Automating the Management of Environmental Compliance Reporting: Making the Complex Simple

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Abstract

Environmental compliance reporting requirements are notoriously complex. This reporting complexity is compounded by organizational and functional complexity at Rocky Mountain Arsenal (RMA), where the Department of the Army has undertaken a multi billion dollar environmental cleanup action. This site is subject to both fixed and contingent federal, state, and local reporting requirements. Management and operation of the site is characterized by numerous organizational layers, and compliance information is generated by many different contractors and subcontractors. This information must be compiled by various managers and reported to either regulators or Department of the Army offices. The RMA Environmental Compliance Office and top-level management must be assured that these reports are being promptly generated and submitted. With over 1,500 individual reporting requirements forecasted for over the next 11 years, the managerial challenge is immense.

To facilitate the collation of data and issuance of compliance reports, an intranet-based database is being developed. This database is designed to be available to all personnel with access to the site’s environmental compliance intranet. It presents all applicable reporting requirements in an easily sortable format. Information available for each report includes deadlines, report status, recipients, individuals responsible for report generation, and other relevant data fields. Reports can be generated that are pertinent to a specific project, office, individual, or timeframe. Because the database is an integral component of the RMA environmental compliance intranet site, reporting requirements can be linked to the regulatory or site-specific document that is driving the report. As a given report is issued, those responsible for its issuance update the database and certify that the report has been transmitted, thus enabling the RMA Environmental Compliance Office and site managers to keep real-time track of a report’s status.
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Introduction

The complexity and ever-changing nature of environmental reporting requirements are well known. This complexity is compounded by organizational and functional complexity at the Rocky Mountain Arsenal (RMA) in Commerce City, Colorado. RMA is a Superfund site being remediated through a coordinated effort among the Army, the Fish and Wildlife Service, and Shell Oil. This multi billion dollar cleanup is scheduled to last until 2011 and is being performed by a multitude of contractors and subcontractors. The Environmental Compliance Office at RMA is tasked with ensuring that all activities are done in compliance with federal, state and local environmental regulations. A key element to compliance is ensuring that all environmental compliance reporting requirements are met in a timely manner. The potential exists for over 1,500 reports to be developed, issued, and tracked over the next 11 years of the project. These reports are developed not only by the RMA Environmental Compliance Office, but also by design engineers, project control personnel, logistics personnel, and other groups working on the site.

To facilitate the collation of data and issuance of reports, an intranet-based database is being developed. It is intended to provide the RMA Environmental Compliance Office and the upper level RMA managers with a tool to more efficiently manage the compilation and issuance of these reports. The database will be available to all personnel with access to the site’s environmental compliance intranet. It will present all applicable reporting requirements in an easily sortable format. Information to be available on the database for each report includes deadlines, report status, recipients, individuals responsible for report generation, and other relevant data fields. Reports can be generated that are pertinent to a specific project, office, individual, or timeframe. Because the database is an integral component of the RMA environmental compliance intranet site, reporting requirements can be linked to the regulatory or site-specific document that is driving the report. As a given report is issued, those responsible for its issuance update the database and certify that the report has been transmitted, thus enabling managers to keep real-time track of the report’s status.

History of RMA

RMA consists of over 17,000 acres of land located just outside of Denver. It operated as a chemical munitions production facility from 1942 until 1982. During that period portions of the installation were also leased to various commercial operations. One such firm, Shell Oil, used the production facilities to manufacture pesticides and other commercial products. RMA has been the focus of an aggressive soil and groundwater contamination cleanup program since the 1980s. Contaminated sites included unlined and lined lagoons and basins used to store liquid waste, open burning and detonation areas, and landfills that received both liquid and solid wastes. In 1984, the Army completed a Preliminary Assessment and Site Inspection that identified 179 potentially contaminated sites on RMA. The site subsequently was added to the National Priorities List and divided into two operable units for remediation. The Army has completed 14 emergency responses at 17 sites, and five groundwater extraction and treatment systems...
have been installed. In 1996, the Record of Decision (ROD) identified 31 implementation projects, including the demolition of over 100 structures, construction of 2 hazardous waste landfills, continued treatment of groundwater, and encapsulation of contaminated soil. Currently, 2 primary operations are ongoing at RMA - the implementation of the remedy and transfer of the installation to a National Wildlife Refuge in accordance with stipulations of the Rocky Mountain Arsenal National Wildlife Refuge Act.

