FITNESS FOR DUTY IN THE NUCLEAR POWER INDUSTRY

SUMMARY OF SEMI-ANNUAL PROGRAM PERFORMANCE REPORTS

(JANUARY 3 THROUGH JUNE 30, 1990)

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EXECUTIVE SUMMARY

On June 7, 1989, the NRC published a rule in the Federal Register (10 CFR Part 26, Fitness-for-Duty Programs) requiring that each licensee authorized to operate or construct a nuclear power reactor implement a fitness-for-duty (FFD) program for all personnel having unescorted access to the protected area of the plant. This rule became effective on July 7, 1989, with an implementation date of January 3, 1990. A central element of the required FFD program is the drug and alcohol testing program. This report summarizes the 84 semi-annual reports on FFD program performance provided to the NRC by 54 utilities as required by 10 CFR Part 26.

During the period January 3 to June 30, 1990, licensees reported that they had conducted 137,953 tests for illegal drugs and alcohol. Of these tests, 1,313 (0.95%) were positive.

A majority of the positive test results (875) were obtained through pre-access testing. Of tests conducted on workers having access to the protected area, there were 299 positive tests from random testing, 90 positive tests from for-cause testing, and 11 positive tests from periodic and other categories of testing. Follow-up testing of workers resulted in 38 positive tests. For-cause testing resulted in the highest percentage of positive tests; over 25 percent of for-cause tests were positive. This compares to positive test results in under 1.5 percent of pre-access tests and under 0.5 percent of random tests.

Positive test results also varied by category of worker. Overall, short-term contractor personnel had the highest rates of positive tests (1.35%). Licensee and long-term contractor personnel had lower rates of positive test results (.61% and .86%, respectively).

Of all drugs tested, marijuana was responsible for the majority of positive test results, followed by cocaine and alcohol.

Positive test results and categories of drugs identified varied by region. Regional variations reported here are considered preliminary because a six-month period is not long enough for all sites to have a comparable range of experiences (for example, not all sites have had an outage) and because interpretations of reporting requirements varied by utility. Since such differences may have a substantial impact on the percentage of positive test results, regional differences should be interpreted with caution.

Preliminary results indicate that Region IV had the lowest overall percentage of positive tests (.67%); while other regions had percentages of about 1 percent. Marijuana accounted for the largest percentage of positive test results in all regions except Region I, where cocaine was responsible for the highest percentage. Positive test results for cocaine differed dramatically across regions, accounting for only 14.8 percent of all positive tests in Region V compared to 37.9 percent in Region I. Region V had a higher percentage of positive test results for amphetamines (8.0%) than other regions.

Many licensees provided detailed accounts of lessons learned during the reporting period. A brief summary of lessons learned is presented in Section V of this report and a complete compilation is provided in Appendix C.

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INTRODUCTION

Since the late 1970s, the U.S. Nuclear Regulatory Commission (NRC) has been concerned with the potential impact on the health and safety of the public of fitness-for-duty (FFD) problems among personnel with unescorted access to protected areas in commercial nuclear power plants. As the nationwide epidemic of drug abuse grew, it became apparent that the nuclear power industry was not immune to its effects. In response, and with the cooperation and support of the industry, the NRC published a rule on June 7, 1989, in the *Federal Register* (10 CFR Part 26, Fitness-for-Duty Programs), requiring each licensee authorized to operate or construct a nuclear power reactor to implement a FFD program for all personnel having unescorted access to the protected area of the plant. This rule became effective on July 7, 1989, with an implementation date of January 3, 1990. The rule established broad requirements for the control of FFD problems stemming from illegal drug use, alcohol abuse, abuse of legal drugs, and any other mental or physical problems that could impair performance or that in other ways raised questions about the reliability and trustworthiness of employees or their ability to safely and competently perform their duties.

A central element of the required FFD program is the drug testing program. This element is designed to both deter and detect the use of illegal drugs and the misuse of alcohol and other legal drugs. Because of the importance of this element, the NRC has required that power reactor licensees provide semi-annual reports on the results of their drug testing programs. These reports are to provide the NRC with information on the effectiveness of individual programs and of the programs as a whole in minimizing the impact of drugs and alcohol on the plants. The reports are also of use to the industry as it attempts to improve and refine FFD programs. The NRC anticipates publishing these reports periodically.

This report has been compiled to summarize industry experience to date. It is based on the semi-annual program performance reports covering the period from January 3 to June 30, 1990, and contains information on positive test results by category of test, category of drug, category of worker found to be abusing drugs, and region. The information contained in this report comes from all current power reactor licensees. Fifty-four utilities submitted 84 reports, representing 75 nuclear power plant sites and 9 corporate offices. In all cases, the results pertain to *confirmed* positive test results. A detailed description of the technical background for the FFD program performance reports is provided in Appendix A. Of particular use to the industry is the compilation of lessons learned provided by licensees (Appendix C).

Several observations are in order. First, overall positive test rates appear to be quite low; however, these rates continue to represent a substantial number of nuclear workers or applicants identified as having drug or alcohol problems. Thus, while the NRC and industry may have reason to be encouraged by these results, additional progress can be made. Second, while reporting appears to have been fairly complete and systematic, there are a few points where clarification is needed. Appendix A of this report provides this clarification.

The NRC welcomes suggestions concerning the content of this report. Comments should be forwarded to:

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SECTION 1: OVERALL TEST RESULTS

This section contains information on drug and alcohol testing results for each category of test required by 10 CFR Part 26. The test results are reported in five categories: pre-access, random, for-cause, follow-up, and other. The definitions of these categories are given in Table 1.

The number of tests performed and the number of positive tests results are reported in Table 2. A total of 137,953 tests were reported in 84 FFD program performance reports provided by 54 utilities (75 sites and 9 corporate headquarters). The overall positive rate was slightly less than 1 percent (0.95%) across all categories of tests. Although this percentage may seem small, in absolute numbers 1,313 workers or applicants tested positive for drugs and/or alcohol. Pre-access testing identified 875 applicants or workers as having positive test results. Of those workers who had unescorted access to the protected area, 299 were identified as having positive test results for drugs or alcohol based on random tests and 90 were found positive based on for-cause tests.

Figure 1 provides a graphic representation of the numbers in Table 2. Random and pre-access testing resulted in similar numbers of tests (61,066 and 73,577, respectively) and, when combined, these two types of test accounted for the overwhelming majority of tests performed (134,643 tests; 97.60% of all tests reported). Comparing the number of positive test results, pre-access testing accounted for the majority of all positive tests, (875; 66.6%) followed by random (299; 22.8%) and for-cause testing (90; 6.9%).

Figure 2 shows the percentage of confirmed positive tests for each category of test. The percentage for each category was calculated by summing the number of positive tests in each test category and dividing it by the total number of tests conducted in that category. For-cause testing resulted in the highest percentage of positive tests (25.3%). This is an expected result, since for-cause tests are based on referral by a supervisor trained in behavioral

Table 2
Test Results by Test Category

	Number of Tests	Positive Tests	Percent Positive
Pre-Access	61,066	875	1.43%
Random	73,577	299	0.41%
For-Cause	356	90	25.28%
Follow-Up	1105	38	3.44%
Other	1849	11	0.60%
TOTAL	137,953	1313	0.95%

Table 1
Definitions of Test Categories

PRE-ACCESS	This category combines results from pre-employment and pre-badging tests.
RANDOM	Random testing refers to a system of unannounced and unpredictable drug testing administered in a statistically random manner to a group so that all persons within that group have an equal probability of selection.
FOR-CAUSE	The "for-cause" testing category includes the results of tests based on behavioral observation programs, based on credible information that an individual is abusing drugs or alcohol, or based on a reasonable suspicion that drugs or alcohol may have been involved in a specific event (i.e., post-accident).
FOLLOW-UP	Follow-up testing refers to chemical testing at unannounced intervals to ensure that an employee is maintaining abstinence from the abuse of drugs or alcohol.
OTHER	The "other" testing category is used for all types of drug and alcohol testing reported by licensees that were not specifically required by the rule. In some cases, the basis for testing was unclear; therefore, as discussed in Appendix A, these results should be interpreted with care.

* *These definitions are based on the definitions given in Section 26.3 in 10 CFR Part 26 and on explanations of the FFD performance data in the form provided to licensees by NUMARC. In some cases, categories from the reporting form were combined to mirror the categories covered in the rule. Categories of testing not included in 10 CFR 26 were combined as "other". For a full discussion of the categories and seperate results of all test categories reported, see Appendix A: Technical Background and Appendix B: Supporting Data.*

observation techniques or on credible information indicating inappropriate drug and alcohol use. (Post-accident tests were included in this category; however, there were no positive test results from the 21 post-accident tests reported; see Appendix B, Table B1.) Unfortunately, no information is available regarding the type of drugs that resulted in positive for-cause tests; hence, the ability of supervisors to detect the use of specific drugs and alcohol cannot be determined. Of the pre-access tests, 1.4 percent were positive; 0.4 percent of the random tests were positive.

Summary of Major Findings

- Drug and/or alcohol use in violation of 10 CFR Part 26 was confirmed in about 1 percent of the tests.
- Most of the positive tests were among workers who never attained access to the protected area. Nonetheless, nearly 400 workers with access tested positive across the industry in the six-month period.

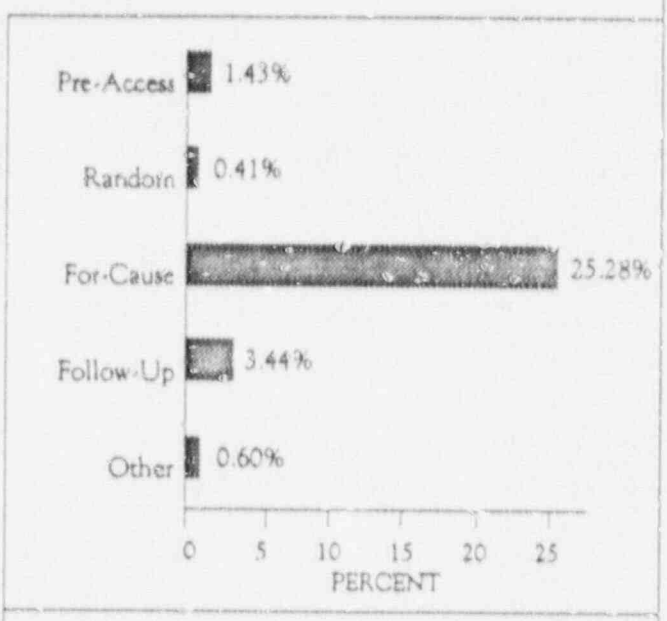


Figure 2
Percent of Positive Tests in Each Test Category

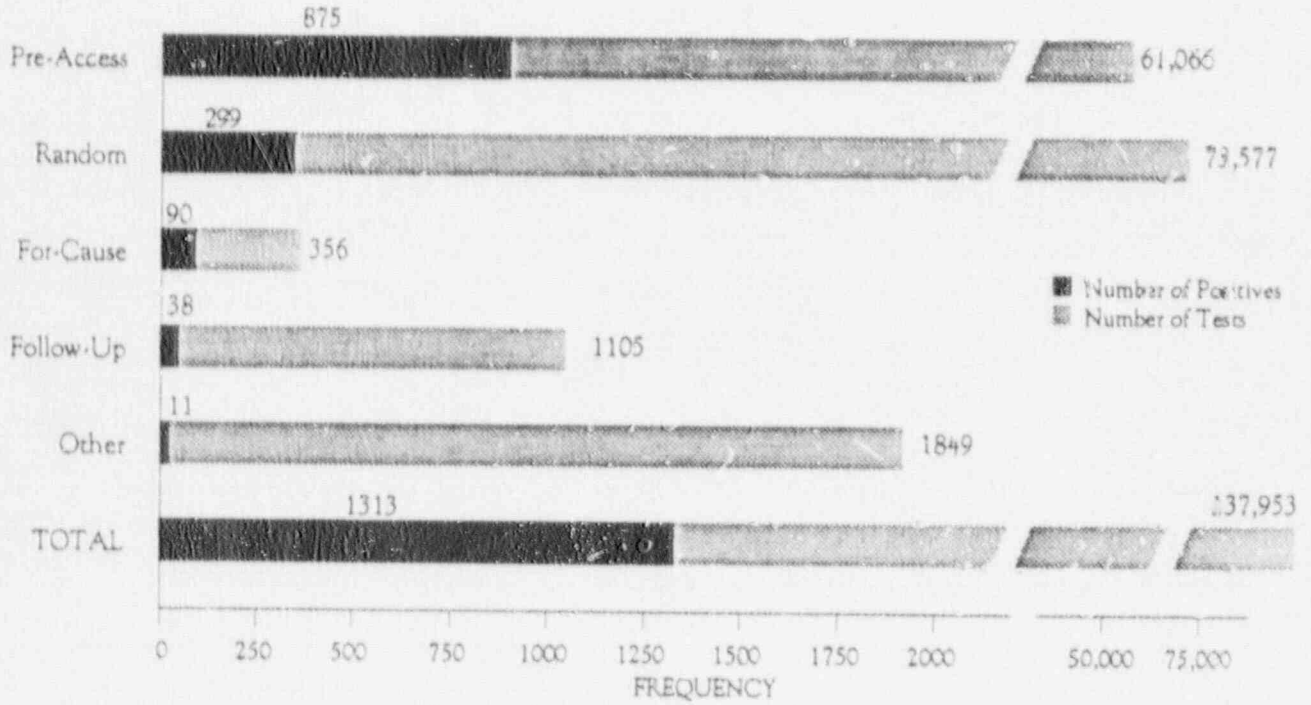


Figure 1
Comparison of Test Categories

SECTION 2: TEST RESULTS BY WORKER CATEGORY

This section examines test results for three categories of workers: licensee employees, long-term contractors, and short-term contractors. The basis for the distinction among workers is provided in Appendix A.

For licensee employees, the majority of tests (50,402) were a result of the random testing program, while for short-term contractors, the majority of tests (41,613) were a result of pre-access testing (see Table 3). Long-term contractor personnel experienced about the same number of pre-access and random tests (3,741 and 4,193, respectively). These differences indicate that licensee employees (and, to a lesser extent, long-term contractors) usually experience one pre-access test and then remain under a random testing program. In contrast, short-term contractor personnel may experience many pre-access tests at a number of sites, but spend less time than licensee employees or long-term contractors under a random testing program. Figure 3 shows these differences in percentages. For licensee employees, 23 percent of all tests were pre-access and 73 percent were random; for short-term contractors, the proportions are reversed, with 68 percent of tests in the pre-access category and 31 percent in the random category. Long-term contractor personnel had about half of their tests in each category. For-cause testing, follow-up testing, and other testing together account for only about 4 percent of the tests taken by licensee employees and about 1 percent of the tests taken by contractor personnel.

Figure 4 compares positive test results for licensee employees, long-term contractor and short-term contractor personnel. In all test categories except follow-up tests, the percentages of positive test results were higher for short-term contractor personnel than for either licensee or long-term contractor personnel.

In pre-access testing, short-term contractors tested positive about 40 percent more often than did workers in either of the other categories (1.56% of all pre-access tests performed on short-term contractor personnel were positive, compared to 1.17% for licensee employees and 1.15% for long-term contractors). Because of the large number of pre-access tests experienced by short-term contractors and the percentage of positive test results obtained, positive pre-access test results from short-term contractors accounted for almost half (648) of all positive test results (see Table 3).

Random testing also produced different percentages of positive results across categories of workers. Short-term contractors had more than twice the percentage of positive test results found among licensee employees

Table 3

Test Results by Test Category and Worker Category

TYPE OF TEST	LICENSEE EMPLOYEES	LONG TERM CONTRACTORS	SHORT-TERM CONTRACTORS	TOTAL	PERCENT
PRE-ACCESS					
Number Tested	15,712	3,741	41,613	61,066	
Number Positive	184	43	648	875	1.43%
RANDOM					
Number Tested	50,402	4,193	18,982	73,577	
Number Positive	153	20	126	299	0.41%
FOR-CAUSE					
Number Tested	182	26	148	356	
Number Positive	40	6	44	90	25.28%
FOLLOW-UP					
Number Tested	916	4	185	1105	
Number Positive	36	0		38	3.44%
OTHER					
Number Tested	1,514	63	272	1849	
Number Positive	6	0	5	11	0.60%
TOTAL					
Number Tested	68,726	8,027	61,200	137,953	
Number Positive	419	69	825	1313	0.95%

(0.66% and 0.30%, respectively; see Figure 4). Hence, although licensee employees experienced more than twice as many random tests as did short-term contractors, the two categories of workers had similar numbers of positive test results (126 for short-term contractors compared to 153 for licensee employees).

There are similarities between the percentages of positive results from for-cause tests for licensee employees and long-term contractors—in each group, about 22 percent tested positive. A higher percentage of short-term contractors, about 30 percent, had positive test results from for-cause tests.

Follow-up testing was used primarily for licensee employees (n=916 tests), less often for short-term contractors (n=185 tests), and almost never for long-term contracted personnel (n=4 tests).

Positive results for follow-up testing were close to 4 percent for licensee employees, and slightly above 1 percent for short-term contractors. Of the four follow-up tests conducted on long-term contracted personnel, none were positive (see Figure 4).

In all, there were 229 confirmed positive test results among licensee employees (not including pre-access or follow-up tests) and 184 referrals to Employee Assistance Programs. Seventy-eight licensee employees had their access restored during the six-month period from January 3 to June 30, 1990.

"Other" tests were conducted for various reasons, preventing a meaningful interpretation of these test results.

Summary of Major Findings

- Positive test rates were higher for pre-access testing than for random testing, and were highest of all for for-cause testing.
- Licensee employees and long-term contractor personnel had about the same positive test rate. Short-term contractor personnel had considerably higher positive test rates for both random and pre-access testing.

