

## **Scope**

The purpose of this grant is to seek funding assistance from the Department of Homeland Security to improve the fire suppression capability of the Navajo Nation Department of Fire & Rescue Services by purchasing large diameter hoses, attack hoses (for compliance with voluntary standards, such as NPFA 1901), LDH appliances and tools, nozzles, foam concentrate, and foam application appliances.

## **Scope of Work**

The Navajo Nation Department of Fire & Rescue Services is a multi-service provider. The department provides fire, rescue and hazardous materials response and mitigation. Although the department performs EMS activity, it is only performed on a back-up basis when our sister organization, the Navajo Nation Department of Emergency Medical Services, is unavailable.

Services are provided from six fire stations located within the major growth communities of the Navajo Nation, who each have anywhere from 10-15 volunteer firefighters and one paid firefighter. From each fire station there exists a minimum of one fire truck (1250 gpm/1000 gallon) and one rescue unit (non-pumper). A station may have an additional fire truck, a tanker, a ladder or an ambulance. Total, the Navajo Nation Department of Fire & Rescue Services has 9 pumpers and 1 ladder.

## **The Navajo Nation**

The Navajo (Indian Reservation) Nation is the largest federally recognized Indian tribe in the United States. Its land base is over 27,000 square miles and extends into the States of Arizona, Utah and New Mexico. The Navajo Nation is larger than 10 of the 50 states in the United States, as such much of its land base is remote and isolated.

According to the 2000 U.S. Census, there are 180,000 residents residing on Navajo Nation tribal land, 168,000 are Navajo enrolled members, with the remaining being non-members who reside and work within the Navajo Nation.

Although the Navajo Nation has a large population base, the Navajo Nation Department of Fire & Rescue Services does not provide coverage to all. As previously noted, the Department of Fire & Rescue Services only services the major growth communities (six in all). Other fire departments, such as the Bureau of Indian Affairs (BIA), Township Fire Departments, and County Fire Departments cover other areas of the Navajo Nation.

For Navajo Nation land in New Mexico and Utah, fire protection is provided by the counties of those states, and no Navajo Nation Fire Departments exist. For this reason, the population we serve is much less than the population provided by the 2000 Census.

## **Problem Statement**

With such a large remote land base, limited fire suppression vehicles and manpower, the Navajo Nation Department of Fire & Rescue Services' loses property from fires, not only due to extended response times, but from inadequate equipment to combat fires.

For suppression activity, the Department of Fire & Rescue Services is still using conventional methods only – water application. Although effective for Class “A” fires, a structure fire on the Navajo Nation will require multiple refills from water sources far from the fire’s origin (anywhere from 1 to 30 miles). Fire apparatus of the Navajo Nation Department of Fire & Rescue Services do not have foam capability in terms of CAFS, around the pump proportioners, or in-line educators. To obtain effective use of water requires the addition of foam, which according to literature reduces the surface tension of water allowing it to absorb and penetrate better into ordinary combustibles. The use of foam will help in water use reduction, and provide quicker and more efficient fire control.

Within the Navajo Nation, there exist oil and natural gas pipelines and refinery stations, along with conventional hazards such as gasoline, service and propane stations, and highway transportation of flammable and combustible liquids and gases. These types of fires (Class “B”) require the use of a Class “B” foam, which again the department does not have, nor the equipment. Any flammable liquid fire will have to be fought strictly defensive, protecting any Class “A” exposure and allowing the fire to burn (adding to air pollutants).

When hydrants are available for a sustained water supply, it is policy to lay a supply line. Although a water distribution system is available, the average hydrant static pressure on the Navajo Nation is 50 psi with a residual of 12-20 psi. The Navajo Nation Department of Fire & Rescue Services still uses 2-1/2” hose (some use 3”) as supply line, with these hoses being over 15 years of age. To gain effective use of our water distribution system we should be using larger diameter hose (LDH), as recommend by water flow literature (i.e. Paul Shapiro).

For attack lines, the Department of Fire & Rescue Services uses a combination of 1-1/2” and 1-3/4” hose. Because of its reasonable cost, we have been able to buy hand-lines to replace the older and damaged ones. However we are unable to address the need of having spare attack hoses in order to re-supply a pumper after use. In essence, when spare hoses are reloaded, the recommended amount established by NFPA 1901 is not put on the pumper because we don’t have a good supply.

Last hose testing (for supply lines) were conducted in the year 2000. Because 1 in 4 supply hoses failed, and the department ceased testing of supply hoses on the fear that many will be lost. Because our hydrant pressure hardly exceeds 100 psi, the department felt pretty safe of not testing them in accordance with NFPA 1962.

