

QP-229

Revision: 0

Effective Date: 8/2/2010

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**Environment, Safety, Health & Quality Directorate**

**Waste and Environmental Services**

**Environmental Data & Analysis Group**

**Title: ON-CALL RESPONSE TO SABREECAM OFF-NORMAL NOTIFICATIONS**

Derivative Classifier:  Classified  Unclassified

Name: Jean Dewart	Organization: WES-EDA	Signature: Signature on File	Date: 7/22/2010
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**Approval Signatures:**

Subject Matter Expert: William F. Eisele	Organization: WES-EDA	Signature: Signature on File	Date: 7/22/2010
Responsible Line Manager: Jackie Hurtle	Organization: WES-EDA	Signature: Signature on File	Date: 7/26/2010

*The Waste and Environmental Services has been identified as Low Hazard Operations, therefore excluded from portions of the Conduct of Operations (P315) Process. Any work identified or performed in a Moderate or High Hazard Nuclear Facility shall be coordinated through appropriate Facility Manager.*

Title: <b>ON-CALL RESPONSE TO SABRE ECAM OFF-NORMAL NOTIFICATIONS</b>	No.: QP-229	Page 2 of 11
	Revision: 0	Effective Date: 8/2/2010

## 1.0 PURPOSE AND SCOPE

This standard operating procedure (SOP) states the responsibilities and describes the process for on-call responses to off-normal notifications from the SabreECAM system for the Los Alamos National Laboratory (LANL) Waste and Environmental Services Division (WES), the Environmental Data and Analysis Group. This procedure integrates the criteria of the Quality Assurance Plan for the Environmental Programs, hereinafter referred to as the Quality Assurance Plan.

All on-call WES-EDA responders should implement this procedure upon receipt of an off-normal notification via e-mail or pager from the SabreECAM system. A SabreECAM is capable of detecting and measuring real-time concentrations of plutonium-239 (and other selected radionuclides) in air. This system provides an early warning of a potential environmental release of airborne Pu-239 substantially above normal ambient levels as a result of failed engineered controls or other upset conditions, particularly during remediation activities. Although this system may be used to assist emergency responders during an accidental release to the environment, its intended purpose is for situational awareness only.

## 2.0 BACKGROUND AND PRECAUTIONS

### 2.1 Background

A network of commercially available, portable, lightweight alpha environmental continuous air monitors (ECAMs) coupled with cell phone modem communications and in-house developed data acquisition and dynamic web display software has been deployed for the real-time, remote monitoring of plutonium-239 (Pu-239) in air during remediation activities. This system has been developed and implemented to provide immediate situational awareness of potential airborne releases from the remediation activities to the public.

The ECAMs are Bladewerx SabreECAM environmental continuous air monitors that reside in AirNet cabinets placed around remediation sites. These units are self-contained ECAMs that perform air sampling from the surrounding environment, analyze the data, and save it internally for acquisition. Features of this ECAM include alpha spectroscopy and the use of an embedded PC to analyze spectral data and perform data logging and communications functions.

Software written in ASP.NET 2008 is designed to display data in tabular or plot format from remotely located environmental continuous air monitors (ECAMs) designed to determine, in real time, atmospheric concentrations of Pu-239 aerosol.

Software written in Visual Basic 2008, is designed to dial out every 15 minutes to the remotely located ECAMs that have attached cell phone modems, acquire environmental data, and store the data in a SQL Server data base located on a dedicated data base server. The program acquires environmental data, parses it for validity, logs data to the data base server along with any commentary (e.g., errors in parsing data).

### 2.2 Precautions

None.

## 3.0 EQUIPMENT AND TOOLS

On-call pager (664-3395)

Computer with internet browser (preferably Mozilla Firefox or Safari) and internet access

CryptoCard

On-call log book

Current copy of this procedure

Title: <b>ON-CALL RESPONSE TO SABRE ECAM OFF-NORMAL NOTIFICATIONS</b>	No.: QP-229	Page 3 of 11
	Revision: 0	Effective Date: 8/2/2010

## 4.0 STEP-BY-STEP PROCESS DESCRIPTION

### 4.1 Shift Turn Over

**SME Coming Off On Call Status** 1. Contact oncoming SME to perform shift turn over and provide on call pager and log book.

