

Regulatory Information Submission System (RISS)

Introduction

The Regulatory Information Submission System (RISS) was created by Environment Canada (EC). It is an internet-based application to allow regulatees to submit information to EC the federal government in electronic form as prescribed by statutes or regulations administered by EC. The application was developed to deal first with pulp and paper mills in Ontario that are required to report monthly on their effluent quality under the Pulp and Paper Effluent Regulations (PPER), brought into force in 1992 under the *Fisheries Act*. RISS has since been adapted so that owners and operators of metal mines, regulated under the Metal Mining Effluent Regulations of the *Fisheries Act*, are also able to submit required information electronically.

An example of the requirement to submit data electronically where an electronic format – in this case, RISS – is provided by EC is the wording found in s.9(3) of the PPER and s.23 of the MMER:

s.9(3) Each report referred to in this section shall be submitted electronically in the format provided by the federal Department of the Environment, (PPER)

s. 23. Each report referred to in sections 7, 21 and 22 shall be submitted electronically in the format provided by the federal Department of the Environment, (MMER)

Further, while originally developed for regulatees in EC's Ontario Region, today pulp and paper mills and metal mines in Ontario, Atlantic and Pacific and Yukon Regions report required, regulatory data using RISS.

Under RISS, submitted data are processed instantly, enabling EC to collect, store and analyze data for the purposes of evaluating compliance with regulatory requirements on a timely basis.

RISS enables the department's enforcement personnel to review quantities of pollutant releases on a sector-wide basis and to examine violation statistics in numerical form. RISS generates detailed bilingual textual descriptions of violations relating to individual facilities. These capabilities of RISS provide focus for compliance promotion, development of a cost-effective National Enforcement Plan, and aid in the preparation of detailed charges and court briefs.

Requests made under the *Access to Information Act* and *Privacy Act* for information stored in the RISS database can be retrieved within minutes. Requests made for the same information held in paper form incurred expense for copying and collating with several weeks delivery time. Further, there was undue risk placed on the original paper documents that could be used as evidence in court proceedings.

Description of the Problem to be Solved

RISS was created to allow federal regulatees to submit electronic reports to EC. It is superior to the former practice where tens of thousands of pages were submitted annually for review. Under the previous "paper" system, manual re-entry of data from paper reports and spreadsheet templates to other EC databases was time-consuming and error-prone. No consistent format, either paper or electronic, was used by any section of EC prior to the launch of RISS. It was, therefore, clear that an electronic system was the only solution to:

- (1) meet an increasing workload associated with new regulations;
- (2) meet private- and public-sector stakeholder needs across several industrial sectors; and
- (3) provide a single standard for analytical laboratories acting on behalf of their client pulp and paper mills or metal mines to enter required information – currently information related to effluent quality of pulp and paper mills and metal mines.

Objectives and Outcomes

RISS collects information from pulp and paper mills subject to the Pulp and Paper Effluent Regulations (PPER) and metal mines subject to the Metal Mining Effluent Regulations (MMER) and their contract laboratories that perform acute lethality tests and other tests. RISS data collection and compliance evaluation modules for other environmental regulations under statutes administered by EC are currently being considered.

Pulp and Paper Sector

The Pulp and Paper Effluent Regulations were promulgated in May 1992, under the authority of the *Fisheries Act*. Pulp and paper mill operators are required to report effluent quality monitoring information on a monthly basis to an authorization officer listed in Schedule V of the regulations (i.e., Regional Directors, Environmental Protection). Among the data to be reported are daily quantity of paper product manufactured, daily volume of effluent deposited from each effluent outfall, suspended solids (SS) and biochemical oxygen demanding (BOD) matter concentrations in those deposits and the results of ALT on rainbow

trout and *Daphnia magna* including myriad quality control data on each test. No consistent format, either paper or electronic, was used by mill operators during the decade prior to the launch of RISS in Ontario Region.

The RISS – PPER module was launched December 1, 2003, for official use in Ontario Region, to record data from pulp and paper mills located in that province. Historical data from pollutant release reports from December 1992 to October 2003 were loaded into the RISS – PPER module database. In January 2007, the system was expanded to Atlantic and Pacific and Yukon Regions, and historical records from Atlantic Region for the period beginning in 2002 were uploaded as well as historical records for Pacific and Yukon Region from 1995 onward.