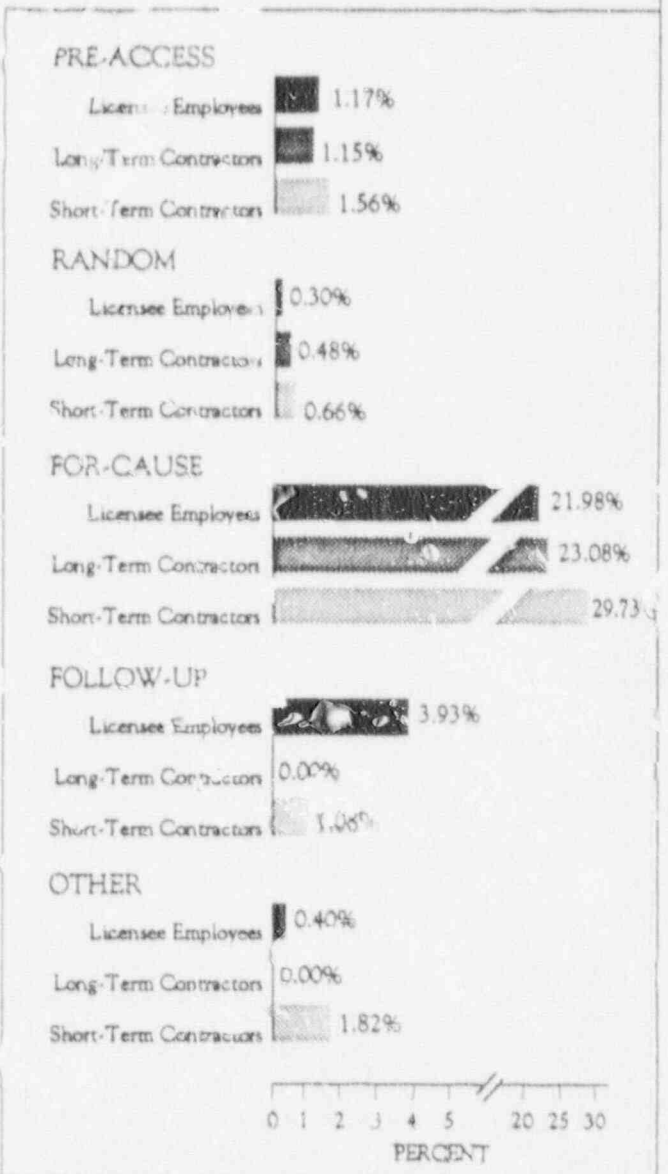


Figure 4
Comparison of Test Outcomes by Worker Category

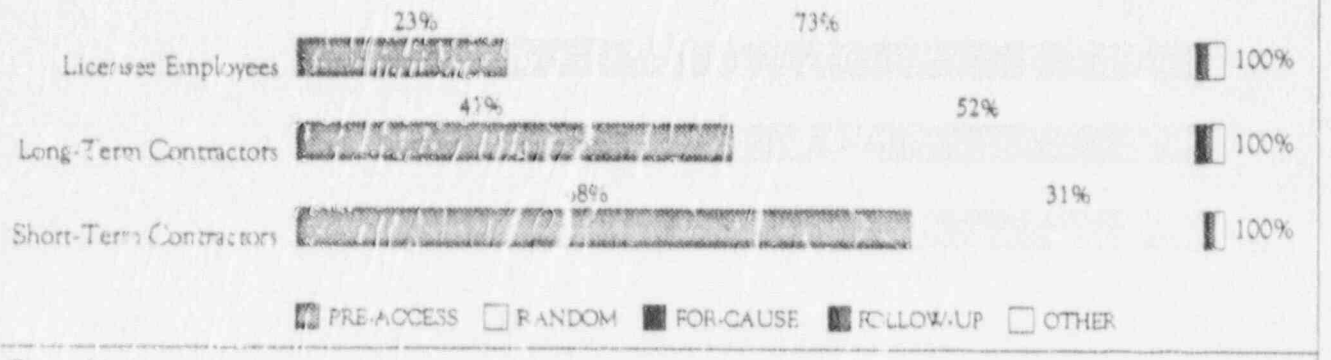


Figure 5
Comparison of Test Category Percentages by Worker Category

SECTION 3: TEST RESULTS BY DRUG CATEGORY

The FFD rule (10 CFR Part 26) requires that the number of confirmed positive test results also be reported by drug category. Part A of this section examines the number of confirmed positive results for each of the six substances specified by the rule: marijuana, cocaine, opiates, amphetamines, phencyclidine, and alcohol. Part B of this section reports the results from tests using screening levels lower than those required by 10 CFR 26. Part C reports the results of testing for additional drugs.

The information presented here is reported as if all program performance reports used the same interpretation of the reporting requirements. Unfortunately, reporting instructions for substances were interpreted in different ways. In some cases, only positive results that were confirmed by the Medical Review Officer (MRO) were included. In other cases, all results that were confirmed positive by GC/MS screening were included. Some sites that routinely do tests on two aliquots from each sample reported two positive test results; others counted both as one positive result, since they come from the same sample.

Part A: Positive test results by drug category

This section includes only positive test results for the five drugs specified in 10 CFR Part 26 and for alcohol. The total number of confirmed positive test results for substances is expected to differ from the total number of confirmed positive results by test category. This difference occurs because refusals to take tests are not included in the reports on substances. In addition, positive tests for drugs not specified in 10 CFR Part 26 are not included in this section. Finally, poly-drug use by an individual results in one positive test but more than one substance is detected.

Figure 5 shows the percentage of positive test results for each category of drug and for alcohol specified in 10 CFR Part 26. Of the total confirmed positive tests by substance (n=1,341 confirmed positive test results), the majority (51.83%) were positive for marijuana. Cocaine was next, with 26.40 percent of the total confirmed positive tests, followed by alcohol (15.36%). Opiates, amphetamines, and phencyclidines together accounted for less than 7 percent of all positive drug tests.

The variations in reporting noted above may mean that the absolute number of positive test results reported in each drug category is high. This is particularly likely in the case of amphetamines and opiates, since positive results for these substances are often ruled by the MRO to have been caused by other, legal substances. However, the positive results for amphetamines and opiates represent fairly small shares of all positive results (2.2% and 4.0%, respectively), so this data collection problem should not have a substantial impact on the ratio between the various substances being detected in tests.

In other words, regardless of the actual number of positive test results, for the panel of drugs specified by 10 CFR Part 26, one would expect that marijuana would account for about half of the positive results; cocaine for over a quarter; alcohol for about 15 percent; and amphetamines, opiates, and phencyclidines for about 6.5 percent.

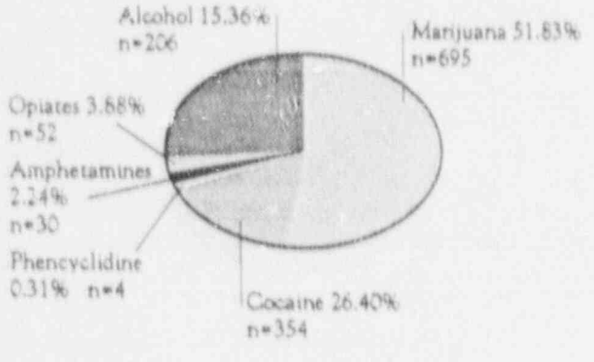


Figure 5
Confirmed Positives by Drug Category

Part B: Lower Screening Levels

The fitness-for-duty rule (10 CFR Part 26) provides flexibility by allowing licensees to use lower cutoff levels than those specified in the NIDA guidelines provided in 10 CFR Part 26. Although only a few licensees used lower cutoff levels for cocaine and opiates, many licensees used lower levels for initial screening tests for marijuana.

Thirty-eight of the 84 sites used levels lower than the NRC level of 100 nanograms per milliliter (ng/ml), 27 used 50 ng/ml, and 11 used 20 ng/ml for initial screening. Figure 6 compares the rate of positive tests found using these different cutoff levels for marijuana. These rates were calculated by summing the number of positive test results for marijuana for each cutoff level and dividing them by the number of tests using that cutoff category. As shown in Figure 6, licensees using lower cutoff levels had a higher percentage of positive test results: at 20 ng/ml, about 8 tests out of 1,000 were positive; at 50 ng/ml, about 5 tests out of 1,000 were positive; and at 100 ng/ml, about 4 tests out of 1,000 were positive.

Although some licensees used lower cutoff levels for other substances, no reportable differences in the percentage of positive test results were identified. Levels used for cocaine did not differ for initial screening (all licensees used 300 ng/ml) and two licensees reported

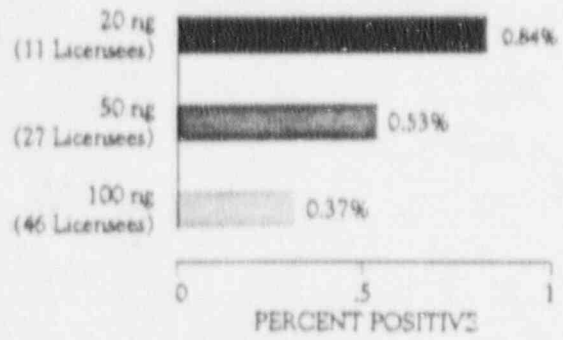


Figure 6
Confirmed Positives for Marijuana by Screen Level

using a lower level (50 or 100 ng/ml) for confirmation. A few licensees (11) used lower confirmation levels for opiates. Amphetamines were screened at 300 ng/ml by five sites and confirmed at levels of 300 ng/ml and below at four sites, compared to the maximum levels of 1000 ng/ml and 500 ng/ml specified by 10 CFR Part 26. (See Appendix A for a summary of the screening levels specified in 10 CFR Part 26.)

Part C: Additional Drugs

Thirty-nine sites reported testing for a broader panel of drugs than the five specified in the rule. All 39 sites testing for additional drugs tested for benzodiazepines; 32 tested for barbiturates, 19 tested for methaqualone, 10 tested for methadone, 2 tested for methamphetamines, and 4 tested for propzyphrine. Table 4 lists the number of licensees testing for each additional drug, the total number of tests performed by all licensees testing for each additional drug, the number of positive test results, and the percentage of positive test results. There were no positive test results for three of the drugs; methaqualone, methadone, and methamphetamines. There were a total of 24 positive test results for barbiturates, 28 for benzodiazepines, and 4 for propzyphrine.

The most common additional drugs tested were benzodiazepines and barbiturates. Figure 7 reports on the test outcomes for the 32 licensees testing for both of these additional drugs. It provides the percentages of positive tests for the panel of drugs included in 10 CFR Part 26, and for benzodiazepine and barbiturates. For these 32 sites, benzodiazepines and barbiturates accounted for 3.86 percent and 3.17 percent of positive tests, respectively. This

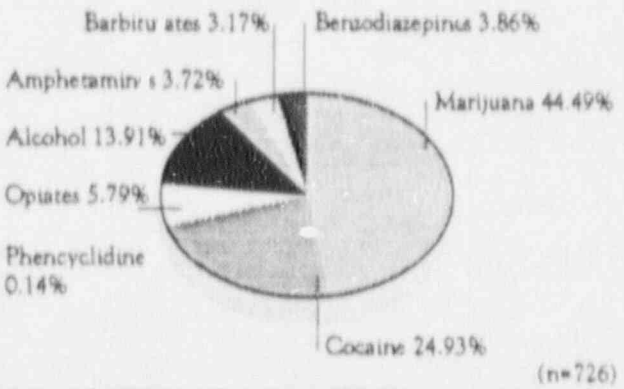


Figure 7
Confirmed Positives by Drug Category Including Benzodiazepines and Barbiturates

Table 4
Test Results for Additional Drugs

	Number of Licensees	Number of Tests Performed	Number of Positives	Percent Positive
Barbiturates	32	62,286	24	0.04%
Benzodiazepines	39	73,061	28	0.04%
Propzyphrine	4	7,752	4	0.05%
Methadone	10	19,709	0	0.00%
Methaqualone	19	32,846	0	0.00%
Methamphetamines	2	5,473	0	0.00%

is a percentage comparable to amphetamines, and substantially higher than phencyclidine.

Summary of Major Findings

- Marijuana was found to be the major drug of abuse, accounting for over 50 percent of all positive tests.
- Cocaine and alcohol also accounted for significant proportions (about 25% and 15%) of all positive tests.
- Using lower screening cutoff levels for marijuana than were required (20 ng/ml vs. 100 ng/ml) more than doubled the confirmed positive test rate.
- Among the sites testing for additional drugs, barbiturates and benzodiazepines were the drugs most frequently added to the panel. These drugs accounted for small but significant percentages of confirmed positives for those sites that included them.

SECTION 4: TEST RESULTS BY REGION

In this section, information on testing programs is summarized for each of the NRC administrative regions. (Regions are identified in Appendix A.) Region IV sites reported the lowest percentage of positive test results (0.67%), while Region III had the highest (1.16%) (see Figure 8). Since the rate of positive test results may change as all licensees experience scheduled outages, these differences represent preliminary findings.

The percentage of all positive test results accounted for by a particular drug varied by region. Figure 9 summarizes these data by region for each drug. Marijuana accounted for the highest percentage of positive test results in Region III (62%), the majority of positive test results in Regions II and IV (54% in each), and less than half of all positive test results in Regions I and V (37% and 41%). The highest percentage of positive results from cocaine was in Region I (38%), and the lowest percentage in Region V (15%).

In general, opiates and amphetamines represented a substantially smaller percentage of positive tests than did marijuana and cocaine. Region V was an exception; here, opiates and amphetamines together accounted for 17 percent of all positive test results. As noted earlier, these differences may reflect differences in reporting practices across regions. Positive tests for phencyclidine were only reported in Regions I, II, and III.

The percentages of all positive test results accounted for by alcohol varied substantially across regions. Region IV had the highest percentage, at 26 percent; Region V, the lowest, at 8 percent.

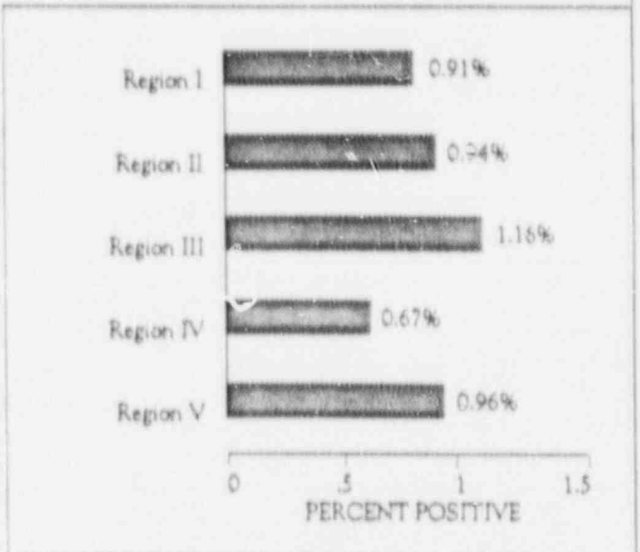


Figure 8
Confirmed Positives: Regions I-V

Summary of Major Findings

- The pattern of findings varied from region to region.
- Region IV had the lowest overall test rate and Region III had the highest.

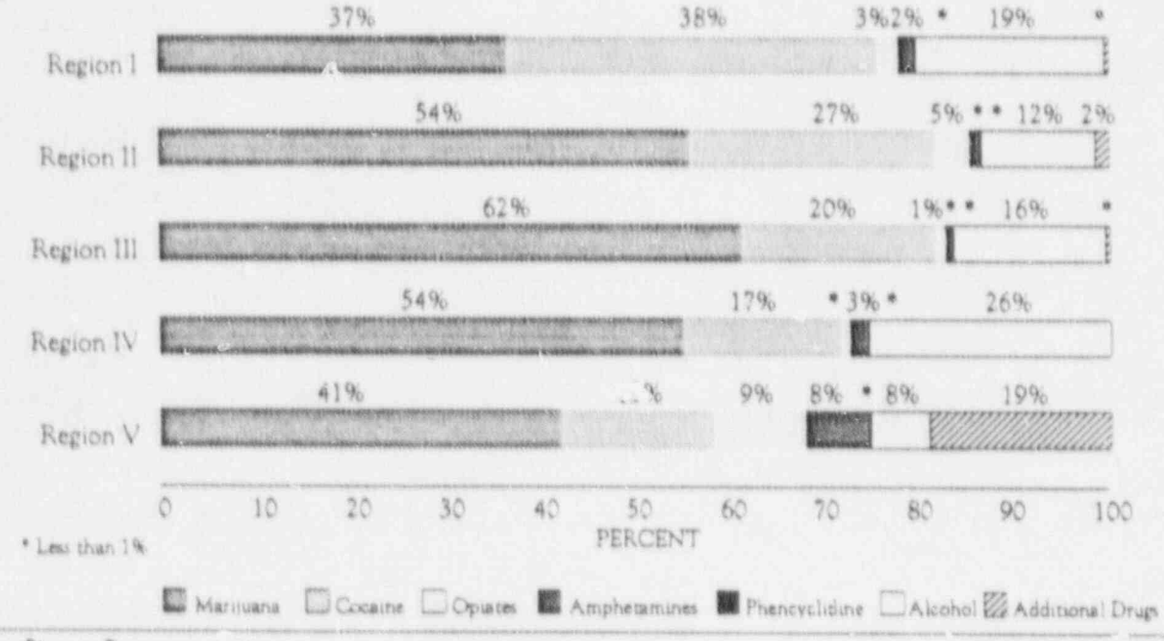


Figure 9
Confirmed Positives by Drug Category: Regions I-V

SECTION 5: LESSONS LEARNED

As part of the FFD program performance report, many licensees reported on lessons learned during the initial implementation of the FFD program. Below is a brief listing of some of the problems noted and solutions suggested in these reports. This is not intended as a full summary of the reports, and many additional and useful suggestions are found in the full compilation of reported lessons learned that is provided in Appendix C.

Many licensees reported problems with HHS-certified labs. Some solutions included:

- using a large and flexible lab
- improvement of the procedures to ensure that unsatisfactory lab performance is reported
- implementation of a procedure to certify a scientist review of discrepancies between test results
- increased monitoring of laboratory performance and testing criteria.

Many licensees noted difficulties in ensuring a random and unannounced random testing program at a 100 percent rate. Several improvements were noted:

- testing on the backshift
- modifications to the random selection process
- computer enhancements.

In a number of licensee reports, issues regarding the collection facility and on-site testing were raised. Frequently, inappropriate test sample collection materials were used initially. Licensees responded by:

- providing improved packaging of material
- changing procedures for handling test samples
- developing procedures for test sample collection.

Concerns regarding FFD training requirements were cited in several instances. These concerns included:

- annual requalification training for supervisors in behavioral observation
- the requirement for additional training of supervisors and escorts
- training of contract supervisors.

Several licensees noted difficulties with assuring that all personnel covered by 10 CFR Part 26 are tested under the random testing program. Licensees responses included:

- addition of a collection facility at corporate offices for those with infrequent access to protected areas
- off-site testing of FFD personnel.

Several licensees noted the need for complete procedures and reported additional procedures that had been written. Procedures developed to support the FFD program addressed:

- call-in protocol
- test sample collection and handling
- laboratory monitoring
- maintenance of site facility instrumentation.

Various aspects of FFD program management were raised by the licensees. Specific issues addressed were:

- the difficulties of providing program management oversight from a corporate office and the requirement for on-site management
- the necessity for procedures for MRO reviews and reports and the requirement to involve the MRO in policy decisions
- the availability requirements of the FFD manager.

APPENDIX A

Technical Background

This section includes:

- A description of the data used as the basis of the report
- A list of the utilities and sites providing data for this report
- Additional detail on the definitions of categories used in the report
- Other relevant information (e.g. the substances required by 10 CFR Part 26).

Data Source

The data for this study are drawn from the semi-annual reports on FFD program performance that were submitted in accordance with 10 CFR Part 26 by all NRC licensees authorized to operate or construct a nuclear power reactor. Eighty-four forms were received from 54 utilities—75 from sites and 9 from corporate offices (see Table A1). The form used was a standardized data collection form developed by NUMARC to fulfill Part 26.71(d) of the rule. This part of the rule specifies that the data reported shall include:

- random testing rate
- drugs tested and cutoff levels, including results of tests using lower cutoff levels and tests for other drugs
- workforce populations tested
- numbers of tests and results by population and type of test (i.e., pre-badging, random, for-cause, etc.)
- substances identified
- summary of management actions
- a list of events reported.

The number of positive tests for overall results of testing and the number of tests identifying specific substances are not expected to be equal. A total of 1,313 positive test results were reported and a total of 1,397 substances were identified. There are several reasons for this difference:

- A refusal to test is documented as a positive result but does not identify a substance.
- Poly-substance abuse is counted as one positive result but results in the identification of more than one substance (a positive test for both marijuana and alcohol would be counted as two substances for example).
- Licensees interpreted reporting instructions for specific drugs in different ways. In some cases, only positive results that were confirmed by the Medical Review Officer (MRO) were included. In other cases, all results that were confirmed positive by GC/MS screening were included.
- Some sites that routinely do tests on two aliquots from each sample reported one positive test result but two positive tests for the substance identified, others counted both as one positive result, since they come from the same sample.

