fires to ignite over control lines
4. Utilize fire behavior training to assist in determining fire suppression objectives, strategy and tactics, and provide for improved firefighter safety including:
  - Identifying safe suppression tactics
  - Identifying fire line control locations
  - Reinforcing the need for escape routes and safety zones
  - Identifying the best locations for escape routes and safety zones

Insomuch as the training outlined above is normally four weeks in duration, for the course timeframe to be accelerated a minimum number of students should participate. In addition to a fuller understanding of fire behavior and the ability to more effectively forecast the potential impact of weather, at the end of the course students would be provided with Power Points presentations for future use when they are called upon to train others.

Summary:

The objective of this course is to provide ProBosque staff with additional tools for both tactical firefighting and planning purposes. While it may not be exactly as done in the US, by providing the above information it is believed that ProBosque staff will be able to use the information provided to more effectively respond to local needs and conditions. Firefighter safety is the ultimate goal of this course.

(5/30/11 telephone conference w/ Marie-Aimee & Ricardo)

Misunderstanding of role of certain institutions, esp ProBosque - not their role to coordinate civil protection; pg to be forthcoming

Can the report be divided into two parts: forest fighting & civil protection (which is everything else -- medical & other natural disasters)

Focus just on Malinalco & Chalma, not for all of Region 6 (which includes all 12 municipalities), for both forest fires & issue of civil protection

Three parties: FCM, ProBosque & Municipality of Malinalco: who shall I address it to in the Municipality?

< emphasis on PMP and > emphasis on Municipality of Malinalco which includes the PMP

Revised report with focus on two areas:

- Regional overview from the forest fire prospective
- Civil protection for Malinalco & Chalma
- Revised dates (6/15 comments to me; 7/1 my revised report returned to ProBosque, FCM & municipality of Malinalco; 8/1/ reactions to me following its review; 9/1 medical/ff donations to Mexican Red Cross; 11/1 firefighter training)

Laura is longtime friend of Mexican Red Cross regarding medical supplies; they want to be the POC for medical supplies; who should be contact?

- for ex, cotton & linen is barred for import into Mexico
- goal is to help Mexico thru Mex Red Cross, w/ commitment to benefit Malinalco, Chalma & the region
- OK to put ff'ing equipment in the same container