



DELAWARE STATE UNIVERSITY  
DOVER, DELAWARE 19901

Office of the President

(302) 739-4901  
FAX: 739-6292

March 10, 1994

Mr. Charles W. Hehl  
Director  
Region 1  
Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, Pa. 19406-1415

Dear Mr. Hehl:

In response to your letter dated February 10, 1994, the enclosed report is being submitted. It describes and enumerates the University's efforts to recover the exit signs and to comply with directives of the Nuclear Regulatory Commission.

Please contact Mr. Clifton Coleman, Jr., Director of Personnel and Safety and Security (302-739-5116) if additional information is needed.

Sincerely,

*William B. DeLauder*  
William B. DeLauder  
President

Enclosure

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PDR ADOCK 03031282  
C PDR

STATUS REPORT TO  
NUCLEAR REGULATORY COMMISSION  
FOR MISSING EXIT SIGNS

Delaware State University  
Dover, Delaware 19901  
March 10, 1994

BACKGROUND

In September 1993, the University occupied the New Residence Hall. During the period of September 19, 1993 through February 10, 1994, 50 exit signs were removed from the New Residence Hall. The signs contain radioactive material (tritium) and are generally licensed by the NRC. Each sign contains approximately twenty curies of tritium.

The signs were installed by the contractor in July 1993. The contractor was asked to replace the signs and, upon contacting the sign vendor, the contractor was informed that the signs contained a radioactive material that is generally licensed by the NRC. The contractor informed the NRC and the licensee of the stolen signs.

Ms. Julie Phelps, Vice President for Business and Finance at the University, and Dr. Mohamed Shanbaky, NRC Region I Office, had several telephone conversations. A follow up letter from the NRC dated February 10, 1994 required the University to take the following actions:

- a. Immediately initiate a thorough investigation to locate the radioactive exit signs.
- b. Immediately initiate a general search for the signs at all potential locations that they may be located; this may include student housing. This initial comprehensive search was to be completed by the end of the business day on February 14, 1994.
- c. An information notification, with adequate circulation throughout the University Community, was to be issued by February 14, 1994. The notification was to include a description of the signs, a picture of the signs, and potential radiological hazards associated with the breakage of these self luminous signs.
- d. In accordance with 10 CFR 31.2 and CFR 20.2201, a written report is to be submitted to the NRC Region 1 within 30 days from the initial telephone notification of this event. All substantive information that may include the recovery of the signs, any additional loss or theft and all actions taken to prevent future loss or theft of these signs should be addressed in the written report to the NRC.

## UNIVERSITY RESPONSE

Delaware State University recognizes its obligation to comply with the letter dated February 10, 1994 sent to Ms. Julie Phelps from the Nuclear Regulatory Commission. The University has accomplished all the requirements of the letter and has taken additional action to ensure the University community is protected from potential harm of the radioactive material contained in the exit signs. The following actions have been taken by the University:

- a. A thorough investigation to locate the radioactive signs began immediately. While the intensity of the investigation and search has decreased, the University continues its efforts to locate the exit signs and these efforts will continue.
- b. On February 10, 1994 University professional staff met with the residents of the New Residence Hall. The residents were advised of the potential harm the radioactive signs could cause and were requested to return the signs to the University. Students were advised the signs could be returned at several locations on the campus and there would not be any disciplinary actions taken against persons who returned the exit signs.
- c. On February 14, 1994, the University distributed a one page notice to the University community regarding the potential health hazard of the exit signs. This notice included a picture of the exit signs, a description of the signs, the potential health hazards, and a contact person for additional information regarding the exit signs. This notice was distributed to all residence halls and placed on bulletin boards throughout the University. The Delaware State News, the local newspaper, published a story on the front page and The Hornet, the campus newspaper published an article on the exit signs. A copy of the notice and the newspaper articles are included as a part of this report.
- d. On February, 15, 1994 a general search for the exit signs was conducted in all the residence halls of the University. This search of the residence halls was completed by the close of business on February 15, 1994. The NRC required this search to be completed by February 14, 1994. The one day delay was necessary because of the extreme weather conditions.
- e. The contractor who installed the exit signs will modify the installations to make the exit signs tamper resistant. It is expected the modification will be completed by April 15, 1994.
- f. There was concern that some of the exit signs may have

been discarded in the trash. We requested the Delaware Emergency Management Agency to monitor the University's trash compactors for radioactive contamination from possible discarded exit signs. Additionally, all the public areas of the New Residence Hall was monitored for contamination. The results were negative for all the areas tested. A copy of the letter from the monitoring agency is attached.

