



Agile Compliance Management Systems for Environmental, Health & Safety

An Executive White Paper

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Agile Compliance Management Systems for Environmental, Health & Safety

Executive Summary

Compliance is not an optional activity. The regulated community is well aware of the serious consequences of NOT complying with rules, regulations, policies and procedures — including fines, negative impact on company image and product branding, and even criminal penalties. Unfortunately, achieving and/or assuring compliance can be a tremendous challenge – a single facility can be responsible for meeting thousands to hundreds of thousands of discrete requirements each year. In addition, compliance management often touches nearly all aspects of the enterprise.

Manual compliance management processes can place a huge time and money burden on major corporations and government agencies, with costs easily reaching six and seven figures annually for each facility. Business and regulatory pressures, as well as the sheer volume of data, are compelling reasons for any large organization to seek an Environmental, Health & Safety (EH&S) management information system (EMIS) for compliance.

Unfortunately, when developed in reactive fashion, software systems for compliance management can pose another set of challenges. A hodgepodge of discrete spreadsheets, paper logs and small databases can result in data overload and confusion. Even well designed systems can be difficult to manage, from both subject matter and information technology perspectives. Many commercial software solutions exist, but what constitutes a capable system? How do today's commercial systems stack up?

Businesses should seek powerful, flexible IT solutions to automate compliance. The Capability Maturity Model¹ describes an organization's maturity and its capability to institutionalize continuous improvement processes in daily practice. Adapted to EH&S, this model aligns with International Organization for Standardization (ISO), federal, state and industry Environmental Management Systems standards. Capable EMIS allow capable businesses—those committed to continuous improvement—to manage EH&S compliance.

The centerpiece of a capable EMIS should be an "Agile" Compliance Management System (CMS). Agile Compliance Management Systems support continuous improvement within an organization. They also help push compliance tasks to the operational level, enabling staff to fulfill their compliance responsibilities in the course of their regular jobs and helping assure that those tasks are completed.

An Agile CMS has certain characteristics — it is modular, iterative, time-bound, economical, adaptive, incremental, convergent, people-oriented, collaborative and complementary. The benefits of such capable, agile information systems include better risk management, and thus risk-based decision-making, as well as quantifiable and "soft" Return on Investment.

This White Paper describes how two of the leading commercial EH&S software solutions on the market, *Essential Compliance Manager*[™] and *Essential Task Manager*[™], align with these characteristics. This paper provides advice for those seeking an IT solution for EH&S compliance management to help them:

- Understand the problem to be solved. Involve stakeholders and document their needs.
- Select a solution with well-defined business logic. Look for fit with near-term and future needs.
- Ensure that the organization's business processes are aligned.
- Leverage EH&S information and technology fully throughout the enterprise.
- Find a translator that can speak to EH&S, business and IT needs.

The Need for Improved EH&S Compliance Solutions

Compliance with rules, regulations, policies and procedures is a top concern of business executives. Business and regulatory pressures, as well as the sheer volume of data, are driving all kinds of organizations to seek environmental, health and safety management information systems (EMIS) for compliance management.

Business and Regulatory Drivers

The Title V federal air permit rules and the Sarbanes-Oxley Act launched U.S. business into a new era of compliance. Today, companies must have capable systems to monitor processes and emissions so they can, with confidence, assert that they comply with all requirements.²

Companies need critical pieces of information to credibly demonstrate compliance and to assure that senior management is well informed when signing compliance certifications. Companies must have knowledge of their day-to-day operations and environmental, health & safety (EH&S) impacts. Management must address compliance across a wide range of business management systems including daily transaction processing, content and records management, performance metrics, and reporting.

Information technology (IT) is becoming a normal, reasonable business practice for compliance management. Stakeholders *expect* companies of a certain size to use information systems and information technology.³ The cost to manually conduct EH&S compliance-related tasks is overwhelming, approaching hundreds of thousands of dollars or more each year for large, complex facilities.

It is difficult to measure compliance without a basic, shared management system. Before Title V and Sarbanes-Oxley, many organizations did not know exactly how they were complying with environmental rules and regulations. Each department had its own systems, with varying degrees of complexity from handwritten operations logs and spreadsheets to sophisticated software applications. These multiple systems did not share critical knowledge, nor provide it to the right people at the right time.

At the same time, some companies began to look beyond compliance to corporate sustainability—the triple bottom-line of economic, environment and social impacts.

Today, companies measure the success of their compliance programs using a number of metrics such as the number of tasks completed on time, percentage of tasks completed during a designated period, the criticality of tasks that remain uncompleted and other benchmarks.