Table A1

List of Utilities Submitting Reports for Sites and Corporate Offices

COMPANY/PLANT(S)
1 Alabama Power Farley 1 & 2
2 Arizona Public Service Palo Verde 1, 2, 3
3 Arkansas Arkansas Nuclear One 1 & 2
4 Baltimore Gas & Electric Calvert Cliffs 1 & 2
5 Boston Edison Pilgrim
6 Carolina Power & Light Robinson 2 Brunswick 1 & 2 Shearon Harris Corporate Office
7 Cleveland Elec. Illum. Perry 1 & 2
8 Commonwealth Edison Byron 1 & 2 Braidwood 1 & 2 Zion 1 & 2 Dresden 2 & 3 Quad Cities 1 & 2 Lasalle 1 & 2 Corporate Office
9 Colorado (Public Service) Fort St. Vrain
10 Consolidated Edison Indian Point 1 & 2
11 Consumers Power Palisades Big Rock Point Corporate
12 Detroit Edison Fermi 2
13 Duke Power McGuire 1 & 2 Oconee 1, 2, & 3 Catawba 1 & 2 Corporate Office
14 Duquesne Light Beaver Valley 1 & 2
15 Florida Power & Light Turkey Point 3 & 4 St. Lucie 1 & 2
16 Florida Power Corporation Crystal River 3
17 Georgia Power Hatch 1 & 2 Vogtle 1 & 2
18 GPU Nuclear Corporation Three Mile Island 1 Oyster Creek 1 Corporate Office
19 Gulf States Utilities River Bend 1
20 Houston Light & Power South Texas 1 & 2
21 Illinois Power Clinton 1
22 Indiana & Michigan Electric Cook 1 & 2
23 Iowa Electric Duane Arnold
24 Long Island Lighting Shoreham
25 Louisiana Power & Light (Entergy) Waterford 3
26 Maine Yankee Atomic Power Maine Yankee
27 Nebraska Public Power District Cooper Station
28 Niagara Mohawk Power Nine Mile Point 1 & 2
29 Northeast Utilities Haddam Neck Millstone 1 & 3 Corporate Office
30 Northern States Power Monticello Prairie Island 1 & 2 Corporate Office
31 Omaha Public Power District Fort Calhoun
32 Pacific Gas & Electric Diablo Canyon 1 & 2
33 Pennsylvania Power & Light Susquehanna 1 & 2
34 Philadelphia Electric Limerick 1 & 2 Peach Bottom 2 & 3 Corporate Office
35 Portland General Electric Trojan
36 Power Authority, New York Indian Point 3 Fitzpatrick
37 Public Service Gas & Electric Hope Creek 1 Salem 1 & 2
38 Public Service of New Hampshire Seabrook 1
39 Rochester Gas & Electric Ginna
40 Sacramento Municipal Utility Rancho Seco 1
41 South Carolina Electric & Gas Summer 1
42 Southern California Edison San Onofre 1, 2, & 3
43 Systems Energy Resources Grand Gulf 1 & 2
44 Tennessee Valley Authority Bellafonte 1 & 2 Browns Ferry 1, 2, & 3 Sequoyah 1 & 2 Watts Bar 1 & 2
45 Texas Utility Elec. (TU Electric) Comanchee Peak 1 & 2
46 Toledo Edison Davis Besse 1
47 Union Electric Callaway 1
48 Vermont Yankee Nuclear Power Vermont Yankee 1
49 Virginia Electric & Power North Anna 1 & 2 Surry 1 & 2 Innsbrook (Corporate)
50 Washington Public Power Supply WNP-1 & 2
51 Wisconsin Electric Power Point Beach 1 & 2
52 Wisconsin Public Service Kewaunee
53 Wolf Creek Nuclear Wolf Creek 1
54 Yankee Atomic Electric Yankee-Rowe 1

Testing Categories

The following testing categories were included in the analyses presented in this report. These definitions are based on the definitions given in 26.3 of 10 CFR and on explanations of the FFD performance data in the form provided to licensees by NUMARC.

Pre-access

This category combines results from pre-employment and pre-badging tests. The pre-employment testing category is limited to those persons seeking employment in the nuclear power portion of the company. The pre-badging category refers to current employees applying for positions in the company that require unescorted access to the protected area. These categories are combined in the body of this report. Because some licensees combined pre-employment and pre-badging test results and reported them together under pre-employment, a clear comparison of the positive rates for the two different tests is not possible.

Random Tests

Random testing refers to a system of unannounced and unpredictable drug testing administered to a group in a statistically random manner so that all persons within that group have an equal probability of selection.

For-cause

For-cause testing is performed based on behavioral observation programs or on credible information that an individual is abusing drugs or alcohol. Also included in this category is post-accident testing, administered because of the occurrence of specific events (e.g., accidents resulting in injuries).

Follow-up Testing

Follow-up testing refers to chemical testing at unannounced intervals to ensure that an employee is maintaining abstinence from the abuse of drugs or alcohol.

Other

This category includes results from the periodic testing conducted by some licensees coincident with annual physicals or similar periodic events. Results reported in the NUMARC form's "Other" category are also included. Instructions accompanying the form do not define what testing should be included in this category. In one case, a licensee reported including a specific number of blind test results in the "Other" category—these were omitted prior to data analysis. In most cases, however, there are no specifics regarding what is included in the "Other" category.

Tables B1, B2, and B3 present the number of tests, number positive, and average percent positive for each of the test categories requested on the NUMARC form.

Worker Categories

Results for three categories of workers were requested in the NUMARC forms. The following categories were used:

Licensee employees

Licensee employees work for the utility and are covered by the fitness-for-duty rule. This category includes both nuclear power plant workers and also corporate or support staff. Companies were asked to report the results for corporate or support staff separately. Only nine companies reported separate corporate results. On average, there were 1,184 licensee employees included in each report.

Long- and short-term contractors

The division of contractor personnel into long- and short-term categories is optional for licensees. The explanation in the NUMARC form suggests that any contractor working for six months or less be considered short-term. Licensees who did not divide contractors into short- and long-term were instructed to report test results for all contractors under the short-term category and to record "N/A" in the long-term category. This means that some long-term contractor test results may be reported under the short-term contractor category; however, no short-term contractor results should be recorded under the long-term category. Because plants varied in their definitions of long- and short-term contractors, any comparisons between rates of positive test results for the two groups should be viewed with caution. On average, there were 305 long-term contractors and 654 short-term contractors included in each report.

Tables B2 and B3 present the number of tests, number positives, and average percent positive by each test category included in the NUMARC form for licensee employees and all contractor employees (B2) and for long- and short-term contractors (B3) separately.

Drug Categories

Substances included in 10 CFR Part 26

The rule requires testing for five drugs and alcohol. Table A2 shows the maximum screening levels and confirmation levels required by the rule.

Plants are permitted to set cutoff levels lower than those specified in the NIDA guidelines. Many licensees chose to do so for at least one category of drugs, as indicated by their reports. However, several plants using lower cutoff levels failed to record the number of positive test results for *both* NIDA guidelines and their own cutoff levels. For this report, the test result reports for lower cutoff levels are assumed to apply to all categories of tests. However, one plant noted that it used lower cutoff levels for certain categories of testing (e.g., pre-access). Information of this type was not provided by other licensees.

Additional Drugs

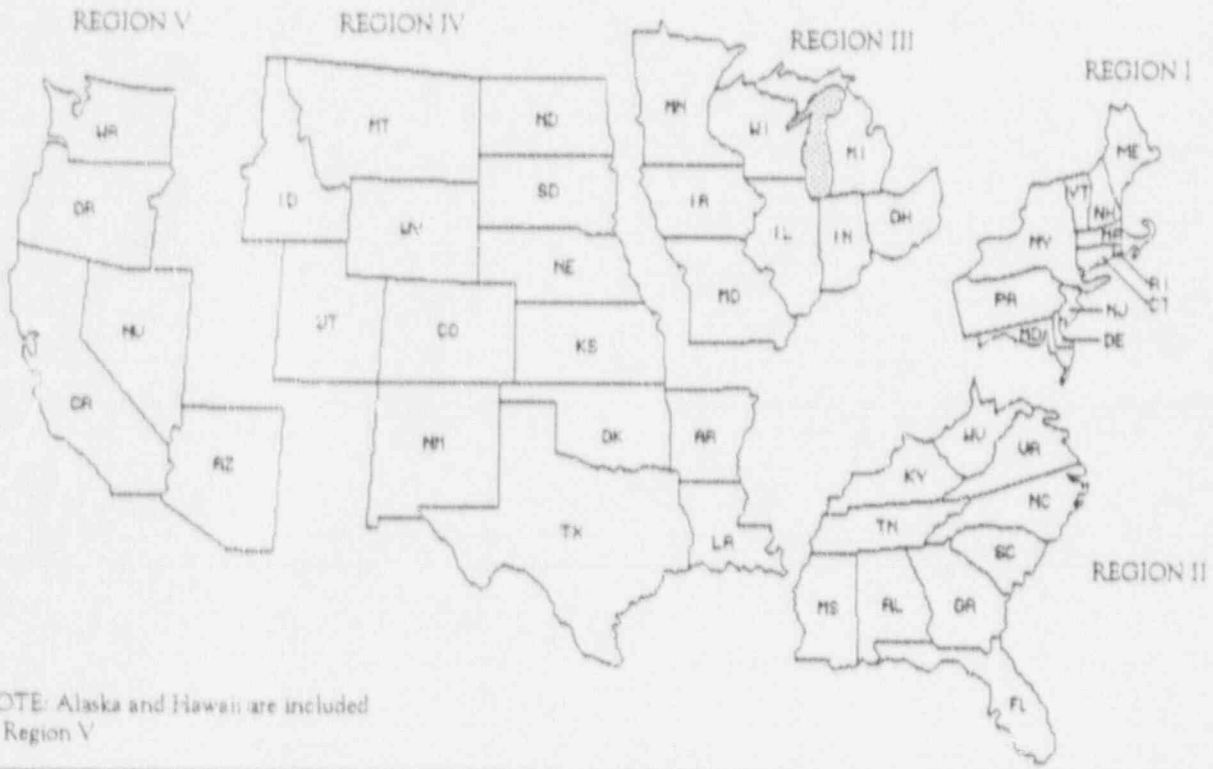
Many plants also tested for drugs other than the six (five illegal and alcohol) categories required by the rule. Information on the number of sites testing for other drugs is presented in Table B4. This information is categorized by region. The table indicates that the additional drugs most often tested for were barbiturates and benzodiazepines.

Table A2
Maximum Screening and Confirmation Levels Required by 10 CFR Part 26

Drug	Screening Level	Confirmation Level
Marijuana	100	15
Cocaine	300	150
Opiates	300	300
Phencyclidine	25	25
Amphetamines	1,000	500
Alcohol	0.04% BAC	0.04% BAC

Regions

The country is divided into five regions, corresponding with NRC administrative regions as shown in Figure A1. Table A6 indicates the number of sites in each region that report testing for additional drugs. Table A7 shows the results of testing for alcohol, marijuana, cocaine, amphetamines, opiates, and phencyclidine.



NOTE: Alaska and Hawaii are included in Region V

Figure A1
Geographic Location of NRC Regions I-V

APPENDIX B

Supporting Data

Table B1:
Test Results By NUMARC Form Test Category
(January through June, 1990)

TEST CATEGORIES	NUMBER
PRE-EMPLOYMENT	
Number Tested	15,507
Number Positive	181
Average Percent Positive	1.17
PRE-BADGING	
Number Tested	45,559
Number Positive	694
Average Percent Positive	1.52
PERIODIC	
Number Tested	1,278
Number Positive	3
Average Percent Positive	0.23
FOR-CAUSE	
Number Tested	335
Number Positive	90
Average Percent Positive	26.87
POST-ACCIDENT	
Number Tested	21
Number Positive	0
Average Percent Positive	0
RANDOM	
Number Tested	73,577
Number Positive	299
Average Percent Positive	0.41
FOLLOW-UP	
Number Tested	1,105
Number Positive	38
Average Percent Positive	3.44
OTHER	
Number Tested	571
Number Positive	8
Average Percent Positive	1.40
TOTAL	
Number Tested	137,953
Number Positive	1,313
Average Percent Positive	0.95

Table B2
Test Results By NUMARC Form Test Category By Licensee Employees and Contractor Personnel
(January through June, 1990)

TESTING CATEGORIES	LICENSEE EMPLOYEES	CONTRACTOR (Long-term/ Short-term)
PRE-EMPLOYMENT		
Number Tested	6,446	9,061
Number Positive	64	117
Average Percent Positive	.99	1.29
PRE-BADGING		
Number Tested	9,266	36,293
Number Positive	120	574
Average Percent Positive	1.30	1.58
PERIODIC		
Number Tested	1,099	179
Number Positive	2	1
Average Percent Positive	.18	0.56
FOR-CAUSE		
Number Tested	167	168
Number Positive	40	50
Average Percent Positive	23.95	29.76
POST-ACCIDENT		
Number Tested	15	6
Number Positive	0	0
Average Percent Positive	0	0
RANDOM		
Number Tested	50,402	23,175
Number Positive	153	146
Average Percent Positive	0.30	0.63
FOLLOW-UP		
Number Tested	916	189
Number Positive	36	2
Average Percent Positive	3.93	1.06
OTHER		
Number Tested	415	156
Number Positive	4	4
Average Percent Positive	0.96	2.56
TOTAL		
Number Tested	68,726	69,227
Number Positive	419	894
Average Percent Positive	0.61	1.29

Table B3

Test Results By NUMARC Form Test Category By Long-term and Short-term Contractor Personnel

(January through June, 1990)

TESTING CATEGORIES	LONG-TERM CONTRACTOR	SHORT-TERM CONTRACTOR
PRE-EMPLOYMENT		
Number Tested	334	8,727
Number Positive	3	114
Average Percent Positive	.90	1.31
PRE-BADGING		
Number Tested	3,407	32,886
Number Positive	40	534
Average Percent Positive	1.17	1.62
PERIODIC		
Number Tested	57	122
Number Positive	0	1
Average Percent Positive	0	0.82
FOR-CAUSE		
Number Tested	26	142
Number Positive	6	44
Average Percent Positive	23.08	30.99
POST-ACCIDENT		
Number Tested	-	6
Number Positive	-	0
Average Percent Positive	-	0
RANDOM		
Number Tested	4,193	18,982
Number Positive	20	126
Average Percent Positive	0.48	0.66
FOLLOW-UP		
Number Tested	4	185
Number Positive	0	2
Average Percent Positive	0	1.08
OTHER		
Number Tested	6	150
Number Positive	0	4
Average Percent Positive	0	2.67
TOTAL		
Number Tested	8,027	61,200
Number Positive	69	825
Average Percent Positive	0.86	1.35

Table B4

Test Results For Additional Drugs

TYPE OF DRUG	REGION I	II	III	IV	V	TOTAL
BARBITURATES						
Number of Licensees Testing	11	10	3	4	4	32
Number of Tests Performed	13,789	23,193	4,646	6,227	14,431	62,286
Number of Positives	2	5	2	0	15	24
Percent Positive	.02	.02	.04	0	.10	.04
BENZODIAZEPINES						
Number of Licensees Testing	11	10	10	4	4	39
Number of Tests Performed	13,789	23,193	15,421	6,227	14,431	73,061
Number of Positives	1	5	0	0	22	28
Percent Positive	.01	.02	0	0	.15	.04
PROPZYPHRINE						
Number of Licensees Testing	3	0	0	0	1	4
Number of Tests Performed	3,121	0	0	0	4,631	7,752
Number of Positives	0	0	0	0	4	4
Percent Positive	0	0	0	0	.09	.05
METHADONE						
Number of Licensees Testing	5	1	1	1	2	10
Number of Tests Performed	6,821	3,274	1,386	1,055	7,173	19,709
Number of Positives	0	0	0	0	0	0
Percent Positive	0	0	0	0	0	0
METHAQUALONE						
Number of Licensees Testing	7	7	1	2	2	19
Number of Tests Performed	6,812	15,534	1,386	3,136	5,978	32,846
Number of Positives	0	0	0	0	0	0
Percent Positive	0	0	0	0	0	0
METHAMPHETAMINES						
Number of Licensees Testing	0	0	0	1	1	2
Number of Tests Performed	0	0	0	1,651	3,822	5,473
Number of Positives	0	0	0	0	0	0
Percent Positive	0	0	0	0	0	0
Total Number of Positives	3	10	2	0	52	56

Table B5

Positive Test Results By Region and By Substance

	REGION I (n=24)	REGION II (n=23)	REGION III (n=22)	REGION IV (n=9)	REGION V (n=6)
Total Tests	35,273	44,591	27,798	13,352	16,948
Total Positive*	321	417	323	90	162
Positive	.91%	.94%	1.16%	.67%	.96%
Confirmed Positives by Drug					
Marijuana	123	226	206	49	91
Cocaine	127	114	65	15	33
Opiates	9	20	3	0	20
Amphetamine	6	2	1	3	18
Phencyclidine	2	1	1	0	0
Alcohol	65	45	54	24	18
Total Reported*	332	408	330	91	180

**Total positive test results and total reported positive results for specific substances are not expected to be the same.*

APPENDIX C

Compilation of Lessons Learned Reported by Licensees

In general, the information provided on lessons learned varied among licensees. Few of the licensees had specifically identified sections on lessons learned. Some licensees indirectly referred to lessons learned when describing their management initiatives. Some licensees said that they had been audited and were in the process of correcting identified weaknesses, but did not mention what these weaknesses were. Of the 54 licensees, 30 did not have any information on lessons learned.

As much as possible, lessons learned information was taken directly from the NUMARC forms submitted by the licensees. In some cases, lessons learned information was combined with other information and was extracted.

ARIZONA PUBLIC SERVICE COMPANY

A quality assurance audit during early implementation of the program identified deficiencies in connection with the off-site laboratory. To correct these deficiencies, actions were taken to select a new off-site laboratory. However, problems with the reporting methods of this laboratory occurred, so additional action was taken to select another laboratory.

Arizona Public Service had originally specified 300 ng/ml as the screening cutoff level for methampetamines. Nichols advised us that it could not adopt that level because it uses a new monoclonal reagent specifically designed to detect methamphetamines and manufactured to calibrate to the DHHS screening cutoff of 1000 ng/ml. Both the manufacturer and Nichols studied the problem and suggested that we could revise our cutoff level to 1,000 ng/ml without compromising the effectiveness of the program. Since the reagent contains two antibodies, one to detect methamphetamines at 1,000 ng/ml and one to detect amphetamines at 300 ng/ml, we now specify those two screening cutoff levels.

Arizona Public Service learned that an off-site laboratory had erroneously reported that two specimens were positive for marijuana. The Medical Review Officer discovered this when requesting results from the lab and finding that two specimens had levels less than 15 ng/ml (the specified cutoff level for confirmatory tests) but had been reported as positives. Arizona Public Service has advised those two individuals who tested positive that their tests were negative and that their records had been corrected.

Arizona Public Service has learned that it is imperative to contract with an experienced laboratory that is large enough and flexible enough to handle special needs. We are also convinced that reliance on a laboratory's certification by DHHS must be supplemented by close monitoring of laboratory performance.

New procedures have been developed to implement Part 26 and these procedures have been revised to further enhance the program.

Additional measures were taken to improve the security at the collection/ testing facility located at the Palo Verde site.

Personnel changes have been made in the program administration to achieve closer supervision of the collection and testing area and to increase the level of regulatory/compliance experience within the group.

The annual requalification training for supervisors in behavioral observation has been placed on the Palo Verde computer-based training system. This will help to ensure consistent application of the training requirements.

A collection facility has been established in Phoenix to accommodate personnel at corporate offices. This will facilitate testing of those individuals who have infrequent access to the protected area.

Chain-of-custody forms with bar coding will be added to the program within the next eight to ten weeks. This will help reduce the potential for human error in data entry at the lab.

Arizona Public Service is planning to provide a new brochure which will again inform our personnel about our Employee Assistance and Fitness-for-Duty Programs.