- g. The residence life staff continues to meet with the students of each residence hall and are making announcements over the intercom system in each residence hall at least four times a day.
- h. A letter was mailed to all parents of the Delaware State University student body. The letter is attached.

#### REMARKS

University employees may not have been aware these specific signs were being installed, however, if the University was considering the pros and cons of installing these signs it may not have considered these signs a risk. In fact, the manufacturer's literature states "If the protective shields and case are penetrated and a tube should break, releasing tritium gas, there is no hazard. The literature is attached.

#### RESULTS

The University has not only met, but exceeded the requirements of the NRC as stated in your letter dated February 10, 1994. We have recovered twelve of the missing exit signs. The University has and will continue to make every effort to recover the missing exit signs, protect the community from the potential hazards, and comply with the requirements of the NRC.

## NOTICE TO THE UNIVERSITY FAMILY REGARDING POTENTIAL HEALTH HAZARD

A significant number of self-luminous "EXIT" signs have been removed from the new residence hall. The University has recently become aware that each sign contains 20 curies of tritium, a radioactive substance. The signs are completely safe and pose no danger as long as they are intact; however, if a sign is damaged enough to break the vial of tritium, the resulting radioactivity may be sufficient to cause a long-term health risk to anyone exposed. The exit signs measure 12 3/4" H x 8 1/2" W x 1" D with a gray case and red lettering.

Any person in possession of these signs is urged to return them to the Public Safety Office, Room 156, Memorial Hall, or the Information Center located at the main entrance. Resident students may contact their Resident Assistant. The University will accept the "EXIT" signs with "no questions asked." Please do not place these signs in the garbage or try to dispose of them in any other manner.

Any person with information regarding the missing "EXIT" signs or with any questions or concerns may contact Mr. Clifton Coleman, Delaware State University Director of Public Safety and Personnel: 739-5117.

BELOW IS A PICTURE OF THE EXIT SIGN:



**BetaLux™**  
SELF-LUMINOUS  
LIFE-SAFETY INSTITUTIONAL SIGNS

• VANDAL RESISTANT

NOTICE TO THE PUBLIC REGARDING POTENTIAL HEALTH HAZARD

A significant number of self-luminating "EXIT" signs have been taken from the new residence hall on the campus of Delaware State University during the past four months. The University has recently become aware that each sign contains 20 curies of tritium, a radioactive substance. The signs are completely safe and pose no danger as long as they are intact. However, if a sign is damaged enough to break the vial of tritium, the resulting radioactivity may be sufficient to cause a long-term health risk to anyone exposed.

The EXIT signs are 12.75" by 8.25" by 1.00" with a light gray case and red lettering. Any person in possession of these signs is encouraged to return them to the Public Safety Office of Delaware State University. Do not place these signs in the garbage or try to dispose of them in any other manner.

The University will accept the returned EXIT signs with "no questions asked" at the information station located at the main entrance to campus on Route 13.

Anyone with information regarding the missing EXIT signs or with any questions or concerns may contact Mr. Clifton Coleman, DSU Director of Public Safety and Personnel, 739-5117.

PRESS RELEASE - FEBRUARY 12, 1994



## DelState seeks return of signs

Staff report

DOVER — Exit signs have been taken down from the new residence hall on the campus of Delaware State University during the past few months.

The university recently became aware that each sign contains 20 curies of tritium, a radioactive substance, according to a prepared statement released Monday by Anthony Hicks, spokesman.

The signs are completely safe and pose no damage as long as they are intact, the statement read.

However, if a sign is damaged enough to break the vial of tritium, the resulting radioactivity may be sufficient to cause a long-term health risk to anyone exposed, according to the statement.

Anyone in possession of these signs should return them to the Public Safety Office of DelState at the main entrance off U.S. 13. "no questions asked," the statement read.

Information about the exit signs may be directed to Clifton Coleman, director of Public Safety and Personnel, 739-5117.

NEWS JOURNAL  
FEBRUARY 15, 1994

## **DelState warns sign stealers of radioactivity**

DOVER — Anyone in possession of self-illuminating "EXIT" signs stolen from Delaware State University's new residence hall may have more than just a hot item on their hands — each sign contains a small amount of tritium, a radioactive material.

University officials said the 50 to 60 missing signs pose no danger, as long as they are intact. The signs should not be placed in the garbage or disposed of in any other manner.

The signs may be returned — "with no questions asked" — to the information station at the college's main entrance on U.S. 13.

Anyone with information or questions about the missing signs may call Clifton Coleman, director of public safety and personnel, at 739-5117.

