Do You E-File?
Opportunities, Costs and Procedures for Effective E-Filing Practices

The National Regulatory Research Institute

February 2007

EXECUTIVE SUMMARY

In 2001, the NRRI evaluated state commissions' use of electronic record filing (ERF) systems. At the time of the report, only a handful of states allowed utility companies to file with the commission electronically. An NRRI survey conducted in 2006 determined that ERF systems are in use, in planning, or in development in at least eleven states. Although the widespread adoption of electronic record filing has been slowed by risk and uncertainty, a few states have continued to push the frontier.

The decision to pursue electronic record filing policy usually originates at the top of the commission. In at least one state, however, the impetus came from a state legislative mandate for greater public access to information. Regardless of where the decision was made, most states share similar experiences during the needs assessment; system development, including the decision to either build the system with internal programming staff or outsource programming to vendors; and funding phases. The discussion of these similarities eases access to the ERF learning curve for commissions new to ERF.

We present an overview of the technology available to commissions and discuss several important factors surrounding ERF that should be considered when designing and implementing electronic record filing and management systems. In general the technology available today is faster, more reliable, more accurate, and less expensive than five years ago. These changes reduce commission cost and risk associated with ERF system development.

The paper also discusses the growing prevalence and importance of information-sharing between commissions and identifies areas for future research. Information is usually passed between commissions via networks of intermittent emails and phone calls. Formalizing these networks, by creating an agreed upon electronic filing language, will increase commission effectiveness and efficiency. We recommend more attention be devoted to this area.

Finally, this paper makes several recommendations for commissions looking to implement ERF policy. Commissions should make a complete assessment of work and document flows within the commission and build ERF into commission strategic plans; ERF systems can be leveraged to meet strategic objectives. Commissions should also include user surveys during the assessment phase and incorporate feedback into the system's design. Finally, PUCs should ensure compliance with state electronic record laws while exploiting the benefits of ERF.

07-01

This NRRI paper was funded by the members of The National Association of Regulatory Utility Commissioners (NARUC). The views expressed herein do not necessarily reflect the views of NARUC or any of its members.

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Acknowledgments

Paul A. Laurent, Joe McGarvey, and Jack Derifaj of the NRRI staff designed and conducted the survey and follow-up interviews and performed the data analysis. The NRRI would like to thank Bruce Burcat, Delaware Public Service Commission; Michelle Cooke, California Public Utility Commission; Tonya Clark, Idaho Public Utilities Commission; Judi Cooper, Iowa Utilities Board; Deena Frankel, Vermont Public Service Board; Gabe Cisneros, New Mexico Public Regulation Commission; Burl Harr, Minnesota Public Utilities Commission; Gary Kitts, Michigan Public Service Commission; Charles Lape, Connecticut Department of Public Utility Control; Lisa Needham, North Carolina Utilities Commission; Paul C. Newman, Public Service Commission of Wisconsin; Gerry Pacyna, Virginia State Corporation Commission; Christine Pirik, Public Utility Commission of Ohio; and Rupert D. White, Public Utilities Commission of Nevada for their assistance in designing the survey, participating in follow-up interviews, and commenting on earlier drafts of this paper. The NRRI would also like to thank former NRRI Interim Director Dr. Vivian Witkind Davis and present NRRI Director Scott Hempling for their contributions.

I. Introduction and Overview

A. Purpose

Many utility regulatory agencies now permit or require electronic filing of official submissions and issuances. The agencies' goal is to improve the regulatory process by making communication -- internal and external -- speedier, more accessible, and less costly.

In the past five years, state public utility commissions' (PUC) understanding of electronic filing (e-filing) and implementation has increased. When NRRI last studied the matter in 2001, only a few states allowed utility companies to file electronically.[1] Alaska, for example, began the process of implementing an electronic records filing system in 1999, choosing eventually to scan and store paper filings as tagged image file format (TIFF). Michigan accepted electronic submissions in portable document format (PDF). Illinois, Texas, Connecticut, and Missouri allowed the use of various formats for utility electronic record filing. NRRI's 2001 report explained that wider acceptance of ERF was slowed by a lack of resources, restrictive legal processes, existing procedural requirements based on paper filing and document retention, slow adaptation of information systems by commission stakeholders, industry structure change, and limitations of the state-wide information systems planning process.[2]

PUC acceptance and implementation of e-filing are growing. Most commissions continue to focus system development on commissioner and staff support, but some expansion is noticeable. First, states did not *require* electronic filing in 2001. Today, at least six states do require utilities to file documents electronically. Second, whereas in 2001 none of the states allowed utilities to e-file using common data definitions,[3] today at least eleven states have an ERF system in place, in development or in planning, and one state, Kansas, prefers the use of XML (See Appendix).[4] Facilitating this commission progress is the availability of technology detailed in Part III (step 5) below.

With this experience behind us, two questions arise:

1. Should state commissions that do not allow or require electronic filings do so?

2. For those state commissions that already do so, what enhancement to present practices are feasible and cost-effective?

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[1] D. Wirick, *E-Regulation*. The National Regulatory Research Institute. August 2001. NRRI 01-11.

[2] Id., at iii.

[3] Id.36.

[4] Given the survey response rate (n=35), it is likely that the values we report here underestimate the true number of states that currently require e-filing.

This report helps answer these questions by introducing the non-technical reader to the range of purposes and possibilities for marriages between commission functions and current technology.

B. Organization

The remainder of this Introduction defines terminology and describes our survey methods.

Part II asks two questions: How can e-filing enhance the quality of regulation? What costs and risks should decision makers watch out for?

Part III describes an eight step process for decisionmaking about the type and extent of e-filing. Those steps are:

A. Design and implementation: The eight steps
   1. Organize an implementation team
   2. Assess commission needs
   3. Determine project budget
   4. Determine legal definitions and status of e-filings and e-records
   5. Design the system using current technology
   6. Provide guidance to users
   7. Evaluate design and implementation
   8. Coordinate with other state commissions

B. Ensure cross fertilization

Part IV offers recommendations and next steps.

C. Terminology

1. An **electronic record** is a record created, sent, or received by the commission in the normal course of business using the Internet, intranet, extranet or any other medium that has the capacity to store or transmit information electronically.

2. **Electronic management systems** replace paper-filing systems with electronic records that can be easily transferred, accessed, filed and recalled.