Drowning in Data

Business enterprises are drowning in data. EH&S compliance has generated a proliferation of business processes—e.g., Title V compliance certification; periodic monitoring, recordkeeping and reporting; SARA Title III Annual Toxic Release Inventory reporting; and air emissions inventories—that all require similar data presented in different formats.

Business & Regulatory Drivers for EH&S

Global pressures

- global competition
- sustainability
- operations in different countries
- operations in different time zones
- standardization among locations

Regulatory and other directives

- EH&S laws, rules, regulations, including federal air permits (i.e., Title V)
- Sarbanes-Oxley Act re corporate governance
- Securities and Exchange Commission rules for environmental liability disclosure
- ISO, industry and state-specific Environmental Management Systems

Competitive pressures

- stakeholder needs and interests
- company performance
- benchmarking
- company image
- corporate policies

This proliferation of data has resulted in a proliferation of compliance systems, both manual and automated, which, for the most part, are isolated, resulting in data that are:

- not shared throughout the organization
- not integrated
- not available for timely decision-making
- reactive or backwards looking.

Staff Resources

These information management challenges have been exacerbated by widespread cutbacks in EH&S staff over the past decade. Staff reductions have had a tremendous impact on the ability of some companies to meet their compliance requirements. While compliance (and other) requirements continue to multiply, EH&S groups are relegated to “doing more with less.”

Today, few organizations are looking for further staff cuts but all are urgently interested in learning how to *avoid adding staff*. In many organizations with manual or isolated compliance systems, EH&S professionals are relegated to clerical tasks when they could be adding to the bottom line by working on more strategic issues.

Capable Software Supports Compliance

An effective or “capable” EMIS is a critical part of the continuous improvement process. Many organizations today have adopted environmental management systems (EMS) in the form of ISO 14001, the American Chemistry Council’s Responsible Care® Management System, U.S. EPA or state EMS.^{4,5,6,7} EMS include EH&S compliance management processes, among many other EH&S processes. Organizations that have committed to continuous improvement have committed to verification and measurement as part of the Quality Improvement (Plan-Do-Check-Act) Cycle.

Organizations must reach a certain level of maturity before they can address continuous improvement. The Software Engineering Institute⁸ developed the Capability Maturity Model to describe software development.⁹ Today referred to as CMMI (Capability Maturity Model Integration), this model applies continuous growth and development to different disciplines, including human resources. Organizations have mapped CMMI to ISO 9001 and to Six Sigma processes.

For an organization to become “capable,” it must institutionalize its processes; processes must be ingrained in day-to-day work. The CMMI uses five levels to grade the maturity of organizations (Figure 1):

1. Initial: incomplete
2. Managed: repeatable, focus on project management
3. Defined: focus on engineering processes
4. Quantitatively Managed: focus on product and process quality
5. Optimizing: focus on continuous improvement

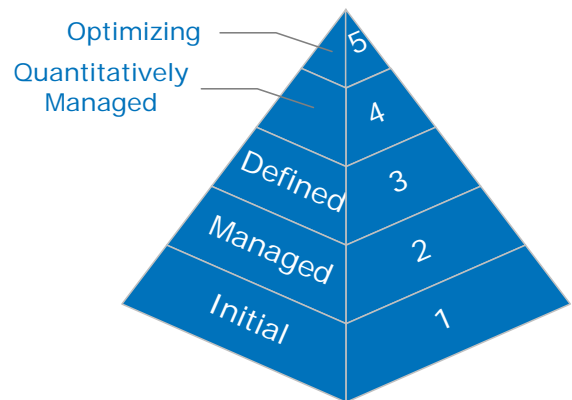


FIGURE 1. Capability Maturity Levels

These levels apply just as easily to EH&S compliance and task management as they do to IT and human resources. Many companies believe that they are at a higher capability maturity level than they really are. In addition to the capability maturity levels, the model addresses five Key Process Areas, or KPAs. These fit nicely with ISO quality management systems and environmental management systems models (Table 1).

TABLE 1. Capability Maturity Model Key Process Areas Parallel
ISO Environmental Management Systems Concepts

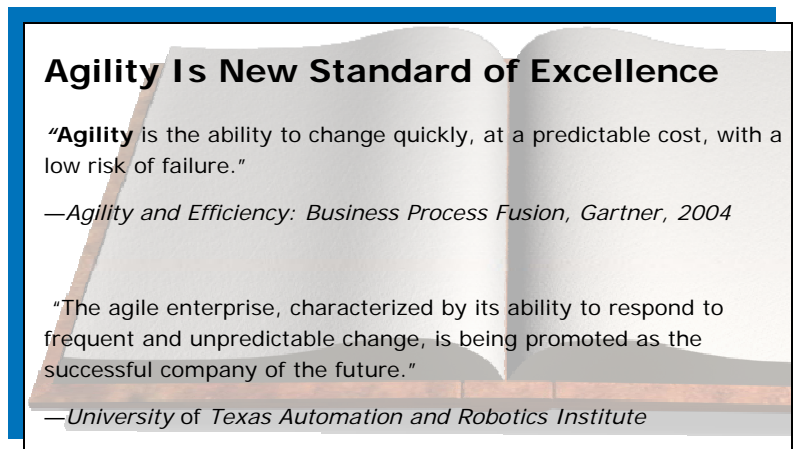
CMMI Key Process Areas	ISO EMS Concepts
Goals	Act
Commitment	Leadership Commitment
Ability	Plan
Measurement	Do
Verification	Check