2. Review system status with oncoming SME including which units are operational, off-normal status messages, alarms, etc. This would normally be done by reviewing entries in the log book with the oncoming SME

3. Indicate in log book end of on call status with a signature, date, and time.

### 4.2 On Shift SME Actions

**SME On Shift** 1. Indicate in log book beginning of on call status with a signature, date, and time. Wear pager or have nearby while on call. The on-call SME should be able to access a computer and telephone within one hour of being notified via pager of an off-normal status message or alarm.

2. Access CAMNET web site (<http://camnet.lanl.gov/>) and review status of each operational station at beginning and end of each daily shift while at work by individually selecting each station and inspecting tabular data to see if data is being uploaded in a timely manner and inspecting chronic data plots of each operating parameter to ensure parameters are within normal tolerances. It is also possible to perform a quick review of the status of all active SabreECAMs by reviewing the data view web page by clicking on the "Current Data" link on the left side of the CAMNET web site.

Note: The CAMNET web site is currently only accessible using the Mozilla Firefox or Safari web browsers. There is an issue with MS Internet Explorer that limits the functionality of the CAMNET web site.

3. If it is apparent that the entire ECAM data acquisition system is not functioning, contact the ECAM project leader as soon as possible.

4. Respond to either e-mail or pager notifications of off-normal messages or alarms as follows:

Note: The following status codes or messages may be received via e-mail or pager.

Text continued next page.

Title: <b>ON-CALL RESPONSE TO SABRE ECAM OFF-NORMAL NOTIFICATIONS</b>	No.: QP-229	Page 4 of 11
	Revision: 0	Effective Date: 8/2/2010

Cont. 4. If the following notifications are received, respond immediately and begin to interpret the data and plots as described in section 3.c. below after logging into the system:

- Minimum detectable limits have been exceeded (typically 1 to 3 mrem dose and 0.3 pCi/m<sup>3</sup> to 0.6 pCi/m<sup>3</sup> depending on the particular unit)
- Twice the minimum detectable limits sensed
- High alarm:
  - Chronic DAC-Hr: 2.0 (equivalent to 5 mrem)
  - Chronic DAC: 1.0 (equivalent to 0.002 pCi/L)
  - Acute DAC-Hr: 40.0 (equivalent to 100 mrem)

If the following notifications are received, proceed with section 3.b. below after logging into the system:

- Low flow: < 2.0 Lpm
- High flow: > 10.0 Lpm
- Low flow fail: < 1.5 Lpm
- Low battery: < 6.7 Volts
- Poor fit: > 2 good of fit (GOF) parameter
- Detector fail: no counts received from detector
- Internal comm: no communications with SabreMCA (multichannel analyzer)
- Out of calibration: > 180 days

All of the status codes, except the “high” alarm, “minimum detectable limits have been exceeded,” and “twice the minimum detectable limits sensed” can be relayed to the ECAM project leader during working hours via e-mail or phone, i.e., these status codes are not time sensitive in terms of an immediate response required.

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a. Access CAMNET web site (<http://camnet.lanl.gov/>) and review status of ECAM with issue. Use the SSL Portal at <https://ssl-portal.lanl.gov> to access the CAMNET web site off site (a small patch called Juniper will install on your computer the first time you access the SSL Portal). You will need your CryptoCard to access the portal. Refer to Attachment 1 for further instructions on how to access the SSL Portal.

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b. If notification is not indicative of a release (not a minimum detectable limit exceeded or not a high alarm), document in logbook. Notify ECAM project leader via phone or e-mail if on shift or as soon as possible, otherwise.

