

WEBINAR 1: LESSONS LEARNED FROM MULTI-STATE E-MANIFEST PILOT STUDY

SUMMARY

I. Background

On April 22, 2009, the U.S. Environmental Protection Agency (EPA) held a webinar to discuss the lessons learned from a multi-state pilot study on the e-Manifest. This was the first of four webinars that EPA will hold to solicit user input into the design, development, and operation of a national e-Manifest system. The national system would be an alternative to the current paper-based procedures found in 40 CFR Parts 262 to 265.

Section II of this document summarizes the webinar. Section III presents a question about the e-Manifest that was e-mailed to EPA after the webinar. A response is provided. A table of attendees is included at the end of this document. The presentation slides used during the webinar are provided as separate attachments.

II. Summary

The facilitator began the webinar by briefly recounting the user meeting on the e-Manifest that was held on November 19 and 20, 2008, at EPA Headquarters in Arlington, VA. He also indicated that a meeting summary had been sent to participants for their review and comment. He then discussed the purpose and schedule of the four webinars. Finally, he turned the webinar over to representatives of the pilot study to present the lessons learned. The presenters included Michael Beaulac of the Michigan Department of Environmental Quality and Jason Bunker and Bret Smith of Windsor Solutions.

The presenters first gave an overview of the project and pilot system. Participants in the project included four state environmental agencies (Michigan, Massachusetts, New Jersey, and Minnesota), EPA's Office of Resource Conservation and Recovery, industry stakeholders, and Windsor Solutions (*i.e.*, the contractor that supported the pilot). The National Environmental Information Exchange Network was used to exchange information among trading partners via Extensible Markup Language (XML). The goals of the pilot were to demonstrate burden reduction and enhanced cradle-to-grave tracking of waste and to complement EPA's rulemaking on a national e-Manifest system. The pilot period ended in December 2008 after four months of operation.

It is estimated that the national cost to industry under the current manifest system is about \$410 million per year (over \$500 per manifest). If approximately three-quarters of all manifest transactions were electronic, EPA estimates an annual savings of about \$100 million to states and the regulated community. This projected amount is equivalent to a net unit savings of \$23 to \$40 for each completed manifest form.

The pilot system provided three user-centric interfaces:

- **Desktop Web Site User Interface** is the version of the e-Manifest system accessible through a standard browser (*e.g.*, Internet Explorer, Firefox, etc.) on a desktop or laptop computer. This interface offered a full set of user functions.
- **Mobile Web Site User Interface** is designed and optimized to run on any mobile device Internet browser (*e.g.*, Pocket PC, Smartphone, etc.) and was built simply to demonstrate basic capabilities for searching and viewing manifests on a mobile platform. It offered a scaled-down set of functions in comparison with the Desktop Web Site User Interface.
- **Mobile Client User Interface** provides users with several core functions available within the Desktop Web Site User Interface and also can be used in an offline mode with no Internet connection available. This interface also is referred to as the "Smart Mobile Client."

The pilot system also offered a **Web Services Interface** that facilitated a multi-manifest data submission process (*i.e.*, machine-centric interface). This interface defined the messages and their content and, when implemented, allowed external systems to upload manifest data to the e-Manifest central system. While the method of submitting the data through Web Services differed from that implemented in the user-centric approach, the back-end processes (*e.g.*, data constraints, business rule validation) executed after receipt of the data submission were identical.

In addition, two e-signature approaches were piloted in connection with the user-centric interfaces: a Personal Identification Number (PIN)/password and a digitized signature. The Desktop Web Site User Interface supported the PIN/password approach, while the Mobile Client User Interface supported both approaches. The digitized signature enabled compliance with the Cross-Media Electronic Reporting

Regulation (CROMERR) even when captured offline using the Mobile Client User Interface.

Once the state agency node received the manifest, local automated processes were responsible for performing state-specific quality assurance checks and loading the manifest data into the state agency's internal information management systems. This was a successful approach.