Characteristics of Agile CMS

Agile processes originated in the software industry in Japan in the late 1990s. While the term initially applied to software development, it has been applied in other business areas. This White Paper extends the agile model to Compliance Management Systems (CMS) designed specifically for Environmental, Health & Safety.

An Agile CMS should exhibit ten characteristics:¹⁰

1. Modular
2. Iterative
3. Time-Bound
4. Economical
5. Adaptive
6. Incremental
7. Convergent
8. People-Oriented
9. Collaborative
10. Complementary



Modular

Agile systems allow Users to employ part or all of the software application to meet their business needs. Users can implement, or “plug in” additional features and functionality as needed. The software modules share common elements, so that Users benefit from the system’s framework.

Iterative

Agile systems are developed by a procedure in which repetition of a sequence of operations yields results successively closer to a desired result. This allows for continuous improvement.

Time-Bound

Agile systems make things happen within a defined time constraint. They can deliver a solution quickly, in Internet time—in weeks, not in months or years. Once implemented, these systems deliver data in real-time or near time to provide the greatest value.

Economical

Agile systems are designed to be affordable, choosing simplicity over complexity to solve a given problem. They are economical from a cost perspective, with clear benefits for dollars spent. This does not mean that the system is inexpensive.

Adaptive

Agile systems streamline business processes, but adapt to business processes rather than completely changing them. Systems provide standardized business processes and a degree of structure, but also adapt to changes in the business.

Incremental

Agile systems are incremental in both their development and implementation. This allows the solutions to be developed to address customer needs, market drivers and company vision. It also allows staged or phased adoption vs. “big bang” implementation, to show early value as well as to minimize risks to the end-user organization.

Convergent

Agile systems can use several technologies—such as Web services, portals, data warehousing, e-mail, executive decision support tools and data dashboards— providing the User a seamless solution. Agile systems also join convergent information sources—operations data, regulatory data, public information sources, metrics and key performance indicators (KPIs)—again, in a seamless solution.

People-Oriented

Agile systems provide a user-friendly interface and are easy to navigate. They elevate staff productivity rather than complicating day-to-day tasks. Their business processes are logical to the casual User, mirroring the real world. You'll know when your process is right when it doesn't take extraordinary people to do ordinary tasks.¹¹

Collaborative

Agile EMIS foster collaboration by:

- improving business processes
- facilitating distributed teamwork
- distributing data entry throughout the company, allowing entry where data originate, often in operations
- automating work flows, bringing together many parties
- serving as a central data repository, allowing many people to share data, enhancing the corporate knowledge base
- providing more accurate, real-time, consistent information
- reducing or eliminating duplicate data entry

Complementary

Agile systems have complementary elements that comprise the solution. These elements include integrated modules. They also include tools that harmonize with the business functionality, such as wizards, data manipulation tools and decision support tools.

The Value of Agile CMS

Agile CMS can provide a number of direct or “hard” benefits—improving the organization’s ability to manage risk and providing a solid Return on Investment (ROI). In addition, Agile CMS provide many indirect or “soft” benefits that are more difficult to quantify but may represent an even greater potential advantage to that organization.

Businesses often refer to risk management and ROI when discussing the value of IT initiatives, though these terms are often misused. Let’s take a moment to see how they really relate to Agile CMS.

Risk Management

Agile CMS help organizations to manage risks. We accept risks every day, according to our organization’s risk tolerance level. What is risk? *Risk* refers to the uncertainty that surrounds future events and outcomes. It is the expression of the likelihood and impact of an event with the potential to influence the achievement of an organization’s objectives.¹²

What is risk management?