Current State of Environmental Compliance Reporting at RMA

An oversight partnership has been developed at RMA to facilitate the implementation of the remedy and the transfer to the refuge. The Army, the Fish and Wildlife Service, and Shell Oil have agreed to jointly manage these operations. While the Army remains the lead agency, all three groups have an equal say in the management of the site. The RMA Environmental Compliance Office, therefore, represents all three organizations. The responsibility for managing the large volume of environmental compliance reporting requirements is distributed among the various entities responsible for issuing the reports. For example, the Resource Conservation and Recovery Act (RCRA) Treatment, Storage and Disposal Facility (TSDF) Annual Report is issued by the compliance office, while the monthly discharge report for the Hazardous Waste Landfill Wastewater Treatment Plant is the responsibility of the Project Treatment Engineer for that facility. In the past, the only way for upper level managers or the compliance office to be assured that the monthly discharge report had been issued was to contact the Project Treatment Engineer directly. At a less complex site, such a procedure might be practical, but when the monthly discharge report is but one of a multitude of reports being issued, it becomes impractical. More than 1,400 fixed reporting requirements and potentially 100 contingent reports are forecasted for over the life of the project. A contingent report is defined as a report required in response to a specific event, for example a spill response report issued for a specific material spill. All applicable environmental regulations and more than 100 RMA-specific documents (e.g., 100% designs, Federal Facility Agreement, Record of Decision, Pest Management Plan) were reviewed and reporting requirements were extracted. More than 25 different individuals are responsible for ensuring these reports are issued, in addition to several upper-level managers who are responsible for overseeing the performance of these 25 individuals. In such a complex collaborative project environment, the practice of delegating responsibility for report issuance is mandatory. Oversight of such a system, however, becomes a major challenge.

Conceptual Design

An interactive database with web-based interface was determined to be the most efficient tool for managing the environmental compliance reporting system at RMA. The RMA Environmental Compliance Office has an intranet site to manage and disseminate environmental information more efficiently. This intranet site was designed to provide compliance-critical information to RMA personnel in compliance-relevant positions. Thus, the intranet site already targets the same pool of employees responsible for
compliance reporting. Therefore, it seemed logical to use this same site as a vehicle for the interactive reporting database.

Components critical to the success of the site were deemed to be easy access, real-time availability of data, user-friendly reporting features for upper level management, a flexible sorting feature to filter data, and the ability to amend reporting requirements as regulations and negotiated agreements change over time. Additional desirable components included electronic links to documents and regulations that require the reports and customized email prompts to remind specific individuals of upcoming and past due reporting requirements.

Database Specifics

The database was developed using SQL Server 7.0 and was written using Javascript. The server is a Netscape Enterprise Server 3.0 that resides on a Unix operating system. The database was developed with eleven fields:

1. Fixed or Contingent – states whether the reporting requirement is fixed in time (e.g., an annual TSDF report) or contingent (e.g., a spill report).
2. Status – states whether the requirement has been satisfied.
3. Date – the date the report is due (not applicable to contingent requirements).
4. Project – the name of the ROD implementation project or other identifier (e.g., Hazardous Waste Landfill, General Administration/Facility Operations and Management).
5. Subject Area – categorizes the requirements based on the 21 protocols under the Army Environmental Compliance Assessment System.
6. Action – states the action and name of the report (e.g., submit Toxic Chemical Release Report).
7. Receiver – names the ultimate recipients of the report. (The recipients can be external in the case of a report to the EPA for example, or internal in the case of data required to be submitted to the Environmental Compliance Office by numerous contractors for collation prior to submittal to an external agency.)
8. Preparer’s Title – the job title of the individual responsible for generating the report.
9. Preparer’s Name – the name of the individual responsible for generating the report.
10. Reference – the regulation or RMA document that mandates the generation of the report.
11. Trigger – in the case of contingent reporting requirements this field states the event necessitating the report (e.g., if a PCB transformer is involved in a fire).

Each reporting requirement constitutes a single record set. Each record set is available to be viewed by anyone with view rights. Edit rights are, however, limited to the system administrator and the individual responsible for issuing the report. This procedure enables the issuing individual to update the database once the report is issued. It also provides the capability to amend the reporting requirement. For example, if RMA and
the EPA agree to delay the deadline for a project’s 100% design, the RMA Senior Project Controls Engineer can amend that record set in the database. This information would then be instantly available to everyone with view rights.

