

ISO 14001: A Road Map to Continuous Utility System Improvement

Nigel O. Grace, Donna M. Grace, Albert L. Perez, and Nicole A. Maywah

In 1996 the International Organization for Standardization (ISO) finalized ISO 14000, a series of standards that specifically address the utilization of Environmental Management Systems (EMS) as a means for improving an organization's environmental compliance posture. ISO is a private sector, international standards body based in Geneva, Switzerland. The 14000 series of voluntary standards and reference documents are designed to provide the general framework for organizing the tasks necessary for effective environmental management. Literature on the subject frequently refers to ISO 14001 because it is the actual standard. All other sections in the series are support documents, including guidelines for implementation, environmental auditing, environmental labeling, and product life cycle assessment.

Although developed in Europe, both the American Society for Testing & Materials and the American Society for Quality Control have approved the 14000 series as an American National Standard. Internationally, the series and similar environmental management systems have been well received and widely adopted; however, many U.S.-based companies have been slower than their international counterparts in adopting the standards. For example, Britain had the Global Environmental Management Initiative (GEMI), and other Europeans utilized the Environmental Management and Audit Scheme (EMAS). The International Organization for Standardization developed the ISO 14000 series in an attempt to create an EMS that could be accepted by all nations and thus lead to greater consistency across international and other boundaries.

The *Environmental Management Systems Primer for Federal Facilities* acknowledges that 14001 is "becoming widely adopted throughout the private sector in the United States and internationally."¹ Joseph Cascio, chairman of the U.S. Technical Advisory Group states "the number of [U.S.] organizations actually implementing ISO 14001 outstrips any other country."² The ISO 14000 EMS is industry's response to the recent inclination of regulators to move away from the traditional "command and control" compliance approach — encouraging organizations to take a proactive, preventative, and holistic approach to managing environmental impacts.

Within the U.S. there are currently several pilot projects to evaluate the effectiveness of the ISO 14001 Environmental Management System as a way to improve environmental performance. EPA is funding state and municipal pilot projects to explore the utility of EMS, especially those based substantially on ISO 14001, for the environmental activities and challenges of local governments. For example, there is an ISO 14000 Multi-State Working Group that includes ten state regulatory bodies that are testing the benefits of EMSs in order to develop a coherent and uniform approach for state agencies to integrate ISO 14001 in state programs. It is still too early to evaluate the results of these case studies. Various Department of Defense and Department of Energy facilities are currently implementing ISO 14001.³ Still other federal facilities are considering adopting environmental management systems as evidenced by the above-mentioned primer.

The purpose of the ISO 14000 series is to provide a framework for an overall strategic approach to an organization's environmental policy, plans, and actions. The standard highlights environmental stewardship at multiple levels beyond the single facility that adopts it in that it evaluates the goods and services that it both uses and produces. The series seeks to:

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1. Provide a platform for organizations to demonstrate their commitment to environmental protection.
2. Help management pursue continual improvement in environmental performance.
3. Provide a worldwide focus on environmental management.
4. Promote a voluntary, consensus standards approach for environmental issues.
5. Harmonize national environmental rules, labels, and methods.
6. Promote environmental predictability and consistency across state and national borders.
7. Demonstrate a commitment to moving beyond regulatory compliance.
8. Minimize trade barriers.⁴

ISO 14001 is a voluntary standard. The International Organization for Standardization does not monitor whether organizations comply with the requirements of its standards. However, many testing laboratories and certification bodies offer independent (third party) conformity assessment services that provide confirmation that products, services, and systems adhere to ISO standards.

ISO 14001 Components

The first section of the standard directs the organization to identify its activities, products, or services that can or already significantly impact the environment. Secondly, the organization must develop an environmental policy "appropriate to the nature and scale" of the activities, products, or services with significant environmental impacts.⁵ There must be a specific commitment to prevent pollution. Top management must define the policy and ensure that it is communicated to all employees. In the policy, the organization must commit to comply with all pertinent environmental legislation, regulations, and/or legal requirements. Perhaps most important, the section directs the organization to set, review, and document definable environmental objectives and targets at relevant functions and levels within the organization.