“To many social analysts, politicians, and academics it is the management of environmental and nuclear risks, those technology-generated macro-risks that appear to threaten our existence. To bankers and financial officers it is the sophisticated use of such techniques as currency hedging and interest rate swaps. To insurance buyers and sellers it is coordination of insurable risks and the reduction of insurance costs. To hospital administrators it may mean ‘quality assurance.’ To safety professionals it is reducing accidents and injuries.”¹³

However, from a broader perspective, *risk management* is a systematic approach to setting the best course of action in the face of uncertainty by identifying, assessing, understanding, acting on and communicating risk issues. In addition, *integrated risk management* is a continuous, proactive and systematic process to understand, manage and communicate risk from an organization-wide perspective. It is about making strategic decisions that contribute to the achievement of an organization’s overall corporate objectives.¹⁴

For IT solutions risk management involves reducing the variability on one’s ROI for the same return. With an EMIS, the hope is to reduce the variability in the return on the EMIS investment—lower compliance costs, fewer Notices of Violation, and better operational performance.

This is where spreadsheet solutions to EMIS problems offer a highly negative return. They solve the EMIS problems and may even lower compliance costs and improve operational performance, but the variability or potential variability of that return is high. For example, what happens if a key staff member leaves the firm or is incapacitated? If an EMIS reduces compliance costs by 25%, but increases the variability of those costs by 50%, the risk has increased and the project has a risk-adjusted ROI that is negative.

Return on Investment

Agile Compliance Management Solutions can also provide organizations with a fast, strong ROI. Quantifiable savings can result from direct, out-of-pocket cost savings, reduced labor and increased productivity. The bottom-line impact can be improved capital utilization and increased profitability.

“Soft” yet extremely important business advantages can come in many forms including enhanced company image and branding, better customer relations driving increased market demand, improved labor relations enabling better use of human capital, satisfied internal and external stakeholders and more. The net result can be very real increases in the “triple bottom line” of sustainability—economic, social and environmental.

Dollars & Sense: CMS Delivers Strong ROI

Essential Suite™ software from ESS is part of a major implementation by a global chemical company that has streamlined about 200 diverse EH&S reporting systems into one. The results? The company expects to save \$4 million annually and recover their investment in only 2½ years.

Best Practices

Agile Compliance Management Systems also can help organizations adopt EH&S, operations and business best practices. Agile solutions consider the best practices of the User community, which spans multiple industries and types of Users. These EMIS solutions are built through a series of iterations that result in improvements in software features, functionality, quality and technology with each new release.

Essential Compliance Manager™ & Essential Task Manager™ Work Together as an Agile CMS

How well does *Essential Suite*™ from ESS, one of the leading software suites on the market today, deliver on the promise of an enterprise-level EMIS? The new *Essential Suite* (Version 6) puts a fresh face on a well-established product line. It has many strengths including broad and deep functionality, a contemporary look and Microsoft® .NET architecture.

More to the point of this White Paper, since an Agile CMS is key to a capable EMIS, how do two *Essential Suite* modules—*Essential Compliance Manager* integrated with *Essential Task Manager*—measure up against the described characteristics of Agile CMS?

Essential Compliance Manager and *Essential Task Manager* are part of the Performance Management functionality of *Essential Suite* (Figure 2). *Essential Compliance Manager* is designed to enhance compliance with EH&S requirements by streamlining the tracking of regulations, permits and policies. It supports various environmental management systems (EMS) initiatives such as ISO 14001, Responsible Care® Management System and federal and state EMS. *Essential Task Manager* is designed to streamline tasks and track task progress through completion. *Task Manager* is fully integrated with *Compliance Manager*.

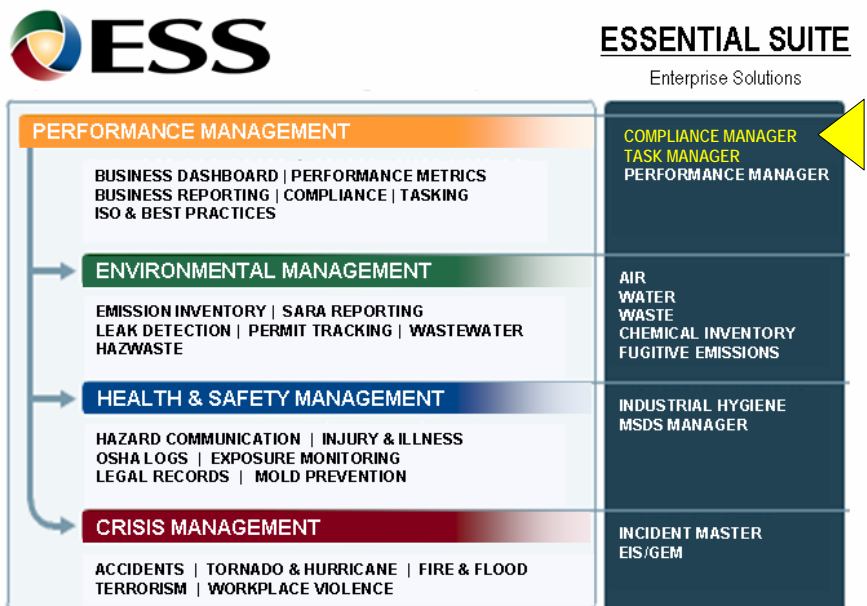


FIGURE 2: *Essential Compliance Manager* and *Essential Task Manager* are part of a robust EMIS with a broader footprint—*Essential Suite* from ESS.