An example of several data sets follows:

<table>
<thead>
<tr>
<th>Fixed?</th>
<th>Met?</th>
<th>Date</th>
<th>Project</th>
<th>Subject Area</th>
<th>Action</th>
<th>Receiver</th>
<th>Title of Preparer</th>
<th>Name of Preparer</th>
<th>References</th>
<th>Trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>Yes</td>
<td>02/28/00</td>
<td>Landfill Wastewater Treatment System</td>
<td>Installation Restoration Program</td>
<td>Submit Discharge Monitoring Report</td>
<td>EPA, CDPHE, TCHD</td>
<td>Project Treatment Engineer</td>
<td>John Doe</td>
<td>CERCLA Compliance Document for Effluent Discharge Requirements, Section 6.2</td>
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<tr>
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<td>Yes</td>
<td>03/01/00</td>
<td>General Admin/O&amp;M</td>
<td>Hazardous Waste</td>
<td>Submit biennial generator report</td>
<td>CDPHE, RVO R/RCM</td>
<td>RVO Cultural Resources Team Chair</td>
<td>Jane Doe</td>
<td>6 CCR 1007-3, 262.41, RVO Waste Management Plan, Section 7</td>
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</tr>
<tr>
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<td>No</td>
<td>06/01/00</td>
<td>Cultural Resources</td>
<td>Report</td>
<td>Submit annual report</td>
<td>SHPO</td>
<td>RVO Cultural Resources Team Chair</td>
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<td>Cultural Resources Programmatic Agreement, Stipulation IX</td>
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<td>No</td>
<td>06/30/00</td>
<td>General Admin/O&amp;M</td>
<td>Emissions</td>
<td>Submit Street Sweeping report</td>
<td>CDPHE, RVO R/RCM</td>
<td>RVO Project Manager</td>
<td>Mark Doe</td>
<td>6 CCR 1001-18, I.E.2 &amp; I.I.D.1</td>
<td>N/A</td>
</tr>
<tr>
<td>Fixed</td>
<td>No</td>
<td>07/31/00</td>
<td>Hazardous Waste Landfill</td>
<td>Installation Restoration Program</td>
<td>Submit report incorporating all HML environmental monitoring results</td>
<td>EPA, CDPHE, TCHD</td>
<td>RVO Hazardous Waste Landfill Operations Manual, Operating and Recordkeeping Plan, Section 11.3</td>
<td>Mark Doe</td>
<td>Hazardous Waste Landfill Operations Manual, Operating and Recordkeeping Plan, Section 11.3</td>
<td>N/A</td>
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<tr>
<td>Cont.</td>
<td>No</td>
<td>N/A</td>
<td>General Admin/O&amp;M</td>
<td>PCBs</td>
<td>Notify ASAP or at least within 24 hrs.</td>
<td>EPA</td>
<td>RVO R/RCM</td>
<td>Howard Doe</td>
<td>40 CFR 781.125(a)(1)(i)</td>
<td>N/A</td>
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The system provides an almost limitless ability to sort and view data. The data sort page enables the user to screen data sets based on any of the available fields. For example, a user could request to view all reporting requirements for which a specific individual is responsible during the upcoming three months. Similarly, an upper level manager could ask to see which reports have been issued by his/her division over the last year in the areas of hazardous waste and cultural resources. Another possibility would be for a manager or the compliance office to generate a report detailing which reports are past due.

The flexible email prompt feature enables individuals to request that reminders be sent to their email account based on their own preferences. For example, some individuals may prefer weekly reminders in the month leading up to a deadline, while others may not want any reminders at all. This feature is activated and managed by the individual whose name appears as the preparer for a given report.

In addition to the inclusion of external reporting requirements, several internal reporting requirements are also being evaluated for inclusion in the database. This use of the system is particularly well suited to RMA, where numerous contractors and subcontractors have to channel information to an individual responsible for external
reporting. For example, the compliance office is responsible for reporting street sanding data as required by the Clean Air Act. Two separate contractors provide street sanding services to RMA. The system requires that the environmental compliance representative for each contractor submit the necessary data to the compliance office one month before the external report is scheduled to be issued. A matrix of such data-flow requirements is being developed to more fully incorporate this feature into the database.

Conclusion

The flexible and powerful information database tool being developed for RMA has great potential to simplify the complex world of environmental compliance reporting. This tool will be particularly useful in a large, multi layered organizational structure such as at RMA, where distributed management of compliance reporting is required. As personnel become more familiar with the system, its flexibility will enable them to customize it to best serve their needs. Whether it’s a top level manager who wants to be assured that all reporting requirements were met for the past year or a pest management coordinator who needs to be reminded to send an updated installation Pest Management Plan to the Army, this system can deliver.