3. **Electronic record filing (ERF)**, a subset of electronic records management, is the process of filing official utility related documents with an official government body through the Internet, an intranet, extranet, or any other medium with the capacity to store or transmit information electronically. The extent of ERF systems use ranges from paper documents electronically filed as images to documents created, stored, and recalled using an extensible markup language, or XML.

4. Extensible markup language (XML) is a type of markup language commonly used to create markup languages that define common data characteristics in a body of information using markers or tags.[5] These tags allow users to search, manipulate, and analyze electronic databases faster and more accurately than paper-based databases. In addition to straightforward data management, XML represents a philosophy for information handling that seeks maximum usefulness and flexibility by refining data into its purest and most structured form.[6]

A utility mailing address is an example of a body of information that can be tagged. Rather than entering the entire physical address into a database in a single field, the user can break the address into several parts: utility name, street number and name, city, state, and postal code. Defining each data piece, and breaking it into its most basic components, facilitates storage, management, tracking, analysis and reporting. The user can then, for example, search the database for every entry under XYZ Utility Company using a simple query, correct any errors, analyze the data, and create a detailed and accurate report of all records tied to XYZ Utility Company.

D. Survey method

This report is based on a 2006 survey of state commissions, conducted by NRRI on behalf of the NARUC Staff Subcommittee on Executive Management. See the Appendix for survey instrument and complete results.

The Internet-based survey consisted of 55 questions using a branching technique in which respondents were asked further questions depending on their answers to prior ones. The survey was conducted from May to June 2006. The questions were developed by the NRRI with input from staff from the public service commissions of Ohio, Connecticut, Delaware, and Virginia.

The stated purpose of the survey was to "determine the present state of commission information technology and ERF systems use, and to identify potential common interests in ERF systems development." The survey was sent to the Executive Directors of all state public service commissions, who were asked to respond to the survey as well as send it to the head of information technology for the commission. Respondents who identified themselves as IT staff rather than Executive Directors were asked additional, and more technical, questions about ERF usage in the commission.

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[5] See, for example, Ray, E. (2001) *Learning XML: Creating Self Describing Data*. O'Reily Press. Cambridge, Mass. According to Ray, there are actually several markup languages. The Standard Generalized Markup Language, or SGML, is the root language of all markup languages, and Hypertext Markup Language, or HTML, is the language commonly used to display text on the Internet, to name two examples.

[6] Id.

Fifty-eight respondents from 35 states participated in the study: 38 executive directors and 20 IT staff members. There were no discrepancies between the answers of the IT staffers and executive directors for the states where both parties responded. In a few instances the same respondent answered the survey twice. When there were any discrepancies between the two responses, the results of the latter response were used under the presumption that the respondent was more likely to have obtained new information in order to provide a more accurate response.

Ten survey respondents were selected for follow-up telephone interviews. The panel was selected based on several variables including commission size and state population. For completeness, the panel included states from different regions in the U.S. Interviewees were asked ten questions based on individual survey responses and were encouraged to provide as much information as possible. The interviews lasted between fifteen and eighty minutes. California, Nevada, Idaho, New Mexico, Iowa, Wisconsin, Michigan, North Carolina, and Connecticut participated in follow-up interviews.

II. Should We E-File? A Catalogue of Costs, Benefits and Risks

A. Benefits: How can e-filing enhance the quality of regulation?

1. Early adapters

Early adapters of e-filing had these goals in mind:

a. Electronic communications among commissioners and staff;

b. Website development, to provide tariff filings and other submissions and issuances to the public;

c. Customer complaint tracking;

d. Docket management; and

e. Development of Geographic information systems (GIS).[7]

Another obvious goal was cost savings. The Wisconsin Public Service Commission, for example, believes it has cut printing and postage costs by an estimated 40% or $40,000 to $50,000 each year; and has saved $100,000 in annual labor costs, previously devoted to maintaining a paper-based filing system.

Distinct from these internal costs savings are the utilities' costs savings -- about $1,000,000 each year, as estimated by the Wisconsin Commission.

[7] See note 1 above.

2. More sophisticated benefits

The introduction of more sophisticated benefits has tracked the public's growing expectations of open government. The expectations often are codified in state sunshine acts, which in turn have prompted commissions' decisions to implement ERF systems. As one observer argues, "The dominant technologies of the age are information processing and communications, and because the heart of government has always been the processing of information and communication with those who are governed, the new technologies and government are intensely intertwined."[8]

3. Resulting benefits

Resulting benefits can include:

a. Knowledge management, including data warehousing and mining, document warehousing, and text mining;

b. Collaboration facilitated by knowledge management systems;

c. Regulation of information by combined knowledge management and collaborative support systems;

d. Facilitating utility market operations and creating smart networks and autonomous markets using a regulation industry specific markup language.[9]

4. Conclusion on benefits

E-filing systems facilitate communication along three dimensions: between commissions and their constituents, between commissions and their employees, and with other commissions.[10] The facilitation takes the form of greater access, faster access, and more economical access. The assumption for spending money on e-filing is that this increased communication improves the quality of regulation, reduces the cost of regulation,[11] increases the public's trust in regulation, or all three.

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[8] See Paul Frissen, "The Virtual State: Postmodernisation, Informitisation, and Public Administration" in Brian D. Loader (Editor), *The Governance of Cyberspace: Politics, Technology, and Global Restructuring* (New York, NY: Routledge, 1997), p 111.

[9] See note 1 above at v.

[10] See note 7 above.

[11] See, Landsbergen, D. (2004) "Screen-Level Bureaucracy: Databases as Public Records" in *Government Information Quarterly*, 21 (1): 24-50. Although some commissions do

B. Costs and risks: What should decision makers watch out for?

Commissions have raised the following concerns:

a. out of pocket costs;

b. hard-to-quantify costs: "potential for failure, increased total system cost, hidden and distributed staffing costs, security breaches, system obsolescence, user dissatisfaction, failure to integrate information systems into the strategic direction of the agency, and system and vendor dependence."[12]

c. value

d. timeliness

e. accuracy

f. usability (including accessibility and search-ability)

g. search-ability

h. legal concerns

i. security

III. How Should We Design and Implement E-Filing? Eight Steps

Implementing e-filing involves at least the following steps:

1. Organize an implementation team
2. Assess commission needs
3. Determine project budget
4. Determine legal definitions and status of e-filings and e-records
5. Design the system using current technology
6. Provide guidance to users
7. Evaluate design and implementation
8. Coordinate with other state commissions
9. Ensure cross-fertilization

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realize substantial savings, they are not guaranteed.