Modular

Essential Compliance Manager and *Essential Task Manager* can operate as either a stand-alone solution set or in combination with *Essential Suite's* other media-specific EH&S modules. While the *Essential Compliance Manager* and *Essential Task Manager* tandem is modular, it is also a complete, enterprise solution in its own right.

Iterative

The *Essential Compliance Manager/Task Manager* solution set is iterative from two perspectives: software development and implementation. ESS software development is customer-driven. Each software release goes through several iterations to incorporate features requested by software end-

users. Customers work closely with ESS product managers—in focus groups and elsewhere—from initial concept through beta testing, resulting in a product that is as free from defects as possible.

The architecture and the integrated, modular nature of the software also enable *Essential Suite* Users to take an iterative approach to implementation. They can implement those features that meet their near-term needs, while considering future expansion. Once the system framework is implemented (business hierarchy; permits, rules and regulations; chemicals and materials, contacts, etc.), the customer can add business-specific functionality such as the compliance calendar. If the customer desires, they can tie operations data directly to *Essential Compliance Manager*. Later, they may wish to add air emissions, waste management or wastewater calculations modules to further automate *Essential Compliance Manager*.

Essential Compliance Manager also has robust tools to speed implementation. Users can set up compliance categories and tasks, and then duplicate these for other equipment, processes or facilities.

Time-Bound

The application provides rapid access to potential deviation data through alerts and notifications. When Users receive an e-mail alert or a notification of an upcoming task assignment, all they need to do is click on a hyperlink that takes them right to the application so take appropriate action. The integration with e-mail is seamless.

It has robust reporting tools to allow operations, EH&S staff and management alike to quickly view operational status. This allows informed decision-making that employs shared, rather than isolated, data.

Economical

Essential Compliance Manager pushes tasks to the lowest reasonable cost within the organization, typically to those who know best how to complete the tasks. The system reduces the cost of completing and documenting each task manually, which can range into the hundreds of thousands of dollars annually or higher for a complex facility. The system also helps to reduce the typical high costs of deviation reporting by standardizing and automating ad hoc data queries and common reports.

Adaptive

The system is flexible and scalable, meeting the needs of different types of organizations:

- Large, complex companies with large, complex compliance issues such as Title V federal air permits
- Companies looking for solid compliance calendar and task management functions, and perhaps management of permits
- Companies that plan to grow.

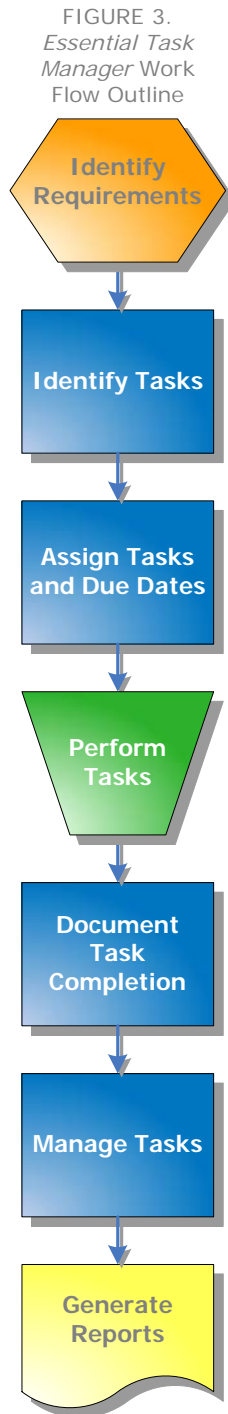
Essential Task Manager provides the flexibility to manage virtually any type of task, whether or not compliance-related. Clients can use it to manage projects and activities outside of the EH&S domain.

The Compliance Calendar emulates how Users see the world. The Task Calendar Display allows the User to quickly view tasks by day, week, month or year in an easy-to-use, intuitive display. Users can view tasks by task owner, by task owner's supervisor, or by group.



Essential Compliance Manager and Essential Task Manager software saves time and money by enabling operations-level personnel to handle a greater share of EH&S compliance responsibilities.

Essential Task Manager helps to standardize and institutionalize the compliance task management work flow (Figure 3).