In the third section of the standard, the organization must develop a program for achieving its management objectives. The program will include assigning responsibility for objectives at "each relevant function and level of the organization" and establishing a time frame for their accomplishment.⁶

The fourth major section of the standard calls for the implementation and operation of the environmental management program. The organization's management will provide the human, technological, and financial resources as well as specialized skills necessary for implementation and control of the environmental management system. The section calls for the appointment of a specific "management representative" responsible for ensuring that the EMS requirements are established, implemented, and maintained. Furthermore, the management representative must report on the performance of the EMS to top management for review and improvements.⁷ This section includes provisions to educate employees or members at each relevant function and level about the organization's EMS and their roles and responsibilities in achieving the organization's

goals. In addition, the provisions call for training of employees or members to carry out their tasks within the EMS. Finally, within Implementation and Operation, there must be procedures for preventing and mitigating any environmental impacts from accidents and emergency situations.

The Checking and Corrective Action section directs the organization to monitor and measure operations with significant environmental impacts on a regular basis. The organization must establish and maintain a documented procedure for evaluating compliance with pertinent environmental laws and regulations. The standard calls for a continuous audit of compliance with and performance of the environmental management system.⁸

Finally, the standard requires that top management review the environmental management system and provide changes to policy, objectives or operations when necessary which should lead to greater efficiency and continual improvement.

Advantages

Since ISO 14001's finalization in 1996, there has been a plethora of information distributed about it, especially on the Internet. The upcoming sections reflect some of the advantages and disadvantages many of these sources have addressed. The advantages of the ISO 14001 EMS are the following:

1. Promotes a common approach to environmental management.
2. Establishes a systematic, cost-effective approach to the management of environmental interactions.
3. Enhances an organization's ability to attain and measure environmental performance; thus, making its environmental management structure and procedure more visible and understandable to external parties — especially regulatory bodies.
4. Helps a facility lower its risk profile and manage liabilities before crisis situations arise.
5. Makes organization a better candidate for innovative programs and flexible approaches because it will address important concerns regulators may have about operations. See Regulatory Benefits and Incentives section below.
6. Is an excellent public relations tool demonstrating commitment to environmental stewardship to regulatory bodies, non-governmental organizations, and the public.
7. Increases any organization's competitive posture by streamlining focus of efforts, continual improvement efforts, and promoting creativity, as well as other advantages that make a facility more competitive.
8. Formalizes integration of environmental management with overall management objectives.
9. Provides the framework for continuous improvement and makes benefits auditable.
10. Positions any facility as a leader in EMS. Federal agencies developed and endorsed the Federal Facilities Guidance for the Code of Environmental Management Principles (CEMP) which contains some of the principles and performance objectives in ISO 14000 for its own federal facilities. This also indicates that these standards could ultimately be adopted widely by utilities. See Regulatory Benefits and Incentives section in this report.
11. Reduces the cost of doing business. For example, after an initial investment of time and resources to assemble the data and plans required in the 14001 EMS, an organization can find information needed for permits and other regulatory needs almost immediately. This leads to fewer costs in terms of paperwork, time, and human resources to a utility especially if multiple regulatory bodies begin accepting EMS documentation instead of their own tedious plans and requirements.

12. Promotes a spirit of collaboration with regulators and facilitates the streamlining of permitting processes.

Disadvantages

Some of the negative aspects and potential disadvantages of the ISO 14001 EMS include the following:

1. It is a procedural as opposed to performance standard; therefore, by itself EMS does not guarantee performance or compliance. 14001 merely describes a process which should lead towards improved performance and compliance with environmental regulations.
2. There are differences in the definitions of pollution prevention in ISO 14001 and the Pollution Prevention Act. The Pollution Prevention Act defines pollution prevention as source reduction with recycling and treatment as less desirable "end-of-pipe" alternatives whereas ISO considers recycling and treatment as pollution prevention.⁹ The implications of this difference are that any entity adhering to ISO 14001 must be mindful of the differences between the regulations to which it is subject and the ISO guidelines, and address them.
3. There is a dearth of information on results of ISO implementation. On the other hand, this can be an advantage in that the facility that adopts this EMS can be ahead of the game and become a trendsetter.
4. There is risk in adopting the standards because they may not be accepted as widely as expected in the United States; however, acceptance is highly probable because of the standard's popularity overseas. The work and time invested in the ISO process should yield information easily transferable to all reports that are required by regulatory or other bodies requesting documentation of environmental impacts.
5. The National Pollution Prevention Roundtable, a U.S. organization with members from various governmental agencies within the 10 EPA regions, expresses the sentiment of many in the environmental community that industry developed the standard without sufficient input from the environmental community and public interest organizations.¹⁰
6. Although the standard directs an organization to make environmental policy available to the public, the National Pollution Prevention Roundtable found that "the standard does not require sufficient public disclosure of a firm's environmental impacts."¹¹