[12] See note 1 above at iv.

This section discusses each step. By describing these steps one at a time, we do not mean that commissions must implement these steps in sequence. Some of the steps are iterative, in that decisions at one stage affect decisions at other stages, requiring one to circle back to revisit prior decisions as implementation takes shape. Some of the steps can also be taken concurrently. The implementation team, for example, can verify legal definitions while at the same time assessing the commission's needs.

A. Design and implementation: The eight steps

1. Organize an implementation team

a. Initiation: The driving force behind ERF development is usually the Commission Chairman or Executive Director. In some states, the initiative has come from the state legislature, broadening requirements of public access. In California, for example, the Legislature required the Commission to provide on-line access to certain materials; then the Administrative Law Judge Division undertook the responsibility of implementing the new system.

b. Post-implementation management: Some commissions distribute management responsibility among multiple departments; others place full responsibility in a single department.

c. Use outside consultants or in-house staff? Building and maintaining an ERF system requires special expertise. Should that expertise come from inside or outside the commission? The choices are: use internal programmers, buy an off-the-shelf product and customize, use an outside vendor but obtain a license to modify the source code internally, or rely entirely on the outside vendor.

In-house expertise gives the commission control over system quality and design, producing a system tailored to meet the commission's needs. But unless internal staff has state-of-the-art experience, outside help can reduce development, design, and long-term maintenance costs. There is a risk that outside vendors will "push their products" rather than customize a commission solution. Another risk arises if suppliers retain ownership of the software source code and decline to modify it to meet commission needs. The California Commission solved this problem by negotiating ownership of the source code for their customized ERF product. Ownership allows modification.

If a commission purchases an off-the-shelf product, it should choose one supported by multiple vendors having staying power and experience.

California used a mix of internal developers and vendors to build its system. The system is currently composed of 20 modules, including 16 for docket management and one for electronic filing. Although staff describes initial communications with vendors, who actually outsourced development, as "difficult," they report satisfaction with the resulting partnership and product.

Case study on internal reliance: Wisconsin

Wisconsin decided to rely on internal programming. Its interest began with allowing formal case filings online, and then grew to include all filings. The Commission allowed public documents first, then confidential documents. Eventually all staff documents were filed electronically too.

It took two commission programmers three months to build the system; another five to six months to launch it. Cost was about $100,000. In 2004, the commission recognized e-records as official, and in January 2005, the commission met its goal of paperless filing.

The development process took into account user comfort, creating confidentiality stamps and time stamps. The staff also eschewed features it deemed unnecessary, including electronic signatures, cover letters, and affidavits, on the grounds that the person sending the file electronically will normally be an administrative staff person, not the responsible executive.

2. Assess needs

The second step begins when the Commission begins assessing current system design and defining requirements for new system. North Carolina actually conducted a survey to determine the views of internal users. Doing so helps build support for changes.

Other agencies' experiences help stimulating thinking. Wisconsin, Nevada, and North Carolina reviewed other state commissions' ERF systems; California examined both the FCC and FERC e-filing systems for guidance during system design. North Carolina investigated other in-state agencies.

3. Determine budget

Commission information technology (IT) budgets vary. Comparable information is hard to develop because each state spends on different items. Here are three examples of commission cost information. Readers interested in details should contact the commissions directly.

The North Carolina Utilities Commission paid about $1,200,000 for hardware, software, and networking initially; they continue to pay $40,000 annually for 150 development hours.

The California Legislature approved an ERF budget of approximately $400,000 along with a $50,000 annual maintenance and support contract.

The Nevada Public Utilities Commission received state funding of $1.4 million dollars for their ERF system, including $560,000 for hardware and software, $40,000 to $50,000 in annual maintenance costs, $300,000 for records management, and $180,000 for training.

States also vary on whether they paid for development out of the regular budget, or received special funds from the Legislature for this purpose.

States should also consider budgeting for the long-term costs of information back-up.

4. Determine legal definitions and status of filings and records

Regulatory practitioners make filings to satisfy legal requirements, or to establish prerequisites for legal entitlements. A filing will constitute such a "marker" if state law recognizes the filing as official. The question here is whether and how a state extends official recognition to electronic filings; and whether the state does so without undermining the legal status of paper filings.

The Uniform Electronic Telecommunications Act of 1999, adopted by the National Conference of Commissioners for Uniform State Laws (NCCUSL), defined an "electronic record" as a record "created, generated, sent, communicated, received, or stored by electronic means."[13] Congress in 2000 defined "electronic record" as "a contract or other record created, generated, sent, communicated, received, or stored by electronic means."[14] At that time, 25 state legislatures had adopted similar wording as their legal definition of an electronic record. Today, 46 states, and the District of Columbia, have adopted similar definitions, signaling the growing prevalence and importance of electronic records.

South Carolina, Alabama, and Ohio have made their electronic transaction and record laws technology-neutral.[15] The Ohio Revised Code defines an electronic record is "any document, device, or item, *regardless of physical form or characteristic*, created or received by or coming under the jurisdiction of any public office of the state or its political subdivisions, which serves to document the organization, functions, policies, decisions, procedures, operations, or other activities of the office" (emphasis added).[16] This definition, one of the broadest among commissions participating in our study, is aimed at increasing government transparency, accountability, and public access to information.

Are paper filings still official, or required? Some state laws mandate retention of a paper copy of certain electronic records. These states are not necessarily the same states in which electronic records are treated as official. Eight of 23 commissions, for example, that are in states that treat records as official do not treat the documents as official themselves (See Appendix).

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[13] Uniform Electronic Telecommunications Act (UETA), 1999.

