

Development of a Compliance Information Management Tool for Tufts University

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Abstract:

In order to maintain environmental compliance, EH&S managers must ensure that all environmental requirements are completed according to regulatory deadlines. Meeting all deadlines can be a daunting task since failing to meet one or more of them can result in substantial fines. To successfully meet deadlines, an easy-to-use electronic environmental compliance information management system was custom developed for Tufts University to facilitate program management and report on all requirements, tasks, due dates, and responsible persons. The electronic compliance system was custom designed by working closely with the EH&S and information technology departments. The tool was integrated with university computer systems to allow for automated e-mail notifications of upcoming tasks to prevent missed regulatory deadlines. It resides on the university network and includes security protocols and user permissions.

Background

The Environmental Health and Safety (EH&S) department at Tufts University (Tufts) was interested in a computer based environmental compliance information management system to store, maintain, automate, and report environmental and safety compliance data related to its EH&S programs. The purpose of the electronic database was to develop a user-friendly system that could be used by the environmental managers and their staff to track the status of regulatory compliance at three separate Tufts' campuses and to ensure Tufts' ability to maintain compliance.

In general, the EH&S department is primarily responsible for completing the following activities at three campuses in Medford, Boston, and North Grafton, Massachusetts:

- Developing environmental and safety policies and programs;
- Obtaining and maintaining permits (however, the Facilities Department is primarily responsible for Tufts air permit);
- Managing hazardous waste being stored prior to transport, and filing and maintaining all required records;
- Drafting and implementing oil SPCC at the program level, hazardous waste contingency, and OSHA prevention and emergency response plans;
- Maintaining environmental compliance; and
- Developing and providing training that complies with applicable federal and state regulations.

The EH&S managers, located in Medford, work closely with the facilities directors, located at each campus, to execute the EH&S programs.

Woodard & Curran completed and delivered a final environmental compliance audit report to Tufts that identified regularly occurring tasks that must be performed in order to maintain compliance with various rules. These tasks were incorporated into the environmental compliance information management system to provide a tool for EH&S managers to track and maintain regulatory compliance. The system integrates and centralizes data associated with environmental requirements, thereby facilitating electronic management of data and program operations.

System Development Was Based on a Needs Assessment

A needs assessment was initiated as the first step to design and build the information management system. The assessment is a critical component to the development and implementation of an environmental compliance information management system. The primary purpose of the needs assessment was to work with the project stakeholders and end users to determine the data to be handled by the system, system functionality (i.e., what reporting routines the system will incorporate) and system operation within existing client infrastructures. Since the system was custom developed for Tufts, it was important to understand the needs of the users at the start of the development of the project.

The needs assessment consisted of two components: (1) a project workshop with stakeholders and end-users; and (2) conceptual system planning and design. The resulting product of the needs assessment was an implementation plan that served as the design document for tool development. The workshop was divided into both joint and individual sessions with representatives of Tufts Information Technology (IT) department and the EH&S department.

The first part of the needs assessment workshop was attended by EH&S representatives and focused on understanding the objectives of the environmental compliance information management system and user

needs. Individual breakout sessions were completed with the IT representative, and focused on discussions regarding software, hardware, operating platforms and infrastructure. The breakout session with the EH&S representatives reviewed action items from the EPA compliance audit and applicable environmental, safety, and fire safety requirements Tufts' wanted to incorporate into the system. At the end of the workshop, representatives from both EH&S and IT reconvened to review each breakout session and summarize the workshop findings.

The results of the needs assessment provided guidance in the system planning on many fronts. In terms of infrastructure, an understanding of the software, database platforms, and e-mail integration with Tufts' existing systems was developed. In the meeting with the EH&S representatives, an understanding of applicable regulatory and functional requirements to be incorporated into the compliance information management system was created. Because both the IT group and EH&S group participated, we were able to plan a solution that meets the needs of the end users, while being compatible and consistent with computer systems overseen by the IT group.

Compliance Information Management System Application

Several key features were found to be important in the technical design of the compliance information management system. These features are outlined below:

- The application is deployed at the desktop using a standard install package, with the underlying data residing on a server at Tufts. The database and application are supported by the Tufts database administrator.
- The tool includes the ability to provide specific users with three types of access: (1) read only; (2) read/write; or (3) read and mark tasks as complete access based on a user name and password.
- Data entry is completed by filling out forms designed as part of the application. The forms are filled out by entering data into individual fields included on them. Data entry is intended to only include information associated with recurring, regularly scheduled requirements. Data to be entered relates to locations, tasks, personnel, and vendors.
- Data editing is completed using the same forms as used for data entry (described above). Only users who have "write" permissions to the database will be able to edit data.
- A query tool was developed to query the underlying requirements, associated tasks, and results by due date, responsible person, building number, building room number, completion status, and/or campus. This tool enables the user to view specific information located in the database in a designated format

