

SUSTAINABLE OPERATIONS – LIFE AFTER EMS AT ANY FACILITY

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ABSTRACT

Much confusion exists concerning how sustainable management of Federal, be it energy research and development, waste management or other industrial operations can be successfully integrated into an existing or soon to exist ISO Environmental Management System (EMS). This presentation explores issues that arise when implementation of an EMS, and lofty “sustainable mission” goals and policies are called for simultaneously.

Using observations and practical experience across multiple EMS implementation projects in Department of Energy, Department of Army and Research & Development operations, this presentation will describe barriers encountered and solutions during and after EMS implementation. Clear and concise lessons learned will be shared so the audience can take home the fix and implement it immediately.

Dynamac Corporation has reviewed and implemented multiple projects attempting to establish sustainable goals over the long term, including Ft. Hood, TX and operates many “ancillary” compliance sites including hazardous materials and the like. During the last year there have been numerous attempts to establish “fence to fence” sustainability programs throughout the Department of Defense. In addition, there are requirements through Executive Order 13148 to implement Environmental Management Systems.

This presentation will illustrate that these programs are not mutually exclusive and more importantly, may not require separate funding.

We illustrate methods that can be employed to avoid extra effort regarding implementation of multiple programs designed to meet the same long-term objective that is the long-term viability of mission.

Using coordinated database functionality, cross-disciplinary team assembly, communication and a high degree of enabling skills, we have successfully overcome many of the barriers one will typically encounter during the process of implementation. Functionality is preserved; mission enhanced and compliance maintained without introducing excessive external costs.

There is confusion about how “environmental management system” (EMS) and “sustainable operations” (SOPS) might play together in the management of governmental programs. There is also a great deal of confusion as to how to measure performance. We have seen this first-hand in our experiences in implementation support for EMS at Army Research Laboratory and Ft. Hood, Texas in addition to other locations. For all intents and purposes the difference, explained a bit later, between the programmatic approaches for each is fundamental. Let me illustrate by providing first, definitions.

Environmental Management System (EMS): part of an organization’s management system (interrelated elements used to establish policy and objectives that achieve results) used to develop and implement its environmental policy and manage its environmental aspects. This is inherently environmental in nature. *ISO 14004:2004 (E) draft*

Sustainable Operations (SOPS): All encompassing operations generally including environmental, social and financial goals that ensure the **long-term viability** of a mission. *Arbitrary definition based on implementers objectives.* Encompasses much more than environmental aspects.

Integrated Safety Management (ISM): Work conducted in such a manner that protects workers and other people, and does not cause harm to the environment. Safety is an integral part of each job —not a stand-alone program *DOE EH Website 2005.*

A fundamental difference between these two programs is that one (EMS) is a fully documented and auditable system and the other (SOPS) is based on the agency objectives over time. This does not mean that a sustainability management system cannot be auditable. An EMS is always auditable by definition. Before we explore the differences in these programs and ways to overcome misunderstanding associated with implementation, let me illustrate how these programs relate to each other. Table I below shows the common elements of EMS, SOPS and ISM programs. It is necessary to understand these relationships in order to begin integration efforts that capture even greater efficiencies in performance and cost of either of these programs if they stand alone.

Table I. Common Elements of EMS, SOPS & ISM Programs.

	EMS	SOPS	ISM
<i>Define Scope</i>	X	X	X
<i>Prepare Policy Statement</i>	X	X	X
<i>Identify Aspects</i>	X	X	X
<i>Identify Legal Requirements</i>	X	X	X
<i>Establish Objectives & Targets</i>	X	X	X
<i>Develop Training</i>	X	X	X
<i>Develop Communication System</i>	X	X	X
<i>Prepare Documentation</i>	X	X	X
<i>Develop Documentation Controls</i>	X	X	X
<i>Establish Operational Controls</i>	X	X	X
<i>Develop Emerg. Response Program</i>	X	X	X
<i>Develop Audit Program</i>	X	X	X
<i>Develop Management Review Program</i>	X	X	X

In most governmental organizations, social aspects are weighted less heavily, as the endorsement of a federal agency’s activities by the public is inherent by definition. However, there are instances that require local social considerations to be taken into account when developing sustainability programs. In general, sustainable operations or “sustainability” of mission can be

reached by using a 14001 EMS as a tool. The two programs can work toward the same vision. They do this in different ways but it is possible, as I will show, to be complimentary. In addition, occupational safety and health considerations have been integrated in different ways in the Department of Energy's vision of sustainability. The "Integrated Safety Management" or ISM has attempted to place safety & health policies and directives into a top-down management system much like EMS. Again, these systems can, and should be integrated.