ARKANSAS NUCLEAR ONE (ENTERGY OPERATIONS)

Our initial six months into this program has given rise to certain observations: 1. For this area, THC and alcohol are by far the drugs of preference. 2. All instances of presumptive positive tests for amphetamines have been attributed to prescribed and over-the-counter anorectics and cold preparations. There has been no indication of abuse of this class of drug and, furthermore, the pattern of use seems to be seasonal (Spring) in nature.

CAROLINA POWER & LIGHT

Approximately 3% of the average number of employees with unescorted access were randomly tested resulting in no violations. The conclusion is that the program's goals and objectives are being achieved.

Carolina Power & Light has one pool from which its workers are selected for random testing. The weekly testing rate is 2% of the corporate pool and year-to-date have tested 2,331 workers while the average number available for testing was 4,254 resulting in a year-to-date rate of 54.8%.

No conclusions can be drawn from the EAP utilization data based upon year-to-date information.

The employees in violation of the FFD program were referred to the EAP. The company's policy is to

terminate employment or to permanently deny the contractor access based upon a confirmed illegal drug test. Also, the company does offer rehabilitation for the first offense for a confirmed alcohol violation; therefore, of the three employees referred to the EAP, only one had their unescorted access reinstated. All contractors in violation of the FFD program were permanently denied access. Contractors are not provided company EAP services.

DUKE POWER COMPANY

McGuire Nuclear Station

A change was implemented in the badging and access procedure which would help ensure that access is not made at another Duke station when a badge has been placed on FFD hold.

Catawba Nuclear Station

The company realized that workers were able to determine when night testing would take place because they could see when the lights were on in the Medical Facility. Since that time the company has kept these lights on all the time so that workers are not able to tell when testing will take place.

DUQUESNE LIGHT COMPANY

The random generating computer program was pulling lists with several repeat names from a previous list. To respond to this problem, a new computer program has been formulated, and its progress is being monitored.

There is currently no method in place to check on our day-to-day progress in attempting to reach a random test number equal to 100% of the badged work force by year's end. A new software program can be formulated to help us track our daily progress. This software can also help us monitor the progress of our blind proficiency testing and our follow-up testing to ensure compliance with 10 CFR Part 26.

10 CFR Part 26 requires that the MRO contact the licensee within ten days of a presumptive positive screening test by the laboratory. The MRO was required to adjudicate each positive and was not always able to do so within ten days since the certified copy of the chain-of-custody form verifying the positive test was not always available. Arrangements have since been made to overnight express mail the chain-of-custody form to the MRO each day. In doing so, we are able to circumvent both the U.S. post office and the company mail system.

The FFD manager was not always immediately available to attend to situations in which her input was mandated. A list was published of the FFD manager's program representatives. These individuals are all well-versed in the FFD program. One of these individuals is now available at all times.

If a specimen is colder than 90.5 degrees F, this is reason to suspect that it is adulterated. Our thermometer only registered to 95 degrees F. In response, new thermometers were purchased which register down to 80.0 degrees F.

Two of our personnel were trained as instructors on the intoxilyser instrument. During this training, deficiencies were noted in our routine maintenance and care of these instruments. A monitored program was implemented to routinely rotate our intoxilysers out of service for maintenance and cleaning. This is all documented in permanent log books.

An individual came to the medical facility to be tested. He insisted on recording the entire procedure on a tape recorder. This was allowed. We subsequently determined that it is illegal to tape record someone without their permission by Pennsylvania State Law. The collection site is no longer to grant permission to tape record the collection procedure.

FLORIDA POWER & LIGHT

The random selection was changed from a daily to weekly process to increase the personnel selected/tested ratio and to facilitate testing across all shifts and days of week. The number of weekly random tests was scheduled to reach 100% in eleven months.

FLORIDA POWER CORPORATION

Random testing was not truly random in that during certain shifts the company did not collect specimens thereby establishing predictable periods during which workers would not be tested.

FPC revised its FFD program to perform testing during backshifts and will continue to evaluate the program to ensure that random drug testing is performed during all shifts.

Reporting requirement deficiency: FPC needs to determine what testing results qualify as "unsatisfactory performance testing results" for proper reporting.

FPC has since made some determination of what should be listed and reported as unsatisfactory laboratory performance.

Employees expressed a perception that a self-referral to the EAP would result in automatic termination.

FPC's policy already clarifies current practice for self-referrals. This will be re-communicated to employees in the annual FFD training.

GPU NUCLEAR

GPU Nuclear divided its population to be tested at each site between employees of the GPU system companies as one group and all other as another group. The number to be tested in each group varies depending upon the size of the subsets of the population on site during the week, such that the testing rate would reflect the weekly average of the subset population. However, the Parsippany licensee employees with unescorted access were randomly tested at a test rate less than 100% of the popula-

tion during this reporting period.

The shortfall of the Parsippany licensee employees was caused by individuals being unavailable for testing for valid reasons (e.g. vacation day, sick day, not on site, etc.). Therefore, the generated list was not large enough to allow for the exceptions to random testing and still maintain a testing rate of 100%.

GPU is in the process of completing the necessary modifications to the random selection system in order to correct those anomalies which occurred in the selection process as described above. The modifications should be completed by September 1, 1990. The testing program anticipates achieving a statistical testing rate of 100% for the entire year.

GULF STATES UTILITIES COMPANY

During the first six months of the FFD Program, RBS experienced five unsatisfactory blind performance test results. Two were due to human error at GSU's contract laboratory, one due to indeterminate reasons, and two involved the possible deterioration of contaminants in the BPT specimen. GSU has directed the BPT specimen supplier to:

1. Ensure the BPT specimen contaminant level is at least 20% above the established initial cutoff level.

2. Provide three gas chromatography/mass spectrometry (GC/MS) certifications on all positive batches. Two of these GC/MS certifications are to be performed by independent laboratories and the other by the supplier. The average of the three GC/MS tests shall be the certified contaminant level of the BPT specimen.

THE LIGHT COMPANY (HOUSTON LIGHTING & POWER COMPANY)

It was determined that there was a need to increase employee awareness with regard to heavy alcohol consumption during off-duty hours and the impact of the lowered positive alcohol level from 0.10 to 0.40% BAC. This was accomplished by an information program for employees and by presentations made during department staff meetings.

LONG ISLAND LIGHTING COMPANY

One program weakness was discovered during this reporting period. The Shoreham Fitness-for-Duty Alcohol and Drug Screening Procedure did not require alcohol testing during pre-access screening. Actions taken in this case were: 1) persons who did not receive the alcohol screening were identified and either had the screening performed or else had their badges pulled; 2) Emergency Planning verified that no unbadged personnel had been added to the EOF/TSC on-call list; 3) the internal checklists used by Emergency Planning and Screening and Badging were revised to ensure that the requirement for alcohol testing during pre-access screening was met; and 4) a revision to the Shoreham Fitness-for-Duty Alcohol and Drug Screening procedure was initiated.

MAINE YANKEE

The home or hotel numbers should be included on contractor pre-access and random forms to facilitate contact by the Medical Review Officers in the event of a presumptive positive test.

That open communications with employees is the key to successful implementation.

Some workers, for various reasons, take up to three hours to produce the required specimen.

Program implementation and maintenance is extremely expensive, and requires ongoing review and modification.

NEW YORK POWER AUTHORITY

Indian Point

As a result of low creatinine levels, it became necessary to involve the Medical Review Officer in policy decisions. The Physician provided guidelines to assist collection site personnel in determining the need to repeat the screen as a result of low creatinine.

An aggressive attitude towards initial training of employees and contractors was taken. Personnel were trained as supervisors or escorts. Upon evaluation, it was determined that no formal method had been developed to identify recently promoted personnel who would then require additional training. Immediate programmatic steps were taken to correct this weakness.

Analysis of the random testing data compiled for this report showed that the number of personnel tested during the six-month reporting interval fell short of the expected 50%. Upon review, the program director realized that the statistical base he had been monitoring was on the number of personnel selected for sampling as opposed to the actual number of personnel that had been tested. To meet the annual requirement of 100%, the test percentage has been increased.

Fitzpatrick

The report for a blind test specimen sent to the drug/alcohol testing laboratory on March 22, 1990, was not received by Fitzpatrick personnel as of May 29, 1990. Upon investigation it was discovered that the Medical Review Officer was still awaiting lab results of the blind test specimen. Further investigation revealed that the drug/alcohol testing laboratory had misplaced the blind test sample. The sample was later located by the laboratory. The MRO was informed that in the future he should notify Fitzpatrick personnel within five days if no response has been received from the laboratory on a blind test specimen.

An investigation was conducted in order to determine the reason for the misplacement of the blind test specimen. It was discovered that the courier of the drug/

alcohol testing laboratory contracted by the Fitzpatrick plant was removing test samples from sealed transport boxes and transferring them to larger containers. Fitzpatrick personnel informed the laboratory that this procedure is unacceptable since it can cause test samples to be misplaced. The laboratory courier now transports the test samples in their original sealed transport boxes.

A test sample which tested positive for cocaine was not declared a confirmed positive by the Medical Review Officer since the individual who provided the sample denied drug use and requested the aliquot of the original sample and split sample to be tested. The MRO decided to maintain the individual's site access while awaiting subsequent test results, citing legal reasons. The results of subsequent tests confirmed the positive result. The MRO decided, as a result of this incident, that in the future an individual's site access will be denied based on the positive result of the first drug/alcohol test performed.

If an individual is unable to void a 60 milliliter sample initially, the individual shall be detained in visual contact with the collection site person until the individual is able to void another specimen which, when combined with the first one, equals at least 60 milliliters. This procedure was put into effect when two test samples by the same individual on the same day produced conflicting test results. Since these samples did not contain the appropriate amount of liquid, the tests were ruled indeterminate.

NEW HAMPSHIRE YANKEE

Specifically developed plexiglass specimen holders were placed into use to more rapidly identify minimum collection size for compliance with 10 CFR Part 26 concerning a minimum of 60 ml of urine collected for laboratory analysis.

Development of a batch and non-batch reporting system in conjunction with SmithKline Beecham Clinical Laboratory, for use during outage situations.

Implementation of a graphic and analytical studies for systematic data evaluation.

Identification of the lack of 6-monoacetylmorphine testing by contract laboratory and subsequent implementation by contracted laboratory to comply with 10 CFR Part 26.

Installation of a facsimile machine to assist in better communication between the licensee, the medical review officer, and the contract laboratory.

The purchase of an evidential grade breath testing device for use upon activation of Emergency Operations Facility.

The purchase of a third IVAC temperature measuring device as a back-up for units currently in use and for use during plant shut-downs.

Computer enhancements to add additional reporting capabilities for use during statistical and analytical studies.

Computer enhancements to random selection process to ensure process equitability.

The development and implementation of a voluntary alcohol screening process to better meet the intent of 10 CFR Part 26.

The purchase and use of non-alcohol hand wipes in the screening lanes to ensure the hygiene of the screening technician and eliminating any possible chain-of-custody concerns by allowing the screening technician to remain stationary during the process.

The development of a form to be used by the Medical Review Officer for reporting any results other than routine negatives.

Changes were made to the bathroom structure in response to low temperature problems, to include the posting of signs specifically requesting specimens be returned to the collector as soon as possible, and the addition of foam pads on toilet tank covers in an attempt to alleviate temperature loss by conduction.

The prefabrication of blood alcohol kits to better expedite confirmatory testing. These kits include blood tubes, chain-of-custody forms, medical technician instructions, and chain-of-custody bags, along with a master checklist for implementation of confirmatory blood alcohol testing.

The posting of signs inside the screening facility explaining that readings below 0.003% BAC during the initial breath alcohol test should be considered zero. This was done to alleviate any concerns by station personnel on the technical capabilities of the evidential breath testing devices used in the screening lanes.

PENNSYLVANIA POWER & LIGHT COMPANY

Tracking supervisors, especially contractor supervisors, is difficult due to the dynamic nature of our work force. We will be sending lists of all badged personnel to cost center managers on a quarterly basis for the identification of any new supervisors and to ensure that training is given, if not already received. Once identified as a supervisor, individuals are entered into our Personnel Qualifications System through which annual retraining can be tracked by computer.

Incorporated FFD program management responsibilities into a new, on-site position which reports directly to the superintendent of the plant. This strengthens overall program management and reduces the number of persons receiving confidential information.

PORTLAND GENERAL ELECTRIC COMPANY

An audit of the FFD program produced two primary areas of concern:

The procedure to ensure that employees have not consumed alcohol within five hours of reporting for

nonscheduled work had not been adequately implemented in some cases. Further emphasis will be placed on the importance of call-in procedures to supervisors with call-in responsibilities.

Collection center instrument calibration techniques and PGE's stringent acceptability ranges for measuring PH and specific gravity for specimen integrity checks need to be reevaluated. PGE will develop and implement specific operating procedures with improved instrument calibration methodologies and revised specimen integrity check parameters.

The contract laboratory incorrectly reported a blind specimen as negative. On the same day, the laboratory was informed of the incident of false negative reporting and was requested to investigate the circumstances and to review all quality control data associated with confirmatory testing of that particular specimen. The laboratory ascertained that the sample was in fact positive. A review of this situation found that the false negative report was a result of an administrative error at the laboratory. PGE has required the following actions to be taken at the laboratory to prevent reoccurrence of this situation:

- The procedure for certifying scientist review of test results will be modified to check for discrepancies between records. All certifying scientists will be informed and instructed on this change.
- An additional review step will be included for all specimens that initially screen positive but for which the confirmatory GC/MS response is zero. This review will be performed by either the scientific director or one of the toxicology supervisors.

PUBLIC SERVICE ELECTRIC & GAS COMPANY

PSE&G recommends that the NRC consider removing opiates from the panel of drugs to be tested. We have found that testing for opiates significantly delays pre-access processing, and significantly undermines the program acceptance and credibility. M-A-M is only present for a very short period of time, and there is widespread use of opiate cough suppressants and analgesics. The present requirement that demands expensive GC/MS confirmation to supposedly "rule out heroin abuse" is extremely expensive due to the type of testing required for detection. In the five years of testing by PSE&G at its nuclear facilities, there have been no detected cases of heroin abuse. In addition to the problem with cough suppressant and analgesics, widespread consumption of food containing poppy seeds and the common knowledge that poppy seeds may result in a positive drug test result make it almost impossible to declare a positive per the rule. A significant amount of expense can be eliminated by removing opiates from the panel of drugs tested in areas of the country and/or states where heroin abuse does not appear to be common.

PSE&G strongly believes that a FFD program cannot be functionally practiced as only a drug and alcohol detection/deterrence program. The level of decision making involves more than just review of drug and alcohol results. Medical Review Officer (MRO) involvement is essential and critical to a properly functioning FFD program. PSE&G mentions this since the DOT is considering the removal of the MRO review requirement for all test results.

ROCHESTER GAS & ELECTRIC COMPANY

As a result of an FFD audit, RG&E discovered that, while the contractor had submitted the required FFD certification documents, two employees had not taken the alcohol test. Although RG&E had not pre-approved the contractor's FFD program, the pre-badge drug tests were conducted by a HHS-certified laboratory and were negative.

Upon investigation, RG&E has determined that there were no adverse results of this error as both contractor employees worked in a crew environment and were continuously under direct behavior observation by RG&E employees.

To prevent this situation from occurring in the future, RG&E will require contractors to identify both the date and the laboratories conducting the drug and alcohol tests on the FFD program certification documents.

SOUTHERN CALIFORNIA EDISON COMPANY

Some administrative difficulties were encountered in the re-sorting of the blind specimens due to the packaging methods of BDA-supplied positive and negative samples. These difficulties involved some chain-of-custody discrepancies which have now been corrected and reconciled. At no time was program testing adversely affected since the problems were strictly limited to the blind sample process. All blind sample pre-screen results and NIDA-certified lab results are now in agreement. Additionally, internal administrative procedures have been strengthened and a kit packaging change has been instituted by the vendor to preclude further problems in this area of the program.

SYSTEMS ENERGY RESOURCES

At the onset of testing, several presumptive positive specimens sent by GGNS to the HHS-certified confirmation laboratory were determined to be negative at the confirmation laboratory on their initial test. Occasionally, a presumptive positive specimen at GGNS would be sent to the confirmation laboratory for analysis only to be negative on their initial test. This led to the assumption that these inaccuracies were due to differences in the type of drug analysis equipment used at GGNS and the confirmation laboratory.

GGNS's drug analysis equipment utilizes EPIA technology while the confirmation laboratory was using the EMIT technology. Careful analysis of the two systems by the confirmation laboratory and representatives for Abbott Laboratories disclosed that there are differences between the two systems that could account for the variances in results. It has been determined that the Abbott drug assays utilizing EPIA are more sensitive and more susceptible to react to certain drug analogues of the opiate and amphetamine classes, such as substances found mostly in over-the-counter medications. The Fitness-for-Duty Program management is pleased with the overall performance of the Abbott equipment and contractually specified that the confirmation laboratory use the same type of equipment.

This eliminated the variances that were occurring between the on-site laboratory and the off-site laboratory. GGNS has contracts with two confirmation laboratories for redundancy purposes. This system should minimize dependence on one laboratory in the case that there is an event (i.e., decertification, unsatisfactory blind performance specimen test result, etc.) that limits the confirmation laboratory's performance.

TU ELECTRIC

FFD Management submitted blind sample containers with seals that had been tampered with along with normal daily collections. The medical staff were not as conscientious as expected in noting the tampered specimens. Corrective action was taken with medical laboratory management.

UNION ELECTRIC COMPANY

A FFD program person was called out on a weekend to activate temporary power to our cooling storage units for specimens. Upon arrival, the person was informed that work was in progress to restore normal power. The FFD program person waited nearly six hours while service personnel attempted unsuccessfully to restore normal power, before activating the temporary power.

Since this occurrence, FFD program personnel subject to being called out to activate the temporary power supply have been instructed to activate the power supply within a two-hour time frame.

The Union Electric Company has discontinued on-site testing of FFD program personnel. This action was taken to avoid situations in which FFD personnel might see a presumptive test that belongs to them and worry unnecessarily about the results.

VIRGINIA ELECTRIC & POWER COMPANY

The quality assurance department conducted a three-month assessment of the FFD program including a review of the FFD procedures. The resulting changes to the procedures require individuals responding to an emergency call-out to perform a self-assessment of their fitness for duty based on criteria issued to each responder. The FFD procedures now clearly convey the assessment process and the means by which responders should report for duty during an emergency.

Also, as a result of a quality assurance audit during the second quarter, proper on-site test facility air conditioning is being provided for the test equipment's operating parameters.

WISCONSIN PUBLIC SERVICE CORPORATION

A random computer program was written to select the day and shift for each random test date. Implementation began in May of 1990. Prior to that date, this selection was administratively controlled.

The following companies did not provide information on lessons learned (N=30):

Alabama Power Company
Baltimore Gas & Electric
Boston Edison
Commonwealth Edison Company
Consolidated Edison Company of New York
Consumers Power Company
Detroit Edison
Entergy Operations, Inc. (Louisiana)
Georgia Power Company
Illinois Power Company
Indiana Michigan Power Company
Iowa Electric Light & Power Company
Nebraska Public Power District
Niagara Mohawk Power Corporation
Northeast Utilities
Northern States Power Company
Omaha Public Power District
Pacific Gas & Electric Company
Philadelphia Electric Company
Public Service Company of Colorado
Sacramento Municipal Utility District
South Carolina Electric & Gas Company
Tennessee Valley Authority
Toledo Edison
Vermont Yankee Nuclear Power Corporation
Washington Public Power Supply System
Wisconsin Electric
Wolf Creek Nuclear Operating Corporation
Yankee Atomic Electric Company

January 31, 1991

Joseph H. Autry, III, M.D.
Director, Division of Applied Research
Room 9 A 54
National Institute on Drug Abuse
Department of Health and Human Services
Rockville, MD 20857

Dear Dr. Autrey:

The attached report is forwarded for your use as appropriate. It has been compiled to summarize industry experience from January 3 to June 30, 1990, with drug testing required by 10 CFR Part 26.

