



# OpenEMS Effluent Management Software

## Features

- Automated effluents records management application for ensuring regulatory compliance
- Easily generates gaseous and liquid release permits with the permit-processing wizard
- Automatically checks technical specifications on-line for worry free regulatory compliance
- Ties seamlessly to your Canberra countroom management systems and gets information without complex procedures
- Implements site-specific requirements without complex software modification
- Easily generates liquid and gaseous release permits
- Generates automated technical specifications, limit tracking and compliance
- Performs site specific dose projections based on real information without expensive software customization
- Handles composite sample management
- Incorporates distributed multi-user functionality providing access and control of the system from any client workstation
- Provides comprehensive security to control access to system

## Description

OpenEMS is the effluents management system with the power and flexibility to meet your specific site needs today and into the future. OpenEMS uses the latest technology to seamlessly integrate with

plant equipment and create a user friendly automated method for tracking radiological effluents from your site without expensive and hard to maintain custom software.

With OpenEMS, you effortlessly combine the results of radioisotopic analysis with release point monitors and perform all required RETS/ODCM calculations from a single software package. As with all our software solutions, a flexible limit checking routine is included to ensure technical specification compliance at all times. Because we understand the flexibility required for meeting each sites' needs, the application can easily be customized through a familiar spreadsheet interface; stringent security prevents unauthorized modifications and ensures only approved changes are used. All of this is accomplished and tracked automatically without time consuming and error prone manual methods.

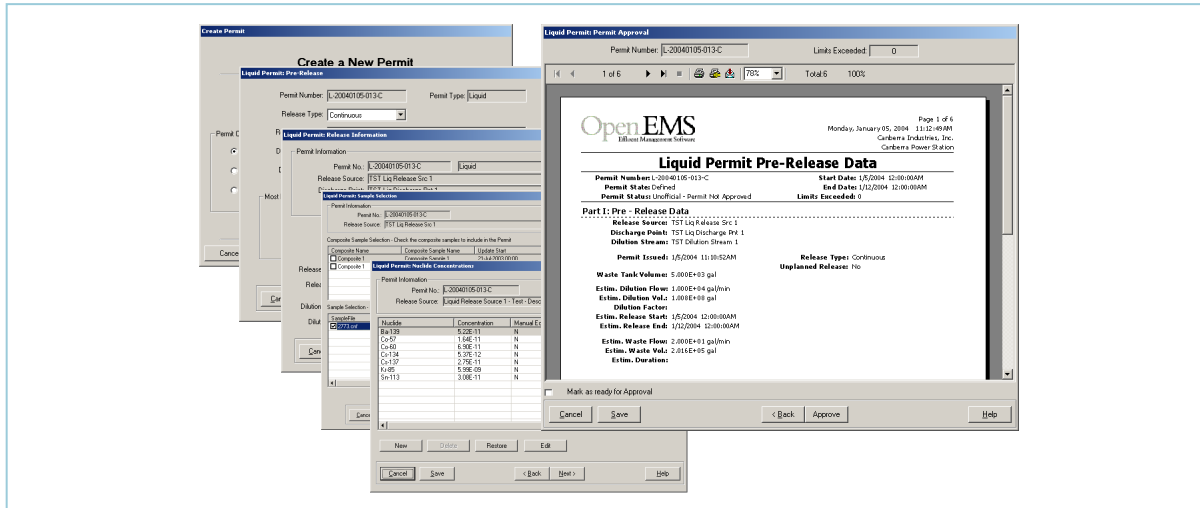
### Permit Processing Wizard

Each site has specific needs for effluent processing and reporting. With OpenEMS, meeting these stringent requirements is easy through the use of our Permit Processing Wizard. This wizard guides the user through all the required steps, one at a time, ensuring site-specific requirements are met and nothing is missed. Never again will a user forget to check the tech specs or use the wrong sample. OpenEMS tracks all the required information and ensures each step is followed without extensive training and time consuming manual calculations.

The user identifies the permit type (liquid or gas) and the smart wizard guides you through the remaining process in five easy steps. Once a permit is started you can easily check the status or process the information from any workstation on the network. Simple navigation controls allow use with minimal training, ensuring maximum flexibility and efficiency. The wizard uses your specific plant setup and requirements to determine what steps to take and what information is required.



# OpenEMS Effluent Management Software



Permit Processing Wizard

The OpenEMS permit wizard takes care of all the complicated analysis and calculations that precede the release of any effluents from Nuclear Power Plants into the environment. OpenEMS takes the results from plant samples and converts them into monitor setpoints and dose calculations for each release, for all receptors and pathways. This means that for each release, OpenEMS must perform the thousands of individual calculations, whose net effect is to arrive at a rate of release and dilution volume, which meets stringent regulatory requirements.