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c. If notification is indicative of a release (minimum detectable limit exceeded or high alarm), review concentration, dose, and spectrum plots for time period under consideration. Questions to ask yourself are:

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Title: <b>ON-CALL RESPONSE TO SABRE ECAM OFF-NORMAL NOTIFICATIONS</b>	No.: QP-229	Page 5 of 11
	Revision: 0	Effective Date: 8/2/2010

- 1) Is the concentration or dose plot above the MDC (minimum detectable concentration) or MDD plot, respectively, and sustained, i.e., either remaining level or increasing in magnitude above the MDC or MDD plot?
  - 2) Is the dose plot increasing and then leveling off and the concentration plot increasing, reaching a peak, and then decreasing. This is indicative of a “puff” release. Or are the dose plot increasing without leveling off and the concentration plot increasing, without peaking and then decreasing? This is indicative of a continuous release.  
  
Note: The dose is representative of the activity detected on the filter over the previous 4 hours by virtue of the SabreECAM using a 4-hour chronic window that advances forward in time every minute. However, the concentration is based on the differential of two 4-hour chronic windows that do not overlap, i.e., the concentration determination uses data that goes as far back as the previous 8 hours.
  - 3) How far above the MDC and MDD plots are the concentration and dose plots trending, respectively? If the concentration and/or dose plots closely hover around and then rapidly drop below the MDC and/or MDD plots, it is unlikely there is a transuranic radioactive materials release. On occasion, the MDC or MDD plot will momentarily fall below the general trend line and meet up with the concentration or dose plot, thus generating a notification that the concentration or dose has “exceeded” the MDC or MDD, respectively. These momentary “excursions” can be ignored.
  - 4) Has there been a flow failure? A low or “no” flow value can affect the concentration and dose values. Check the tabular or plot flow data. A separate e-mail message or page regarding a flow failure should have been received for that unit. Also, note that a filter time reset or reboot of the unit will cause a sharp spike in the concentration, dose, GOF, and counts plots. You should receive a notification from the field team that a unit has been reset or rebooted if this spike is observed.
  - 5) Review the spectrum plot(s) for the time period under consideration. Is there a distinct peak around the or near the Pu-239 channel marker in either the histogram itself or the curve fit? Is it sustained for several, consecutive, spectrum plots? How is the curve fit for the radon progeny peaks? Is it typical where the curve to the right of the radon progeny markers drops sharply and the curve to the left tails off gradually? Or, is it rather broad to the right and left of the channel marker possibly indicating a poor curve fit.
  - 6) Does the LANL spectrum sums plot indicate the presence of a peak around or near the Pu-239 channel marker? Using the sums plot incrementally increases the statistical power of the analysis by summing counts over more than one spectrum snapshot. The spectrum snapshot is a differential spectrum based on cumulative spectra at the beginning and end of the 4 hour chronic window.
  - 7) Review concentration and dose plots for adjacent and downwind ECAMs. Do these plots indicate the potential for a release?
  - 8) Does the GOF (goodness of fit) plot for the time period of interest show a higher than normal (compared to previous time periods) trend? This poor fit trend should be reflected in the spectrum plots reviewed above in step 5) and a status code for poor fit may have been received via e-mail or pager. Note that a poor fit message is not generated until a GOF of 2 has been exceeded. This is not very helpful as an indicator of poor fit so you should check the actual GOF plot.
  - 9) Review concentration and dose plots for adjacent and downwind ECAMs. Do these plots indicate the potential for a release?
- d. If the indications in steps c.1) through c.9) indicate a real radioactive materials release, request a second opinion from other SMEs to help make a final decision. Also, contact the RP-1 team leader in charge of MDA B project radiation protection and ask if there are any radiological work place indicators such as CAM alarms that would corroborate a radioactive materials release from the enclosure or other operation.

Title: <b>ON-CALL RESPONSE TO SABRE ECAM OFF-NORMAL NOTIFICATIONS</b>	No.: QP-229	Page 6 of 11
	Revision: 0	Effective Date: 8/2/2010

### 4.3 Abnormal Event Notifications

#### SME On Shift

- 1) If the estimated dose is < 25 mrem and does not appear to be increasing:
  - a. Contact both the TA-21 Operations Center at 667-0835 and MDA B operations management (refer to contact list) and describe the situation. Ask MDA B operations management to immediately initiate the abnormal event notification process in accordance with P322-3, Manual for Communicating, Investigating, and Reporting Abnormal Events (<https://policy.lanl.gov/pods/policies.nsf/MainFrameset?ReadForm&DocNum=P322-3&FileName=P322-3.pdf>).
  - b. Notification should then be made to the ECAM project leader and WES-EDA management (refer to contact list). Ask WES-EDA management to immediately report this abnormal event to WES-DO management, and for them to then contact ADESH&Q management.
  - c. Contact the ENV-ES Rad-NESHAP team leader or alternates to collect hi-vol air sample filters and have them analyzed.