Metal Mining Sector

The Metal Mining Effluent Regulations were promulgated in fall 2002, under the authority of the *Fisheries Act* and require metal mine operators to report effluent quality monitoring information on a quarterly basis to an authorization officer listed in Schedule 1 of the regulations (i.e., Regional Directors, Environmental Protection). Among the data to be reported are volumes of effluent deposited from each final discharge point, and arsenic, copper, cyanide, lead, nickel, zinc, suspended solids, radium-226, pH concentrations in those deposits and the results of ALT on rainbow trout and *Daphnia magna* including myriad quality control data on each test. No consistent paper or electronic reporting format was developed by the department for use by mines during the two years prior to the expansion of RISS to include regulatory data from metal mines. Twenty-four months of historical data from Ontario metal mines were imported into the RISS database. Atlantic Region also imported its data into the RISS – MMER module.

All five EC regions provided the RISS development team with interpretations and unique situations for the application of the MMER, resulting in the creation of a single comprehensive system. RISS has fostered consistent and national enforcement of regulations and led to less costly data storage-and-retrieval.

The RISS-MMER module was launched on February 1, 2005, for official use in four of the five EC regions. The module was launched in Quebec region on March 1, 2006. Historical pollutant releases report data from December, 2002 to the launch date were uploaded into RISS for the benefit of all its users.

Environmental Effects Monitoring

The MMER provide for the submission of Environmental Effects Monitoring (EEM) reports on a quarterly basis. Mine operators must submit information related to the effects of their effluents on a list of living organisms. The RISS-EEM component was the first attempt at providing a nationally consistent electronic reporting format for environmental effects monitoring data. The RISS-EEM module was launched concurrently with RISS-MMER and is in use in all five EC regions.

Acute Lethality Bioassays

Two analyses are common to environmental legislation for paper and mining industries: bioassays on rainbow trout and *Daphnia magna*. Effluents from these industrial point sources are monitored for their effects on the health of fish and other micro-organisms. Environment Canada authorization officers (as identified in Schedule V of the PPER and Schedule 1 of the MMER) receive and analyze information to be reported pursuant to certain reference biological test methods:

- Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout. EPS 1/RM/13 Second Edition - December 2000
- Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*. EPS 1/RM/14 Second Edition - December 2000

(as set out under "Data to be Reported" Section 8.1). Prior to the launch of RISS, these quality assurance laboratory notes were created by 25 Canadian bioassay testing laboratories and submitted in various paper forms.

Each bioassay generates between 100 and 145 datum (for single and multiple concentration tests, respectively) that must be reported for a potential 2.5 to 3.5 million datum annually under PPER and MMER for all five EC regions. Bioassay records are complex to analyze. It has been estimated that these analyses would require a full time employee working only on this task. RISS is able to process all the records instantly.

Laboratories are notified by RISS of any critical omissions and errors reported in their bioassay records while they work in draft mode prior to official release of records to their clients. This compliance evaluation process is executed again upon official submission of the section 8.1 data by industry to EC via RISS. Compliance evaluation text messages are collected in each bioassay record and detail the non-conformance of the test with the bioassay reference method. This also triggers violation flags for Environment Canada fishery officers/fishery inspectors.

This module was built to avoid the loss of resources in enforcement actions taken against regulatees for deposits of acutely lethal effluent in cases where the bioassay test was not performed in accordance with the

test protocol (i.e. Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout. EPS 1/RM/13 Second Edition - December 2000). A bioassay rendered invalid by not following the test protocol is not likely to lead to a successful prosecution and a finding of guilt. Failure to test in accordance with the methods set out in the PPER and MMER may lead to charges for alleged non-compliance and eventual penalties as severe as those imposed for deposits of acutely lethal effluent.

RISS – ALT module was launched on February 1, 2005 for official use and currently serves the MMER. It was expanded in October 2006 to serve the Pulp and Paper Effluent Regulations, through the creation of a RISS-PPER module link. Currently, 25 analytical laboratories across Canada use the system to report on behalf of their client paper mills and metal mines.

Additional Regulations

EC is currently considering the addition to RISS of the proposed regulations governing municipal wastewater effluents to be developed under the *Fisheries Act* and the proposed, revised PCB Regulations under the *Canadian Environmental Protection Act, 1999*.