The information contained in the report comes from all current power reactor licensees. Fifty-four utilities submitted 84 reports, representing 75 nuclear nuclear power plant sites and 9 corporate offices. In all cases, the reported results pertain to confirmed positive test results which were verified by the Medical Review Officer.

Sincerely,

Brian K. Grimes, Director
Division of Reactor Inspection
and Safeguards
Office of Nuclear Reactor Regulation

Attachment:
As stated

Distribution:
RSGB r/f
DRIS r/f
E. McPeek
L. Bush
P. McKee
B. Grimes
Central Files
PDR

Identical Letter sent to:
Mr. Richard Enkeboll
Nuclear Management and Resources Council
Suite 300
1776 Eye Street, N.W.
Washington, D.C. 20006-2496

OFC	:RSGB:NRR	:RSGB:NRR	:RSGB:NRR	:D:DRIS:NRR	:	:
NAME	:EMcPeek:cb	:LBush	:PMcKee	:BKGrimes	:	:
DATE	:1/24/91	:1/27/91	:1/29/91	:1/ /91	:	:

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FITNESS FOR DUTY IN THE NUCLEAR POWER INDUSTRY

SUMMARY OF SEMI-ANNUAL PROGRAM PERFORMANCE REPORTS

(JANUARY 3 THROUGH JUNE 30, 1990)

N. Durbin
S. Murphy
T. Fleming
J. Olson

January, 1991

Prepared for
U.S. Nuclear Regulatory Commission

Battelle Human Affairs Research Centers
Pacific Northwest Laboratory

EXECUTIVE SUMMARY

On June 7, 1989, the NRC published a rule in the Federal Register (10 CFR Part 26, Fitness-for-Duty Programs) requiring that each licensee authorized to operate or construct a nuclear power reactor implement a fitness-for-duty (FFD) program for all personnel having unescorted access to the protected area of the plant. This rule became effective on July 7, 1989, with an implementation date of January 3, 1990. A central element of the required FFD program is the drug and alcohol testing program. This report summarizes the 84 semi-annual reports on FFD program performance provided to the NRC by 54 utilities as required by 10 CFR Part 26.

During the period January 3 to June 30, 1990, licensees reported that they had conducted 137,953 tests for illegal drugs and alcohol. Of these tests, 1,313 (0.95%) were positive.

A majority of the positive test results (875) were obtained through pre-access testing. Of tests conducted on workers having access to the protected area, there were 299 positive tests from random testing, 90 positive tests from for-cause testing, and 11 positive tests from periodic and other categories of testing. Follow-up testing of workers resulted in 38 positive tests. For-cause testing resulted in the highest percentage of positive tests; over 25 percent of for-cause tests were positive. This compares to positive test results in under 1.5 percent of pre-access tests and under 0.5 percent of random tests.

Positive test results also varied by category of worker. Overall, short-term contractor personnel had the highest rates of positive tests (1.35%). Licensee and long-term contractor personnel had lower rates of positive test results (.61% and .86%, respectively).

Of all drugs tested, marijuana was responsible for the majority of positive test results, followed by cocaine and alcohol.

Positive test results and categories of drugs identified varied by region. Regional variations reported here are considered preliminary because a six-month period is not long enough for all sites to have a comparable range of experiences (for example, not all sites have had an outage) and because interpretations of reporting requirements varied by utility. Since such differences may have a substantial impact on the percentage of positive test results, regional differences should be interpreted with caution.

Preliminary results indicate that Region IV had the lowest overall percentage of positive tests (.67%); while other regions had percentages of about 1 percent. Marijuana accounted for the largest percentage of positive test results in all regions except Region I, where cocaine was responsible for the highest percentage. Positive test results for cocaine differed dramatically across regions, accounting for only 14.8 percent of all positive tests in Region V compared to 37.9 percent in Region I. Region V had a higher percentage of positive test results for amphetamines (8.0%) than other regions.

Many licensees provided detailed accounts of lessons learned during the reporting period. A brief summary of lessons learned is presented in Section V of this report and a complete compilation is provided in Appendix C.

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INTRODUCTION

Since the late 1970s, the U.S. Nuclear Regulatory Commission (NRC) has been concerned with the potential impact on the health and safety of the public of fitness-for-duty (FFD) problems among personnel with unescorted access to protected areas in commercial nuclear power plants. As the nationwide epidemic of drug abuse grew, it became apparent that the nuclear power industry was not immune to its effects. In response, and with the cooperation and support of the industry, the NRC published a rule on June 7, 1989, in the *Federal Register* (10 CFR Part 26, Fitness-for-Duty Programs), requiring each licensee authorized to operate or construct a nuclear power reactor to implement a FFD program for all personnel having unescorted access to the protected area of the plant. This rule became effective on July 7, 1989, with an implementation date of January 3, 1990. The rule established broad requirements for the control of FFD problems stemming from illegal drug use, alcohol abuse, abuse of legal drugs, and any other mental or physical problems that could impair performance or that in other ways raised questions about the reliability and trustworthiness of employees or their ability to safely and competently perform their duties.

A central element of the required FFD program is the drug testing program. This element is designed to both deter and detect the use of illegal drugs and the misuse of alcohol and other legal drugs. Because of the importance of this element, the NRC has required that power reactor licensees provide semi-annual reports on the results of their drug testing programs. These reports are to provide the NRC with information on the effectiveness of individual programs and of the programs as a whole in minimizing the impact of drugs and alcohol on the plants. The reports are also of use to the industry as it attempts to improve and refine FFD programs. The NRC anticipates publishing these reports periodically.

This report has been compiled to summarize industry experience to date. It is based on the semi-annual program performance reports covering the period from January 3 to June 30, 1990, and contains information on positive test results by category of test, category of drug, category of worker found to be abusing drugs, and region. The information contained in this report comes from all current power reactor licensees. Fifty-four utilities submitted 84 reports, representing 75 nuclear power plant sites and 9 corporate offices. In all cases, the results pertain to *confirmed* positive test results. A detailed description of the technical background for the FFD program performance reports is provided in Appendix A. Of particular use to the industry is the compilation of lessons learned provided by licensees (Appendix C).

Several observations are in order. First, overall positive test rates appear to be quite low; however, these rates continue to represent a substantial number of nuclear workers or applicants identified as having drug or alcohol problems. Thus, while the NRC and industry may have reason to be encouraged by these results, additional progress can be made. Second, while reporting appears to have been fairly complete and systematic, there are a few points where clarification is needed. Appendix A of this report provides this clarification.

The NRC welcomes suggestions concerning the content of this report. Comments should be forwarded to:

Mr. Loren Bush
Chief of Program Development and
Review Section
Division of Reactor Inspection and
Safeguards
U.S. Nuclear Regulatory Commission
Room 9D24
Washington, D.C. 20555

SECTION 1: OVERALL TEST RESULTS

This section contains information on drug and alcohol testing results for each category of test required by 10 CFR Part 26. The test results are reported in five categories: pre-access, random, for-cause, follow-up, and other. The definitions of these categories are given in Table 1.

The number of tests performed and the number of positive tests results are reported in Table 2. A total of 137,953 tests were reported in 84 FFD program performance reports provided by 54 utilities (75 sites and 9 corporate headquarters). The overall positive rate was slightly less than 1 percent (0.95%) across all categories of tests. Although this percentage may seem small, in absolute numbers 1,313 workers or applicants tested positive for drugs and/or alcohol. Pre-access testing identified 875 applicants or workers as having positive test results. Of those workers who had unescorted access to the protected area, 299 were identified as having positive test results for drugs or alcohol based on random tests and 90 were found positive based on for-cause tests.

Figure 1 provides a graphic representation of the numbers in Table 2. Random and pre-access testing resulted in similar numbers of tests (61,066 and 73,577, respectively) and, when combined, these two types of test accounted for the overwhelming majority of tests performed (134,643 tests; 97.60% of all tests reported). Comparing the number of positive test results, pre-access testing accounted for the majority of all positive tests,

Table 2
Test Results by Test Category

	Number of Tests	Positive Tests	Percent Positive
Pre-Access	61,066	875	1.43%
Random	73,577	299	0.41%
For-Cause	356	90	25.28%
Follow-Up	1105	38	3.44%
Other	1849	11	0.60%
TOTAL	137,953	1313	0.95%

(875; 66.6%) followed by random (299; 22.8%) and for-cause testing (90; 6.9%).

Figure 2 shows the percentage of confirmed positive tests for each category of test. The percentage for each category was calculated by summing the number of positive tests in each test category and dividing it by the total number of tests conducted in that category. For-cause testing resulted in the highest percentage of positive tests (25.3%). This is an expected result, since for-cause tests are based on referral by a supervisor trained in behavioral

Table 1
Definitions of Test Categories

PRE-ACCESS	This category combines results from pre-employment and pre-badging tests.
RANDOM	Random testing refers to a system of unannounced and unpredictable drug testing administered in a statistically random manner to a group so that all persons within that group have an equal probability of selection.
FOR-CAUSE	The "for-cause" testing category includes the results of tests based on behavioral observation programs, based on credible information that an individual is abusing drugs or alcohol, or based on a reasonable suspicion that drugs or alcohol may have been involved in a specific event (i.e., post-accident).
FOLLOW-UP	Follow-up testing refers to chemical testing at unannounced intervals to ensure that an employee is maintaining abstinence from the abuse of drugs or alcohol.
OTHER	The "other" testing category is used for all types of drug and alcohol testing reported by licensees that were not specifically required by the rule. In some cases, the basis for testing was unclear; therefore, as discussed in Appendix A, these results should be interpreted with care.

* *These definitions are based on the definitions given in Section 26.3 in 10 CFR Part 26 and on explanations of the FFD performance data in the form provided to licensees by NUMARC. In some cases, categories from the reporting form were combined to mirror the categories covered in the rule. Categories of testing not included in 10 CFR 26 were combined as "other". For a full discussion of the categories and separate results of all test categories reported, see Appendix A: Technical Background and Appendix B: Supporting Data.*

observation techniques or on credible information indicating inappropriate drug and alcohol use. (Post-accident tests were included in this category; however, there were no positive test results from the 21 post-accident tests reported; see Appendix B, Table B1.) Unfortunately, no information is available regarding the type of drugs that resulted in positive for-cause tests; hence, the ability of supervisors to detect the use of specific drugs and alcohol cannot be determined. Of the pre-access tests, 1.4 percent were positive; 0.4 percent of the random tests were positive.

Summary of Major Findings

- Drug and/or alcohol use in violation of 10 CFR Part 26 was confirmed in about 1 percent of the tests.
- Most of the positive tests were among workers who never attained access to the protected area. Nonetheless, nearly 400 workers with access tested positive across the industry in the six-month period.

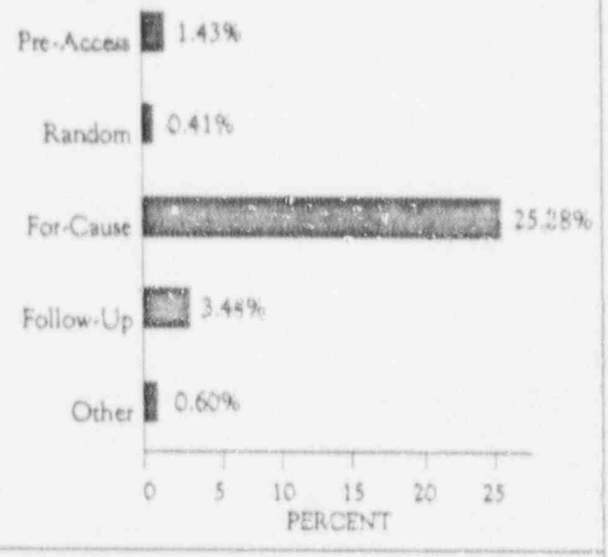


Figure 2
Percent of Positive Tests in Each Test Category

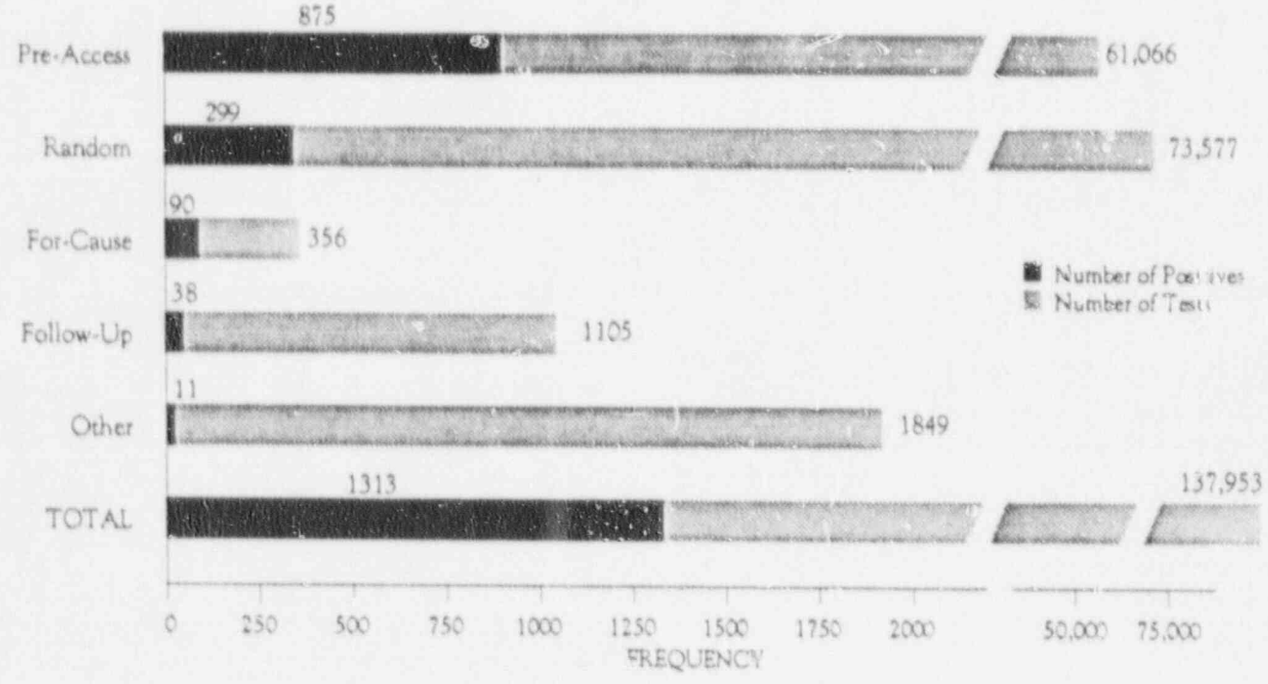


Figure 1
Comparison of Test Categories

SECTION 2: TEST RESULTS BY WORKER CATEGORY

This section examines test results for three categories of workers: licensee employees, long-term contractors, and short-term contractors. The basis for the distinction among workers is provided in Appendix A.

For licensee employees, the majority of tests (50,402) were a result of the random testing program, while for short-term contractors, the majority of tests (41,613) were a result of pre-access testing (see Table 3). Long-term contractor personnel experienced about the same number of pre-access and random tests (3,741 and 4,193, respectively). These differences indicate that licensee employees (and, to a lesser extent, long-term contractors) usually experience one pre-access test and then remain under a random testing program. In contrast, short-term contractor personnel may experience many pre-access tests at a number of sites, but spend less time than licensee employees or long-term contractors under a random testing program. Figure 3 shows these differences in percentages. For licensee employees, 23 percent of all tests were pre-access and 73 percent were random; for short-term contractors, the proportions are reversed, with 68 percent of tests in the pre-access category and 31 percent in the random category. Long-term contractor personnel had about half of their tests in each category. For-cause testing, follow-up testing, and other testing together account for only about 4 percent of the tests taken by licensee employees and about 1 percent of the tests taken by contractor personnel.

Figure 4 compares positive test results for licensee employees, long-term contractor and short-term contractor personnel. In all test categories except follow-up tests, the percentages of positive test results were higher for short-term contractor personnel than for either licensee or long-term contractor personnel.

In pre-access testing, short-term contractors tested positive about 40 percent more often than did workers in either of the other categories (1.56% of all pre-access tests performed on short-term contractor personnel were positive, compared to 1.17% for licensee employees and 1.15% for long-term contractors). Because of the large number of pre-access tests experienced by short-term contractors and the percentage of positive test results obtained, positive pre-access test results from short-term contractors accounted for almost half (648) of all positive test results (see Table 3).

Random testing also produced different percentages of positive results across categories of workers. Short-term contractors had more than twice the percentage of positive test results found among licensee employees

Table 3
Test Results by Test Category and Worker Category

TYPE OF TEST	LICENSEE EMPLOYEES	LONG-TERM CONTRACTORS	SHORT-TERM CONTRACTORS	TOTAL	PERCENT
PRE-ACCESS					
Number Tested	15,712	3,741	41,613	61,066	
Number Positive	184	43	648	875	1.43%
RANDOM					
Number Tested	50,402	4,193	18,982	73,577	
Number Positive	153	20	126	299	0.41%
FOR-CAUSE					
Number Tested	182	26	148	356	
Number Positive	40	6	44	90	25.28%
FOLLOW-UP					
Number Tested	916	4	185	1105	
Number Positive	36	0	2	38	3.44%
OTHER					
Number Tested	1,514	63	272	1849	
Number Positive	6	0	5	11	0.60%
TOTAL					
Number Tested	68,726	8,027	61,200	137,953	
Number Positive	419	69	825	1313	0.95%

(0.66% and 0.30%, respectively; see Figure 4). Hence, although licensee employees experienced more than twice as many random tests as did short-term contractors, the two categories of workers had similar numbers of positive test results (126 for short-term contractors compared to 153 for licensee employees).

There are similarities between the percentages of positive results from for-cause testing for licensee employees and long-term contractors—in each group, about 22 percent tested positive. A higher percentage of short-term contractors, about 30 percent, had positive test results from for-cause tests.

Follow-up testing was used primarily for licensee employees (n=916 tests), less often for short-term contractors (n=185 tests), and almost never for long-term contractor personnel (n=4 tests).

Positive results for follow-up testing were close to 4 percent for licensee employees, and slightly above 1 percent for short-term contractors. Of the four follow-up tests conducted on long-term contractor personnel, none were positive (see Figure 4).

In all, there were 229 confirmed positive test results among licensee employees (not including pre-access or follow-up tests) and 184 referrals to Employee Assistance Programs. Seventy eight licensee employees had their access restored during the six-month period from January 3 to June 30, 1990.

"Other" tests were conducted for various reasons, preventing a meaningful interpretation of these test results.

Summary of Major Findings

- Positive test rates were higher for pre-access testing than for random testing, and were highest of all for for-cause testing.
- Licensee employees and long-term contractor personnel had about the same positive test rate. Short-term contractor personnel had considerably higher positive test rates for both random and pre-access testing.