[14] E-SIGN Act, 106 P.L. 229; 114 Stat. 464; 2000 Enacted S. 761; 106 Enacted S. 761

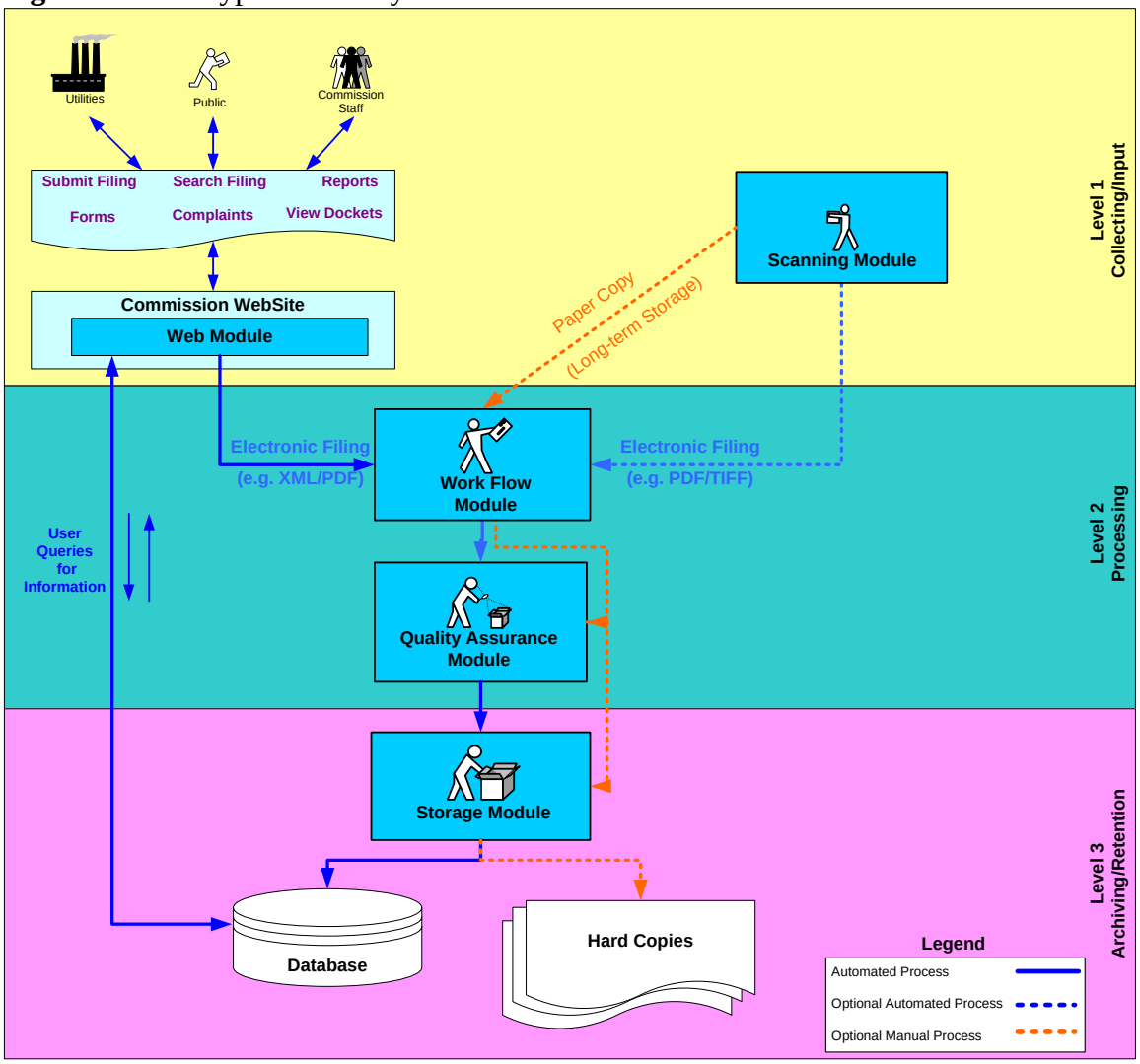
[15] See Smedinghoff, T, & Hill Bro, R (1999). *Electronic Signatures Legislation.* FindLaw Library. http://library.findlaw.com/1999/Jan/1/241481.html.

[16] Ohio Revised Code Sec. 149.011

5. Design the system using current technology

E-filing technology has advanced in response to the demand for system modules able to interact with each other seamlessly. There are three major modules that form a typical ERF system. Below we describe these modules and the present technology in broad terms to give the reader a general understanding of how these technologies interact. The figure below displays the modules graphically. Because the core of technology is software, we also briefly discuss several different software products used by commissions. Our discussion, however, is in no way an endorsement of the technologies discussed.

Figure 1: Archetype of ERF Systems



Source: NRRI construct

a. Level 1: Information collection and input: The user interface

The ERF Web Module is the user's gateway to the ERF system. Typically, it is a web page residing on a commission website. The Web Module includes activities ranging from electronic filing by utilities to document search and retrieval by the public and staff.

For commissions that accept or require paper filings, the Web Module can be designed to eliminate several steps. Commissions receive paper copies either by mail or over the counter. Staff then manually scan these documents into images and post them to the website. Unfortunately, human involvement often means human error. The ERF Web Module allows electronic submission, thereby skipping some of the human scanning and posting functions. If the Commission still requires paper filings (along with the e-filing), an ERF Scanning Module is available. This module can use Optical Character Recognition (OCR), to translate scanned documents into searchable text.[17]

In the past, scanning speeds and OCR accuracy were suboptimal; so commissions left many documents in graphic state (as an image file, such as TIFF or PDF image), as opposed to a searchable text format. Recent technology advances have increased both the speed and reliability of OCR software. Document size is also a concern when dealing with files scanned as images, as distinct from text files. We address this problem under the Storage Module below.

The following are examples of software that states use to convert paper documents into electronic records.

1. IBM Content Manager
2. Paperflow
3. ColdFusion[18]

[17] See Lias, Sami (2002). Optical Character Recognition. Computer World. Retrieved October 6, 2006, from www.computerworld.com. Optical Character Recognition (OCR) is a type of computer software that is used to digitize print media. The process begins by scanning the document as an image using an optical scanner. "The OCR software then processes these scans to differentiate between images and text and determine what letters are represented in the light and dark areas. Older OCR systems match these images against stored bitmaps based on specific fonts." OCR packages today use complex algorithms to differentiate individual character strokes and spaces between characters, improving accuracy.

[18] See for example, ActiveSoftware Website at http://www.activsoftware.com/activescan/executive.cfm. ActiveScan is software used in collaboration with ColdFusion that allows it to scan documents via the Internet.

b. Level 2: Information processing

Level 1 described the user-system interface, and methods to deal with paper filing (via the Scanning Module). The system next must manage and distribute these documents for review, storage, and other processing needs. Addressing these needs is a management control mechanism called the Workflow Module.