Regulatory Benefits and Incentives

As can be expected, the regulatory response to environmental management systems is very positive. EPA encourages the use of EMSs that focus on improved environmental performance and compliance as well as source reduction (pollution prevention) and system performance.¹² Furthermore, the Federal Facilities Enforcement Office of EPA and the Office of Environmental Policy and Assistance of the U.S. Department of Energy wrote the *Environmental Management Systems Primer for Federal Facilities* (published in 1998) for federal managers who are considering EMS adoption. The primer reveals that many U.S. government agencies are themselves considering adoption of the ISO 14001 EMS.¹³

With increasing environmental regulatory oversight, there is a need for some systematic way of providing consistent and accurate information to the various agencies and regulatory bodies requesting documentation. Such requests often require a great deal of time and effort expended by the regulated party. Using ISO 14001 to organize records and the like provides for a convenient way to address regulatory concerns. Mary McKiel of the EPA Standards Network raises the issue of consistency when she states, "If you can systematize your approach to environmental regulation, and beyond regulation, you have a

better chance of having consistency when those of us in the regulatory community knock on your door.”¹⁴ Perhaps even more significantly, an EMS makes management structure and procedure more visible and understandable to regulators.¹⁵

Adopting the ISO 14001 standard demonstrates a willingness to comply with environmental regulation and be proactive with respect to environmental concerns. The Federal primer acknowledges that “an effective EMS can be an important part of a compliance system, and can reasonably be expected to ensure and improve environmental compliance”.¹⁶ An ISO 14001 adopting utility might be looked upon more favorably by regulators, increasingly environmentally conscious consumers and environmentally concerned organizations.¹⁷ ISO 14001 certification may be used as a basis for negotiating flexibility in certain areas where regulators have discretion.¹⁸ The National Pollution Prevention Roundtable ISO 14000 Workgroup predicts that regulators may even grant regulatory flexibility directly.¹⁹

In addition to improving relations with regulators, an EMS may yield definite financial benefits with respect to regulators. The Federal Primer reveals that “An EMS is also consistent with the 1995 EPA Self-Policing Policy which sets forth conditions for reductions in civil penalties and limited liability for criminal prosecution. Organizations that have implemented ISO 14001 can expect both prosecutorial and sentencing flexibility under existing Department of Justice and U.S. EPA guidelines.²⁰ Systematic discovery of violations through a compliance management system or environmental audit, by demonstrating due diligence, is a condition for elimination of gravity-based penalties. EPA has applied the Self-Policing Policy in many cases, most of which resulted in substantial moderation or waiver of penalties.”²¹

Furthermore, adoption of an EMS can make a facility a better candidate for innovative programs and flexible approaches that federal agencies are now offering. Some of these programs, such as the Environmental Leadership Program, entail eligibility “for fewer inspections and a self-correcting period for violations. Other benefits can include expedited permitting, longer permitting cycles, and others deemed appropriate by EPA and States.”²²

Another such program that can yield financial advantages is Project XL. The primer states “a facility accepted for Project XL may receive permission to go outside the current regulatory structure in order to achieve a superior result at a lower cost than could be achieved by strict adherence to regulation.”²³

Even if regulators do not directly grant incentives to adopt an EMS, the process of adopting an EMS can yield several benefits internally which increase a facility’s competitiveness. Through an EMS self-examination, a facility may discover opportunities for operational changes that can in turn lead to a reduction in the number of applicable regulatory requirements. For example a facility could decide to substitute regulated chemicals or change a particular process which would reduce permitting or reporting requirements as well as waste management costs. An EMS should also reveal overlaps in existing compliance systems and encourage a facility to adopt cost-effective pollution prevention measures.²⁴

Regulatory Concerns

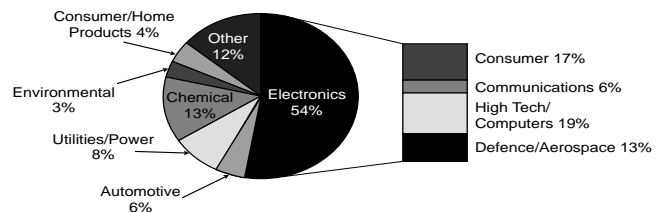
While regulatory response to adoption of EMS is very favorable, regulators have been cautious in stating whether any special consideration or decreased oversight will be given to certified entities.²⁵ Regulators such as EPA stress that an organization must exhibit credible evidence that an EMS is being used to ensure compliance and advance environmental mission goals. The Federal Primer states “By demonstrating improved environmental performance, an EMS can open the door to improved relations with regulators, stakeholders, and