One barrier in doing this is organizational isolationism. More popularly known as "turf battling". In order to protect or even increase one's funding or exposure for both personal and organizational reasons, sustainability of the mission can be overlooked. In other words, short-term returns outweigh long-term returns on investment. We have all experienced this before. The most often cited example is energy systems. Shall we pay the extra cost to finance renewable energy projects knowing the payback period extends beyond our particular ownership? In terms of one's home, financial considerations are generally paramount. With public agencies, the answer may be a bit more complex.

In order to overcome the barrier of isolationism, we need to, as practitioners of sustainable enterprise, bring the isolationists to the table. We need to gain championship among all interested parties. What does that require? A cross-disciplinary team of professionals who may or may not have knowledge of or an interest in achieving long-term viability is necessary. Have we met people riding it out until retirement? Have we met those who believe environmental protections come secondary to about everything else? These are the same folks who need to be convinced that environmental protections through EMS implementation can and do affect mission in tangible ways, even in the long-term. Inherent here is the challenge of assembling a team qualified to do the work of implementation. This will require an understanding among the team of how the proposed environmental impacts will be mitigated (selected during the EMS implementation process) and how they enhance mission. Assembling the team then requires team members:

- a. willing to discuss operational detail related to environmental impacts
- b. interested and talented to find solutions
- c. able to dissect the mission component(s) they represent
- d. able to function in a team environment
- e. able to look holistically at mission needs

That leads to an additional procedural challenge. Who do we invite to the team? The confusion here can appear in the form of what comes first, the chicken or the egg? Do we assemble a team that represents all of our agency's activities or do we consider our agency's activities before assembling the team?

ANSWER: Do a complete aspect/impact analysis first.

The need for an aspect/impact analysis results in the benefit of potentially reducing team size. Logistically and practically, it's better to meet with a few individuals than have a roomful. If the top objectives are selected against the prioritized aspects/impacts of the agency operations, and for all of the Department of Energy (DOE) folks, this is where you add your safety and health

concerns. If they are considered within the context of the operation, you will get an integrated result in your weighted matrix.

EXAMPLE: If air emissions is an impact identified as significant during the EMS process and the emission is the result of an activity taking place on the grounds being considered, then the matrix developed to address all issues should have safety, environment and health effects quantified and ranked in some way. We recommend a weighted scale using the established team.

This should be accomplished systematically across all determined aspects/impacts identified. A word of caution is needed here. Generally, long-term effects of an impact are not considered. It is important to have some grasp on the scale of the impact, its temporal features and its effects on both human health & the environment. Fortunately, most of the impacts one will encounter at any given facility, installation or campus are known. For those that are not, it might be suitable to assign a qualitative value to the impact. For example: How often is biodiversity taken into account if one has an emission impact? Generally speaking, we need to think holistically, in terms of impacts analysis and interaction between our activities, products and services and our communities.

At the Army Research Laboratory, the team was comprised of a member from each of the following technical branches:

- a. Environmental
- b. Processes & Properties
- c. Impact Physics
- d. Composites & Lightweight Structures
- e. Metals & Ceramics
- f. Public Works
- g. Hazardous Materials Pharmacy
- h. Polymers Research

This team was truly cross-disciplinary, and represented the diverse points of view we need to embrace. We were able to use this team to develop and implement the metrics as indicated in Table II below:

Table II. Metrics Developed and Implemented by Army Research Laboratory Cross Disciplinary Team.

		TECHNICAL		ENVM	ENVM
ID NUMBER	ISSUE	POC	BRANCH	ASPECT	IMPACT
011-2002	Energy use in Building	Moyer	All	excess energy consumption	natural resource depletion, emissions.

OBJECTIVE	TARGET	STATUS
reduce energy use by 10% this CY.	post signs for turning off lights in bathrooms after use, signs in admin areas to power off computers after use or when 2 hours idle.	Evaluate installation of motion detectors. Need more signs for light usage only; contact Alison Thomas at EPA HQs at 202-586-2099 for additional stickers; B.Moyer placed order, awaiting receipt. Brian to follow-up.

Another barrier is often defining the most beneficial practice for any aspect identified to need mitigation in order to achieve “continuous improvement”. Continuous improvement requirements in the 14001 standard refer to systematic re-visitation of the objectives and targets by those engaged in the system. Specifically, top management. We need to prove that the system is being nurtured by the organization. This seems like a lofty requirement. It is not. As we monitor progress against our defined objectives and targets, we see improvements. We have:

- Fixed a piece of equipment
- Added a piece of equipment
- Held a meeting on a previously undescribed impact
- Received OK to purchase a new add-on to a process
- Added a new member to our team w/particular expertise
- Met monthly in lieu of annually
- Measured our energy use and it went down...