Identify requirements. One of the greatest challenges in any organization is to identify all of the requirements that apply to the business. *Essential Suite* enables organizations to more easily identify requirements. The software allows Users to manage virtually any type of external or internal rules, regulations, policies or procedures. It links requirements to permits, processes and equipment. Users have different options for managing tasks according to their organization's needs—directly from permits, rules, regulations, policies or by compliance scenarios.

Identify tasks. *Essential Task Manager* enables Users to document tasks generated by requirements, for example, inspection, monitoring, recordkeeping or reporting. Task Manager cuts through the legal rhetoric of rules and regulations, providing a "plain language" description of the task to be done. The software provides the flexibility to model virtually any type of task, whether or not compliance-related, such as event- or data-driven, one-time, recurring and rolling recurring. It allows Users to group tasks, whether to follow a work shift, to manage all tasks associated with an incident or event, or other logical grouping. It allows Users to model task relationships to fit the real world, for example, where a single requirement drives three tasks, or where a single task meets three requirements.

Assign tasks and due dates. The software provides adapts to how a User wishes to assign tasks to people. The Task Assignment Creation wizard steps the User through the task assignment process. Alternately, Users can enter task statements, due dates and descriptions on the fly. Users can assign tasks to individuals and to teams.

The software is flexible with respect to the assignment of task completion dates. Users can assign one-time or recurring completion dates, including rolling recurring dates. Task owners receive notification of task assignments via e-mail, and they can easily view upcoming assignments on the Task Calendar.

Perform tasks. While the physical task completion in most cases is outside of the *Essential Compliance Manager* system, the software eliminates the need for paper logs, multiple spreadsheets and small databases.

Document task completion. *Essential Task Manager* allows the customer to determine how their organization wishes to close tasks; a one-step closure by the task owner or a two-step closure that allow a supervisor to verify and close the task. The system enables the task owner to easily report on task completion status by entering task completion information in a simple form.

Manage overall task data. The system provides an array of standard reports, as well as robust query tools for ad hoc reporting, thus adapting to how the User wishes to view compliance and task management data. Further, *Essential Suite* has a valuable audit trail feature. This provides the system administrator with an audit trail of changes to rules, requirements, permits and tasks.

EDITOR'S NOTE:

Advanced Reporting Solution Available



ESS' *Essential Advanced Reporting Solution* (ARS) allows end-users to interact with information and answer ad hoc questions themselves, with minimal knowledge of the underlying data structures. This means virtually all clients can easily create reports and perform calculations. As a result, ARS provides virtually limitless reporting possibilities when combined with tools such as Congas, Business Objects, Crystal Reports and Microsoft Excel.

Incremental

The incremental, modular system allows organizations to buy only what they need, thus limiting business risk. Organizations can purchase the *Essential Compliance Manager/Essential Task Manager* solution alone, or can purchase the entire integrated suite of EH&S functionality. Organizations can also implement *Essential Compliance Manager/Essential Task Manager* alone, or in conjunction with other *Essential Suite* modules. *Essential Suite* shared elements include the business hierarchy, Users, materials database and the optional regulatory subscription service.

The system is fully scalable. Organizations can start with a small number of facilities and Users, and expand their implementation to additional facilities and Users.

Convergent

Essential Compliance Manager uses convergent information technologies to deliver a complete compliance solution. It takes advantage of Web services to integrate with other systems. It leverages browser technology to deliver data any time, anywhere, to anyone with Internet access. Its multiple security levels, including security down to the level of individual data entry forms and reports, provide significant flexibility.

An exclusive feature is *Essential Compliance Manager's* integration with a top online regulatory search, retrieval and update service, *CyberRegs™* by Citation Publishing.¹⁵ This integration allows organizations to receive automated updates identifying new, changed or deleted federal and state regulations that may affect that client's operations. The frequency of these updates can be adjusted to meet each client's needs. *Essential Compliance Manager* then bulk imports the relevant citations AND identifies associated compliance tasks that the client may need to address (Figure 4).