the public. But don’t expect instant credibility!”²⁶

One of the reasons that the regulatory community has not been more vocal about ISO 14001 and other environmental management systems is that if there is any decline in performance at a certified facility, the public will hold regulators responsible. The Federal Primer states “Until EMSs build a track record of performance, the regulatory stance toward EMSs will remain unclear.”²⁷ Again, ISO 14001 by itself does not guarantee improved environmental performance. On the other hand, the primer cautions “But remember that an EMS can help improve the accountability of people in regulated entities, and should support a management framework for improving performance and compliance.”²⁸

Florida Utilities Applications: Threat of Privatization

ISO 14001 is a system created by business for business with emphasis on efficiency and continual improvement. Adoption of an EMS can make a utility or any facility more competitive, thus, reducing the threat of privatization. The Environmental Management Systems Primer for Federal Facilities states “It [an EMS] can put federal environmental management practices on the same level as those of America’s best-run corporations. And it can do so in visible ways that will be recognized by stakeholders inside and outside a federal agency.”²⁹ One can extend this concept to all levels of government-run facilities from municipalities to state entities. Being more competitive lessens the likelihood of privatization. The accompanying figure shows that currently 8% of ISO 14001 registered U.S. organizations are utilities or power related entities.³⁰



The Future of Florida Water Resources and the Use of ISO 14001

As regulators move away from the command and control approach to policy, they will increasingly reward entities which take initiative in improving their environmental performance. ISO 14001 is one such tool that can improve an organization’s environmental compliance posture as well as promote efficiency and continuous improvement — all characteristics that decrease the threat of privatization. With the possible future trend of environmental management systems replacing certain elements of regulatory oversight (such as inspections or permits) where regulators have discretion, it behooves Florida water resource managers to investigate the possible benefits of adopting the ISO 14001 Environmental Management System.³¹

References

- ¹ *Environmental Management Systems Primer for Federal Facilities*. Federal Facilities Enforcement Office of the U.S. Environmental Protection Agency and Office of Environmental Policy and Assistance of the U.S. Department of Energy, 1998. p. 1.
- ² Joseph Cascio, “ISO 14001 Acceptance in the U.S.A.” *ANSI Online* http://web.ansi.org/public/iso14000/news/cascio_14.html, last modified November 17, 1997 (visited March 19, 1999).
- ³ Cascio, op. cit., p. 2.

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Hurricane Preparedness: Broward County's Infrastructure Improvements

Gary S. Fox and Shajan Joykutty

Hurricane Andrew in 1992, one of the most severe hurricanes ever to hit the U.S., caused massive destruction in South Florida. Combined damage estimates for both private and public sector have been in excess of \$8 billion.

Prior to Hurricane Andrew, public utilities had placed little or no importance on preparation and response strategies to storms. However, the destruction caused by Andrew to Miami-Dade's South District Wastewater Treatment Plant provided a wake-up call to utility owners in South Florida to fund and aggressively pursue hurricane protection, damage mitigation, and response strategies in the operations and management of treatment plants. Broward County is initiating a \$5 million rehabilitative project to strengthen its existing facilities against storm damage. Critical lift stations, generators, operation centers, and disposal systems of the Broward County North Regional Wastewater Treatment Plant will be improved under the project.

Treatment Plant Vulnerability

Wind related structural failures forced the Miami-Dade South District Plant out of operation for several days while emergency repairs were carried out. Power loss, process equipment failure, and destruction of solids handling facilities interrupted critical plant functions. For example, metal digester covers were blown away in the storm, prestressed concrete double-tee roof systems failed due to uplift pressure created in buildings when doors failed, and large roll-up door failures exposed buildings to internal wind pressure causing failure of walls and roofs.

Post-disaster investigations revealed that design standards had to be made more stringent to minimize damage from future storms. Also, the ability to provide basic wastewater treatment services immediately following a hurricane was extremely important in large urban centers like South Florida. Existing treatment facilities had to be rehabilitated to perform better under hurricane conditions.

Protection Levels

Damage assessments after Hurricane Andrew revealed that local building standards had to be upgraded for better performance under wind loads. For wastewater facilities, it was recognized that standards for design and construction had to be higher than the minimum "Building Code" levels. To establish risk levels, utilities in South Florida have begun to assign different protection levels to different functions offered by facilities. Each protection level is assigned a basic wind velocity for the purposes of design.

