

**NATIONAL FIRE INCIDENT REPORTING SYSTEM (NFIRS)
ENHANCEMENTS PROJECT**

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 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 in need of modernization. Additionally, because of limited 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.

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 partially fund 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. As a result of stakeholder interviews and analysis of the data conducted during the requirements analysis, 126 specific wants and needs (identified problems) 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. From this work, a blueprint was developed for 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.

Strategic Needs:

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

1. **Modernized System:** NFIRS requires modernization in order to align with modern software 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) queries and output 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. **Self service:** The system should support self-help services to reduce the need for USFA and State Program Managers involvement.
10. **Vendor support:** 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 impact on the vendors.

The strategic needs will be addressed with the planned system enhancements. The solution chosen for updating NFIRS will modernize the system through new Architecture and new development, and entails re-writing NFIRS from the ground up. It will include commercial off the shelf (COTS) solutions for Data Warehousing, Business Intelligence/Reporting, GIS, and Business Rules Management. NFIRS will be re-written in accordance with modern coding and agency Enterprise Architecture standards.

In order to facilitate a modular approach to the NFIRS enhancement process, the work has been separated into the following five discrete phases.

1. **Data Entry Browser Interface.** This feature provides for a totally web based data entry tool eliminating the need to download and install client software on the user's computer. Use of approved 3rd party commercial software as an alternative is still permitted. (*Released July, 2010*)
 - Ease of installation and use for small departments.
 - More data collected "real time".
 - Improved participation among smaller departments.
2. **Data Warehouse & Mining.** This feature will provide flexible and efficient ways of retrieving and exporting data. (*planned release date: Summer, 2011*)
 - Better system performance and better functionality to suit user needs.
 - Improved ability to get and share information from NFIRS among outside organizations in a variety of formats.
 - Improved ability to compare incident data nationally and among departments and states.
 - Greater control in setting up customized queries using Business Objects.
 - Will provide a wider variety of "canned reports" for those users who would prefer not to use Business Objects.
 - Adds the ability to create 'ad hoc' queries of data without relying on canned reports.
 - Adds the ability for users to create their own reports and share them with other users.
3. **New NFIRS Web Portal.** This objective continues the modernization of the USFA solution by adding a web based portal, and implements a role based security model to give users single point access for the NFIRS data entry, report dashboards and access to administrative applications. While the individual applications would maintain a similar look and feel they will be encapsulated into a single location within the portal.
 - Users no longer have to manage multiple logins and passwords for different parts of the NFIRS system and tools.
 - Adds user self service options for password resets, reducing NFIRS help desk costs.
 - Allows state users to manage their own privacy data setting for individual fields if they differ from the national standard due to state specific privacy laws.
 - Creating and managing user groups will be streamlined, reducing NFIRS help desk costs.
 - Updates the NFIRS to meet government wide enterprise architecture and security standards.

4. Revision of the NFIRS Data Entry Applications. This objective provides a true integration of the portal with the Incident Reporting application as the core with the addition of a new rules engine.

- NFIRS rule changes are currently difficult and expensive to make. The new rules engine will reduce or eliminate the need for IT contractor services in this area, reducing sustainment costs.
- The USFA users will be provided the capability to maintain the system themselves where possible using configurable business rules. This will further reduce USFA sustainment costs.
- The system will provide an intelligent way to report incidents with minimal user re-education by providing an interview style incident reporting capability, in addition to the current form based style). This will greatly improve NFIRS data quality and reduce training costs for states.
- The system will provide online help with user manuals, and on-screen help. In addition, tutorials on common functions will be developed to aid the users. This will reduce training costs and improve data quality.

5. Enhanced User Interface. The final objective adds the remaining functionality to complete the NFIRS application. GIS will be incorporated into the Incident Reporting application as well as administrative applications to support system users.

- Permits users to analyze their data using maps and geographic displays of the fire problem in their communities.
- New administrative controls will give state program managers greater control and new features to administer fire department access.
- Adds capabilities to interface NFIRS data with other Federal Agencies such as BATFE, CPSC, and the DHS Grants program.
- Will provide capability for third party vendors to register and test their data for compliance with the NFIRS standard.
- Will provide the capability for authorized users to set up self defined codes for a fire department, state, or nationally, which are in addition to the national level codes. These codes will allow states and fire departments to collect greater detail than the NFIRS standard if they chose. The system will also provide the capability for authorized users to set up codes for special studies' fields.
- Adds logging to better trace system problems which will reduce system down time and significantly reduce sustainment costs.

(Target dates for phases 3 through 5 will be identified as work progresses.)

Once complete, changes to the system will result in the following:

- Improvements in the way data is collected and released by states will make NFIRS data available for national use faster.
- Improved access to NFIRS data for decision making at all levels of use.
- Large improvements in data quality due to the addition of data collection 'interview' functionality and on-line help and tutorials.
- Modernizing the system to allow self-help maintenance by users will reduce NFIRS sustainment and training costs.
- Brings system architecture and code base into compliance with current FEMA and DHS Information Technology standards.
- Modernizing the NFIRS code and adding improved logging feature to the system will significantly reduce the current system instability and reduce sustainment costs.
- Increased NFIRS participation due to less frustration with current system inadequacies, improved data access and reporting capacities, and user friendly data entry tools.

Planned upgrades to the NFIRS system will not include changes to the standard (NFIRS 5.0). The NFIRS modules, data elements and codes will remain unchanged until work is completed on the system upgrades. Once the upgrades are complete, planning for an upgrade to NFIRS 6.0 will begin.