— Chris Donahue





# DELAWARE STATE UNIVERSITY

OFFICE OF THE VICE PRESIDENT FOR STUDENT AFFAIRS

## MEMORANDUM

**TO:** All Resident Students

**FROM:** *Gladys D.W. Motley*  
Gladys D.W. Motley  
Vice President for Student Affairs

**DATE:** February 15, 1994

**SUBJECT:** MISSING EXIT SIGNS IN THE NEW RESIDENCE HALL (EAST AND WEST)

The Nuclear Regulatory Commission requires that we do a safety inspection of all campus facilities including residence halls. This inspection is now in progress.

We apologize for the inconvenience, and thank you for your cooperation.

pdp

MEMORANDUM SENT TO ALL RESIDENT STUDENTS



# DELAWARE STATE UNIVERSITY

OFFICE OF THE VICE PRESIDENT FOR STUDENT AFFAIRS

LETTER MAILED TO ALL PARENTS  
OF DELAWARE STATE UNIVERSITY  
STUDENTS

TO: Parents of Delaware State University Students

FROM: Gladys D. W. Motley  
Vice President for Student Affairs

DATE: February 22, 1994

RE: Missing Self-Luminous "EXIT" Signs - A Potential Health Hazard

A significant number of self-luminous "EXIT" signs have been removed from the new residence hall. The University has recently become aware that each sign contains 20 curies of tritium, a radioactive substance. The signs are completely safe and pose no danger as long as they are intact; however, if a sign is damaged enough to break the vial of tritium, the resulting radioactivity may be sufficient to cause a long-term health risk to anyone exposed. The "EXIT" signs measure 12 3/4" x 8 1/2" x 1" with a gray case and red lettering. The following activities have been completed or are in progress in an effort to alert the University Community:

- On Thursday afternoon, February 10, 1994, the University learned for the first time that each "EXIT" sign contained a radioactive substance. From 4:30 p.m. - 6:30 p.m., four administrators visited every floor of New Hall East and New Hall West and met with all of the students present, alerting them of the missing signs and potential health risk. On one floor of New Hall West a student went into a suite and returned with a sign.
- The resident staff continues to meet with the students of each residence hall and are making announcements over the public address system in each residence hall at least four times a day.
- The University Public Relations Office released an announcement to the newspapers in Delaware, and the radio stations made several announcements.
- On Monday, February 14, 1994, letters were distributed to the resident students.
- On Tuesday, February 15, 1994, from 11:00 a.m. - 8:00 p.m., several administrators and staff members inspected each student's room on campus and provided more information for the students.
- Information was mailed to all commuter students and the entire University family received the information through the campus mail. All offices were provided the same information for distribution.
- A drop-in box has been placed in each residence hall for information concerning the signs.
- Any person in possession of these signs is urged to return the signs to designated locations on campus with "no questions asked." Everyone has been advised not to place these signs in the garbage or try to dispose of them in any manner.

The University is required by the Nuclear Regulatory Commission (NRC) to submit a report within the next two weeks. Unfortunately, a significant number of signs are still missing. Thank you for taking the time to read this memo and please discuss this matter with your son or daughter. If you have any information regarding the missing "EXIT" signs or any questions/concerns, please contact Mr. Clifton Coleman, Director of Public Safety and Personnel (302) 739-5117 or my office (302) 739-4943.

1200 N. DUPONT HIGHWAY • DOVER, DELAWARE 19901-2277 • (302) 739-4943 • FAX (302) 739-5344



STATE OF DELAWARE  
DEPARTMENT OF PUBLIC SAFETY  
DELAWARE EMERGENCY MANAGEMENT AGENCY  
P. O. Box 527  
DELAWARE CITY, DELAWARE 19706

OFFICE OF THE  
DIRECTOR

TELEPHONE: (302) 834-4531  
1-800-292-9588  
FAX No.: (302) 834-7495

March 1, 1994

Lt. Jimmy A. Brown  
Delaware State University  
1200 N. duPont Highway  
Dover, DE 19901-2277

RE: Radiological Response 25 February 1994

Dear Lt. Brown:

The following areas at the University were monitored for contamination from discarded EXIT signs, all with negative results:

1. All-Rite Rubbish Removal compactor, S/N 46149
2. All-Rite Rubbish Removal compactor, no S/N  
(at motor pool area)
3. New dormitory building, all five floors of  
East Wing; all three floors of West Wing

This does not mean the signs weren't at one time in the compactors or hallways, it means there is no contamination at this time in those areas. Additionally, we did not monitor individual dormitory doorways or rooms.

If you have any further questions or problems, please feel free to contact me at the numbers above.

Sincerely,

A handwritten signature in cursive script, appearing to read "Alan McClements".