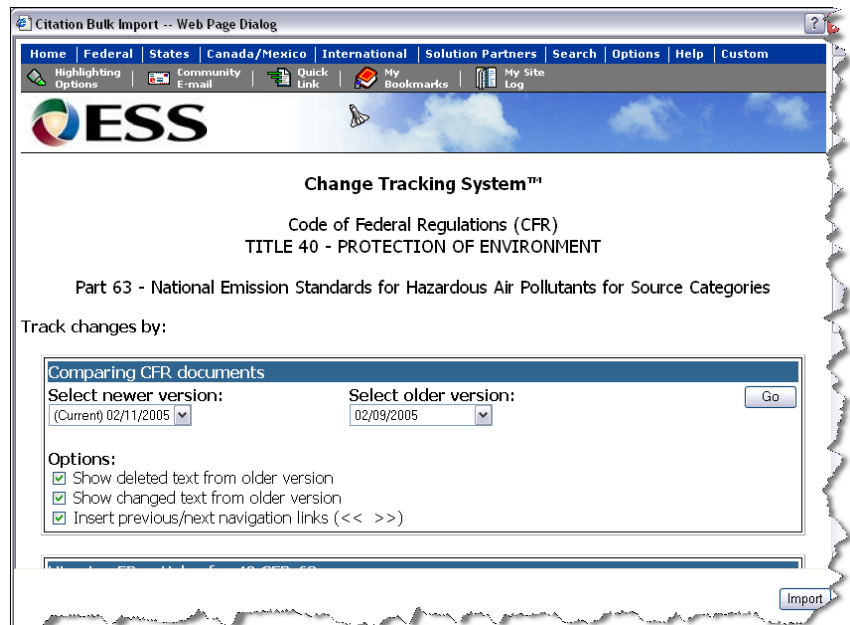


FIGURE 4. Integrated Regulatory Citation Update Service

Integration with e-mail systems allows the User to choose the types of notifications—on a preset schedule with four choices; data/event-triggered; or on demand—all from the application. Integration with process data historians allows the use of rolled-up operations data directly for compliance alerts. Interfaces to other data sources allow businesses to leverage information resident in elsewhere—for example, copies of permits, standard operating procedures or Notices of Violation and to Web sites for easy reference.

People-Oriented

Essential Compliance Manager is designed with the User in mind. It has an attractive, clean login screen. Windows authentication is now available, allowing Users to skip past login entirely. The interface for the casual User presumes simplicity and allows for drill-down to a greater level of detail. The Navigation Pane has a common Microsoft folder look and feel.

With *Essential Compliance Manager*, EH&S professionals simply click on a link in his/her notification e-mail to review rule changes, accepts changes to the database and determines if task changes are needed. Task owners receive e-mail notifications of task assignments and click on a hyperlink that takes them directly to the login screen.

The software allows Users to export data to Excel for further analysis and charting. Its online help is rather complete, allowing the User to find answers to simple and complex questions.

Collaborative

Essential Compliance Manager, together with *Essential Task Manager*, allows Users separated by geography, business line or time zone to work more effectively as a team to address business processes, compliance tasks, regulations, etc.

The system supports and facilitates effective work flow management by tracking the start and end of each process, the equipment involved, and key decision tools. Its robust tracking capability helps client organizations address potential deviations from permit or regulatory requirements. Operations-level task owners can identify questionable situations for review by a qualified EH&S professional to determine whether or not a deviation has occurred.

The system's task calendar allows Users to view upcoming tasks and how these tasks fit into the greater picture (Figure 5). Users can easily access their compliance calendar, viewing tasks where they are the task owner, the supervisor or a member of a team. This helps Users to plan for recurring tasks, anticipating resource needs. Task owners can use the calendar listings to hyperlink directly to the login screen and get started on the task.

Complementary

Essential Compliance Manager is one of a series of *Essential Suite* solutions that can work together or as stand-alone products (Figure 2). The *Essential Data Loader* and its compliance template are complementary tools to the *Compliance Manager* solution.

Closing Advice

Many commercial EH&S management information systems are available on the market, so many that it is confusing unless you are intimately familiar with software offerings and their capabilities. What is a capable system, and how can it help you to address your compliance needs, at the same time managing risk and showing benefits to your enterprise?

Before embarking upon an EH&S compliance initiative, first, understand the problem(s) to be solved. Get your arms around the problem—perhaps simply the need to centralize and share task calendars, or something much more. Involve key stakeholders, document your needs and set scope boundaries.