The intent of assigning a protection level to a process building or facility is to ensure adequate wind resistance under an established category of hurricane storm. The protection levels for Broward County are summarized in Table 1.

Buildings and facilities designed for a Building Code Protection level would survive a Class 2 storm as designated by the National Oceanographic and Atmospheric Agency (NOAA) hurricane disaster scale. A Shelter Protection level would ensure survivability under Class 4 storms. Hurricane Andrew produced wind speeds in excess of a Class 4 storm.

Based on a risk evaluation, the selection of a protection

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Table 1 - Protection Levels

Level	Design Wind Velocity ¹	NOAA Hurricane Category
Building Code Protection	110 MPH	2
Function Protection	130 MPH	3
Shelter Protection	150 MPH	4

¹ Average speed of a unit of wind at 10 meters (33 feet) above the ground, as it travels through a distance of one mile

Table 2 - Facility/Protection Levels

Protection Level	Typical Facilities
Building Code Protection	Sludge Handling Facilities, Digesters, Open Aeration Basins, Odor Control Facilities
Function Protection	Emergency Generators Facilities, Master Lift Stations, Outfall Pumping Stations
Shelter Protection	Occupied Buildings, Control Buildings, Operational Staff Offices

level in the design of a facility would be made by the utility. Table 2 shows the assignment of the three protection levels to some of the wastewater facilities in Broward County.

The ability to restore disposal capabilities immediately following a hurricane is an important factor in establishing protection levels to facilities. For example, pumping stations that dispose treated effluent should be designed to a higher standard than solids handling and process facilities. Buildings that house treatment plant staff during a hurricane should be designed for protection of inhabitants and assigned shelter-level protection.

Flood damage due to hurricanes should also be considered in the design of facilities. Buildings that accommodate critical electrical and control equipment should be constructed above the storm surge elevations predicted for the level of protection. For example, pumping stations in the Florida Keys are designed on pilings that elevate building floors 15 feet above sea level.

Design Criteria

South Florida Building Code has adopted the wind design standards of the American Society of Civil Engineers Minimum Design loads for Buildings and Other Structures (ASCE-7). ASCE-7 prescribes methods to calculate wind forces on build-

ings and other structures based on a specified wind speed. South Florida wastewater facilities are currently designed to this standard. Wind forces calculated per ASCE-7 standards are substantially higher than other national standards.

Metal construction has been a cost-effective approach for the South Florida construction industry. However, many metal structures failed during Hurricane Andrew. Typical failure mechanism involved the separation of metal wall and roof panels from structural steel framing systems under wind induced forces. Based upon observed hurricane damage to metal buildings, concrete and block structures are preferred for new Broward County facilities. Hollow concrete block walls are now reinforced for lateral strength against wind forces. Also, roof systems are anchored to walls to prevent uplift failures. In utility structures, poured concrete slabs are used to increase dead weight for resisting wind uplift. For example, the outfall pump station and the electrical generator facility at the Broward County NRWTP are metal structures. The exterior metal skin of the buildings will be replaced with precast concrete panels bolted to the interior structural steel framing.

Exposed process equipment, such as odor control structures, fuel tanks, and electric load centers, are now anchored for wind resistance. Critical equipment is placed in buildings that are designed for the desired level of wind protection.

Building Products/Wind Testing

Breach of the building envelopes because of failures of such components as doors, windows, skylights, and roof ventilators contributed to major losses in Hurricane Andrew. Recognizing the importance of securing building shell openings, Broward County is now requiring all exterior building products to be tested for wind resistance. The following mandatory tests are now required of building products.

The tests are conducted on such components as windows, doors, and skylights. Static and cyclic wind tests involve subjecting products to static and cyclic wind loads that are fifty percent higher than the calculated design wind pressures per ASCE-7. The impact tests consist of a large missile and a small missile test. In the large missile test, a 9-pound, 2- by 4-inch wood pole is shot at 50 feet per second into the product. In the small missile test, stone aggregates are shot at the product. Products are required to withstand the missile impact when

tested. Windows and other brittle materials covering openings are provided with shutters that are tested for wind resistance.

The stringent test procedures mandated by building codes are providing stronger building products in the utility market. Exterior steel doors are replacing aluminum and wood doors. "Three-Point Locks" are now required to successfully pass the wind pressure tests.