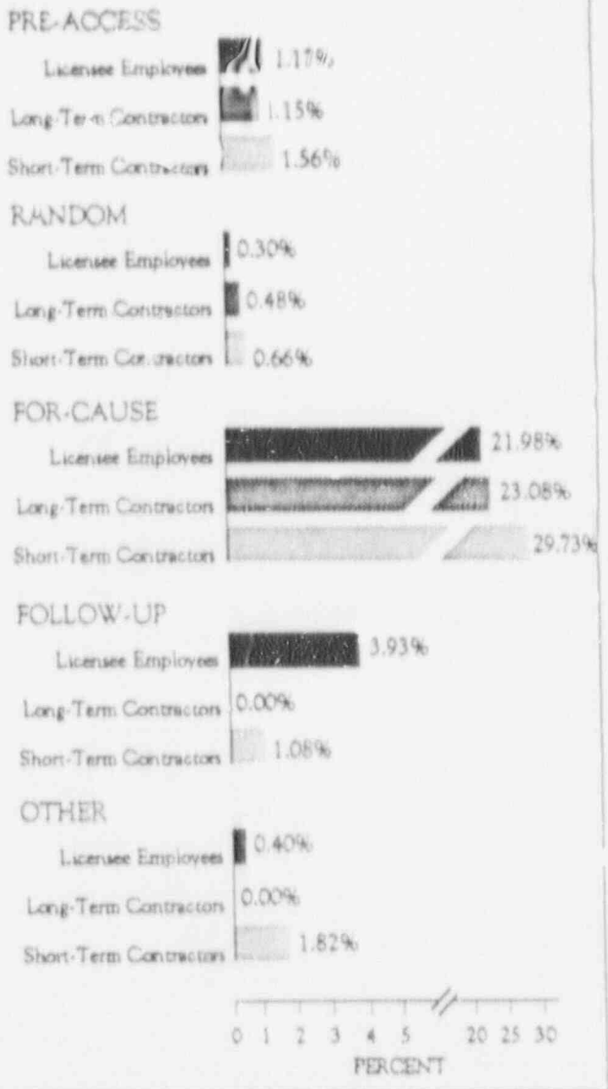


Figure 4
Comparison of Test Outcomes by Worker Category

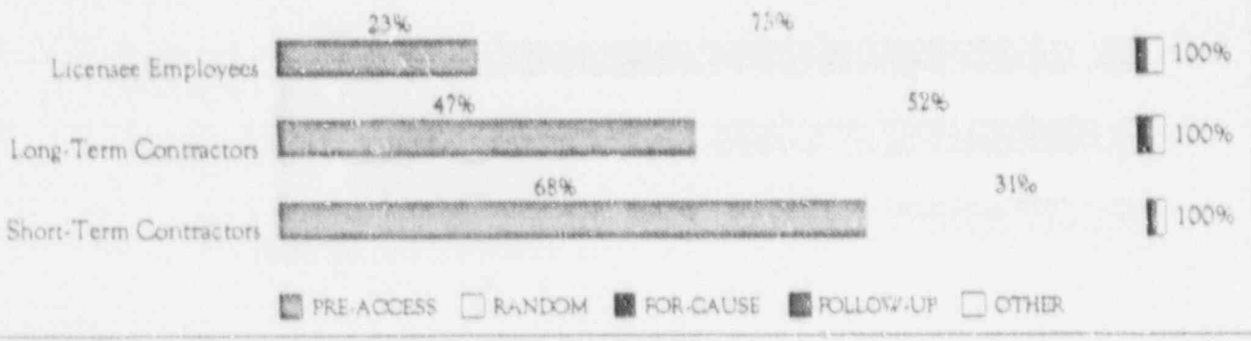


Figure 3
Comparison of Test Category Percentages by Worker Category

SECTION 3: TEST RESULTS BY DRUG CATEGORY

The FFD rule (10 CFR Part 26) requires that the number of confirmed positive test results also be reported by drug category. Part A of this section examines the number of confirmed positive results for each of the six substances specified by the rule: marijuana, cocaine, opiates, amphetamines, phencyclidine, and alcohol. Part B of this section reports the results from tests using screening levels lower than those required by 10 CFR 26. Part C reports the results of testing for additional drugs.

The information presented here is reported as if all program performance reports used the same interpretation of the reporting requirements. Unfortunately, reporting instructions for substances were interpreted in different ways. In some cases, only positive results that were confirmed by the Medical Review Officer (MRO) were included. In other cases, all results that were confirmed positive by GC/MS screening were included. Some sites that routinely do tests on two aliquots from each sample reported two positive test results; others counted both as one positive result, since they come from the same sample.

Part A: Positive test results by drug category

This section includes only positive test results for the five drugs specified in 10 CFR Part 26 and for alcohol. The total number of confirmed positive test results for substances is expected to differ from the total number of confirmed positive results by test category. This difference occurs because refusals to take tests are not included in the reports on substances. In addition, positive tests for drugs not specified in 10 CFR Part 26 are not included in this section. Finally, poly-drug use by an individual results in one positive test but more than one substance is detected.

Figure 5 shows the percentage of positive test results for each category of drug and for alcohol specified in 10 CFR Part 26. Of the total confirmed positive tests by substance (n=1,341 confirmed positive test results), the majority (51.83%) were positive for marijuana. Cocaine was next, with 26.40 percent of the total confirmed positive tests, followed by alcohol (15.36%). Opiates, amphetamines, and phencyclidines together accounted for less than 7 percent of all positive drug tests.

The variations in reporting noted above may mean that the absolute number of positive test results reported in each drug category is high. This is particularly likely in the case of amphetamines and opiates, since positive results for these substances are often ruled by the MRO to have been caused by other, legal substances. However, the positive results for amphetamines and opiates represent fairly small shares of all positive results (2.2% and 4.0%, respectively), so this data collection problem should not have a substantial impact on the ratio between the various substances being detected in tests.

In other words, regardless of the actual number of positive test results, for the panel of drugs specified by 10 CFR Part 26, one would expect that marijuana would account for about half of the positive results; cocaine for over a quarter; alcohol for about 15 percent; and amphetamines, opiates, and phencyclidines for about 6.5 percent.

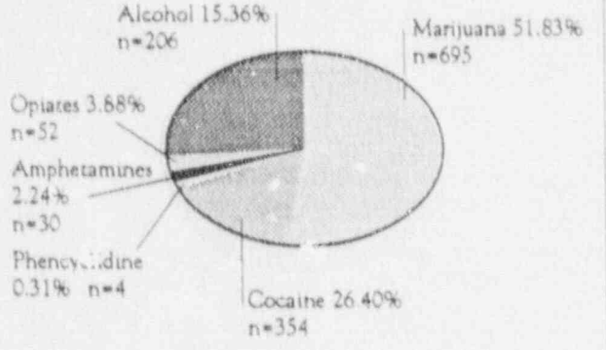


Figure 5
Confirmed Positives by Drug Category

Part B: Lower Screening Levels

The fitness-for-duty rule (10 CFR Part 26) provides flexibility by allowing licensees to use lower cutoff levels than those specified in the NIDA guidelines provided in 10 CFR Part 26. Although only a few licensees used lower cutoff levels for cocaine and opiates, many licensees used lower levels for initial screening tests for marijuana.

Thirty-eight of the 84 sites used levels lower than the NRC level of 100 nanograms per milliliter (ng/ml); 27 used 50 ng/ml; and 11 used 20 ng/ml for initial screening. Figure 6 compares the rate of positive tests found using these different cutoff levels for marijuana. These rates were calculated by summing the number of positive test results for marijuana for each cutoff level and dividing them by the number of tests using that cutoff category. As shown in Figure 6, licensees using lower cutoff levels had a higher percentage of positive test results: at 20 ng/ml, about 8 tests out of 1,000 were positive; at 50 ng/ml, about 5 tests out of 1,000 were positive; and at 100 ng/ml, about 4 tests out of 1,000 were positive.

Although some licensees used lower cutoff levels for other substances, no reportable differences in the percentage of positive test results were identified. Levels used for cocaine did not differ for initial screening (all licensees used 300 ng/ml) and two licensees reported

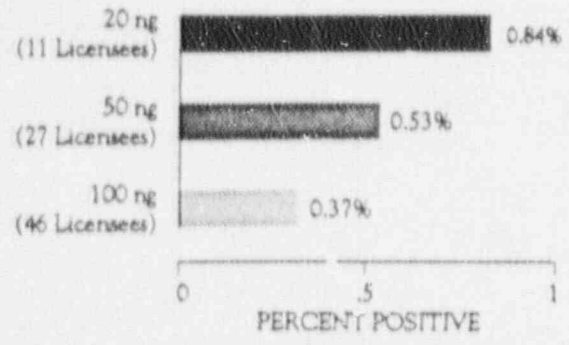


Figure 6
Confirmed Positives for Marijuana by Screen Level

using a lower level (50 or 100 ng/ml) for confirmation. A few licensees (11) used lower confirmation levels for opiates. Amphetamines were screened at 300 ng/ml by five sites and confirmed at levels of 300 ng/ml and below at four sites, compared to the maximum levels of 1000 ng/ml and 500 ng/ml specified by 10 CFR Part 26. (See Appendix A for a summary of the screening levels specified in 10 CFR Part 26.)

Part 3: Additional Drugs

Thirty-nine sites reported testing for a broader panel of drugs than the five specified in the rule. All 39 sites testing for additional drugs tested for benzodiazepines; 32 tested for barbiturates, 19 tested for methaqualone, 10 tested for methadone, 2 tested for methamphetamines, and 4 tested for propzyphrine. Table 4 lists the number of licensees testing for each additional drug, the total number of tests performed by all licensees testing for each additional drug, the number of positive test results, and the percentage of positive test results. There were no positive test results for three of the drugs; methaqualone, methadone, and methamphetamines. There were a total of 24 positive test results for barbiturates, 28 for benzodiazepines, and 4 for propzyphrine.

The most common additional drugs tested were benzodiazepines and barbiturates. Figure 7 reports on the test outcomes for the 32 licensees testing for both of these additional drugs. It provides the percentages of positive tests for the panel of drugs included in 10 CFR Part 26, and for benzodiazepine and barbiturates. For these 32 sites, benzodiazepines and barbiturates accounted for 3.86 percent and 3.17 percent of positive tests, respectively. This

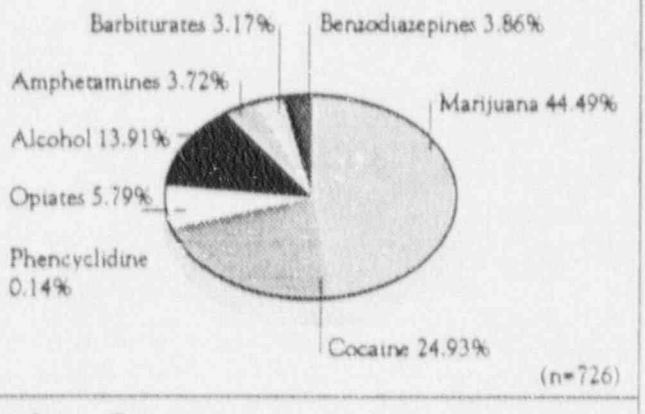


Figure 7
Confirmed Positives by Drug Category Including Benzodiazepines and Barbiturates

Table 4
Test Results for Additional Drugs

	Number of Licensees	Number of Tests Performed	Number of Positives	Percent Positive
Barbiturates	32	62,286	24	0.04%
Benzodiazepines	39	73,061	28	0.04%
Propzyphrine	4	7,752	4	0.05%
Methadone	10	19,709	0	0.00%
Methaqualone	19	32,846	0	0.00%
Methamphetamines	2	5,473	0	0.00%

is a percentage comparable to amphetamines, and substantially higher than phencyclidine.

Summary of Major Findings

- Marijuana was found to be the major drug of abuse, accounting for over 50 percent of all positive tests.
- Cocaine and alcohol also accounted for significant proportions (about 25% and 15%) of all positive tests.
- Using lower screening cutoff levels for marijuana than were required (20 ng/ml vs. 100 ng/ml) more than doubled the confirmed positive test rate.
- Among the sites testing for additional drugs, barbiturates and benzodiazepines were the drugs most frequently added to the panel. These drugs accounted for small but significant percentages of confirmed positives for those sites that included them.

SECTION 4: TEST RESULTS BY REGION

In this section, information on testing programs is summarized for each of the NRC administrative regions. (Regions are identified in Appendix A.) Region IV sites reported the lowest percentage of positive test results (0.67%), while Region III had the highest (1.16%) (see Figure 8). Since the rate of positive test results may change as all licensees experience scheduled outages, these differences represent preliminary findings.

The percentage of all positive test results accounted for by a particular drug varied by region. Figure 9 summarizes these data by region for each drug. Marijuana accounted for the highest percentage of positive test results in Region III (62%), the majority of positive test results in Regions II and IV (54% in each), and less than half of all positive test results in Regions I and V (37% and 41%). The highest percentage of positive results from cocaine was in Region I (38%), and the lowest percentage in Region V (15%).

In general, opiates and amphetamines represented a substantially smaller percentage of positive tests than did marijuana and cocaine. Region V was an exception; here, opiates and amphetamines together accounted for 17 percent of all positive test results. As noted earlier, these differences may reflect differences in reporting practices across regions. Positive tests for phencyclidine were only reported in Regions I, II, and III.

The percentages of all positive test results accounted for by alcohol varied substantially across regions. Region IV had the highest percentage, at 26 percent; Region V, the lowest, at 8 percent.

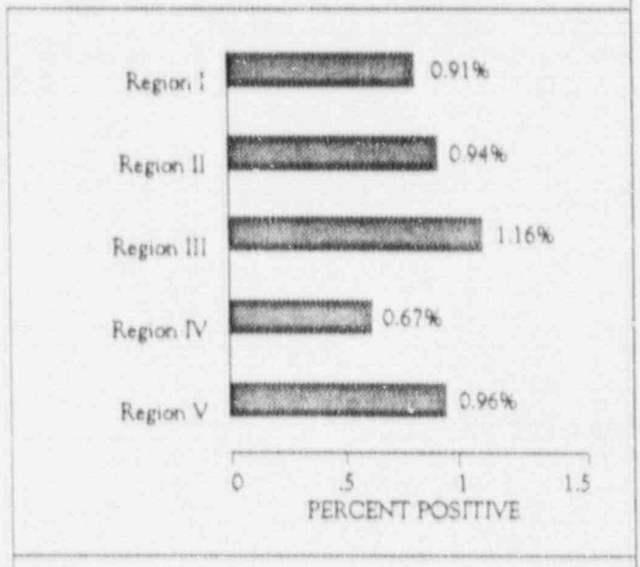


Figure 8
Confirmed Positives: Regions I-V

Summary of Major Findings

- The pattern of findings varied from region to region.
- Region IV had the lowest overall test rate and Region III had the highest.

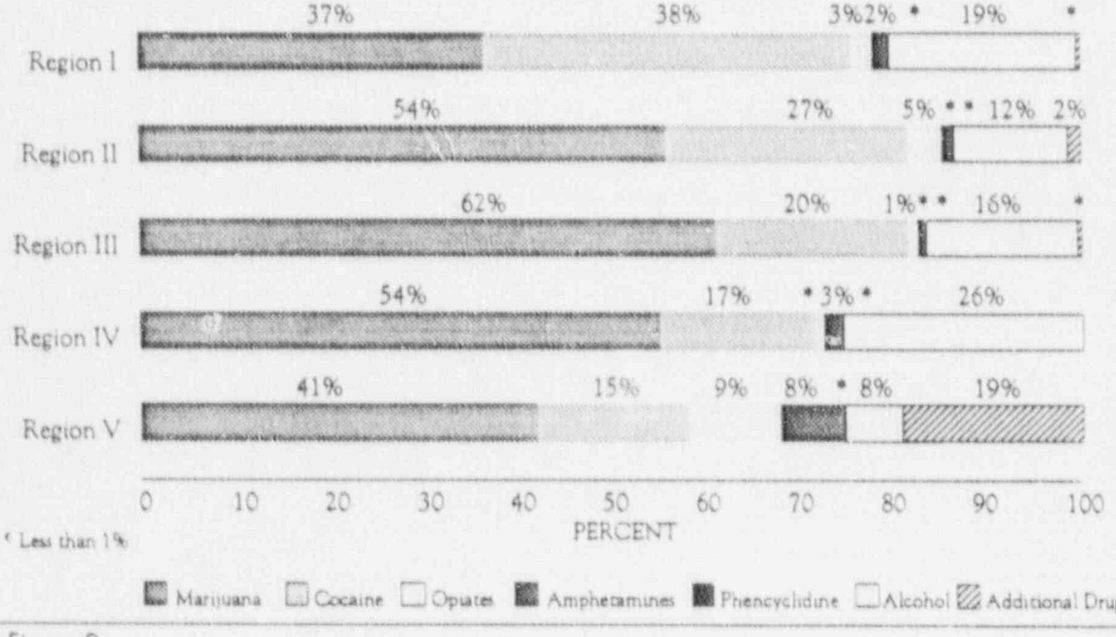


Figure 9
Confirmed Positives by Drug Category: Regions I-V

SECTION 5: LESSONS LEARNED

As part of the FFD program performance report, many licensees reported on lessons learned during the initial implementation of the FFD program. Below is a brief listing of some of the problems noted and solutions suggested in these reports. This is not intended as a full summary of the reports, and many additional and useful suggestions are found in the full compilation of reported lessons learned that is provided in Appendix C.

Many licensees reported problems with HHS-certified labs. Some solutions included:

- using a large and flexible lab
- improvement of the procedures to ensure that unsatisfactory lab performance is reported
- implementation of a procedure to certify a scientist review of discrepancies between test results
- increased monitoring of laboratory performance and testing criteria.

Many licensees noted difficulties in ensuring a random and unannounced random testing program at a 100 percent rate. Several improvements were noted:

- testing on the backshift
- modifications to the random selection process
- computer enhancements.

In a number of licensee reports, issues regarding the collection facility and on-site testing were raised. Frequently, inappropriate test sample collection materials were used initially. Licensees responded by:

- providing improved packaging of material
- changing procedures for handling test samples
- developing procedures for test sample collection.

Concerns regarding FFD training requirements were cited in several instances. These concerns included:

- annual requalification training for supervisors in behavioral observation
- the requirement for additional training of supervisors and escorts
- training of contract supervisors.

Several licensees noted difficulties with assuring that all personnel covered by 10 CFR Part 26 are tested under the random testing program. Licensees responses included:

- addition of a collection facility at corporate offices for those with infrequent access to protected areas
- off-site testing of FFD personnel.

Several licensees noted the need for complete procedures and reported additional procedures that had been written. Procedures developed to support the FFD program addressed:

- call-in protocol
- test sample collection and handling
- laboratory monitoring
- maintenance of site facility instrumentation.

Various aspects of FFD program management were raised by the licensees. Specific issues addressed were:

- the difficulties of providing program management oversight from a corporate office and the requirement for on-site management
- the necessity for procedures for MRO reviews and reports and the requirement to involve the MRO in policy decisions
- the availability requirements of the FFD manager.

APPENDIX A

Technical Background

This section includes:

- A description of the data used as the basis of the report
- A list of the utilities and sites providing data for this report
- Additional detail on the definitions of categories used in the report
- Other relevant information (e.g. the substances required by 10 CFR Part 26).

Data Source

The data for this study are drawn from the semi-annual reports on FFD program performance that were submitted in accordance with 10 CFR Part 26 by all NRC licensees authorized to operate or construct a nuclear power reactor. Eighty-four forms were received from 54 utilities—75 from sites and 9 from corporate offices (see Table A1). The form used was a standardized data collection form developed by NUMARC to fulfill Part 26.71(d) of the rule. This part of the rule specifies that the data reported shall include:

- random testing rate
- drugs tested and cutoff levels, including results of tests using lower cutoff levels and tests for other drugs
- workforce populations tested
- numbers of tests and results by population and type of test (i.e., pre-badging, random, for-cause, etc.)
- substances identified
- summary of management actions
- a list of events reported.