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- 2) If the estimated dose is  $\geq 25$  mrem or if the dose is currently < 25 mrem, but appears to be increasing to the point where at least 25 mrem will be reached in within a hour or less:
  - a. Immediately contact EM&R at 667-6211 and describe the situation. Request that the on-call emergency manager be notified and provide a call-back number.
  - b. Follow through with notifications above for < 25 mrem estimated dose.

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- 3) Document all findings and actions taken in logbook. Sign and date the log entries.

### 4.4 Records Management

- Project Leader** 1. Submits completed logbooks to the Records Processing Facility according to EP-DIR-SOP-4004, Records Transmittal and Retrieval Process.

## 5.0 ATTACHMENTS

Attachment 1, SSL Portal Screen Shots

Attachment 2, Contact List

Title: <b>ON-CALL RESPONSE TO SABRE ECAM OFF-NORMAL NOTIFICATIONS</b>	No.: QP-229	Page 7 of 11
	Revision: 0	Effective Date: 8/2/2010

## REVISION HISTORY

Revision No. <i>[Enter current revision number, beginning with Rev.0]</i>	Effective Date <i>[DCC inserts effective date for revision]</i>	Description of Changes <i>[List specific changes made since the previous revision]</i>	Type of Change <i>[Technical (T) or Editorial (E)]</i>
0	8/2/2010	New document.	N/A

[If you have read and understand the preceding document, click here to receive EDS credit.](#)

