

## **Biohazard Detection System (BDS) Briefing Sheet**

1. A high-level description of how the BDS/PCR system works. Not just the PCR part but also how the system fits onto the front end of the incoming mail stream at plants.

The United States Postal Service is committed to keeping its employees and customers safe. To help counter the threat of anthrax in the mail, the Postal Service has developed a Biohazard Detection System (BDS) which uses proven technology designed exclusively for the Postal Service to enable early identification of anthrax.

### **TECHNICAL INFORMATION**

The BDS unit consists of an air-collection hood, a cabinet where the collection and analysis devices are housed, a local computer network connection, and a site controller - a networked computer. All the BDS processes are automated. The equipment continuously collects air samples from mail canceling equipment while the canceling operation is underway. The air collection hood is installed over the canceling equipment at the very first pinch point in the mail processing operation. It absorbs and concentrates airborne particles into a sterile water base. This creates a liquid sample which is injected into a cartridge. An automated polymerase chain reaction (PCR) test is performed on the liquid sample which uses sophisticated DNA matching to detect the presence of anthrax (*Bacillus anthracis*). It is a process that essentially "photocopies" the genes of a sample. There is a template for the anthrax DNA sequence. The test sample is compared to the anthrax template to see if there is a match. The system concentrates air samples for a one hour period followed by the PCR test that takes approximately 30 minutes. While the PCR test is performed the BDS is simultaneously concentrating particles for the next sample. So while the first result requires approximately 1-1/2 hours, subsequent results are obtained every hour. In the future, BDS can be adapted to test for other biological threats.

### **RESPONSE ACTIONS**

If there is a DNA match, the BDS computer network conveys that information to the site controller computer. Local management is notified directly by on-site BDS personnel and also by multiple forms of electronic communication from the BDS site controller. The emergency action plan will be activated. The facility's building alarm will sound and everyone in the building will be evacuated. Upstream and downstream processing facilities will also be notified. An Emergency Notification Center at Postal Service headquarters will be notified as well as community first responders and the Department of Homeland Security. Once the postal employees are outside the building, supervisors will call the roll and make sure everyone in the building has been evacuated. They will explain the nature of the incident, and everyone will wait for direction from community emergency response personnel. An outside lab will perform multiple plate cultures using the BDS positive test sample and other environmental samples. Local public health officials will determine the need for any medication. The mail inside the plant will be retained until it is safe for delivery. The new mail that would normally be processed in this facility will be diverted to other mail processing facilities and delivery operations.

### **BACKGROUND**

The Postal Service conducted extensive testing and research, beginning in October 2001, which resulted in a combination of the latest technologies used in BDS. The Executive Office of Science and Technology Policy created an interagency work group that reviewed the performance of the BDS system and confirmed with their own tests that this is the best possible system the Postal Service can field. In June 2002 the first prototype BDS system was installed in the Baltimore Processing and Distribution Center where it has been operating successfully. During August and September of 2003, a 30 day field test was conducted at Fifteen processing and distribution plants. The sites were Baltimore, MD; Dulles, VA; Southern MD (Capitol Heights); Albany NY; Kilmer, NJ; Manasota, FL; St. Petersburg, FL; Tampa, FL; Midland, TX; Los Angeles, CA; Tacoma, WA; Rockford, IL; Lancaster, PA; Pittsburgh, PA; and Cleveland, OH. BDS units continue to operate today at four of these sites. They are: Baltimore, MD; Pittsburgh, PA; Cleveland, OH; and Lancaster, PA.

2. A status report on the project to install the BDS system nationwide.

The current plan calls for the purchase of 1,728 BDS systems to be installed at 283 sites nationwide. The purchase of the systems is broken into two phases. Phase I calls for the purchase of 742 units followed by a follow-on purchase of 986 units. To this end, a production contract was awarded to Northrop Grumman in May of 2003 to manufacture and install 742 BDS systems. A contract for the additional 986 units will be exercised in the summer of 2004 to ensure uninterrupted production and installation of the units nationwide. The production schedule follows:

First Production System Field Test (Cleveland, OH)	November 2003
Begin Production Deliveries	March 2004
Complete Production Deliveries	November 2005

3. What were the results of testing at the 15 pilot sites?

The 30 day field test was very successful. Below is a summary of the test results obtained during the test period.

- **15 Sites**
- **Over 20 Test Days**
- **Over 2,000 Tests Performed**
- **Over 25 Million Mail Pieces Screened**
- **0 BDS Positives**
- **0 Lab Confirmed Positives**
- **0 False Positives**