Improvements for Stakeholders

Enforcement Branch

RISS is programmed to evaluate data to determine compliance with the regulated deleterious deposit limits under the PPER and MMER. RISS also evaluates compliance with the bioassay reference methods which determine whether or not effluent from pulp and paper mills and metal mines is acutely lethal. Compliance evaluation is completed the instant a report is submitted by a regulatee.

The bioassay module flags tests not performed with strict adherence to the reference methods for rainbow trout and *Daphnia magna*. Any test parameter that renders a bioassay test invalid forms an offence under the *Fisheries Act* and may lead to an enforcement measure such a warning, injunction or prosecution by an EC fishery officer/fishery inspector. For the first time since their promulgation in 1992 for PPER and 2002 for MMER, EC has an electronic application that can evaluate submitted data in a responsive and uniform manner.

During the prosecution *R. v. Provincial Papers, Inc.* (2000) by Ontario region, 25 of 29 acutely lethal deposits (where some effluent concentrations as low as 10% v/v would kill half the rainbow trout in 96 hours) were dismissed by the court,

because they did not strictly conform to the rainbow trout test reference method. For example, the temperature of one test was reported to be outside the allowable range, 15C +/- 1C, by only one Celsius degree - enough for the test to be invalidated.

Under RISS, Enforcement Branch staff can capture the tests that are invalid and take action against a regulatee for failing to comply with the regulatory test method, thereby minimizing the chance of prosecuting for acutely lethal effluent in cases where prosecuting for failure to comply with the test method was the correct choice.

RISS generates numerical violation statistics and detailed textual descriptions, in both official languages, of violations with regulatory limits, monitoring frequency and due dates for the conduct of tests and the submission of test results. The application generates compliance statistics and quantities of the releases of pollutants to Canadian fishery waters on a sector-wide aggregate basis or on an individual facility basis. The standardized text that describes the violations may be copied directly from RISS into:

- the National Enforcement Management Information System and Intelligence System (NEMISIS) database (operated by Enforcement Branch);
- an Enforcement Action Briefing (EAB),
- a written warning,
- inspector's direction under s.38(6) of the *Fisheries Act*; and
- a court brief.

Information gathered by RISS can be used to focus for compliance promotion efforts and assist in development of the National Enforcement Plan.

Any submission made using RISS constitutes an "off-site" inspection. Currently, each effluent quality report made in Canada under the MMER (approximately 90 per quarter) and the PPER (120 per month) must be filed in NEMISIS. Enforcement officers collectively create 1,800 off-site inspection files. If each record takes an average 10 minutes to create, 300 hours per year are required to complete the work.

It may be possible to have NEMISIS extract necessary information from RISS through secure "web service" to create automatically those 1,800 off-site inspection files and auto-populate the NEMISIS check-boxes used to indicate violations with certain regulatory sections. Further, the standardized bilingual violation descriptions, containing most of the elements of an offence, may be copied automatically from RISS into the enforcement officer's notes area. NEMISIS may be programmed to query RISS on a regularly scheduled basis to keep the off-site inspection tally current.

It should be noted that the regulatees under the PPER report deleterious

deposits on a daily basis and that regulatees under the MMER report their deposits on a frequency ranging from every four days to weekly. Enforcement Branch fishery officers/fishery inspectors typically visit these facilities once per year.

Therefore, the annual ratio of effluent samples analyzed by PPER and MMER regulatees and reported through RISS to the number of samples taken by EC fishery officers/fishery inspectors approximates to 350 to 365:1 for PPER and 50 to 100:1 for MMER.

Based on the use of RISS, Ontario Region alone has brought forward at least seven prosecutions under PPER and four under MMER during the period 1993 to 2006. This total exceeds the number of prosecutions based on samples taken by EC fishery officers/fishery inspectors at pulp and paper mills and metal mines.

Private Industry

PPER and MMER regulatees and their contract bioassay laboratories using RISS are notified of any critical omissions and errors while they work in draft mode prior to official submission of their completed data. A compliance evaluation processor runs automatically upon official submission of data.