Requirement	Due Date	Regulatory Area	Contact
Annual Discharge Prevention Briefings	11/22/2003 8:50:29 AM	Oil SPCC Planning	montkush
Annual Report	11/22/2003 8:50:29 AM	Pesticides	keelie
Annual Review of Pesticides	01/02/2004 8:50:35 AM	Pesticides	montkush
Audit Transformer Files	11/17/2003 8:50:25 AM	TSCA	keelie
Boiler Inspection	11/17/2003 8:50:25 AM	Air	zeila
Boiler Records	11/22/2003 8:50:29 AM	Air	keelie
CFCs	05/12/2004 8:50:32 AM	Air	montkush
Chip Tank Clean-Out	06/13/2004 8:50:59 AM	Wastewater	callope
Computer Vehicle Report	08/09/2003 8:50:36 AM	Air	tohapin
Confined Space Entry Training	04/18/2004 8:50:47 AM	OSHA	tohapin
Distribution of Motor Vehicle Fuel	05/07/2004 8:50:39 AM	Air	callope
Distribution of Motor Vehicle Fuel	05/27/2004 8:50:43 AM	Air	zeila
DMR	11/17/2003 8:50:25 AM	Wastewater	zeila
DOT Training	11/17/2003 8:50:25 AM	DOT	montkush
Elevator (Maintenance/Testing?)	11/22/2003 8:50:29 AM	General Safety	keelie
Emergency Engine Records	04/18/2004 8:50:47 AM	Air	keelie
Emergency Eyewash/Shower Tests	06/13/2004 8:50:59 AM	OSHA	callope
Emergency Generators (Testing?)	11/17/2003 8:50:25 AM	General Safety	montkush
Emergency Generator Start Buttons	04/18/2004 8:50:47 AM	Emergency Generator Start Buttons	tohapin


Sample screen shot of compliance data as viewed and edited in the database. Data is organized by category, seen on the tabs at the top.



By using the report button at the top, the user can generate the four types of reports available. They include requirements by campus and for a specific date range.

- The user has the ability to generate the reports that provide important information to the end user. The primary report is the regulatory notification report that provides a list of tasks that need to be addressed within a given date range. The report will list the task, both the contact person and the backup person responsible for the task, the phone number for the contact person, the task due

date, task frequency, and how many days are remaining from the requirement due date. The number of days remaining from the due date will be highlighted on the report if the task is at or beyond the due date, within zero to 30 days of the due date, within 30 to 60 days of the due date, or beyond 60 days from its due date. This is the primary report that EH&S managers will use to monitor and ensure compliance.

 Monthly Status Report August, 2003						
Monthly Status Tufts University Report Generated on:						Boston Campus August 8, 2003
Requirement	Due Date	Frequency	Contact	Phone Number	Backup Contact	Status
Fire Alarm Testing: Residences	08/09/2003 8:50	Quarterly	keelie	207-566-2342	keelie	Under 30 Days
Visual Inspection	08/09/2003 8:50	Monthly	tchapin	207-564-2542	keelie	Under 30 Days
Voltage Testing	08/20/2003 8:50	Every Three Years	montkush	207-564-2542	zelda	Under 30 Days

Sample monthly status report that displays requirements to be completed for a specific month, as well as their current status.

The application includes an automated E-mailing function that notifies the appropriate parties when their tasks are near their deadline date. This part of the application will be generated automatically and will not require user intervention to operate.

System Design and Development

The development of the electronic system was facilitated by following a process that involves a needs assessment, database design, application development, implementation and training. The development process involved a collaborative effort with the users and programmers, and included conceptual design of both the database and user interface screens prior to programming to ensure that the solution was well planned. Prototypes were frequently reviewed to gain further user input and ensure the system met the needs of the end users and was built to be user-friendly. The interface design encompasses the overall

construction of the application. The application is the mechanism by which the database is accessed and queries are completed. The graphical user interface (GUI) was developed to create the menus and buttons by which the application is operated. The interfaces and internal mechanisms to handle the querying of the database and the output generated by the application was custom designed with a high level of input from Tufts. The database was populated with data necessary for Tufts to monitor and maintain compliance with those requirements that are incorporated into the database. A prototype to demonstrate the operations of the system was developed to demonstrate the system to all project representatives. Once the application was completed, detailed testing was performed and the application was finalized.

Summary

The resulting compliance information management system provided a tool for the Tufts' EH&S managers to track and maintain regulatory compliance. The tool was an important next step after the environmental compliance audit, to ensure that progress would continue to be made and non-compliance was prevented. Tufts' EH&S department has been through training on the tool and is actively using this system to facilitate components of their program. The system serves as an important management tool and leads to accountability among staff to be aware of the requirements they are tasked with and ensure they are completed in a timely manner. This system has streamlined operations and has saved time in the management of regulatory compliance information.