Some commissions divide this module into two categories: (1) Manual Workflow and (2) Automated Workflow. A manual workflow involves commission staff members manually deciding which staff should look at which filing, case by case, and distributing the materials accordingly. The manual approach raises again the potential for human error, affecting the quality of information.

An automated workflow offers more control over both the quality of information and the flow of work within a commission. It is available in off-the-shelf programs that can be customized for a particular organization. An automated workflow is controlled by the software, thus reducing the potential for human error. Once commission IT staff programs into the system instructions on which staff may see, edit, and manage each file, it is unchangeable except by IT staff.

Tied into the Workflow Module is the Quality Assurance Module. It is the final check that files posted to the user-system interface are only those authorized. In some commissions, this function is carried out by staff. In others, it is accomplished with a separate computerized script program that updates the website. This approach also allows documents to be checked for authorization before they are published to the Web.

The following are examples of software that states use to manage workflow.

1. FileNet
2. Visual Basic
3. Lotus Notes
4. Microsoft Access
5. Internally developed application

c. Level 3: Information archiving and retention

The final component of an ERF system is the Storage Module. There are two types of storage that could be used to provide long-term access to electronic documents. The first type of storage is dynamic, where data is stored on a hard drive from which the website may retrieve the filing on a day-to-day basis. The second type of storage is static, which is used when commissions are required to store physical hard copies (e.g., paper or microfilm) able to last for many years.

Backup protects the system. The first decision is frequency: some states backup daily, some hourly. The second decision is method. There are several options including tapes, off-site

storage, disaster recovery plans, migration, redundancy using an NAS device,[19] and microfilm. These options are not exclusive of one another. In fact, all commissions responding to the survey reported using multiple back-up methods.

The following are examples of software that states use to store and retrieve electronic records.

1. Oracle
2. MS SQL Server
3. DB2
4. DOCS Open
5. Sybase

6. Provide guidance to users

Staff accustomed to paper must adjust, trusting the electronic system instead of printing documents. Many states commissions provide explicit guidance to their staff on determining which documents should be filed electronically and how electronic records should be managed.

7. Evaluate design and implementation

Idaho, Iowa, Michigan, and Pennsylvania conducted a survey of staff or outside users to evaluate their experience with the ERF system.

8. Coordinate with other state commissions

For the many states who co-regulate multistate utilities, common filing protocols and common access to each other's information would make regulation more efficient. Examples of such sharing include docketed filings, and state-specific information.

A. Docketed utility information
   1. Rulemaking
   2. Compliance investigations
   3. Rate cases
   4. Merger applications
   5. Telecommunications
   6. Registration/Certification filings
   7. Tariff filings
   8. Compliance filings
   9. Complaint cases

[19] Network-Attached Storage (NAS) is a dedicated storage technology that can be connected directly to a computer network to provide centralized data access and storage to network clients.

B. State-specific information
   1. State statutes
   2. Administrative codes
   3. Practice and procedure rules
   4. Staff directories
   5. Comments to federal agencies
   6. Press releases
   7. Public information publications
   8. Workshop proceedings

B. The process of implementation: How do we ensure cross-fertilization among these eight steps?

The presentation of these steps above does not suggest a lockstep process to which states must adhere while designing and implementing an electronic record filing system. Some steps are iterative, in that states should revisit earlier decisions based on knowledge discovered during later steps. States can also take two or more steps at the same time.

Step Eight suggests that increased communication between commissions can aid the regulation of utilities operating in two or more states. It can also help commissions create advanced ERF systems more efficiently. One way to ensure cross fertilization among these steps is to increase communication between the states on the staff level. Efficient communication allows states to create shared knowledge, to coordinate efforts, and maybe skip one or several steps in the development process, saving both time and money.

IV. Recommendations and Ideas for Future Research

A. Recommendations to state commissions

1. Determine whether to rely on internal or external help, or both, and for which tasks. Outside consultants bring broad and deep expertise to the task. But as with any outside consultation, the division of responsibilities between inside and outside help must be clear, as must be lines of accountability.

2. Perform a needs assessment to determine what steps are necessary to fill in the space between present status and goals. Use the benefit and cost factors set forth in Part II. Focusing on cost reduction alone is insufficient, because it is not clear that the savings in administrative expenses alone justifies the expenditures in the short run. Consider the full range of benefits and costs.

3. After establishing access and efficiency goals, conduct a preliminary assessment of the current status, compared to the goals.

4. Include user surveys in any evaluation of the current status of commission use of ERF.

5. With an open source approach, consider applying ERF to multi-state utilities or multi-state regulatory issues. Open source refers to the principle of providing open access to the development and production phases of various products. A well-coordinated open source approach enables system users to play a more integral role in system design. An open systems approach would induce dialogue among commissions while explicating common data definitions, or information tags. When commissions recognize one set of tags, the markup language then becomes common, and communication is ensured. By breaking information into its most basic components, using these tags, the information becomes accessible for multiple uses. Then the information can be stored, managed, analyzed and, most importantly, shared.[20]

6. More efficient sharing of information on multi-state utilities through ERF might improve the effectiveness of the regulatory process. Perhaps states might wish to conduct more streamlined, robust information-sharing with the service areas within regional transmission organizations (RTOs). Or there may be common issues across state lines, such as benchmarking performance of small water utilities that could benefit from routinization of electronic information-sharing.

7. Build ERF into the commission's strategic plan. The narrow view of ERF is as a mechanism to streamline administration, perhaps reducing its costs. These are worthy goals in themselves. But ERF is also a tool for achieving effectiveness in regulation by increasing access to the regulatory process and the associated sharing of information and expertise across a larger universe of players.

B. Ideas for future research

Future ERF research should explore the possible benefits, costs, and risks of (a) developing a commonly recognized utility regulation markup language using XML, and (b) building interoperable commission information systems. From the NRRI survey results it does not appear that ERF has captured the attention of many states as a way to enhance interstate regulatory cooperation. Yet the opportunities abound.

[20] See for example, the World Wide Web Consortium Website at www.w3.org. The Consortium takes an open systems approach to Internet development. "The World Wide Web Consortium (W3C) develops interoperable technologies (specifications, guidelines, software, and tools) to lead the Web to its full potential. W3C is a forum for information, commerce, communication, and collective understanding."

Appendix: Survey Instrument and Complete Results

NRRI Electronic Record Filing Survey Results

Electronic Record Filing (ERF) systems replace paper-filing systems with electronic records that can be easily transferred, accessed, filed and recalled. The ultimate goal of ERF is to enhance the process of regulation by improving knowledge management, collaboration between partners and information management through e-regulation. The extent of ERF systems use ranges from paper documents electronically filed as an image to documents created, stored, and recalled using a markup language like XML.