Private Citizens

Requests made under the *Access to Information Act* and *Privacy Act* for information stored in the RISS database can be retrieved within minutes. Requests made for the same information held in paper form incurred expenses for copying and collating with several weeks' delivery time. It has been EC's experience that information disclosure to the public results in the generation of a vast quantity of paper. It may cost requestors thousands of dollars and weeks to months for EC to complete retrieval and delivery of the requested information. RISS is able to download over 10 years' PPER data for 25 paper mills into Excel, Adobe pdf or simple text files, in only minutes.

Benefits of RISS

RISS has many benefits including:

- instantaneous and secure reporting of regulatory data via Secure Socket Layer 128-bit encryption technology and confidential user name and password
- several layers of hardware security to block entry by non-authorized users;

- minimized record storage space and management costs (paper-based records command a labour- and space-intensive burden to both the regulatee and EC, and made for difficult data management)
- storage of information on state-of-the-art secure database servers with multiple back-up to minimize any down-time for system restoration or upgrading
- creation of a draft mode for a record, allowing a user to enter and edit data on a “24-7” basis wherein the data are inaccessible by EC staff until a final submission procedure is executed by the user
- single-window reporting application for the PPER and MMER
- a real-time processor that scans a user's online activities for data errors and omissions
- ability to download a user's data into delimited text files (ASCII format) and directly in Microsoft Excel files
- electronic submission date-time stamp with unique transaction record number to confirm receipt of data by EC
- evaluation of data on final submission for compliance with regulatory limits, monitoring schedules, adherence to test methods, and due dates for the conduct of tests and for data submission
- violations automatically entered into text strings (from a standardized library of violations) with their pertinent point source names, dates, limits, and amounts in excess of limit
- violation text can easily be copied into reports in the NEMISIS to avoid re-typing
- automatic notification via MS Outlook infrastructure to enforcement personnel of alleged violations
- creation of colour graphics respecting many of the data entered into the application (e.g., violations clearly flagged in red) that may be easily copied from RISS to a text editor (e.g., Microsoft Word document)
- convenient data entry calendars for every outfall and month where RISS users can quickly view effluent monitoring frequency for each regulated parameter
- read-only access by regulated community RISS users to historical data (dating back to December 1992 for pulp and paper mills, and December 2002 for metal mines)
- storage of an indelible copy of data originally submitted by the pulp and paper mill and creation of a duplicate that can be altered by an EC fishery officer/fishery inspector and that reflects any necessary changes requested, in writing, by the owner/operator of a regulated facility
- indelible append-only notes maintain a history of changes by automatically entering the name username (or “login”) of the owner/operator of the regulated facility with a date-time stamp
- minimized turn-around time for *Access to Information Act* and *Privacy Act* requests

Costs and Payback

Tests for which the regulatee or testing laboratory did not follow regulatory requirements

Environment Canada can expect to uncover any tests not performed in compliance with the standard reference methods under the PPER and MMER. The use of RISS can lead to more effective compliance verification of laboratory practices, in order to determine, for example, whether or not the bioassay laboratories are using the test methods set out in regulations or observing the required criteria for precision, accuracy and method detection limit that are set out in the MMER. These are non-quantifiable benefits and may lead to charges or other enforcement measures to resolve alleged violations that would otherwise have gone unnoticed.

Attributes Instrumental in Contributing to Successful Outcome

The Auditor General continues to criticize the federal government for spending millions of dollars on IT consulting and contracting that yield undesired results (e.g., no end-result, information that was available internally, and unfinished product). RISS is an exemplary example of how "to do it right": the use of "in house" talent and expertise; a more reasonable cost than using a consultant or contractor; delivery of RISS ahead of schedule; receipt by regulatees of an electronic application they wanted and were willing to use; and the advantageous retention of corporate knowledge within EC.

Enforcement Branch, Natural Resources Division, Informatics Technology – Ontario Region, Environmental Technology Centre / Biological Methods Division, and the National Office of Environmental Effects Monitoring collaborated on the development of the current version of RISS by providing interpretations and unique situations in application of the PPER and MMER. This led to creation of a single, comprehensive system. The result is consistent enforcement nationally and minimized cost of data storage-and-retrieval. Demonstrations and beta-testing with industry associations were an important component to the creation of the robust system currently in use.

The work on RISS that has been accomplished is also a great example of trust and relationship-building across vertical service lines and branches. Regulatees have accepted the application and have forwarded unsolicited accolades to EC.

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