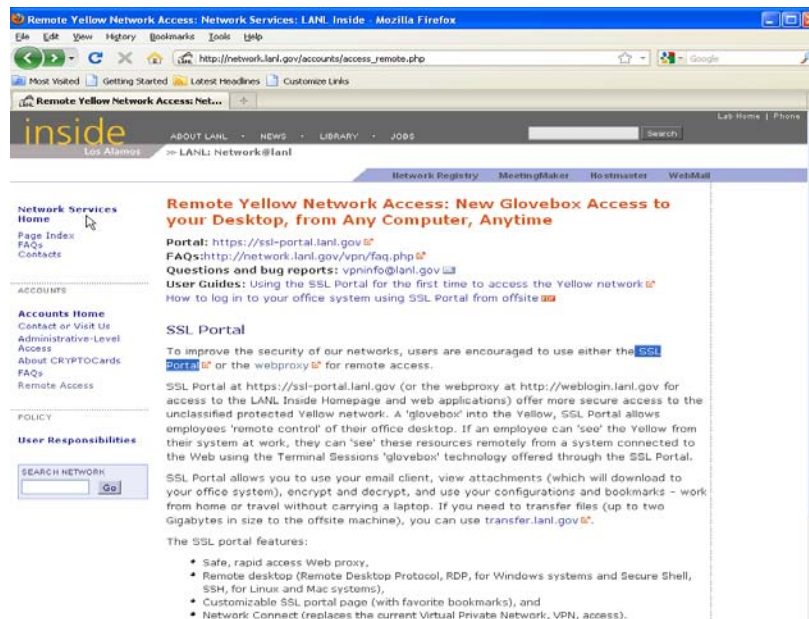
ATTACHMENT 1

QP-229-1

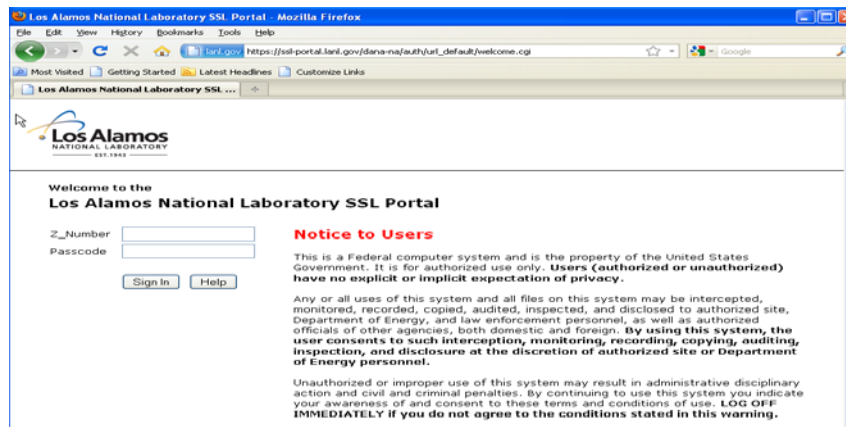
SSL Portal Screen Shots




Start at this web page from the LANL Inside web page and click on link highlighted in blue (highlight for emphasis only – not on actual web page) in “SSL Portal” section:



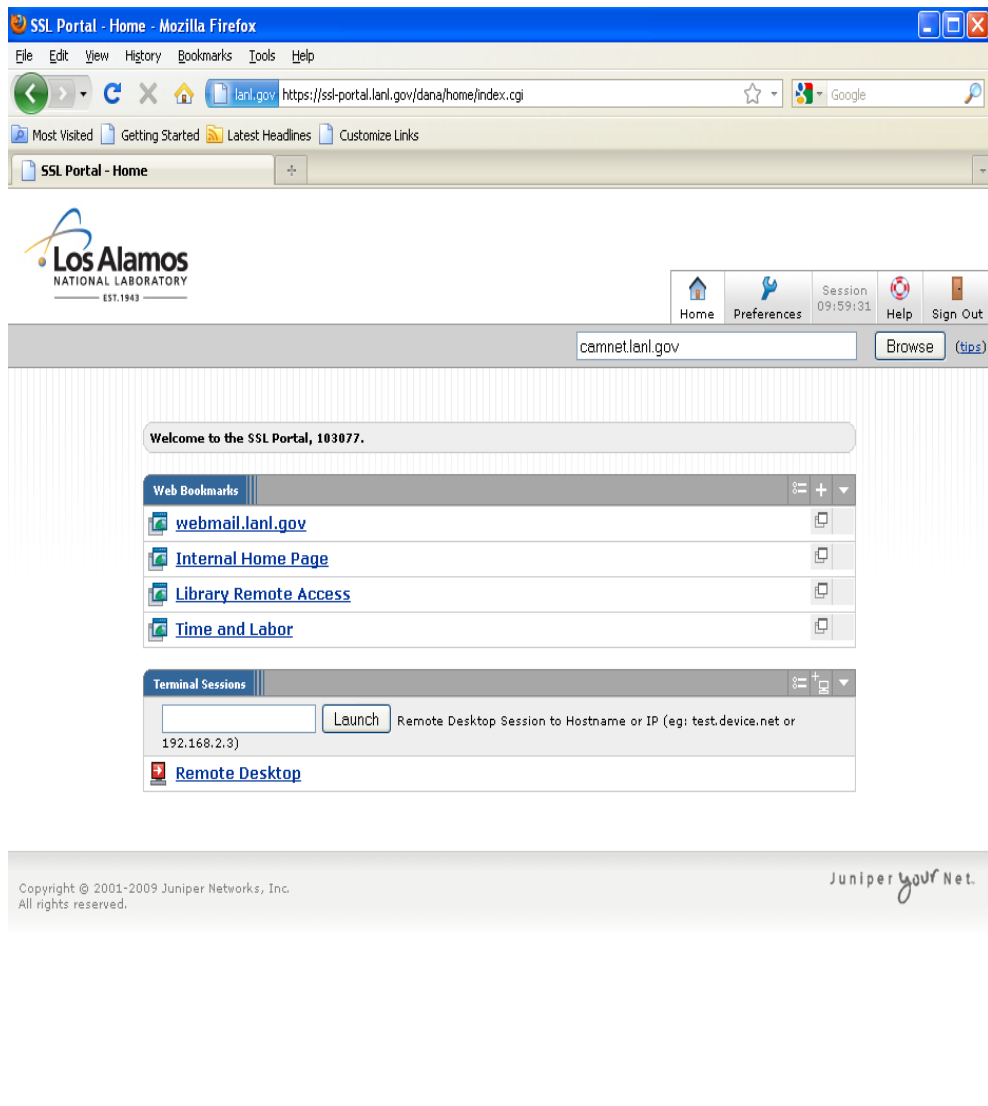
After clicking on link above, you will be at this web page, bookmark this page and then enter your Z number and your CryptoCard passcode:





ATTACHMENT 1	
<p><b>QP-229-1</b></p> <p style="text-align: center;"><b>SSL Portal Screen Shots</b></p>	

Once you have logged into the SSL Portal (after the Juniper patch has been installed), this screen will appear. In the “Browse” field just under the portal buttons at the upper right, type in “camnet.lanl.gov” and click on the browse button. This will take you to the CAMNET web site.



Title: <b>ON-CALL RESPONSE TO SABRE ECAM OFF-NORMAL NOTIFICATIONS</b>	No.: QP-229	Page 10 of 11
	Revision: 0	Effective Date: 8/2/2010

**ATTACHMENT 2**

**QP-229-2**

**Off-Normal Notification Contact List**



**ECAM Project Leader Contact**

- Bill Eisele
  - Work Phone +1 505 667 0295
  - Fax +1 505 665 4747
  - Pager [+1 505 664 8727](tel:+15056648727)
  - Location TA-00, Building 1237, Room 601
  - Home Phone: +1 505 989 1609

**WES-DO/EDA Management Contacts**

- Alison Dorries
  - Work Phone +1 505 665 6952
  - Fax +1 505 665 4747
  - Cell Phone +1 505 699 1979
  - Pager [+1 505 664 5313](tel:+15056645313)
  - Location TA-59, Building OH-3, Room
  - Home Phone +1 505 661-3848
- Scotty Jones
  - Work Phone +1 505 665 7968
  - Fax +1 505 665 4747
  - Cell Phone +1 505 500 2077
  - Pager [+1 505 664 4225](tel:+15056644225)
  - Location TA-59, Building OH-3, Room
- Jackie Hurtle
  - Work Phone +1 505 665 4380
  - Fax +1 505 665 4747
  - Pager [+1 505 664 6641](tel:+15056646641)
  - Home Phone +1 505 672 0844
  - Location TA-00, Building 1237, Room 107D

**ENV-ES Rad-NESHAP Team Leader (& alternates) Contacts**

- Dave Fuehne
  - Work Phone +1 505 665 3850
  - Fax +1 505 667 5006
  - Cell Phone +1 505 699 5619
  - Pager [+1 505 664 8903](tel:+15056648903)
  - Location TA-00, Building 1328, Room 105

Title: <b>ON-CALL RESPONSE TO SABRE ECAM OFF-NORMAL NOTIFICATIONS</b>	No.: QP-229	Page 11 of 11
	Revision: 0	Effective Date: 8/2/2010

**ENV-ES Rad-NESHAP Team Leader (& alternates) Contacts (cont.)**

- Carolyn MacDonell
  - Work Phone +1 505 665 2170
  - Fax +1 505 667 5006
  - Cell Phone +1 505 699 0888
  - Pager + 1 505 664 4805
  - Location TA-00, Building 1328, Room 101
- Debra Archuleta
  - Work Phone +1 505 665 8866
  - Fax +1 505 667 5006
  - Cell Phone +1 505 699 1084
  - Pager + 1 505 664 6746
  - Location TA-00, Building 1328, Room 107

**MDA-B Operations Management Contacts**

- Pete Rice
  - Work Phone +1 505 231 5833 (cell)
  - Pager [+1 505 664 6846](tel:+15056646846)
  - Location TA-46, Building 0326, Room 110
- Bob Harder
  - Work Phone +1 505 500 2113
  - Location TA-21, Building 9003, Room 1001

**RP-1 Contacts**

- Marty Peifer
  - Work Phone +1 505 665 4342
  - Fax +1 505 606 0379
  - Cell Phone +1 505 699 1063
  - Location TA-00, Building 0772, Room 102