The number of positive tests for overall results of testing and the number of tests identifying specific substances are not expected to be equal. A total of 1,313 positive test results were reported and a total of 1,397 substances were identified. There are several reasons for this difference:

- A refusal to test is documented as a positive result but does not identify a substance.
- Poly-substance abuse is counted as one positive result but results in the identification of more than one substance (a positive test for both marijuana and alcohol would be counted as two substances for example).
- Licensees interpreted reporting instructions for specific drugs in different ways. In some cases, only positive results that were confirmed by the Medical Review Officer (MRO) were included. In other cases, all results that were confirmed positive by GC/MS screening were included.
- Some sites that routinely do tests on two aliquots from each sample reported one positive test result but two positive tests for the substance identified, others counted both as one positive result, since they come from the same sample.

Table A1

List of Utilities Submitting Reports for Sites and Corporate Offices

COMPANY/PLANT(S)	COMPANY/PLANT(S)	COMPANY/PLANT(S)
1 Alabama Power Farley 1 & 2	18 GPU Nuclear Corporation Three Mile Island 1 Oyster Creek 1 Corporate Office	37 Public Service Gas & Electric Hope Creek 1 Salem 1 & 2
2 Arizona Public Service Palo Verde 1, 2, 3	19 Gulf States Utilities River Bend 1	38 Public Service of New Hampshire Seabrook 1
3 Arkansas Arkansas Nuclear One 1 & 2	20 Houston Light & Power South Texas 1 & 2	39 Rochester Gas & Electric Ginna
4 Baltimore Gas & Electric Calvert Cliffs 1 & 2	21 Illinois Power Clinton 1	40 Sacramento Municipal Utility Rancho Seco 1
5 Boston Edison Pilgrim	22 Indiana & Michigan Electric Cook 1 & 2	41 South Carolina Electric & Gas Summer 1
6 Carolina Power & Light Robinson 2 Brunswick 1 & 2 Shearon Harris Corporate Office	23 Iowa Electric Duane Arnold	42 Southern California Edison San Onofre 1, 2, & 3
7 Cleveland Elec. Illum. Perry 1 & 2	24 Long Island Lighting Shoreham	43 Systems Energy Resources Grand Gulf 1 & 2
8 Commonwealth Edison Byron 1 & 2 Braidwood 1 & 2 Zion 1 & 2 Dresden 2 & 3 Quad Cities 1 & 2 Lasalle 1 & 2 Corporate Office	25 Louisiana Power & Light (Entergy) Waterford 3	44 Tennessee Valley Authority Bellafonte 1 & 2 Browns Ferry 1, 2, & 3 Sequoyah 1 & 2 Watts Bar 1 & 2
9 Colorado (Public Service) Fort St. Vrain	26 Maine Yankee Atomic Power Maine Yankee	45 Texas Utility Elec. (TU Electric) Comanchee Peak 1 & 2
10 Consolidated Edison Indian Point 1 & 2	27 Nebraska Public Power District Cooper Station	46 Toledo Edison Davis Besse 1
11 Consumers Power Palisades Big Rock Point Corporate	28 Niagara Mohawk Power Nine Mile Point 1 & 2	47 Union Electric Callaway 1
12 Detroit Edison Fermi 2	29 Northeast Utilities Haddam Neck Millstone 1 & 3 Corporate Office	48 Vermont Yankee Nuclear Power Vermont Yankee 1
13 Duke Power McGuire 1 & 2 Oconee 1, 2, & 3 Catawba 1 & 2 Corporate Office	30 Northern States Power Monticello Prairie Island 1 & 2 Corporate Office	49 Virginia Electric & Power North Anna 1 & 2 Surry 1 & 2 Innsbrook (Corporate)
14 Duquesne Light Beaver Valley 1 & 2	31 Omaha Public Power District Fort Calhoun	50 Washington Public Power Supply WNP-1 & 2
15 Florida Power & Light Turkey Point 3 & 4 St. Lucie 1 & 2	32 Pacific Gas & Electric Diablo Canyon 1 & 2	51 Wisconsin Electric Power Point Beach 1 & 2
16 Florida Power Corporation Crystal River 3	33 Pennsylvania Power & Light Susquehanna 1 & 2	52 Wisconsin Public Service Kewaunee
17 Georgia Power Hatch 1 & 2 Vogtle 1 & 2	34 Philadelphia Electric Limerick 1 & 2 Peach Bottom 2 & 3 Corporate Office	53 Wolf Creek Nuclear Wolf Creek 1
	35 Portland General Electric Trojan	54 Yankee Atomic Electric Yankee-Rowe 1
	36 Power Authority, New York Indian Point 3 Fitzpatrick	

Testing Categories

The following testing categories were included in the analyses presented in this report. These definitions are based on the definitions given in 26 of 10 CFR and on explanations of the FFD performance data in the form provided to licensees by NUMARC.

Pre-access

This category combines results from pre-employment and pre-badging tests. The pre-employment testing category is limited to those persons seeking employment in the nuclear power portion of the company. The pre-badging category refers to current employees applying for positions in the company that require unescorted access to the protected area. These categories are combined in the body of this report. Because some licensees combined pre-employment and pre-badging test results and reported them together under pre-employment, a clear comparison of the positive rates for the two different tests is not possible.

Random Tests

Random testing refers to a system of unannounced and unpredictable drug testing administered to a group in a statistically random manner so that all persons within that group have an equal probability of selection.

For-cause

For-cause testing is performed based on behavioral observation programs or on credible information that an individual is abusing drugs or alcohol. Also included in this category is post-accident testing, administered because of the occurrence of specific events (e.g., accidents resulting in injuries).

Follow-up Testing

Follow-up testing refers to chemical testing at unannounced intervals to ensure that an employee is maintaining abstinence from the abuse of drugs or alcohol.

Other

This category includes results from the periodic testing conducted by some licensees coincident with annual physicals or similar periodic events. Results reported in the NUMARC form's "Other" category are also included. Instructions accompanying the form do not define what testing should be included in this category. In one case, a licensee reported including a specific number of blind test results in the "Other" category—these were omitted prior to data analysis. In most cases, however, there are no specifics regarding what is included in the "Other" category.

Tables B1, B2, and B3 present the number of tests, number positive, and average percent positive for each of the test categories requested on the NUMARC form.

Worker Categories

Results for three categories of workers were requested in the NUMARC forms. The following categories were used:

Licensee employees

Licensee employees work for the utility and are covered by the fitness-for-duty rule. This category includes both nuclear power plant workers and also corporate or support staff. Companies were asked to report the results for corporate or support staff separately. Only nine companies reported separate corporate results. On average, there were 1,184 licensee employees included in each report.

Long- and short-term contractors

The division of contractor personnel into long- and short-term categories is optional for licensees. The explanation in the NUMARC form suggests that any contractor working for six months or less be considered short-term. Licensees who did not divide contractors into short- and long-term were instructed to report test results for all contractors under the short-term category and to record "N/A" in the long-term category. This means that some long-term contractor test results may be reported under the short-term contractor category; however, no short-term contractor results should be recorded under the long-term category. Because plants varied in their definitions of long- and short-term contractors, any comparisons between rates of positive test results for the two groups should be viewed with caution. On average, there were 305 long-term contractors and 654 short-term contractors included in each report.

Tables B2 and B3 present the number of tests, number positives, and average percent positive by each test category included in the NUMARC form for licensee employees and all contractor employees (B2) and for long- and short-term contractors (B3) separately.

Drug Categories

Substances included in 10 CFR Part 26

The rule requires testing for five drugs and alcohol. Table A2 shows the maximum screening levels and confirmation levels required by the rule.

Plants are permitted to set cutoff levels lower than those specified in the NIDA guidelines. Many licensees chose to do so for at least one category of drugs, as indicated by their reports. However, several plants using lower cutoff levels failed to record the number of positive test results for *both* NIDA guidelines and their own cutoff levels. For this report, the test result reports for lower cutoff levels are assumed to apply to all categories of tests. However, one plant noted that it used lower cutoff levels for certain categories of testing (e.g., pre-access). Information of this type was not provided by other licensees.

Additional Drugs

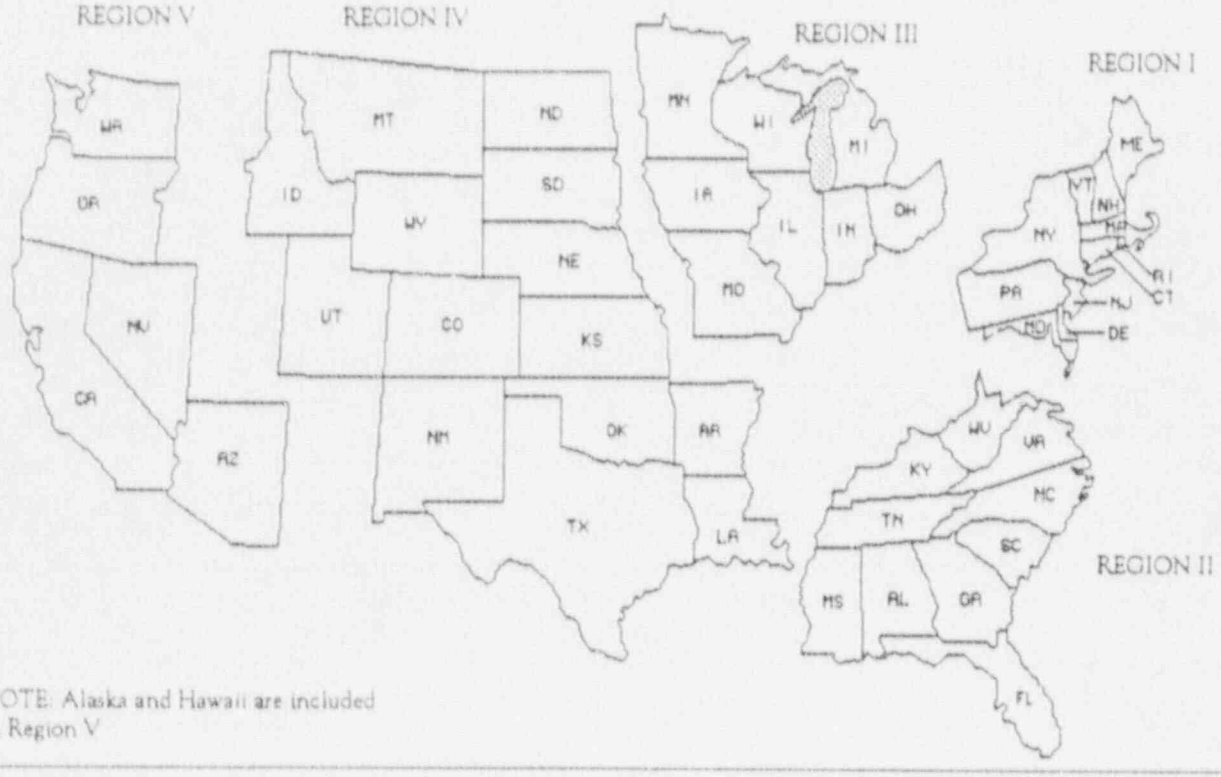
Many plants also tested for drugs other than the six (five illegal and alcohol) categories required by the rule. Information on the number of sites testing for other drugs is presented in Table B4. This information is categorized by region. The table indicates that the additional drugs most often tested for were barbiturates and benzodiazepines.

Table A2
Maximum Screening and Confirmation Levels Required by 10 CFR Part 26

Drug	Screening Level	Confirmation Level
Marijuana	100	15
Cocaine	300	150
Opiates	300	300
Phencyclidine	25	25
Amphetamines	1,000	500
Alcohol	0.04% BAC	0.04% BAC

Regions

The country is divided into five regions, corresponding with NRC administrative regions as shown in Figure A1. Table A6 indicates the number of sites in each region that report testing for additional drugs. Table A7 shows the results of testing for alcohol, marijuana, cocaine, amphetamines, opiates, and phencyclidine.



NOTE: Alaska and Hawaii are included in Region V

Figure A1
Geographic Location of NRC Regions I-V

APPENDIX B

Supporting Data

Table B1:
Test Results by NUMARC Form Test Category
(January through June, 1990)

TEST CATEGORIES	NUMBER
PRE-EMPLOYMENT	
Number Tested	15,507
Number Positive	181
Average Percent Positive	1.17
PRE-BADGING	
Number Tested	45,559
Number Positive	694
Average Percent Positive	1.52
PERIODIC	
Number Tested	1,278
Number Positive	3
Average Percent Positive	0.23
FOR-CAUSE	
Number Tested	335
Number Positive	90
Average Percent Positive	26.87
POST-ACCIDENT	
Number Tested	21
Number Positive	0
Average Percent Positive	0
RANDOM	
Number Tested	73,577
Number Positive	299
Average Percent Positive	0.41
FOLLOW-UP	
Number Tested	1,105
Number Positive	38
Average Percent Positive	3.44
OTHER	
Number Tested	571
Number Positive	8
Average Percent Positive	1.40
TOTAL	
Number Tested	137,953
Number Positive	1,313
Average Percent Positive	0.95

Table B2
Test Results By NUMARC Form Test Category By Licensee Employees and Contractor Personnel
(January through June, 1990)

TESTING CATEGORIES	LICENSEE EMPLOYEES	CONTRACTOR (Long-term/ Short-term)
PRE-EMPLOYMENT		
Number Tested	6,446	9,061
Number Positive	64	117
Average Percent Positive	.99	1.29
PRE-BADGING		
Number Tested	9,266	36,293
Number Positive	120	574
Average Percent Positive	1.30	1.58
PERIODIC		
Number Tested	1,099	179
Number Positive	2	1
Average Percent Positive	.18	0.56
FOR-CAUSE		
Number Tested	167	168
Number Positive	40	50
Average Percent Positive	23.95	29.76
POST-ACCIDENT		
Number Tested	15	6
Number Positive	0	0
Average Percent Positive	0	0
RANDOM		
Number Tested	50,402	23,175
Number Positive	153	146
Average Percent Positive	0.30	0.63
FOLLOW-UP		
Number Tested	916	189
Number Positive	36	2
Average Percent Positive	3.93	1.06
OTHER		
Number Tested	415	156
Number Positive	4	4
Average Percent Positive	0.96	2.56
TOTAL		
Number Tested	68,726	69,227
Number Positive	419	894
Average Percent Positive	0.61	1.29

Table B3

Test Results By NUMARC Form Test Category By Long-term and Short-term Contractor Personnel

(January through June, 1990)

TESTING CATEGORIES	LONG-TERM CONTRACTOR	SHORT-TERM CONTRACTOR
PRE-EMPLOYMENT		
Number Tested	334	8,727
Number Positive	3	114
Average Percent Positive	.90	1.31
PRE-BADGING		
Number Tested	3,407	32,886
Number Positive	40	534
Average Percent Positive	1.17	1.62
PERIODIC		
Number Tested	57	122
Number Positive	0	1
Average Percent Positive	0	0.82
FOR-CAUSE		
Number Tested	26	142
Number Positive	6	44
Average Percent Positive	23.08	30.99
POST-ACCIDENT		
Number Tested	-	6
Number Positive	-	0
Average Percent Positive	-	0
RANDOM		
Number Tested	4,193	18,982
Number Positive	20	126
Average Percent Positive	0.48	0.66
FOLLOW-UP		
Number Tested	4	185
Number Positive	0	2
Average Percent Positive	0	1.08
OTHER		
Number Tested	6	150
Number Positive	0	4
Average Percent Positive	0	2.67
TOTAL		
Number Tested	8,027	61,200
Number Positive	69	825
Average Percent Positive	0.86	1.35

Table B4

Test Results For Additional Drugs

TYPE OF DRUG	REGION I	II	III	IV	V	TOTAL
BARBITURATES						
Number of Licensees Testing	11	10	3	4	4	32
Number of Tests Performed	13,789	23,193	4,646	6,227	14,431	62,286
Number of Positives	2	5	2	0	15	24
Percent Positive	.02	.02	.04	0	.10	.04
BENZODIAZEPINES						
Number of Licensees Testing	11	10	10	4	4	39
Number of Tests Performed	13,789	23,193	15,421	6,227	14,431	73,061
Number of Positives	1	5	0	0	22	28
Percent Positive	.01	.02	0	0	.15	.04
PROPZYPHRINE						
Number of Licensees Testing	3	0	0	0	1	4
Number of Tests Performed	3,121	0	0	0	4,631	7,752
Number of Positives	0	0	0	0	4	4
Percent Positive	0	0	0	0	.09	.05
METHADONE						
Number of Licensees Testing	5	1	1	1	2	10
Number of Tests Performed	6,821	3,274	1,386	1,055	7,173	19,709
Number of Positives	0	0	0	0	0	0
Percent Positive	0	0	0	0	0	0
METHAQUALONE						
Number of Licensees Testing	7	7	1	2	2	19
Number of Tests Performed	6,812	15,534	1,386	3,136	5,978	32,846
Number of Positives	0	0	0	0	0	0
Percent Positive	0	0	0	0	0	0
METHAMPHETAMINES						
Number of Licensees Testing	0	0	0	1	1	2
Number of Tests Performed	0	0	0	1,651	3,822	5,473
Number of Positives	0	0	0	0	0	0
Percent Positive	0	0	0	0	0	0
Total Number of Positives	3	10	2	0	52	56

Table B.5

Positive Test Results By Region and By Substance

	REGION I (n=24)	REGION II (n=23)	REGION III (n=22)	REGION IV (n=9)	REGION V (n=6)
Total Tests	35,273	44,591	27,798	13,352	16,948
Total Positive*	321	417	323	90	162
Positive	.91%	.94%	1.16%	.67%	.96%
Confirmed Positives by Drug					
Marijuana	123	226	206	49	91
Cocaine	127	114	65	15	33
Opiates	9	20	3	0	20
Amphetamine	6	2	1	3	18
Phencyclidine	2	1	1	0	0
Alcohol	65	45	54	24	18
Total Reported*	332	408	330	91	180

**Total positive test results and total reported positive results for specific substances are not expected to be the same.*

APPENDIX C

Compilation of Lessons Learned Reported by Licensees

In general, the information provided on lessons learned varied among licensees. Few of the licensees had specifically identified sections on lessons learned. Some licensees indirectly referred to lessons learned when describing their management initiatives. Some licensees said that they had been audited and were in the process of correcting identified weaknesses, but did not mention what these weaknesses were. Of the 54 licensees, 30 did not have any information on lessons learned.

As much as possible, lessons learned information was taken directly from the NUMARC forms submitted by the licensees. In some cases, lessons learned information was combined with other information and was extracted.

ARIZONA PUBLIC SERVICE COMPANY

A quality assurance audit during early implementation of the program identified deficiencies in connection with the off-site laboratory. To correct these deficiencies, actions were taken to select a new off-site laboratory. However, problems with the reporting methods of this laboratory occurred, so additional action was taken to select another laboratory.

Arizona Public Service had originally specified 300 ng/ml as the screening cutoff level for methampetamines. Nichols advised us that it could not adopt that level because it uses a new monoclonal reagent specifically designed to detect methamphetamines and manufactured to calibrate to the DHHS screening cutoff of 1000 ng/ml. Both the manufacturer and Nichols studied the problem and suggested that we could revise our cutoff level to 1,000 ng/ml without compromising the effectiveness of the program. Since the reagent contains two antibodies, one to detect methamphetamines at 1,000 ng/ml and one to detect amphetamines at 300 ng/ml, we now specify those two screening cutoff levels.

Arizona Public Service learned that an off-site laboratory had erroneously reported that two specimens were positive for marijuana. The Medical Review Officer discovered this when requesting results from the lab and finding that two specimens had levels less than 15 ng/ml (the specified cutoff level for confirmatory tests) but had been reported as positives. Arizona Public Service has advised those two individuals who tested positive that their tests were negative and that their records had been corrected.