The uses for ERF systems range from commission task automation to enhancing the process of regulation through information sharing. As of 2000, many state regulatory commissions used ERF systems to automate commission work and improve workflows. Today, commissions are pushing the envelope and moving towards the goal of e-regulation. Although the challenges commissions face today are the same as five years ago, the benefits of using an advanced ERF system have increased dramatically.

The utility regulation environment today is very different than it was five years ago. Both regulation and technology are constantly changing. In the private sector, successful organizations anticipate change to create a competitive advantage. Much of the public sector is no different. ERF promises commissions the agility needed to increase effectiveness in our constantly changing environment.

The purpose of the survey is to determine the present state of commission information technology, ERF systems use, and to identify potential common interests in ERF systems development. Your input is essential to this study. This survey should take approximately ten to fifteen minutes to complete. We greatly appreciate you taking the time to complete the survey.

This survey is being undertaken by the NRRI for the NARUC Staff Subcommittee on Executive Management. The survey results will be presented to the Staff Subcommittee on Executive Management and will be posted on the NRRI website to allow you to compare your experience with ERF to those of other states.

Your Name _____
Current Position _____
Phone Number _____
E-mail Address _____
Commission Name _____
State _____

Information Technology

1. How does your commission manage information systems? Please check one.

Dedicated IT Department:	CT, KS, LA, MD, NC, NM, OH, PA, TX, WI
We Outsource IT:	None
State IT Department:	UT
Other:	NV

2. If you chose (a) [dedicated IT department] for question 1, please answer questions 2.1-2.6 to the best of your ability.

	IT Staff	Commission Staff	IT Operating Budget	IT Development Budget	Total IT Budget
CT	2	135			
KA	12	215			
LA	5	80			
MD	7	140	$670,000	$100,000	$870,000
NC	4	65			
NM	7	270			$700,000
OH	30	370	$1,000,000	$1,000,000	$2,000,000
PA	16	550			
TX	10	200	$1,000,000	$75,000	$1,100,000
WI	8.5	150	$400,000	$700,000	$1,100,000
Mean	10.15	217.5	$754,000	$515,000	$1,154,000

2.6. Is the IT budget next year greater than, less than, or about the same as this year's budget? Please check one.

Greater than:	None
Less than:	LA, WI
About the same:	CT, KS, MD, NC, NM, OH, TX

Electronic Record Filing
"Electronic record" means a record that is created, generated, sent, communicated, received, or stored by electronic means (E-SIGN Act).21

3. Does your commission have a budget for ERF expansion? If yes, please indicate the amount.

No:	KS, LA,
Yes:	CT, MD ($10,000), PA, NC, NM, OH, TX, WI

4. Does your commission currently use an electronic record filing (ERF) system? Please check one.

Yes:	CT, MD, NC, NM, TX, WI
In Development:	NV, OH, PA
In Planning:	LA
No ERF System:	KS

4.1 If you chose (a) [currently use an ERF system] for question 4, for which applications does your commission use ERF? Please check all that apply.

General records filing:	CT, MD, NC, NM, TX, WI
Tariff reporting:	CT, MD, TX, WI
Docket management:	CT, MD, NC, NM, TX, WI
Hearings:	MD, NC, NM, TX, WI
Orders:	CT, MD, NC, TX, WI
Commission meetings:	CT, MD, NC, NM, TX, WI
Annual reports:	CT, MD, NC, TX, WI
Other:	CT

4.2 If you chose (a) [currently use an ERF system] for question 4, how long has the system been in use?

State	**Years**
CT:	6
MD:	3
NC:	10
NM:	4
TX:	9
WI:	3

21 106 P.L. 229; 114 Stat. 464; 2000 Enacted S. 761; 106 Enacted S. 761

4.3 If you chose (a) [currently use an ERF system] for question 4, what was the cost to implement the system?

-and-

4.4 If you chose (a) [currently use an ERF system] for question 4, what are your current annual costs (licenses, enhancements, training, programming, etc.)?

	Initial System Cost	**Annual System Cost**
MD	$0	$10,000
NC	$1,650,000	$69,000
NM		$120,000
TX	$500,000	$30,000
WI	$120,000	

4.5 If you chose (b) [your commission plans to develop an ERF system] for question 4, for which applications does your commission plan to use ERF?

General records filing:	NV, OH, PA
Tariff reporting:	NV, OH, PA
Docket management:	NV, OH, PA
Hearings:	PA
Orders:	NV, OH, PA
Commission meetings:	NV, PA
Annual reports:	NV, OH, PA
Other:	NV, OH

4.6 If you chose (b) [your commission plans to develop an ERF system] for question 4, in which stage of development are the plans?

Internal planning:	None
RFP:	None
In Development:	OH, PA
Being Implemented:	NV
Other:	None

5. Does your commission plan to make significant changes to your ERF system within the next year?

Yes:	CT, MD, NC, NM, NV, WI
No:	KS, OH, PA, TX

6. Does your commission work with an outside firm in the development, use, or support of your commission's ERF system (i.e. FileNet, STAR, ICAP, etc.)? If yes, please indicate which firm.

Yes:	NC (MBS), NV (High Desert Micromanaging, Inc.), NM (FileNet), OH (Dayhuff Group), PA (Unisys)
No:	CT, KS, MD, TX, WI

7. Does the above arrangement meet your ERF needs?

Yes:	NC, NV, NM, OH, PA
No:	None

8. How does your commission create electronic records? Please check all that apply, and rank 1 to 5 which method is most preferred (1=Most preferred, 5=Least preferred).

	1	**2**	**3**	**4**	**5**
XML	1	3	1	1	0
HTML	1	0	2	3	0
PDF	5	0	0	2	1
DOC	3	3	0	2	1
Print/Scan	2	0	1	3	2
Other	2	1	3	0	5

9. How does your commission store electronic records? Please check all that apply and rank 1 to 4 which method is most preferred (1=Most preferred, 5=Least preferred).