Alan McClements  
Duty Officer

RESULTS OF RADIOLOGICAL INSPECTION OF TRASH COMPACTOR AND PUBLIC  
AREAS OF NEW RESIDENCE HALL

AEM:slf

## What If A Tube Breaks?

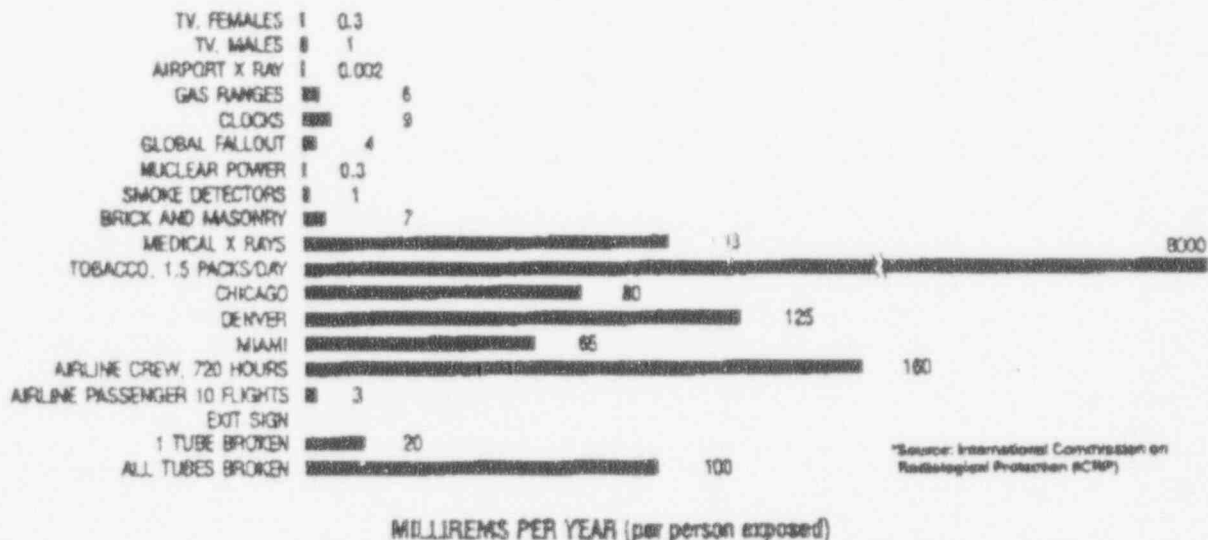
SRBT self-luminous signs contain a number of individual tritium filled tubes contained within a protective case. The tubes in SRBT signs are shock-mounted inside a high-impact plastic case designed to be tamper and vandal resistant. A clear high-impact plastic shield across the face of the sign provides additional protection and serves as another barrier against accidental damage. To meet the regulations of the U.S. Nuclear Regulatory Commission, SRBT signs are extensively tested to ensure that, when properly installed, they will not fail under normal usage conditions.

If the protective shield and case are penetrated and a tube

should break, releasing the tritium gas, there is no hazard. Because it is hydrogen and therefore lighter than air, when released, the tritium gas is dispersed rapidly and harmlessly into the atmosphere to join the naturally occurring tritium already dispersed. In the highly improbable event that all of the multiple tubes should fracture, the effect is still less than half of that received from naturally occurring radioactive sources during a year, and is similar to the difference between living at sea level and moving to an elevation of 5,000 feet. The chart below compares the unlikely complete release of all tritium gas in a self-luminous exit sign to some familiar comparisons we encounter in our daily lives.

## Typical Sources Of Natural And Man-Made Radiation\*

This year, each person in the United States will receive an average of about 80 millirems of radiation from natural sources and about 100 millirems from man-made sources. But individual doses can vary widely. For example, residents of Denver are exposed to more radiation—from cosmic rays, because of the elevation of the city, and from the high uranium content of the soil—than those of Chicago or Miami. Frequent air travelers also get more cosmic radiation; a flight from Los Angeles to Paris delivers about five millirems. Medical technicians accumulate about three times the dose of an average patient. And many everyday objects contain radioactive substances: there's americium in some smoke detectors, radium or tritium in clocks, polonium in tobacco, and uranium or thorium in brick houses.



\*Source: International Commission on Radiological Protection (ICRP)

If you have any questions, why not write us a letter. Address your correspondence to SRB Technologies, Inc., P.O. Box 25267, Winston-Salem, N.C. 27114-5267



SRB Technologies, Inc.

P.O. Box 25267  
Winston-Salem, NC 27114-5267  
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