As for foam use, our organization has yet to use it. This is because our fire apparatus do not have the equipment to make quality foam – foam eductors and nozzles. If a pumper has foam available they will batch mix it (dump it in the water tank). Not only does this ruin the pump, but also produces very poor quality foam.

As for appliances, the Department of Fire & Rescue Services will need new nozzles (we are still running old brass style that have odd shaped stream patterns), foam inductors,

hose adapters (for hydrant to pumper connection, or mutual aid pumper to Navajo Nation pumper connection, etc.), large diameter hose valves, and foam concentrate to improve the suppression capability of our department.

### **Local Impact**

By not having the minimum resources to suppress fires, the Navajo Nation Department of Fire & Rescue Services will continue to lose property from the inadequate use of the water distribution system and available technology (foam and low friction loss hoses).

In terms of oil and gas refinery, mutual aid will have to be called from major municipalities of the state (i.e. Phoenix, Flagstaff, Gallup, etc.) who have foam capability. Not only will there be a time delay from response, but the Navajo Nation economy might be affected.

### **Funding/Budget**

Services provided by the Navajo Nation Department of Fire & Rescue Services are done on a very small budget of \$740,865 for FY2005 (Note: this fiscal year we seen a slight increase, however in the grant application the average over 3 years is presented which is lower then this years budget).

- Personnel - \$443,046
- Travel (vehicle mileage/rental) - \$81,476
- Supplies (office, janitorial, uniforms, medical, parts, printing/binding, tires, etc. and some fire/rescue equipment) - \$66,100
- Lease/Rental - \$1,145.00
- Communication/Utilities (telephone, gas, electric, water, sewage) - \$13,500
- Repairs/Maintenance - \$27,500
- Contractual Services (training, such as CE, college registration fees and to pay for - contract instructor services) - \$30,340
- Special Transaction (volunteer insurance, some training and professional dues) - \$38,258
- Matching funds - \$40,000 (this was for our 2004 awarded grant).

As one can see, our budget is limited and has to accommodate 6 fire stations, 10 apparatus (9 pumpers, one ladder), 6 rescues, 3 ambulances, 60 volunteer firefighters and 10 paid staff, not leaving any room for equipment purchases.

It is estimated that the Navajo Nation Department of Fire & Rescue Services will need the following to meet the goal of improving fire suppression capability. These prices were obtained from Darley On-line. Although the prices from Darley are "marked up", they represent good ballpark figures as to the cost of the product with shipping.

20,000 feet of 4" supply hose at a cost of \$450.00 per 100 section = \$90,000

8,000 feet of 1-3/4" attack line at a cost of \$90.00 per 50 section = \$14,400

30 - 1-1/2 nozzles at \$850.00\* each = \$25,500

20 - 2-1/2 nozzles at \$850.00\* each = \$17,000  
10 – Pumper steamer valves at \$1,300 each = \$13,000  
10 – Hydrant valves at \$1500 each = \$15,000  
10 – LDH hose clamps at \$350.00 each = \$3,500  
10 – 2-1/2” gated Wye (1-1/2 discharge) at \$305.00 each = \$3,050.00  
10 – 2 way (2-1/2”) siamese with 4” storz at \$600.00 each = \$6,000  
60 (6 per pumper of various adapters) – Storz to threaded adapters (for LDH) at \$200.00 each = \$12,000  
20 – Foam Nozzles or Attachments at \$240.00 each = \$4,800  
20 – Foam in-line inductors (both 1-1/2 and 2-1/2) @ \$600 each = \$12,000  
200 – 5 gallon pales of Class “A” foam at \$75.00\* a pale = \$15,000  
200 – gallon pales of Class “B” foam at \$75.00\* a pales = \$15,000

\*Averaged together, i.e. foam and nozzles.

Amount: \$246,250

The Navajo Nation has an indirect negotiation agreement with the US Department in the amount of 21.60%. This charge will need to be included in the amount, there \$246,250 x 21.60% = \$53,190. This brings our new balance to \$299,440.00

### **Closing**

The Navajo Nation Department of Fire & Rescue Services has needed to upgrade its firefighting capability. However do to increasing budget restraints, and our small operating budget, we have not been unable to successful do so. Technology in fire suppression application has changed, and we have not been able to catch up, especially being as rural of a department as we are. The benefits of having equipment for better use of our water distribution system and faster knock down and control of fires is a plus for an organization that has a limited supply in personnel and fire apparatus. Existing hoses are old and probably shouldn't be use, however what is a department to do if they cannot afford to replace 4 miles of hose when other issues are pressing down on the department. With one project out of the way, replacing SCBA, thanks to last years awarded grant, we are off to a good start to begin protecting our people and their property.