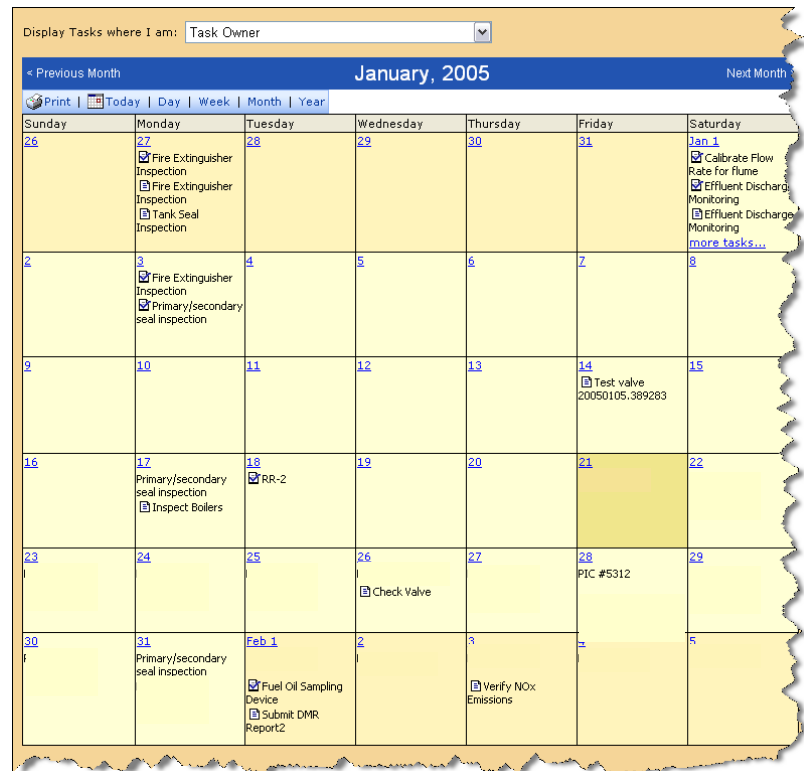


FIGURE 5. Task calendars provide Users with daily, weekly, monthly and yearly views.

Second, select a solution with well-defined business logic. Ensure that the solution has the appropriate breadth and depth, and the appropriate “granularity” to solve business problem(s). Look not only at the software’s ability to solve current needs, but also look to the future.

Third, ensure that your organization is aligned; software can improve operational performance only when its capabilities are aligned with real business processes. This means not only alignment of EH&S processes, but also how EH&S processes align with the organization’s strategic goals.

Fourth, fully leverage your EH&S information while working within your organization’s IT standards and constraints—for servers, desktop computers, network traffic, bandwidth, integrated data sources, etc.

Finally, identify someone who can serve as a translator to communicate with all types of stakeholders in your EH&S compliance initiative. A single EH&S or IT person is not likely to possess the needed skill set. To position your organization for success, ensure that you enlist someone well versed in EH&S, business and IT needs. You will find it rewarding.

About the Author

Ms. Jill Barson Gilbert advises senior management in industry, as well as software, investment, and consulting firms. She has a rare skill set, combining hands-on EH&S experience in industry, management consulting, software product management and software implementation. Jill also has considerable experience in strategic business planning and marketing. Known for leadership, she is a past Vice President of the Air & Waste Management Association. Jill is a thought leader on EH&S management information systems and writes the “IT Insight” column in *EM*, an A&WMA publication. She earned an M.S. in Environmental Management from the University of San Francisco and is a Qualified Environmental Professional. For information, visit www.Lexicon-Systems.com.

About ESS

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¹ Carnegie Mellon Software Engineering Institute, <http://www.sei.cmu.edu/cmimi/cmimi>.

² Gilbert, Jill Barson, “EH&S Compliance: Leading the Pack, or Sitting Back,” *EM*, February 2005.

³ Gilbert, Jill Barson, “EH&S Compliance: Leading the Pack, or Sitting Back,” *EM*, February 2005.

⁴ The Magical Demystifying Tour of ISO 9000 and ISO 14000; International Organization for Standardization: Geneva, Switzerland. See www.iso.org/iso/en/iso9000-14000/basics/general/basics_1.html.

⁵ Responsible Care Management System Technical Specification, Document RCMS 101.01, January 2004, American Chemistry Council Inc.: Arlington, VA. See http://responsiblecaretoolkit.com/pdfs/RCMSTech_012504.pdf?opendocument&Login.

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⁸ Software Engineering Institute, Carnegie Mellon University, <http://www.sei.cmu.edu/sei-home.html>.

⁹ Actually a series of models available from the Software Engineering Institute, <http://www.sei.cmu.edu/cmimi/models/#models>.

¹⁰ Borrowed from Miller, Randy, The Dynamics of Agile Software Processes, Part I: Characteristics, Borland Developer Network, Revised July 15, 2003 (<http://bdn.borland.com/article/0,1410,29726,00.html>).

¹¹ Miller, Randy, The Dynamics of Agile Software Processes, Part I: Characteristics, Borland Developer Network, Revised July 15, 2003.

¹² Robiallard, Lucienne, *Integrated Risk Management Framework*, Treasury Board of Canada Secretariat, Modified April 4, 2001 (http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/riskmanagement/rmf-cgr01-1_e.asp#Introduction).

¹³ Kloman, H. Felix, quoted from *Risk Analysis* article by Software Engineering Institute. See <http://www.sei.cmu.edu/programs/sepm/risk/>.

¹⁴ Robiallard, Lucienne, *Integrated Risk Management Framework*, Treasury Board of Canada Secretariat, Modified April 4, 2001.

¹⁵ For information about Citation Publishing, visit www.citation.com.