	1	**2**	**3**	**4**	**5**
Completely Automated	3	1	2	2	1
Scanned Paper Document	0	2	3	3	1
Print and File	2	2	1	1	1
Other	0	0	0	1	0

10. What software are you utilizing as part of your ERF system?

Lotus Notes:	CT, MD
Access:	MD, NM, NV
Visual Basic:	MD, NV, OH, TX
Other:	KS (Oracle), MD (ColdFusion), NC (DB2), NM (Sybase, Oracle, MS SQL, Paperflow), NV (MS SQL), OH (IBM Content Manager, SQL), PA (Docs Open, FileNet), TX (Internally developed application, Input Accel), WI (Internally developed application)

11. Have you experienced any major problems with the software or do you anticipate any problems in the near future?

Yes:	None
No:	CT, KS, MD, NM, NV, OH, PA, TX, WI

12. How does your commission back up your information system?

Migration:	CT
Back-up tapes:	CT, KS, MD, NC, NM, NV, OH, PA, TX, WI
Disaster recovery plan:	CT, KS, MD, NC, NM, NV, OH, PA, TX, WI
Offsite storage:	CT, KS, MD, NC, NM, NV, OH, PA, TX, WI
Other:	NV, OH

13. How often does your commission back up information?

Once a day:	CT, KS, MD, NC, NM, TX
Two or more times a day:	OH, PA, WI

14. Does your state require you to keep hard copies of electronic records?

No:	AR, CA, CO, FL, GA, MO, MS, MT, NH, OH, SC, WI
Yes:	AL, IA, ID, KS, NC, NM, NV, NY, OR, PA, SD, TX, UT, VA, WI, WV

15. Are electronic records considered “official records” in your state?

No:	ID, NM, TX, UT, VA, WV
Yes:	AL, AR, CA, FL, GA, IA, KS, MD, MI, MN, MO, MS, MT, NC, NH, NY, OH, OR, PA, SC, WA, WI

16. Are electronic records considered “official records” in your commission?

No:	DE, FL, IA, ID, KS, MN, MT, NC, NM, OH, PA, SD, TX, UT, VA
Yes:	AL, AR, CA, CO, GA, MD, MI, MO, MS, NH, NV, NY, OR, SC, WA, WI, WV

17. Does your commission require utility companies to file electronically?

No:	AL, AR, CA, CO, DE, FL, IA, ID, KS, MD, MN, MO, MS, MT, NC, NM, NV, OH, PA, SC, SD, VA, WA, WV
Yes:	GA, MI, NH, OR, UT, WI

18. What area of your commission is responsible for electronic records management? Please check one.

Distributed in Commission:	AL, CO, DE, FL, GA, ID, KS, MI, MN, MS, MT, NH, NM, NV, NY, OH, SC, SD, UT, WA, WI
IT Department:	AR, MD, NC, PA
Other:	CA, CO, IA, MO, OR, TX, VA, WV

19. How do you perceive electronic record management systems are organized in your commission? Please check one.

Individual record keeping:	IA
Work area:	None
Department offices:	KS, MT, NM, WA
Centralized system:	AL, AR, CO, CT, DE, ID, MD, MI, MN, MO, MS, NC, NV, OH, PA, SC, SD, TX, UT, VA, WI, WV
Other:	CA, FL, GA, NY, OR

20. What electronic record management training is provided to commission staff? Please check all that apply.

Formal internal course:	AR, CA, CO, CT, FL, MD, MN, MO, MS, MT, NH, NV, NY, PA, SC
Formal external course:	AL, MI, NM
Hands on training:	AR, CA, CO, CT, GA, ID, MD, MI, MN, MO, MS, NM, NV, OR, PA, SC, SD, TX, UT, VA, WA, WI, WV
None:	DE, KS, NC
Other:	NM, OH

21. Are there documented electronic records management *process* guidelines for your commission explaining which documents should be filed electronically? Please check one.

Yes:	CA, GA, MD, MI, MO, MS, SC, TX, UT, WA
In development:	AL, CO, MT, NC, NH, NM, NV, NY, OH, OR, PA, SD
No:	AR, DE, IA, KS, MN

22. Are there documented electronic records management *user* guidelines for your commission explaining who is responsible for electronic record filing? Please check one.

Yes:	AR, IA, MI, MO, MS, NY, SC, TX, UT, WA, WI
In development:	AL, CA, CO, GA, ID, MD, MT, NC, NH, NM, NV, OH, OR, PA, SD, VA, WV
No:	DE, KS, MN

23. Has your commission completed a user survey to evaluate the ERF system? If so, how recently?

Yes (year):	IA (2004), ID, (2005), MI (2004), PA (2003)
No:	AL, AR, CA, CO, CT, DE, FL, GA, KS, MD, MN, MS, MT, NC, NH, NM, NV, NY, OH, OR, SC, SD, TX, UT, VA, WA, WI, WV

24. How does electronic records management relate to your commission's overall strategic and business plans? Please check one.

Major Component:	AL, AR, DE, FL, MD, MI, MN, MO, NC, NH, MN, NV, NY, PA, SD, TX, UT, WA, WI, WV
Ocasional reference:	AL, AR, DE, FL, MD, MI, MN, MO, NC, NH, NM, NV, NY, PA, SD, TX, UT, WA, WI, WV
Not at all:	KS

25. What areas of electronic record management are of continuing concern in your commission? Please check all that apply.

Security:	AL, AR, CA, CO, CT, DE, FL, GA, IA, KS, MN, NC, NH, NM, NV, NY, OH, PA, SC, TX, UT, VA, WA, WI
Accessibility:	AR, CO, CT, DE, FL, GA, IA, KS, MD, MN, NH, NM, NV, NY, OH, PA, SD, TX, UT
Usability:	AL, AR, CO, CT, FL, GA, IA, KS, MD, MN, NH, NM, NV, NY, OH, OR, PA, SD, TX, UT
Scalability:	CO, CT, IA, KS, MD, MN, NM, NV, NY, OR, PA
Cost:	AL, AR, CA, CO, CT, FL, IA, KS, MN, NC, NM, NV, NY, OH, OR, PA, SD, TX, UT
Value:	Al, CO, CT, FL, IA, KS, MN, NM, NV, NY, OH, OR, PA, TX
Time sensitivity:	AR, CO, CT, FL, GA, IA, KS, MD, MN, NM, NV, NY, OH, PA, UT, VA
Searchability:	AR, CA, CO, CT, DE, FL, GA, IA, MD, MN, MO, NC, NH, NM, NV, NY, OH, OR, PA, TX, UT, WA, WV
System longevity:	CA, CO, CT, DE, FL, IA, KS, MD, MN, NC, NM, NV, NY, OH, OR, PA, SD, TX, UT, WA, WV
Accuracy/Integrity:	AR, CO, CT, DE, FL, IA, KS, MD, MN, NH, NM, NV, NY, OH, OR, PA, TX, UT
Legal:	Al, AR, CO, CT, DE, FL, IA, KS, MD, MN, NH, NM, NV, NY, OH, OR, PA, SC, TX, UT, VA, WA, WI, WV
None:	MI, MS

Information Sharing

26. Does your agency regularly use, reference, or collect documents or other information from utility regulatory commissions in other states?