Windows are being supplied and installed with impact resistant laminated glass or polycarbonate glazing materials. Most openings in the building shell that can be shut down during storms are provided with hurricane shutters. Shoring systems are installed on wide span roll-up doors that can be used to lock doors in the closed position during a storm. Air intake and exhaust louvers are provided with shutters to close off openings during storms. Ventilators are mounted inside the buildings on walls behind louvers. Existing roof ventilators are tied down with tie-down anchors. In general, building products now available are better designed for wind performance than prior to Hurricane Andrew.

Table 3 – Building Product Tests

Test Type	Miami-Dade County Protocol
Static Wind Pressure Test	PA 203
Cycle Wind Pressure Test	PA 202
Impact Test	PA 201

Statewide Code Impacts

House Bill 4181 established the Florida Building Commission. It is working on a new statewide building code, scheduled to go into effect in 2001, which may have different provisions for ensuring wind resistant designs. It is important for utilities to follow the wind design standards being reviewed for incorporation into the code. A statewide debate is currently underway with regard to the incorporation of some of the stringent South Florida wind design standards, such as the missile impact tests and the cyclic wind pressure tests, into the new code.

Irrespective of the provisions in the new state code, it is important for all utilities to consider existing South Florida wind design standards for their capital improvements. These standards can be mandated on treatment plant construction projects either as code enhancements or project specifications.

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⁴ Amy Zuckerman, "World of Standards and Regulations: The Future of ISO 14000 in the U.S." *New Steel*, <http://www.newsteel.com/features/NS9707zu.htm>, July 1997 (visited March 19, 1999).

⁵ *ISO 14001 International Standard: Environmental Management Systems—Specification with Guidance for Use*. International Organization for Standardization, First edition 1996-09-01, Reference # ISO 14001:1996(E), p. 2.

⁶ *Ibid.*, p. 3.

⁷ *Ibid.*

⁸ *Ibid.*, p. 5.

⁹ National Pollution Prevention Roundtable, "ISO 14001 Workgroup White Paper," <http://www.p2.org/iso.html>, January 28, 1998 (visited March 18, 1999), p. 11.

¹⁰ *Ibid.*

¹¹ *Ibid.*

¹² *Environmental Management Systems Primer for Federal Facilities*. op. cit. p. 21.

¹³ *Ibid.*, p. 1.

¹⁴ *Environmental Management Systems Primer for Federal Facilities*. op. cit., p. 21.

¹⁵ *Ibid.*, p. 24.

¹⁶ *Ibid.*, p. 22.

¹⁷ *Ibid.* p. 32.

¹⁸ *Ibid.*, p. 23.

¹⁹ National Pollution Prevention Roundtable, op. cit., p. 12.

²⁰ Cascio, op. cit., p. 3.

²¹ *Environmental Management Systems Primer for Federal Facilities*. op. cit., p. 26.

²² *Ibid.*, p. 27.

²³ *Environmental Management Systems Primer for Federal Facilities*. op. cit., p. 28.

²⁴ *Ibid.*, p. 24.

²⁵ *Ibid.*, p. 23.

²⁶ *Ibid.*, p. 2.

²⁷ *Ibid.*

²⁸ *Ibid.*

²⁹ *Environmental Management Systems Primer for Federal Facilities*. op. cit., p. 1.

³⁰ *ISO 14000 InfoCenter "Analysis of ISO 14001 Registered Organizations in the U.S."*, http://www.iso14000.com/cert_us_analysis.html, January 1, 1999 data, (visited March 18, 1999) p. 1.

³¹ *Environmental Management Systems Primer for Federal Facilities*, op. cit., p. 24. ■

As I Remember Him

Michael Croom

Many of the readers of this journal will recognize the name, Hardy C. Croom III, or — as most of his army of friends knew him — *Skip* Croom. Those who didn't know him but have read the *Florida Water Resources Journal* for any length of time will have heard of him. He passed away this past August 11, two days short of his 94th birthday.

He was the type of man, that if he had not been my grandfather — in truth my dad, as he had no sons and my brother and I had an absentee father — he would have qualified as my *Readers Digest* "Most Unforgettable Person." Those of you who knew him know how much he enjoyed telling a good story, and he had many! I heard most of those stories hundreds if not thousands of times over the years, often late at night, before the fireplace at the family home in Ocala, or driving somewhere, or — my most cherished memories — aboard one of the numerous boats he had over the years.