Of course all of this is done with your plant specific data, directly from the ODCM. When changes in demographics or plant configuration requires modification, it's simple and easy to implement these changes directly in the software without expensive and time consuming coding. The software does not limit the number of samples, release sources, discharge points, receptors or pathways.

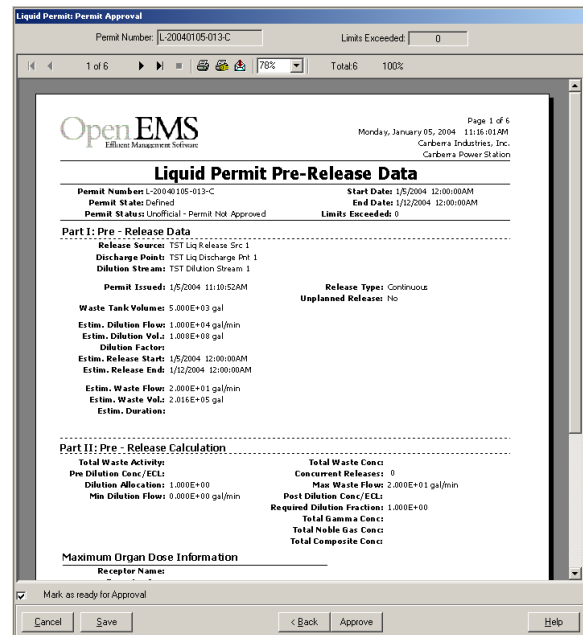
## Permit Approvals

With OpenEMS, permit approvals are all electronic, no need to print any paper records. When a permit has been defined by the user and the results are satisfactory, the permit is submitted as ready for approval. The approving supervisor then simply logs on the system, reviews the data and electronically approves the permit. The entire process is controlled through the comprehensive security system.

Post release processing is just as easy. Once the release is complete, the wizards guide the user through entering actual release information. OpenEMS takes the actual release values and re-performs all required calculations, limit checks and reporting steps, ensuring the highest level of confidence in your regulatory compliance.

## Seamless Integration

Nuclear Power Plants that deploy Canberra's spectroscopy and analysis products such as Apex will have the instant integration of courtroom information automatically. This information flow doesn't just involve counting results, but also plant configuration information, eliminating hours of redundant and error prone data entry. This fast and simple data flow between applications saves time and money.



Electronic Permit Approval

# OpenEMS Effluent Management Software

## Easy Composite Sample Management

OpenEMS helps manage the composite sample process used for hard to detect (non-gamma) nuclides. The software allows the user to assign various release sources to composite sampling routines. When the composite sample results are received from the lab, OpenEMS can automatically update all affected release permits with a single button, eliminating time consuming and error prone manual processes.

**Composite Sample Management Window**

Release Source: TST Liq Release Src 2 | Liquid Release Source 2 - Description  
 Composite Source: Weekly Composite | Composite Sample Period  
 Composite Sample: December 1 | 01-Dec-2003 00:00 | 07-Dec-2003 00:00  
 Sample Date: 01-Dec-2003 00:00

Nuclide	Activity	Analysis Date	Report Date
H-3	1.500E-09	08-Dec-2003 09:00	09-Dec-2003 07:30
C-14			
P-32			
Fe-55	3.700E-08	10-Dec-2003 11:30	14-Dec-2003 07:00
Sr-90			
G-Alpha			
G-Beta			

Buttons: New Composite Sample, Cancel, Save, Update Permits, Close, Help

Composite Sample Update

## Flexibility of Design

Because we understand the flexibility required for meeting each sites' needs today and into the future, every calculation and method can be specifically customized, on site, by the end user. This calculation flexibility is built into the application and doesn't require expensive software modifications or even recompiling the application. This flexibility provides familiar spreadsheet tools, minimizing training time and investment. But the application's flexibility doesn't end there, the system management functions allow users to configure the application to reflect the real life conditions in the plant.

## Reporting

OpenEMS provides a comprehensive set of effluent management reports that are simple to use, requiring no complex setup. Annual reports are available at the click of the mouse. No more time consuming hand calculations and data compiling from separate sources, just select the year of interest and run the report. Interested in historical information? It's available, all of the time.