No:	CO, FL, KS, NC, SC, TX, UT, VA, WA
Yes:	AL, AR, CA, CT, DE, GA, IA, ID, MD, MI, MN, MO, MS, MT, NH, NM, NV, NY, OH, OR, PA, SD, WI, WV

27. If you selected (a) [your commission does use, reference, or collect information from other commissions] in question 23, please identify the types of documents or information used regularly. Please check all that apply and provide comments if necessary.

Docketed Utility Specific

Complaint cases:	CA, CT, GA, ID, MD, MO, MS, MT, NH, NM, NV, NY, PA, WI, WV
Compliance filings:	AL, CA, CT, ID, MD, MT, NM, NV, NY, OH, PA, WV
Tariff filings:	AL, AR, CA, CT, ID, MD, MO, MS, NH, NV, NY, OR, PA, SD, WI, WV
Registration/certification:	CA, CT, MD, MS, NM, NV, NY, PA, SD, WV
Interconnection cases:	AL, CA, CT, ID, MD, MS, MT, NH, NM, NV, NY, OH, PA, WI, WV
Merger applications:	CA, CT, GA, ID, MD, MS, MT, NH, NM, NV, NY, OH, OR, PA, WI
Rate cases:	AL, AR, CA, CT, ID, MD, MN, MO, MS, MT, NH, NM, NV, NY, OR, PA, SD, WI, WV
Compliance investigations:	CA, CT, GA, ID, MD, MO, MT, NM, NV, NY, OH, PA, SD

Non-Docketed Non-Utility Specific

Commission

Rule makings:	AR, CA, CT, DE, ID, MD, MS, MT, NM, NV, NY, OR, PA, WI
Workshop proceedings:	CA, CT, MD, MO, MS, NH, NM, NV, NY, PA
Public information publications:	CA, CT, GA, ID, MD, MN, MS, MT, NH, NM, NV, NY, OH, OR, PA, SD
Press releases:	AL, CA, CT, ID, MD, MO, MT, NM, NV, NY, PA, SD, WI
Comments in Fed. proceedings:	AL, CT, DE, GA, IA, ID, MO, MS, MT, NH, NV, NY, OH, OR, PA, SD, WI
Staff directories:	CA, CT, IA, ID, MD, MN, MS, MT, NM, NV, NY, PA, SD
Practice and procedure rules:	AR, CA, CT, ID, MO, MT, NH, NM, NV, NY, OH, OR, PA, SD
Administrative codes:	AR, CA, CT, ID, MT, NM, NV, NY, OH, PA, WI

State

Statutes relevant to commission:	AR, CA, CT, DE, ID, MD, MS, MT, NH, NM, NV, NY, OH, OR, PA, SD, WI

28. If you selected (b) [your commission does not regularly use, reference, or collect information from other commissions] in question 23, would you be interested in sharing information with other commissions?

Yes:	CA, FL, NC, NM, SC, UT, VA, WA
No:	CO, KS, TX

29. If you selected (a) [you would be interested in sharing information with other commissions], in question 25, please identify the information you would like to share.

Docketed Utility Specific

Complaint cases:	WA
Compliance filings:	WA
Tariff filings:	SC
Registration/certification:	None
Interconnection cases:	SC
Merger applications:	SC
Rate cases:	SC, UT, WA
Compliance investigations:	WA

Non-Docketed Non-Utility Specific

Commission

Rule makings:	SC
Workshop proceedings:	SC
Public information publications:	SC, UT
Press releases:	SC, UT
Comments in Fed. proceedings:	SC, VA, WA
Staff directories:	SC, VA, WA
Practice and procedure rules:	NC, SC, UT
Administrative codes:	SC

State

Statutes relevant to commission:	NC, SC

30. What are your primary concerns about information sharing with other commissions? Please check all that apply.

Security:	AL, CT, IA, NM, NV, NY, OR, PA, SC, SD, TX, UT, WA
Accessibility:	IA, MN, NV, NY, SC, SD, UT
Usability:	CO, IA, KS, MN, NV, NY, OH, SC, UT
Scalability:	IA, NV, NY
Cost:	GA, IA, KS, MN, NM, NY, OR, SC, SD, TX, UT
Value:	IA, KS, NV, NY, SC, TX, VA, WV
Time sensitivity:	IA, KS, MN, NV, NY, OR, UT
Searchability:	IA, MN, MO, NV, NY, OH, OR, SC, SD, UT
Longevity of system:	IA, NV, NY
Accuracy/integrity:	IA, MN, NV, NY, WA
Legal:	CT, IA, KS, NM, NV, NY, OH, PA, SC, SD, UT, WA
None:	AR, CA, DE, FL, ID, MI, MS, MT, NC, NH, WI

31. How important of an objective, for your commission, is document and information sharing with other commission?

Very important:	CA, DE, NH
Somewhat important:	AL, AR, CT, IA, ID, MN, MS, MS, NC, NM, NV, NY, OR, PA, SC, SD, TX, UT, WI, WV
Little importance:	GA, KS, MT, OH, VA, WA
No importance at all:	None

32. Would a standardized method for filing and/or sharing information (such as XML) be useful to your commission?

Yes:	CA, CT, DE, NC, NY, PA, SC
Not sure:	AL, AR, CO, GA, IA, MI, MN, MO, MS, MT, NH, NM, NV, OH, OR, SD, TX, UT, VA, WA, WV
No:	KS, WI

33. How would your commission benefit from information sharing? Please comment.

34. Please use the space below for any additional comments on your IT program, ERF, or information sharing, please feel free to include links to important documents that you believe would be useful:

Thank you for taking the time to fill out this survey. The results will be compiled and presented to the NARUC Staff Subcommittee on Executive Management and will be available on the NRRI website www.nrri.osu.edu.