He often told me of how, after his father died shortly after he was born, his grandfather A. C. Croom looked after him and his mother. As Comptroller for the state of Florida, A.C. was able to procure jobs for my great-grandmother, both of her sisters, and her brother in various offices of the state government in Tallahassee. So it was that the governor of Florida, in whose office my young grandfather was a frequent visitor, decided that Hardy needed to have his long golden curls cut so that he looked more like a boy. The governor told him to go to the corner barbershop and ask the barber for a haircut. Hardy did so, marching proudly down to the barbershop all by himself, getting his haircut, and marching back to the capitol to proudly show off his new look, never knowing that the governor's bodyguard had been a few paces behind him the entire time.

Through family connections Hardy attended what is now Florida State University in its experimental kindergarten program, and later served as a page in the state senate. In high school, he went to New Mexico Military Institute, then a cavalry school, where during the summer camp at Fort Wachuka, his class faced a cavalry charge by the famous 10th Cavalry, better known as the Buffalo Soldiers. When his stepfather, George Blich, died, Hardy had to return to Ocala and continue his schooling in Ocala and Miami. His Aunt Jeff was working as the Food and Society editor for the Miami Herald, so the family spent much of their time in Miami. Aunt Jeff did her best to marry him off to one of the numerous heiresses living in Miami at the time.

After high school, Hardy went off to college at the University of Tennessee, where he studied for two years. In Knoxville, he worked for the Telephone Company, switching out the old candlestick phones for rotary dial phones. He took time off and rode his Indian motorcycle to New York in the winter to visit a friend and stayed for a while and got a job as a telephone lineman in Albany, New York. Eventually the family told him that he needed to continue his education, so he returned to Florida and the University of Florida School of Engineering. He graduated just in time to go to work for Roosevelt's WPA. He was placed in charge of a trenchant camp in Tampa Shores, where he supervised several hundred out-of-work men. When the great hurricane hit the Florida Keys, he and his men joined in the rescue effort. They took a train as far south as the railroad still existed and strung ropes across the gap to swing the bodies of the dead across from the southern section of the track.

After the WPA folded, he moved to North Carolina to work for a fertilizer manufacturer. He was home on a visit when he met my grandmother, Mary Henry, and was swept off his feet by her.

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He married her on August 30, 1936, in the backyard of the Henry home at Live Oak, with the governor elect of Florida as his best man.

They went to live in North Carolina, but returned to Florida where the weather was warmer and it seldom snowed. They settled in Lynn Haven and he worked at the paper mill in Panama City. When the war broke out, he did the same as all the red-blooded males of his time — he went to enlist. He tried the Army, Navy, Marines, and Coast Guard, only to be turned down because of his leg, which he had broken badly as a teen, sliding into home plate.

Despite his protected war-effort job, he wanted desperately to serve. He became an Air Raid Warden and served as the Scout leader of a troop of Sea Scouts during the war. It was in Lynn Haven that he bought the first of many boats he would own over the years.

After Panama City, he moved the family to New Smyrna, where he worked for the city water department. From there he moved to Ocala's city water department. Then in 1953 he took a job in Venezuela for six months supervising the construction of water treatment plants for the Coca Cola bottling company of Venezuela. After his stay in South America, he returned to Ocala and eventually moved the family to Valdosta, Georgia, in the summer of 1954. His stay in Valdosta and at the Owens Illinois Paper Company proved to be the longest he settled in one place until after his retirement.

He retired from Owens Illinois in 1970 and took a job in Jacksonville certifying water treatment plant operators for the state for two years while he waited for Mary to hit her retirement age in 1973. In 1972 he returned to Valdosta and worked one year preparing an operations manual for the Coastal Plans Economic Authority.

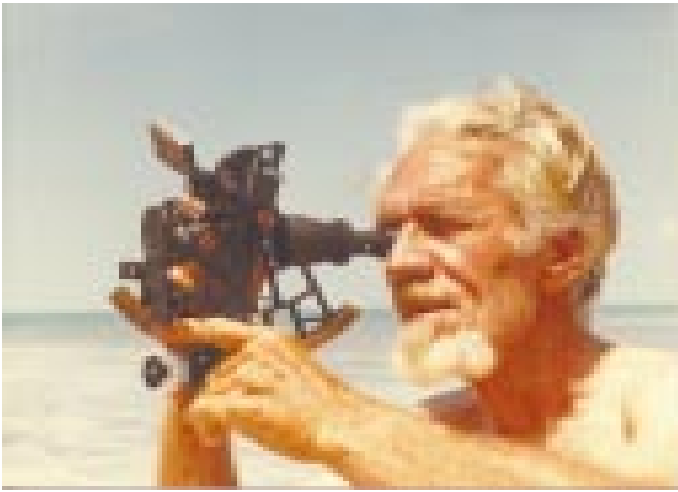
In 1973 he bought a motorhome and loaded Mary, my great