OpenEMS Effluent Management Software  
 Monday, January 05, 2004 2:42:19PM  
 Caribera Industries, Inc.  
 Caribera Power Station

Page 1 of 1

**Appendix B Section E2**  
**Annual Radioactive Effluent Release Report (2003)**  
**Air Doses Due To Gaseous Releases**  
 Reactor Unit: CNP1

Cumulative Doses Per Quarter			
Type of Radiation	Tech Spec Limit	Units	Year to Ending Date
Gamma	5.000E-01	mrem	4.802E-07
Beta	5.000E-01	mrem	7.725E-07

Cumulative Doses Per Year			
Type of Radiation	Tech Spec Limit	Units	Year to Ending Date
Gamma	5.000E-01	mrem	4.802E-07
Beta	5.000E-01	mrem	7.725E-07

End of Annual Radioactive Effluent Release Report

OpenEMS Effluent Management Software  
 Monday, January 05, 2004 2:44:00PM  
 Caribera Industries, Inc.  
 Caribera Power Station

Page 1 of 1

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**Air Doses Due To Gaseous Releases**  
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End of Annual Radioactive Effluent Release Report

OpenEMS Effluent Management Software  
 Monday, January 05, 2004 2:44:00PM  
 Caribera Industries, Inc.  
 Caribera Power Station

Page 1 of 5

**Appendix B Section E3**  
**Annual Radioactive Effluent Release Report (2003)**  
**Doses To A Member Of The Public Due To Radionuclides, Tritium, and Particulates in Gaseous Releases**  
 Reactor Unit: CNP1

Cumulative Doses Per Quarter			
Organ	Tech Spec Limit	Units	Year to Ending Date
Bone	5.000E+00	mrem	8.271E-04
GI-LA	5.000E+00	mrem	1.238E-04
Kidney	5.000E+00	mrem	1.433E-04
Liver	5.000E+00	mrem	1.592E-04
Lung	5.000E+00	mrem	1.524E-04
Skin	5.000E+00	mrem	1.583E-04
Thyroid	5.000E+00	mrem	5.051E-03
Total Body	1.500E+00	mrem	4.054E-04

Cumulative Doses Per Year			
Organ	Tech Spec Limit	Units	Year to Ending Date
Bone	5.000E+01	mrem	8.271E-04
GI-LA	5.000E+01	mrem	1.238E-04
Kidney	5.000E+01	mrem	1.433E-04
Liver	5.000E+01	mrem	1.592E-04
Lung	5.000E+01	mrem	1.524E-04
Skin	5.000E+01	mrem	1.583E-04
Thyroid	5.000E+01	mrem	5.051E-03
Total Body	5.000E+01	mrem	1.644E-05

User: Admin Database: [Server] CNP0019 [Database]: cems

Annual Reports

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# OpenEMS Effluent Management Software

## Specifications

### OpenEMS Server

#### Hardware Requirements

- A network capable PC with a Pentium® 4 processor or better recommended.
- 256 MB of RAM (512 MB recommended).
- Hard disk space required for typical installation: 60 MB. Recommend 2 GB of free space available for operation.
- SVGA or higher-resolution adapter/monitor capable of 1024 x 768 screen resolution. (OpenEMS has been optimized for use with Windows® normal/small fonts.) Most screens require a minimum screen resolution of 800 x 600.
- Microsoft® mouse or compatible pointing device.
- Access to a printer.

#### Software Requirements

- Microsoft Windows 2000 (service pack 3 or higher), or Windows XP.
- Microsoft Excel 2000 or greater.
- MDAC 2.6 or Greater.
- For Oracle® database connection:
  - Oracle 8.1.7.4 ODBC Driver or greater.
- Internet Explorer 5.0 or higher.

### OpenEMS Client

#### Hardware Requirements

- A network capable PC with a Pentium III processor or better.
- 96 MB of RAM (128 recommended).
- Hard disk space required for typical installation: 40 MB. Recommended free space before installation: 100 MB.
- SVGA or higher-resolution adapter/monitor capable of 1024 X 768 screen resolution. (OpenEMS has been optimized for use with Windows normal/small fonts.) Most screens require a minimum screen resolution of 800 x 600.
- Microsoft mouse or compatible pointing device.
- Access to a printer.

#### Software Requirements

- Microsoft Windows NT® Workstation 4.0 (service pack 6a or higher), Microsoft Windows 2000 Workstation (service pack 2 or higher), or Windows XP.
- Internet Explorer 5.0 or higher.

### Database Server

#### Software Requirements

- OpenEMS currently supports Oracle 8.1.7 and Microsoft SQL Server-2000 (SP2) (Windows NT, 2000, XP).
- For OpenEMS Server installations, you must have an existing database installation, or you must set one up before installing the OpenEMS Server software.

