Written by Perry Lovelace, Nepenthe Institute, and John C. Shideler, Futurepast: Inc.
Sunday, 01 April 2001 12:28

Companies implementing an environmental management system need to direct specific attention to critical equipment and maintenance procedures.

In the four and a half years since it was published as an international standard, ISO 14001 has helped many organizations improve their environmental management systems (EMS). The standard from the American National Standards Institute, which is entitled "Environmental management systems–Specification with guidance for use," describes requirements for a complete environmental management system. It is designed to be used by any type and size of organization, private or public.

Like its cousin ISO 9001 for quality management systems, ISO 14001 can be used for third-party registration or certification. As of June 2000, it was estimated that more than 17,000 organizations worldwide had achieved registration to the standard. Industry sectors that lead in ISO 14001 implementation include electronics, chemicals, automotive, construction, and metals.

The standard describes a management system comprising 17 elements. More than half of these resemble requirements for quality management systems found in ISO 9001. One of these elements is operational control. While ISO 9001 is concerned with establishing and maintaining controls to ensure product quality, ISO 14001 requires organizations to plan their activities, including maintenance, to prevent the occurrence of significant environmental impacts.

Specific requirements of ISO14001

The operational control element serves as a key focal point in environmental management. The standard requires an organization to document operating procedures associated with its significant environmental aspects. Moreover, these procedures must stipulate operating criteria. That is, the procedures or work instructions need to guide personnel in the correct execution of the task if failure to do so could result in bad outcomes. These outcomes would include breaching laws or regulations, failing to prevent pollution, or violating the organization's environmental policy or its environmental objectives.

For example, oil and gas platform operators rely upon compressors to move product through pipelines at uniform rates of pressure. In addition to playing a key role in production, oil field compressors are associated with the potential for significant environmental impacts, such as releases of oil or gas to the environment. The

compressors require scheduled maintenance to ensure their suitability for continued service, and platform operators have detailed sets of instructions to ensure that specified operating criteria are met during shutdown, servicing, and startup.

The operational control element of ISO 14001 ensures that organizations plan such maintenance and carry it out under controlled conditions. Another element of the standard requires the organization to maintain records to demonstrate that it meets the requirements of its EMS. Maintenance activities subject to operational control would fall in this category.

In the oil field example, such records could include dates of scheduled or emergency maintenance, a listing of parts replaced or servicing done, and the identity of mechanics and supervisors.

Impact on maintenance

What will be the impact on maintenance? Potentially, equipment that is referenced in the EMS will include any item whose failure or improper operation or repair may result in release of hazardous or toxic materials into the environment. For many industrial plants this may be a significant number of equipment items.

Leading world class organizations most likely already are tracking this environmentally sensitive equipment in their maintenance practices. For many plants, however, equipment failures still produce a significant impact on their daily activities. Plants operating in a reactive management mode may see the costs associated with such failures as an opportunity to establish a toehold on moving toward the preventive, predictive, or productive modes. Such a strategy can address two problems simultaneously. First, since reactive organizations are most likely to be responsible for environmental "excursions," exposure to environmental fines and penalties can be reduced. Second, operational efficiency can improve due to less unplanned downtime.

Companies implementing an EMS will direct specific attention to:

- Preventive maintenance programs and activities
- Predictive maintenance programs and activities
- Maintenance planning, scheduling, and backlog management

- Additional tracking in the computerized maintenance management system (CMMS)
- Root cause analysis procedures and records.

Analysis and optimization of the preventive maintenance (PM) program for equipment items associated with the organization s significant environmental aspects will be necessary to make sure that maintenance is adequately planned. This could provide the stimulus to have a detailed look into the PM program and its coverage.

Additionally, how are potentially significant environmental impacts addressed in the job plans for PM activities? There are two starting points for this optimization: Either examine existing PM activities as they come due and modify them to take into account the analysis of environmental aspects as directed by ISO 14001 (this will take one PM cycle), or begin with a list of the organization's significant environmental aspects, check for appropriate PM coverage, and set up PM actions as needed.

Predictive maintenance (PdM) activities are of several types: vibration, lube sampling, infrared scanning, etc. PdM actions are focused on more critical equipment and this proactive approach may be well suited for equipment associated with the organization's significant environmental aspects. How are these records kept and how can they be used to demonstrate proactive compliance with the EMS? Looking into the PdM program can take the same two starting points as in the PM program above.

The maintenance planning and scheduling functions will be expected to add environmental management activities to their agenda. Several questions worthy of investigation arise: How is the backlog sorted to identify overdue preventive maintenance work? How do activities associated with significant environmental aspects rank in the organization's prioritization process? What Key Performance Indicators are in place for assessing whether the organization is complying with its operational controls and achieving its objectives for environmental performance? Are supervisors clearly responsible for seeing that environmental management activities are performed on time?

The CMMS is a great tool for tracking environmental compliance. Adding an equipment classification for those items associated with significant environmental aspects is an obvious change to make. There may well be new equipment items to include in the hierarchy. Work order types also may be appropriate for an additional type. Designing

environmental performance reports is a good action. A responsive CMMS that is consistent, reliable, timely, and accessible will be a super aid for maintenance participation in the EMS. EHS may even use the CMMS as its basic environmental data tool. Is it possible to display or print a list of equipment that is covered under the environmental management system?

In the event there are environmental excursions, the root cause analysis procedures, operational control procedures, and record keeping will be scrutinized for their effectiveness in finding and eliminating the source(s) of the excursions not only for the specific incident, but extended to all such similar actions and equipment items in the plant. In fact, the EMS will require that a specific root cause analysis procedure be established, implemented, and maintained.

Although these changes in maintenance practices may seem time-consuming at first, they do not all need to be implemented at once. A good plan of attack can incorporate these changes in an orderly and cost-effective manner.

Joint planning important

It is important for an organization that is embarking on the improvement of its environmental management system to recognize the cooperation opportunities inherent in various departments. Environment, health and safety, and maintenance are the departments most impacted by the development of an EMS. Each has its resources and policies which, if joined, can produce a product that is viable and truly in the spirit of the organization's environmental policy at a reasonable cost and effort.

The decision to implement ISO 14001, taken with this perspective, need not be onerous nor just another management flavor, but a dynamic, prideful, team-building process that results in worthwhile work and organizational pride. The alternative to this leadership probably will be just another make-work program that will take its place on the shelves and not extend into the roots of the organization.

ISO 14001 represents a social move toward greater organizational responsibility in protecting and restoring our planet's resources and support systems. Such standards are developed by international consensus to help organizations meet this universal goal. It is up to private and public enterprises to make internal changes to reduce our impact on planetary resources so future generations will have a place to work and fulfill their

dreams. A growing number of large and small companies are realizing environmental protection is just plain good business, and profitable, too. **MT**

Perry Lovelace is the senior partner of Nepenthe Institute, 57 Don Jose Loop, Santa Fe, NM 87505, a consulting firm offering training and consulting in facilities management. He is a professional instructor/consultant with more than 25 years experience. He can be reached at (505) 983-5271.

John C. Shideler is president of Futurepast: Inc. and a consultant specializing in environmental and quality management systems. Futurepast provides consulting, training, and auditing services in environmental and quality management. He is a registered environmental and quality management systems auditor and a member of the U.S. Technical Advisory Group to ISO Technical Committee 207. He can be reached at Futurepast: Inc., 2111 Wilson Blvd., Suite 700, Arlington, VA 22201; (888) 358-9047.