NFIRS Enhancements

Background:

The United States Fire Administration (USFA) through the National Fire Data Center plays a significant role in collecting and distributing data concerning the causes of fires and consequences to fire departments and their communities. Stakeholders at the local, state and federal level have challenged USFA to enhance National Fire Incident Reporting System (NFIRS) to be of a greater value to the fire service by providing current, relevant and accessible data to make more effective decisions, plans and justifications for fire department operations and administration.

The current version of the NFIRS application was developed between 1996 and 2000. The system's code base is a decade old and badly in need of modernization. Additionally, because of low resources for the initial project development and on-going system maintenance, adequate functionality was never developed and implemented in several key areas of the system.

Recent congressional resources for NFIRS enhancements have been provided as outlined in the USFA Reauthorization Act of 2008 and have led to an opportunity for USFA to make long needed upgrades to the NFIRS. These upgrades began in October of 2008 with the development of a web version of the NFIRS client Data Entry Tool.

A comprehensive requirements analysis of the NFIRS system gaps was conducted in 2009 by IBM under an agency contract. As a result of stakeholder interviews and analysis of the data, 126 specific wants and needs statements were gathered, resulting in the identification of 10 different Strategic Need areas requiring improvement. An analysis of alternatives was then conducted to identify the viable solutions that would meet the strategic needs identified in the requirements analysis. The final report produced under this objective delivered a blueprint of how to build a modernized NFIRS that best meets the Strategic Needs identified by the project. The blueprint is separated into phases with the most critical enhancements prioritized to occur first. The blueprint's first phase objective, Data Warehouse & Mining, begins in October of 2009.

Identified Problem(s):

There are several key priority areas in the NFIRS system that USFA receives the most feedback about and are ones prioritized for enhancement:

1. **Data Exports:** NFIRS data is used by USFA, government agencies, and many other organizations for analyses. The current tools to export NFIRS data from the system for analyses have not scaled well with the enormous increase in the size of the database in the past 10 years. The result has been the inability to export and provide most of the NFIRS data to requestors and to USFA for use in data analyses.
2. **Output Reporting Database:** The NFIRS reporting database is not optimized for reporting and performance is poor. This is extremely frustrating to users.
3. **Output Reporting Functionality**: Currently, NFIRS does not provide much of the output reporting functionality expected by users and is customary in modern

reporting systems of this size, complexity and national scope. This has affected all NFIRS data users including those at USFA.

4. **Codebase Optimization/Rewrite.** The NFIRS codebase is old and does not meet agency enterprise standards. There as a need for modernization to improve system performance and to eliminate ongoing problems with NFIRS production server crashes.

5. **Default Data Release Reconfiguration:** The standard mechanism for releasing data into the public domain needs enhancement. The lack of functionality in the current system leads to slower availability of data.

Strategic Needs:

The comprehensive requirements analysis of the NFIRS system gaps resulted in the identification of 10 different Strategic Need areas requiring improvement:

1. **Modernized System:** NFIRS requires modernization in order to align with modern coding standards as well to adhere to the DHS/FEMA Enterprise Architecture (EA). The solution must be web-based and improve system performance, usability, efficiency, scalability, and security including audit and archival capabilities.

2. **Data warehousing and mining:** The As-Is NFIRS system does not facilitate a flexible and efficient way of retrieving data. The enhanced system must provide efficient and effective processes to get data out of the system. The system must support the up-to-date and timely data needs of data analysts, government agencies, non-government organizations, and the public. The system architecture must be scalable to handle increasing quantities of data, and be powerful and flexible to report on and export data in bulk.

3. **Data management and quality:** The system must have enhanced capabilities that allow fire department users and State Program Managers to manage their data files and improve the quality of data entered

4. **Streamlined output reporting and analysis:** The system requires enhanced reporting capabilities to provide functionality offering robust reporting capabilities and analytical tools to make the most of the important data collected. Updated pre-defined reports, ad-hoc reporting capabilities, graphical representations of statistics, drill-down capabilities for details, Geographic Information Systems (GIS) output and queries are highly requested features.

5. **Timely incident reporting:** Improvements to the system usability and analytical tools within the system are required for encouraging users to report incident data more frequently.

6. **Usability:** The system requires improvements that provide intuitive ways to report incidents.

7. **Information sharing:** The system must be capable for facilitating information sharing with other entities' systems using interoperable and flexible data-exchange technologies that are beneficial to the users.

8. **Agility to respond to change:** The application must be able to evolve as user needs grow. The system must be agile so that it may respond to change by providing the capability to configure business rules, be easy to maintain, and be intuitive for users.

9. **<u>Self service:</u>** The system should support self-help services to reduce the need for USFA and State Program Managers involvement.
10. **<u>Vendor support:</u>** The system should support third party software vendors to validate their application data against NFIRS incident reporting standards. This will streamline the changing of standards with limited affect on the vendors.

Planned Enhancement Phases:

In order to facilitate a modular approach to the NFIRS enhancement process, the work has been separated into five discrete phases which may be developed in tandem, or serially as dictated by the resources available to USFA:

1. Data Entry Browser Interface (planned release date: Spring, 2010)
2. Data Warehouse & Mining which provides flexible and efficient ways of retrieving and exporting data (planned release date: Spring, 2011)
3. New NFIRS Web Portal (includes new security model)
4. Revision of the NFIRS Data Entry Applications (includes new rules engine)
5. Enhanced User Interface (includes GIS services & revised administrative applications)