

Redesigning Chemical Waste Management

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Abstract

As part of a continuous improvement effort driven by the Campus Planning and Facilities Department of the University of West Georgia (UWG), the Office of Risk Management/Environmental Health and Safety (RM/EHS) implemented Business Process Redesign (BPR) methodologies in August 2004 on their chemical waste management program, a core process of the University.

Representatives of UWG faculty, staff, and the University System of Georgia (USG) served on a BPR team that selected and evaluated this process due to the potential for noncompliance with EPA/EPD regulations; fines that can be incurred for being in noncompliance; current inefficiency; and the technology options that are available to enhance the service.

The results of the BPR for this process include:

- The identification of several non-value added steps within the process that could be eliminated utilizing a web-based program.*
- A better understanding of the web-based programs that are available, the costs associated with such programs, and the opportunities for modification within the program to make it affordable for smaller institutions.*
- An opportunity to benchmark with other institutions to compare processes.*
- Funding approval for the purchase of a web-based program that allows web-based access with standardized secure authorization enables common data to be shared system-wide, links Material Safety Data Sheets (MSDS) to chemical inventory, creates appropriate reports, and paves the way for other USG institutions to implement at an affordable cost.*

Introduction of the Organization

The University of West Georgia (UWG), a senior unit of the University System of Georgia (USG), is a co-educational, residential, liberal arts institution located on 394 acres in Carrollton, Georgia. UWG originated in 1906 as the Fourth District Agricultural and Mechanical School (A&M), and one of twelve such institutions established by the State of Georgia between 1906 and 1917. From an enrollment of 576 in 1957, the institution's student body is now over 10,000. UWG offers 12 undergraduate degrees with majors in over 50 fields.

Risk Management/Environmental Health and Safety (RM/EHS) is an area of the Department of Campus Planning and Facilities (CP&F), and it is responsible for the protection of UWG students, visitors, faculty, and staff through training, education, hazard abatement, and information dissemination. RM/EHS prepares students for environmental health and safety issues and ensures that all activities conducted on campus meet and exceed requirements set by local, state and federal agencies.

Statement of the Problem/Initiative

Individual departments are responsible for identifying and labeling all chemicals, ensuring that waste containers are properly maintained in a designated area, and notifying RM/EHS when the waste is ready for disposal. RM/EHS personnel are required to research chemical hazards, prepare internal manifest forms, determine waste codes and hazard classes, create chemical disposal inventories, collect and transport wastes to a central location, manage containers until disposal, determine monthly generator status, and maintain records of disposal. This process was given a high consideration for Business Process Redesign (BPR) due to the potential for noncompliance with EPA/EPD

regulations, the penalties that are associated for being in noncompliance, current inefficiency within the process, and the technology options that are available to enhance the service.

Design

As part of a division-wide effort to incorporate BPR in the analysis of its core processes, Director of RM/EHS, Theresa Jablecki-Kriel, appointed campus staff members, safety committee members, and a representative from USG as the cross-functional team to review the existing methods deployed in chemical waste management and the technology that is available to improve its effectiveness. The evaluation of the process revealed that such manual steps as the researching of chemical hazards, preparation of the internal manifest form, determination of the waste codes and hazard class, creation of chemical disposal inventories, and determination of the monthly generator status could be generated from the technology that was available in the form of a web-based program.

Benchmarking with Auburn University, University of Georgia, Georgia Tech, and the Medical College of Georgia revealed that web-based programs have been designed specifically for institutions. These programs enable the generator to prepare and download an internal manifest form that will automatically identify the chemical information, waste codes, and hazards class of the waste. The program can also maintain databases on chemical inventories and the properties of each material (material safety data sheet). RM/EHS would still be accountable to inspect, weigh, transport, and store the containers until disposal.

Implementation

Off-the-shelf programs are designed for industry and do not necessarily meet the needs of a university setting. Because every institution is unique, the programs that have been custom designed for one may not necessarily fit the profile of another. With some institutions quoting design fees of over \$2 million, the possibility and probability of achieving this at UWG seemed remote. Further benchmarking and networking with the Medical College of Georgia however has led to promising discussions with On Site Systems, Inc. who will modify the program they originally designed for the Medical College of Georgia as well as convert the existing chemical data inventory.

Benefits

The benefits that are derived from the implementation of this program include:

- Transferring the burden of responsibility to the generator (faculty and students) and enables them to be more knowledgeable of EPA/EPD regulations and responsible for waste management.
- Allows RM/EHS flexibility to control chemical reference files, oversee compliance, and adapt to regulatory changes
- Redistribution of the workload between the generator and RM/EHS personnel.

The current amount of time devoted to this task by RM/EHS personnel averages 6 hours (\$150.00) per waste pick-up. Implementing the web-based software reduces this cost to 15 minutes (\$ 6.25)

- Simplifies and automates frequent and time-consuming tasks.
- Supports consistent handling of all waste products.

A web-based program also provides web-based access with standardized secure authorization, enables common data to be shared system-wide, links MSDS to chemical inventory, creates appropriate reports, and helps to pave the way for other USG institutions to implement our pilot program at an affordable cost.

With On Site Systems quoting \$23,500 to modify the Medical College of Georgia's program and convert our existing chemical data, the financial payback on the investment is estimated at 5 years. This is based on an average of 30 disposals per year. However, the productivity payback by RM/EHS personnel increases by a minimum of 4.6% when considering the time that has been spent on manual disposal time can now be applied towards such proactive responsibilities as increased building inspections, RM/EHS training, accident prevention, and increased safety communication to the campus community.

Retrospect

UWG and the University System of Georgia are considered the primary beneficiaries. Since 1999 the U.S. Environmental Protection Agency has inspected hundreds of colleges and imposed millions of dollars in penalties. In order to reduce or eliminate such fines, institutions in some cases have agreed to conduct Supplemental Environmental Projects. The following table illustrates the classification of regions within the United States, the number of inspections, and the fines that have been imposed as a result of noncompliance:

Region 1 – 35 Colleges Inspected, - 11 Cited; \$1,074,637 Penalties/ \$2.68 million supplement projects	Region 6 – 14 Colleges Inspected, - 4 Cited; \$40,070 Penalties/ \$189,005 supplement projects
Region 2 – 40 Colleges Inspected, - 13 Cited; \$373,000 Penalties/ \$1.28 million supplement projects	Region 7 – 66 Colleges Inspected, - 4 Cited; \$290,143 Penalties/
Region 3 – 14 Colleges Inspected, - 6 Cited; \$171,622 Penalties/ \$53,780 supplement projects	Region 8 – 10 Colleges Inspected, - 0 Cited
Region 4 – 93 Colleges Inspected, - 2 Cited; \$50,349 Penalties/ Since September 30, 2000	Region 9 – 6 Colleges Inspected, - 1 Cited; \$505,000 Penalties/ \$1.2 million supplement projects
Region 5 – 18 Colleges Inspected, - 5 Cited; \$38,678 Penalties/	Region 10 – 26 Colleges Inspected - 1 Cited; \$9,350 Penalties/

Region 4 represents the southeast portion of the United States and includes the states of Kentucky, Mississippi, Alabama, Georgia, Tennessee, North Carolina, South Carolina and Florida. EPA officials say that the enforcement effort, while at times uneven, is necessary to bring delinquent campuses into compliance with federal environmental laws.