The presenters discussed nine lessons learned from the pilot study:

1. **Pilot system interfaces.** The Desktop Web Site User Interface was the most widely-used method to interact with the system. The downside of the Mobile Web Site User Interface was that it did not have offline capabilities. Users could use the Mobile Client User Interface to pull down manifests that had been created already and edit waste streams a bit before generator signature. It also allowed for the creation of a template-based manifest. Manifest data submitted by Web Services used the same XML schema that was used to send data from the central system to the states. The pilot organizers were not sure if this was the right decision, *i.e.*, whether industry and the states should share the XML schema.
2. **Functional capabilities.** Windsor conducted a survey at the beginning and end of the pilot to ask participants about system functions. Participants placed great value on a simple, straightforward and usable application. The presenters also discussed capabilities that were unanimous favorites (*e.g.*, the ability to submit manifest data electronically to states). Also of note, manifest snapshots supported the copy of record requirements of CROMERR.
3. **Electronic signature options.** The PIN/password approach was found to be effortless and straightforward to use. It was believed that the requirement to provide user credentials along with the digitized signature was unnecessary. Industry generally is concerned about the required mobile technology investment.
4. **Managing electronic custody.** Managing electronic custody ensured that signatures were collected in correct sequence by the correct handlers. Only the handler with electronic custody could modify the manifest. The last person to sign was considered to be in custody of both the waste and manifest. However, organizers noticed that electronic custody of the manifest may not coincide perfectly with physical custody of the waste in all cases. The pilot organizers explored methods to address this (*e.g.*, use of Radio Frequency Identification (RFID) bar codes, which are similar to a

- FedEx style system to ensure that electronic custody always coincides with physical custody).
5. **Offline capabilities.** The system could not validate a signature until the manifest went online. For a national system, there are some issues to explore for offline capabilities, including version control and physical transaction receipts.
 6. **Manifest tracking number (MTN) generation.** The system assigned MTNs to manifests created in the system with a similar format as paper forms. However, a national system will need to address electronic manifests that are created and entered into shipment offline because a MTN would not be assigned by the system for such manifests. Industry users would like the option to reserve blocks of MTNs that could be assigned to their offline manifests.
 7. **Exchange Network role.** There are a lot of potential uses of the Exchange Network in a national system (*e.g.*, central system data publishing services).
 8. **State data exchanges.** The manifest submission process can be automated easily and regulatory agencies can have access to real-time data, which is important for cross-border transport.
 9. **Industry stakeholder involvement.** Industry involvement was instrumental in the definition of the pilot system. User testing showed that if industry's reporting needs are not met and the burden is not reduced, the national system would not be used.

For additional information on the lessons learned, refer to the "Lessons Learned Report" at: <http://www.e-manifestpilot.com/app/News.aspx?article=7>.¹

Following the presentation, the facilitator opened the floor for participant discussion.

Mr. Baker said that the pilot proved that the e-Manifest can and will work. The pilot was implemented successfully.

Mr. Duckworth asked where someone could see details of the XML schema. The presenters stated that it is not available now because it is still being modified. Participants can contact Mr. Bunker directly if they would like additional information (503-675-7833, ext. 203; jason.bunker@windsorsolutions.com). Mr. Bunker stated that he would try to post it within one or two days.

¹ This Web site may be unavailable temporarily. If you cannot access it, try again later.

Ms. Strohm asked what controls were in place to ensure that the generator maintained control of changes to its manifest along the route. The presenters responded that the waste handler with custody of the electronic manifest could make changes comparable to the paper-based system. The presenters stated that a process needs to be developed so that edits to an electronic manifest can be reported back along the chain of custody. They did not pilot this process due to limited resources, but it is discussed in the Lessons Learned Report. In addition, the presenters clarified that a signed electronic manifest could be locked down to prevent further changes to it. This feature is helpful in creating snapshots that show an electronic manifest at particular points along the chain of custody. Snapshots help to show when changes were made and who made them.

Mr. Hill asked how long it takes to create or sign a manifest. The presenters responded that this is a tricky question. For example, one company created a template for its generator customers. Creating a manifest from a template could take 30 seconds. The templates were beneficial because some manifests had dozens of waste streams. Starting from scratch, a waste handler might take 5 to 10 minutes to create a manifest. The time to create a manifest went down over time as the waste handler gained more experience with the system. Signing a manifest through the Desktop Web Site User Interface took a few seconds with a PIN/password. A digitized signature was a bit slow because it required the user to enter credentials in addition to the digitized signature.