These all demonstrate something that improved. Similarly, when we fail...more confusion. A management system is a friend, not foe. We are required by the standard to report nonconformances (NCR). These are not compliance reports and the offices of enforcement do not perform them. These are tools that find weaknesses in our EMS. We may find a procedural problem or an equipment malfunction or a staff change that resulted in a target not being met. We simply document the shortcoming using an NCR. This stays in our record and is auditable. If you implement an active and robust EMS, the NCR file should be large. This is generally an indicator that the system is reviewed often and corrected constantly.

OK, back to the 30,000-foot view of sustainable operations for a moment. If we consider the bigger picture – the view of the world as our organization fits in it, we see something a little different. It may be a different role in energy research. It may be the Office of Policy. In the

Department of Defense, it may be the Command structure we reside in. The connection to the bigger mission, community and environment translates from our activity in some tangible way.

We want our system (the on the ground auditable system) to marry to that bigger intent. In order to be sustainable, one must fit nicely within the community of the public, agency or organization in which it resides. What is sustainable in Idaho Falls, may not be sustainable in Washington D.C. However, the EMS may be indifferent to either – so long as it is auditable. The EMS in D.C. will meet all of the requirements of an EMS, as in Idaho Falls. However, one may do a better job in satisfying sustainable mission goals. This illustrates the need to view an EMS as a tool to get to sustainable operations. Sustainable operations means simply; long-term viability of the mission.

To illustrate the point; if an activity that causes excessive noise in the community is part of ones activities, products or services and it is identified as such in the EMS, then we can make measurable progress to mitigate the excess. If we cannot, we risk losing the mission. The EMS can therefore document our continuous improvement toward mitigating the excess, so we can stay in business and have less impact on the community, thereby satisfying the SOPS requirements in a classic win-win situation.

Another word of caution is needed here. If we develop separate systems to chase sustainable operations and EMS, we will waste resources. There is a body of believers out there that insist these are separate programs. I advocate merging all requirements into one system (including health & safety) to shave costs, gain interactivity and transparency. I cannot find a limitation in any standard that prevents merging systems. I do see a barrier from private industry where they might make money from separate contract efforts. Likewise, I see the barrier illustrated the public service sector where we can try and build new programs to gain attention or funds. In addition, transparency encourages accountability when NCR's are written. Many folks are concerned about accountability tracking. We have witnessed these items in action.

Here is a nice example of some Sustainability Program goals and metrics as developed by Dynamac in part, and Ft. Hood staff.

- All Infrastructure and energy systems are planned, designed, constructed, and maintained to be sustainable and secure**
- Fort Hood will actively reduce its impact on regional air quality from all sources**
- Provide high quality potable water and reduce consumption while maintaining mission readiness and quality of life**
- Training landscapes managed to support current and future mission requirements while sustaining cultural, natural, and land resources**
- Fort Hood will use sustainable products and services, with active regional involvement, to minimize waste and environmental impact.**

Now we have revealed and explored some of the key points when considering sustainable operations and EMS implementation. What do the merging of these systems actually require? How might you go back to your offices and begin a path toward consolidation in order to achieve these cascading efficiencies in cost and labor, while improving your environmental performance?

The first things most of us encounter are the multitude of database systems that we require in our daily duties. There are software products that do everything except cook our lunch, and they're working on that. We have waste tracking systems of various types, inventory tracking for logistical support, EMS software for documentation and project management support to name a few. Not to mention the entire entrée of desktop applications we use. There is general agreement that these systems can be cumbersome and difficult to manage. My view is that we proceed to integration of these systems. In our experience, desktop applications have the capability, if fashioned thoughtfully, to manage an EMS. We can set up document hyperlinks, web links, and data mining functionality right on our desktops. We just do not need expensive subscriptions to fancy web based and other type software products being pedaled on a daily basis. If one can afford and pay for the upload of these systems, then by all means buy it. However, one does not need these programs to get certified to the ISO 14001 Standard. We developed a Microsoft Access® tool with some real nice fill in the blank type worksheets for clients but we have also brought full EMS capability by using Microsoft Excel®. Again, you should try to keep it as simple as possible.