I had the pleasure of working with Hardy Croom when he wrote the column, "Looking Back" for the Florida Water Resources Journal from 1988 through 1995. He was a fascinating man. Then, in his late eighties, he was as spry and energetic as a man half his age, and he never lost his thirst for knowledge and his sense of curiosity. Born a mere two years after the Wright Brothers flew at Kitty Hawk, he lived well into the space age and the era of computers, never failing to keep abreast of developing technologies. He could remember when Buffalo Bill's Wild West Show came to Ocala and when Jacksonville's water was supplied by artesian wells, as well as man landing on the moon and computers on every desktop.

He was as proud as he could be when in 1991 he was finally elected an honorary life member of the operators association (see photo on cover), no matter how overdue that honor may have been.

Hardy's last column in this publication appeared in the May 1995 issue a few months before his ninetieth birthday. In it he wondered how much longer he and Sis would be able to stay at their home in Ocala. He knew that before long they would have to move to his daughter Noel's home in Columbus, Georgia.

The last line of the last column was a quote from a late relative, but it would serve well as Hardy's epithet: "There you have it, my friend, it's a shame we weren't able to spend more time together." — Editor.



grandmother, my brother, and me aboard and took us west to Colorado, then back east and north to Canada for a year and a half. He became certified as a substitute schoolteacher in Florida so that he could administer the lesson plans provided by our school.

After another trip to Canada with my aunt and cousins, they settled in the family home in Ocala. They spent the first four or five winters in the Florida Keys at Fiesta Key, where he became the Poet Laureate of Fiesta Key.

Although officially retired, Hardy was never able to just relax and do nothing.

He took up painting, mastered oils, charcoal, and watercolors, and he displayed his works at the annual art show in Cedar Key, where he priced his works so high that no one would buy them. "I don't want to sell them, I just want to know if people think they are any good," he would say.

He wrote over seven hundred poems, which he proudly passed around to anyone who would read and enjoy them as most did. He then went on to write a regular article for *North Florida Living* along with articles in the *Florida Water Resources Journal* and the *Ocala Star Banner*.

In the early 1980's Hardy bought his first of many computers — a Timex Sinclair. He went through all the versions: Commodore 64s, Commodore Amigas, a Tandy or two, then a real IBM, and a few Apples. He had one in the room he shared with my grandmother up until her death.

In 1995, when Hardy was turning ninety, he and Mary were no longer able to live independently in Ocala. My mother moved them to Columbus, Georgia, to live with her. Mary died in September 1998, after 62 years of marriage, leaving a huge void in Hardy's life.

He still enjoyed his daughter's company, and that of his trusty and loving dog, Spot. Spot wandered up to my parents' flower shop one day, went straight to my grandfather, and sat by his feet. For the rest of his life, the two were inseparable.

I have tried to cover his rich and full life, but there is so much that could be written and told that it would fill a volume. Many of you knew him and he knew many of you. He loved being a "Sludge Shoveler," and was proud to wear his shovel.

My favorite memories of Hardy Croom mostly concern his boat in Jacksonville, the *MYSIS*, a 40-foot cabin cruiser that he named after his wife, who was known as Sis to family and friends. We spent many weekends and most of our summers on the boat cruising up and down the Intercoastal Waterway and "putt-putting" around in the dingy. Most of my favorite memories are of being with him on the water.

My very favorite memory is of a private time when I had him all to myself. He and I went to Miami when I was 15 or so to pick up a 40-foot, gaff-rigged yawl that he had bought. We spent days

getting it ready before we left up the Intercoastal for Jacksonville. Everywhere we put in for the night, he was able to call someone he knew, and they would come get us and take us to dinner. Most were his fellow "Shovelers." He would brag about me and my navigation skills to them — I manned the helm for most of the week-long voyage — and I never felt prouder to be his grandson.

To this day, when I go to visit places he worked, or lived, I will occasionally run into some one that knew him. Just recently I attended a Masonic Lodge meeting in Statenville, Georgia, where many of the members are retired O-iers from the paper mill. I had not been there five minutes when a huge ham fist of a hand plopped down on my shoulder and a red-headed mountain of a man named Louis Carroll said, "I hear you're Skip Croom's boy! I'm pleased to meet you! Your Daddy is a good man!" He may not have been my father, but he was my Daddy, and he was most certainly a "Good Man," and I will miss him sorely. ■