Two participants noted that the pilot Web site (www.e-manifestpilot.com) requires a user login. The presenters clarified that the Web site includes a generic set of accounts, which they use as part of their presentations on the pilot study. However, they do not anticipate granting public access to the accounts. Note that the Web site makes a number of documents available to the public without a login. A series of Web videos describing the system and showing the interfaces can be found at <http://www.e-manifestpilot.com/app/demo.aspx>.²

A participant asked how effectively the XML schema worked. The presenters stated that it worked very well. In particular, electronic signature information entered into user-centric interfaces was captured and stored within the schema. To ensure data integrity, many pieces of information were required. This was not a problem with the user-centric interfaces. The signatures were hashed and stored. Electronic signatures in the Web Services interface were addressed differently, however. The

² This Web site may be unavailable temporarily. If you cannot access it, try again later.

Web Services interface was designed to upload the data of multiple manifests from industry systems to the central system using XML. Methods were developed to provide signatures that were compliant with CROMERR (*e.g.*, uploading manifest data via XML as well as PDF files of manifests that included handwritten signatures).

The facilitator asked what system capability was most important based on users' experience under the pilot. Mr. Baker replied that many users already have in-house programs to create manifests, so the biggest priority for them is submitting copies electronically to states to reduce paperwork.

Ms. Wright asked who would provide the additional codes required by the Biennial Report (*e.g.*, form code) if the e-Manifest system were integrated with the Biennial Report. A response was provided that the manifest could be revised to request those data elements. Although they are not requested on the current manifest, the pilot allowed waste handlers to provide them to address questions about integration with the Biennial Report.

Ms. Keillor said that there is a lot of confusion with partial rejections and clarification about them would be helpful. The presenters replied that they tried to address the rejection process, but it was confusing to them, too. The system enforced what is in the regulations, so users could not deviate from the required process. Ms. Keillor also believes that the possibility may exist for the e-Manifest to satisfy annual reporting requirements for exports.

Mr. Fronczak said that railroads use Electronic Data Interchange (EDI) to track their shipments. They do not want to change this system. They want to be able to convert data directly into the XML system. The presenters stated that the general idea is to have a system that supports railroads and the rest of the shipping industry.

The facilitator asked if the pilot experience changed anyone's assessment of the more important capabilities and benefits of the system. The presenters stated that there was a lot of support for most capabilities. Support for them increased from the first survey to the second. It was clear that the system must be easy to use.

Mr. Hammerberg asked if an economic analysis of the pilot had been prepared. The presenters stated that a back-of-the-envelope estimate had been prepared, but that information is from about four years ago. An analysis had not been done specifically on the results of the pilot.

A participant asked if pilot users realized the expected savings of \$23 to \$40 per manifest mentioned earlier. Mr. Baker said that they had no real savings because the piloted shipments were tracked via the paper-based manifest in addition to the electronic manifest.

Ms. Strohm asked if the national system would be truly paperless or would the Department of Transportation (DOT) still require a paper copy on the truck. A response was provided that a paper document must be carried on the truck to satisfy the DOT requirement.

The facilitator asked what specific lessons from the pilot merit consideration in a national system. Ms. Keillor said that companies need to have time to make adjustments to their systems before the national system comes online.

A participant asked if any shipments that began with an electronic manifest had to change to a paper manifest before reaching the designated facility. The presenters replied that this happened to one shipment. The shipment involved two transporters, but the second one had not signed up to participate in the pilot. Early in the pilot study, it was agreed that if this situation were to occur, the non-participating transporter would sign a paper copy of the manifest and the designated facility would scan and submit it to the state. The scanned copy presented a wet-ink signature, which was considered to have the same integrity as other signature methods.

The facilitator asked how important integration with the Biennial Report is for users. Mr. Baker and Mr. Appelt stated that integration would result in one of the largest savings under the system. Ms. Keillor added that integration is very critical because it would save waste handlers time and energy. Mr. Fronczak said that integration is not important to the railroads.