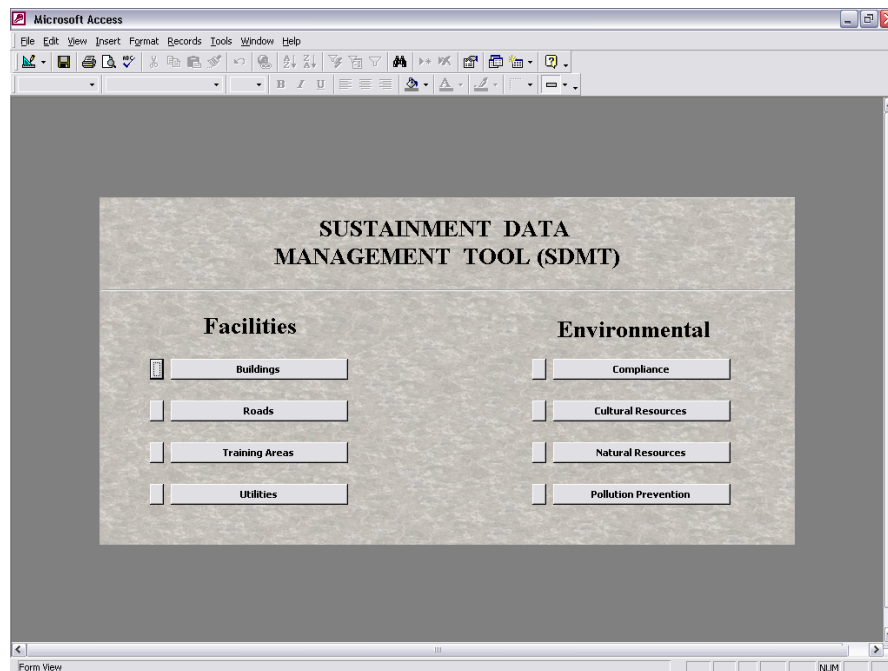


Fig. 1. Sustainment Data Management Tool Interface.

Communication is paramount to a successful implementation of EMS and also for achieving sustainable operations. Again, these two programs are not mutually exclusive. They continuously interact with each other. None of the interactivity is possible though without

employing a team approach. The one common trait of successful EMS, SOPS & ISM implementation has always been a top-down endorsement and then team assembly to accomplish the mission. This is not unusual. We have illustrated the detrimental effect of isolationism in this endeavor. It cannot be stressed enough that good team development and coordination is a key component to sustainable operations. Not only intra-team communication (within team) but also inter-team (between team) communication is needed. In the quest to become sustainable, teams from different occupational classes must interact. Planning departments, Environmental, Public Works, Technical, Support, and the public must all speak to one another in order to gain the knowledge and scope of the mission impacts of operation on the surrounding community and within the broader mission component. Ubiquitous across successful programs is the development and enhancement of public awareness and communication systems. Where Federal missions interface with the public, an excellent public affairs official is worth their weight in gold. The EMS must define and improve upon this interaction process and when it succeeds, sustainability is within its grasp.

Empowerment of individuals is fundamental to the success of a sustainability program. It is also fundamental to an EMS implementation project. Anyone working on a cross-disciplinary team has to feel that their say is important for the success of the project. Everyone should have a feel for his or her individual representation responsibilities but it is not necessary (nor possible) for each team member to be equally versed in environmental impact analysis. In fact, most members of the team will likely not have a clue about impact analysis pertaining to environmental aspects of their operations, much less sustainability aspects. Recall, that is why we have assembled the team. In any case, we must listen to each member and ensure we stay on the same track in terms of carrying out the current team duty related to reaching long-term viability.

Costs will be reduced if one begins to merge these important systems. Merging systems begins by communicating across professional disciplinary boundaries. I do not want to send a message that this is an easy process but it is simple. It does not have to be cumbersome. Inherently, effective teaming and communication are inexpensive. Often, teaming & communication reveal themselves by taking the first steps in setting up the system. Costs pile up when we chase multiple goals across multiple programs without a long-term vision for the future. The cascading efficiencies are revealed in:

- Better cross-agency communication
- Priority based procurements
- Enhanced and common measurement systems
- Improved worker productivity
- Suggestions flying in from the field
- Real-time accountability of staff
- Capital improvement projects that pay back quickly
- Improved project workflow
- Less waste
- Less down time in mission...

and others. Opportunities begin to reveal themselves without expensive and time-consuming process surveys due to the wide range of experience around the table. Collaboration among agency officials is the only true way of achieving long-term success in any mission.

In summary then, EMS and SOPS are related. We can use EMS as a starting point to achieve sustainable objectives. An EMS only requires we consider our environmental aspects and impacts across the scope of our activities, products and services. The system itself though can be used, as we have seen for achieving goals related to sustainability of mission. Sustainability by definition reveals itself in the “fit” of mission to the local community (environment is part) in which it resides. If the “fit” is jeopardized, the mission is at risk to be closed out or transplanted. Other factors affecting long-term viability are social relations and financial stability. Opportunities reveal themselves for reducing cost and saving time when we seek to merge these normally separate systems into one. Overcoming barriers like isolationism, database communication, team interaction and unnecessary detail are critical to overcome in order to use EMS as a tool to reach sustainable operations. I hope you have gleaned some valuable information from this presentation.