The facilitator ended the webinar by confirming that the next webinar will be held on Tuesday, May 12, 2009, from 1:00 to 3:00 PM EDT. A reminder will be sent to participants closer to the webinar's date. During the webinar, participants will be asked to provide feedback on several distinct e-Manifest designs under consideration by EPA.

III. Question Raised about e-Manifest Post-Webinar

Mr. Hill e-mailed EPA indicating that one of the presentation slides states that processing one paper manifest costs over \$500. He expressed interest in locating the study that estimated this dollar amount. In response to this question, EPA is clarifying that the study is entitled, "Hazardous Waste Manifest Cost Benefit Analysis." It was prepared for EPA by the Logistics Management Institute in October 2000 and can be found at www.regulations.gov under Docket Number EPA-HQ-RCRA-2001-0032.

Table of Webinar Participants

Name	Organization	E-mail Address
Rene Anderson	Idaho Department of Environmental Quality	rene.anderson@deq.idaho.gov
Dan Appelt	Safety-Kleen	dappelt@safety-kleen.com
Tom Baker	Veolia ES Technical Solutions	tom.baker@veoliaes.com
Verona Barnes	Georgia Department of Natural Resources	verona.barnes@dnr.state.ga.us
Alexis Bayer	National Association of Manufacturers	abayer@nam.org
John Beard	Missouri Department of Natural Resources	john.beard@dnr.mo.gov
Michael Beaulac	Michigan Department of Environmental Quality	beulacm@michigan.gov
Jason Bunker	Windsor Solutions	jason_bunker@windsorsolutions.com
Joshua Burman	Minnesota Pollution Control Agency	joshua.burman@pca.state.mn.us
Paula Canter	Ohio Environmental Protection Agency	paula.canter@epa.state.oh.us
Mike Curry	Chrysler LLC	mc33@chrysler.com
Charlie Duckworth	Union Pacific Railroad	caduckworth@up.com
Carol Dunston	U.S. Environmental Protection Agency	dunston.carolyn@epa.gov
David Edington	Burlington Northern Santa Fe Railway	david.edington@bnsf.com
Robert Fronczak	Association of American Railroads	rfronczak@aar.org
Michael Fusco	Safety-Kleen	
Jack Griffith	Florida Department of Environmental Protection	john.griffith@dep.state.fl.us
Bryan Groce	U.S. Environmental Protection Agency	groce.bryan@epa.gov
Edward Hammerberg	Maryland Department of the Environment	ehammerberg@mde.state.md.us
Michael Hill	New York State Department of Environmental Conservation	mrhill@gw.dec.state.ny.us
Jennifer Johnson	Missouri Department of Natural Resources	jennifer.johnson@dnr.mo.gov
Melinda Keillor	EQ, The Environmental Quality Company	melinda.keillor@eqonline.com
Richard LaShier	U.S. Environmental Protection Agency	lashier.rich@epa.gov
Wanda LeBleu	U.S. Environmental Protection Agency	lebleu.wanda@epa.gov

Name	Organization	E-mail Address
	Agency	
Laura Lopez	U.S. Environmental Protection Agency	lopez.laura@epa.gov
Frank McAlister	U.S. Environmental Protection Agency	mcalister.frank@epa.gov
William Noggle	U.S. Environmental Protection Agency	noggle.william@epa.gov
Octavian Redes	California Department of Toxic Substances Control	oredes@dtsc.ca.gov
Filipa Rio	Alliance of Automobile Manufacturers	frio@autoalliance.org
Ken Roberge	Canadian Pacific	ken_roberge@cpr.ca
Susan Rokosz	Ford Motor Company	srokosz@ford.com
Ben Smith	Safety-Kleen	ben.smith@safety-kleen.com
Bret Smith	Windsor Solutions	bret_smith@windsorsolutions.com
Lenora Strohm	General Motors Corporation	lenora.strohm@gm.com
John Tully	U.S. Environmental Protection Agency	tully.john@epa.gov
Hope Wright	Illinois Environmental Protection Agency	hope.wright@illinois.gov
Lisa Yeager	South Carolina Department of Health and Environmental Control	yeageref@dhec.sc.gov