Arizona Public Service has learned that it is imperative to contract with an experienced laboratory that is large enough and flexible enough to handle special needs. We are also convinced that reliance on a laboratory's certification by DHHS must be supplemented by close monitoring of laboratory performance.

New procedures have been developed to implement Part 26 and these procedures have been revised to further enhance the program.

Additional measures were taken to improve the security at the collection/ testing facility located at the Palo Verde site.

Personnel changes have been made in the program administration to achieve closer supervision of the collection and testing area and to increase the level of regulatory/compliance experience within the group.

The annual requalification training for supervisors in behavioral observation has been placed on the Palo Verde computer-based training system. This will help to ensure consistent application of the training requirements.

A collection facility has been established in Phoenix to accommodate personnel at corporate offices. This will facilitate testing of those individuals who have infrequent access to the protected area.

Chain-of-custody forms with bar coding will be added to the program within the next eight to ten weeks. This will help reduce the potential for human error in data entry at the lab.

Arizona Public Service is planning to provide a new brochure which will again inform our personnel about our Employee Assistance and Fitness-for-Duty Programs.

ARKANSAS NUCLEAR ONE (ENTERGY OPERATIONS)

Our initial six months into this program has given rise to certain observations: 1. For this area, THC and alcohol are by far the drugs of preference. 2. All instances of presumptive positive tests for amphetamines have been attributed to prescribed and over-the-counter anorectics and cold preparations. There has been no indication of abuse of this class of drug and, furthermore, the pattern of use seems to be seasonal (Spring) in nature.

CAROLINA POWER & LIGHT

Approximately 38% of the average number of employees with unescorted access were randomly tested resulting in no violations. The conclusion is that the program's goals and objectives are being achieved.

Carolina Power & Light has one pool from which its workers are selected for random testing. The weekly testing rate is 2% of the corporate pool and year-to-date have tested 2,331 workers while the average number available for testing was 4,254 resulting in a year-to-date rate of 54.8%.

No conclusions can be drawn from the EAP utilization data based upon year-to-date information.

The employees in violation of the FFD program were referred to the EAP. The company's policy is to

terminate employment or to permanently deny the contractor access based upon a confirmed illegal drug test. Also, the company does offer rehabilitation for the first offense for a confirmed alcohol violation; therefore, of the three employees referred to the EAP, only one had their unescorted access reinstated. All contractors in violation of the FFD program were permanently denied access. Contractors are not provided company EAP services.

DUKE POWER COMPANY

McGuire Nuclear Station

A change was implemented in the badging and access procedure which would help ensure that access is not made at another Duke station when a badge has been placed on FFD hold.

Catawba Nuclear Station

The company realized that workers were able to determine when night testing would take place because they could see when the lights were on in the Medical Facility. Since that time the company has kept these lights on all the time so that workers are not able to tell when testing will take place.

DUQUESNE LIGHT COMPANY

The random generating computer program was pulling lists with several repeat names from a previous list. To respond to this problem, a new computer program has been formulated, and its progress is being monitored.

There is currently no method in place to check on our day-to-day progress in attempting to reach a random test number equal to 100% of the badged work force by year's end. A new software program can be formulated to help us track our daily progress. This software can also help us monitor the progress of our blind proficiency testing and our follow-up testing to ensure compliance with 10 CFR Part 26.

10 CFR Part 26 requires that the MRO contact the licensee within ten days of a presumptive positive screening test by the laboratory. The MRO was required to adjudicate each positive and was not always able to do so within ten days since the certified copy of the chain-of-custody form verifying the positive test was not always available. Arrangements have since been made to overnight express mail the chain-of-custody form to the MRO each day. In doing so, we are able to circumvent both the U.S. post office and the company mail system.

The FFD manager was not always immediately available to attend to situations in which her input was mandated. A list was published of the FFD manager's program representatives. These individuals are all well-versed in the FFD program. One of these individuals is now available at all times.

If a specimen is colder than 90.5 degrees F, this is reason to suspect that it is adulterated. Our thermometer only registered to 95 degrees F. In response, new thermometers were purchased which register down to 80.0 degrees F.

Two of our personnel were trained as instructors on the intoxilyser instrument. During this training, deficiencies were noted in our routine maintenance and care of these instruments. A monitored program was implemented to routinely rotate our intoxilyzers out of service for maintenance and cleaning. This is all documented in permanent log books.

An individual came to the medical facility to be tested. He insisted on recording the entire procedure on a tape recorder. This was allowed. We subsequently determined that it is illegal to tape record someone without their permission by Pennsylvania State Law. The collection site is no longer to grant permission to tape record the collection procedure.

FLORIDA POWER & LIGHT

The random selection was changed from a daily to weekly process to increase the personnel selected/tested ratio and to facilitate testing across all shifts and days of week. The number of weekly random tests was scheduled to reach 100% in eleven months.

FLORIDA POWER CORPORATION

Random testing was not truly random in that during certain shifts the company did not collect specimens thereby establishing predictable periods during which workers would not be tested.

FPC revised its FFD program to perform testing during backshifts and will continue to evaluate the program to ensure that random drug testing is performed during all shifts.

Reporting requirement deficiency: FPC needs to determine what testing results qualify as "unsatisfactory performance testing results" for proper reporting.

FPC has since made some determination of what should be listed and reported as unsatisfactory laboratory performance.

Employees expressed a perception that a self-referral to the EAP would result in automatic termination.

FPC's policy already clarifies current practice for self-referrals. This will be re-communicated to employees in the annual FFD training.

GPU NUCLEAR

GPU Nuclear divided its population to be tested at each site between employees of the GPU system companies as one group and all other as another group. The number to be tested in each group varies depending upon the size of the subsets of the population on site during the week, such that the testing rate would reflect the weekly average of the subset population. However, the Parsippany licensee employees with unescorted access were randomly tested at a test rate less than 100% of the popula-

tion during this reporting period.

The shortfall of the Parsippany licensee employees was caused by individuals being unavailable for testing for valid reasons (e.g. vacation day, sick day, not on site, etc.). Therefore, the generated list was not large enough to allow for the exceptions to random testing and still maintain a testing rate of 100%.

GPU is in the process of completing the necessary modifications to the random selection system in order to correct those anomalies which occurred in the selection process as described above. The modifications should be completed by September 1, 1990. The testing program anticipates achieving a statistical testing rate of 100% for the entire year.

GULF STATES UTILITIES COMPANY

During the first six months of the FFD Program, RBS experienced five unsatisfactory blind performance test results. Two were due to human error at GSU's contract laboratory, one due to indeterminate reasons, and two involved the possible deterioration of contaminants in the BPT specimen. GSU has directed the BPT specimen supplier to:

1. Ensure the BPT specimen contaminant level is at least 20% above the established initial cutoff level.

2. Provide three gas chromatography/mass spectrometry (GC/MS) certifications on all positive batches. Two of these GC/MS certifications are to be performed by independent laboratories and the other by the supplier. The average of the three GC/MS tests shall be the certified contaminant level of the BPT specimen.

THE LIGHT COMPANY (HOUSTON LIGHTING & POWER COMPANY)

It was determined that there was a need to increase employee awareness with regard to heavy alcohol consumption during off-duty hours and the impact of the lowered positive alcohol level from 0.10 to 0.40% BAC. This was accomplished by an information program for employees and by presentations made during department staff meetings.

LONG ISLAND LIGHTING COMPANY

One program weakness was discovered during this reporting period. The Shoreham Fitness-for-Duty Alcohol and Drug Screening Procedure did not require alcohol testing during pre-access screening. Actions taken in this case were: 1) persons who did not receive the alcohol screening were identified and either had the screening performed or else had their badges pulled; 2) Emergency Planning verified that no unbadged personnel had been added to the EOF/TSC on-call list; 3) the internal checklists used by Emergency Planning and Screening and Badging were revised to ensure that the requirement for alcohol testing during pre-access screening was met; and 4) a revision to the Shoreham Fitness-for-Duty Alcohol and Drug Screening procedure was initiated.

MAINE YANKEE

The home or hotel numbers should be included on contractor pre-access and random forms to facilitate contact by the Medical Review Officers in the event of a presumptive positive test.

That open communications with employees is the key to successful implementation.

Some workers, for various reasons, take up to three hours to produce the required specimen.

Program implementation and maintenance is extremely expensive, and requires ongoing review and modification.

NEW YORK POWER AUTHORITY

Indian Point

As a result of low creatinine levels, it became necessary to involve the Medical Review Officer in policy decisions. The Physician provided guidelines to assist collection site personnel in determining the need to repeat the screen as a result of low creatinine.

An aggressive attitude towards initial training of employees and contractors was taken. Personnel were trained as supervisors or escorts. Upon evaluation, it was determined that no formal method had been developed to identify recently promoted personnel who would then require additional training. Immediate programmatic steps were taken to correct this weakness.

Analysis of the random testing data compiled for this report showed that the number of personnel tested during the six-month reporting interval fell short of the expected 50%. Upon review, the program director realized that the statistical base he had been monitoring was on the number of personnel selected for sampling as opposed to the actual number of personnel that had been tested. To meet the annual requirement of 100%, the test percentage has been increased.

Fitzpatrick

The report for a blind test specimen sent to the drug/alcohol testing laboratory on March 22, 1990, was not received by Fitzpatrick personnel as of May 29, 1990. Upon investigation it was discovered that the Medical Review Officer was still awaiting lab results of the blind test specimen. Further investigation revealed that the drug/alcohol testing laboratory had misplaced the blind test sample. The sample was later located by the laboratory. The MRO was informed that in the future he should notify Fitzpatrick personnel within five days if no response has been received from the laboratory on a blind test specimen.

An investigation was conducted in order to determine the reason for the misplacement of the blind test specimen. It was discovered that the courier of the drug/

alcohol testing laboratory contracted by the Fitzpatrick plant was removing test samples from sealed transport boxes and transferring them to larger containers. Fitzpatrick personnel informed the laboratory that this procedure is unacceptable since it can cause test samples to be misplaced. The laboratory courier now transports the test samples in their original sealed transport boxes.

A test sample which tested positive for cocaine was not declared a confirmed positive by the Medical Review Officer since the individual who provided the sample denied drug use and requested the aliquot of the original sample and split sample to be tested. The MRO decided to maintain the individual's site access while awaiting subsequent test results, citing legal reasons. The results of subsequent tests confirmed the positive result. The MRO decided, as a result of this incident, that in the future an individual's site access will be denied based on the positive result of the first drug/alcohol test performed.

If an individual is unable to void a 60 milliliter sample initially, the individual shall be detained in visual contact with the collection site person until the individual is able to void another specimen which, when combined with the first one, equals at least 60 milliliters. This procedure was put into effect when two test samples by the same individual on the same day produced conflicting test results. Since these samples did not contain the appropriate amount of liquid, the tests were ruled indeterminate.

NEW HAMPSHIRE YANKEE

Specifically developed plexiglass specimen holders were placed into use to more rapidly identify minimum collection size for compliance with 10 CFR Part 26 concerning a minimum of 60 ml of urine collected for laboratory analysis.

Development of a batch and non-batch reporting system in conjunction with SmithKline Beecham Clinical Laboratory, for use during outage situations.

Implementation of a graphic and analytical studies for systematic data evaluation.

Identification of the lack of 6-monoacetylmorphine testing by contract laboratory and subsequent implementation by contracted laboratory to comply with 10 CFR Part 26.

Installation of a facsimile machine to assist in better communication between the licensee, the medical review officer, and the contract laboratory.

The purchase of an evidential grade breath testing device for use upon activation of Emergency Operations Facility.

The purchase of a third IVAC temperature measuring device as a back-up for units currently in use and for use during plant shut-downs.

Computer enhancements to add additional reporting capabilities for use during statistical and analytical studies.

Computer enhancements to random selection process to ensure process equitability.

The development and implementation of a voluntary alcohol screening process to better meet the intent of 10 CFR Part 26.

The purchase and use of non-alcohol hand wipes in the screening lanes to ensure the hygiene of the screening technician and eliminating any possible chain-of-custody concerns by allowing the screening technician to remain stationary during the process.

The development of a form to be used by the Medical Review Officer for reporting any results other than routine negatives.

Changes were made to the bathroom structure in response to low temperature problems, to include the posting of signs specifically requesting specimens be returned to the collector as soon as possible, and the addition of foam pads on toilet tank covers in an attempt to alleviate temperature loss by conduction.

The prefabrication of blood alcohol kits to better expedite confirmatory testing. These kits include blood tubes, chain-of-custody forms, medical technician instructions, and chain-of-custody bags, along with a master checklist for implementation of confirmatory blood alcohol testing.

The posting of signs inside the screening facility explaining that readings below 0.003% BAC during the initial breath alcohol test should be considered zero. This was done to alleviate any concerns by station personnel on the technical capabilities of the evidential breath testing devices used in the screening lanes.

PENNSYLVANIA POWER & LIGHT COMPANY

Tracking supervisors, especially contractor supervisors, is difficult due to the dynamic nature of our work force. We will be sending lists of all badged personnel to cost center managers on a quarterly basis for the identification of any new supervisors and to ensure that training is given, if not already received. Once identified as a supervisor, individuals are entered into our Personnel Qualifications System through which annual retraining can be tracked by computer.

Incorporated FFD program management responsibilities into a new, on-site position which reports directly to the superintendent of the plant. This strengthens overall program management and reduces the number of persons receiving confidential information.

PORTLAND GENERAL ELECTRIC COMPANY

An audit of the FFD program produced two primary areas of concern:

The procedure to ensure that employees have not consumed alcohol within five hours of reporting for

nonscheduled work had not been adequately implemented in some cases. Further emphasis will be placed on the importance of call-in procedures to supervisors with call-in responsibilities.

Collection center instrument calibration techniques and PGE's stringent acceptability ranges for measuring PH and specific gravity for specimen integrity checks need to be reevaluated. PGE will develop and implement specific operating procedures with improved instrument calibration methodologies and revised specimen integrity check parameters.

The contract laboratory incorrectly reported a blind specimen as negative. On the same day, the laboratory was informed of the incident of false negative reporting and was requested to investigate the circumstances and to review all quality control data associated with confirmatory testing of that particular specimen. The laboratory ascertained that the sample was in fact positive. A review of this situation found that the false negative report was a result of an administrative error at the laboratory. PGE has required the following actions to be taken at the laboratory to prevent reoccurrence of this situation:

- The procedure for certifying scientist review of test results will be modified to check for discrepancies between records. All certifying scientists will be informed and instructed on this change.
- An additional review step will be included for all specimens that initially screen positive but for which the confirmatory GC/MS response is zero. This review will be performed by either the scientific director or one of the toxicology supervisors.

PUBLIC SERVICE ELECTRIC & GAS COMPANY

PSE&G recommends that the NRC consider removing opiates from the panel of drugs to be tested. We have found that testing for opiates significantly delays pre-access processing, and significantly undermines the program acceptance and credibility. M-A-M is only present for a very short period of time, and there is widespread use of opiate cough suppressants and analgesics. The present requirement that demands expensive GC/MS confirmation to supposedly "rule out heroin abuse" is extremely expensive due to the type of testing required for detection. In the five years of testing by PSE&G at its nuclear facilities, there have been no detected cases of heroin abuse. In addition to the problem with cough suppressant and analgesics, widespread consumption of food containing poppy seeds and the common knowledge that poppy seeds may result in a positive drug test result make it almost impossible to declare a positive per the rule. A significant amount of expense can be eliminated by removing opiates from the panel of drugs tested in areas of the country and/or states where heroin abuse does not appear to be common.

PSE&G strongly believes that a FFD program cannot be functionally practiced as only a drug and alcohol detection/deterrence program. The level of decision making involves more than just review of drug and alcohol results. Medical Review Officer (MRO) involvement is essential and critical to a properly functioning FFD program. PSE&G mentions this since the DOT is considering the removal of the MRO review requirement for all test results.

ROCHESTER GAS & ELECTRIC COMPANY

As a result of an FFD audit, RG&E discovered that, while the contractor had submitted the required FFD certification documents, two employees had not taken the alcohol test. Although RG&E had not pre-approved the contractor's FFD program, the pre-badge drug tests were conducted by a HHS-certified laboratory and were negative.

Upon investigation, RG&E has determined that there were no adverse results of this error as both contractor employees worked in a crew environment and were continuously under direct behavior observation by RG&E employees.

To prevent this situation from occurring in the future, RG&E will require contractors to identify both the date and the laboratories conducting the drug and alcohol tests on the FFD program certification documents.

SOUTHERN CALIFORNIA EDISON COMPANY

Some administrative difficulties were encountered in the re-sorting of the blind specimens due to the packaging methods of BDA-supplied positive and negative samples. These difficulties involved some chain-of-custody discrepancies which have now been corrected and reconciled. At no time was program testing adversely affected since the problems were strictly limited to the blind sample process. All blind sample pre-screen results and NIDA-certified lab results are now in agreement. Additionally, internal administrative procedures have been strengthened and a kit packaging change has been instituted by the vendor to preclude further problems in this area of the program.

SYSTEMS ENERGY RESOURCES

At the onset of testing, several presumptive positive specimens sent by GGNS to the HHS-certified confirmation laboratory were determined to be negative at the confirmation laboratory on their initial test. Occasionally, a presumptive positive specimen at GGNS would be sent to the confirmation laboratory for analysis only to be negative on their initial test. This led to the assumption that these inaccuracies were due to differences in the type of drug analysis equipment used at GGNS and the confirmation laboratory.

GGNS's drug analysis equipment utilizes EPIA technology while the confirmation laboratory was using the EMIT technology. Careful analysis of the two systems by the confirmation laboratory and representatives for Abbott Laboratories disclosed that there are differences between the two systems that could account for the variances in results. It has been determined that the Abbott drug assays utilizing EPIA are more sensitive and more susceptible to react to certain drug analogues of the opiate and amphetamine classes, such as substances found mostly in over-the-counter medications. The Fitness-for-Duty Program management is pleased with the overall performance of the Abbott equipment and contractually specified that the confirmation laboratory use the same type of equipment.

This eliminated the variances that were occurring between the on-site laboratory and the off-site laboratory. GGNS has contracts with two confirmation laboratories for redundancy purposes. This system should minimize dependence on one laboratory in the case that there is an event (i.e., decertification, unsatisfactory blind performance specimen test result, etc.) that limits the confirmation laboratory's performance.

TU ELECTRIC

FFD Management submitted blind sample containers with seals that had been tampered with along with normal daily collections. The medical staff were not as conscientious as expected in noting the tampered specimens. Corrective action was taken with medical laboratory management.

UNION ELECTRIC COMPANY

A FFD program person was called out on a weekend to activate temporary power to our cooling storage units for specimens. Upon arrival, the person was informed that work was in progress to restore normal power. The FFD program person waited nearly six hours while service personnel attempted unsuccessfully to restore normal power, before activating the temporary power.

Since this occurrence, FFD program personnel subject to being called out to activate the temporary power supply have been instructed to activate the power supply within a two-hour time frame.

The Union Electric Company has discontinued on-site testing of FFD program personnel. This action was taken to avoid situations in which FFD personnel might see a presumptive test that belongs to them and worry unnecessarily about the results.

VIRGINIA ELECTRIC & POWER COMPANY

The quality assurance department conducted a three-month assessment of the FFD program including a review of the FFD procedures. The resulting changes to the procedures require individuals responding to an emergency call-out to perform a self-assessment of their fitness for duty based on criteria issued to each responder. The FFD procedures now clearly convey the assessment process and the means by which responders should report for duty during an emergency.

Also, as a result of a quality assurance audit during the second quarter, proper on-site test facility air conditioning is being provided for the test equipment's operating parameters.

WISCONSIN PUBLIC SERVICE CORPORATION

A random computer program was written to select the day and shift for each random test date. Implementation began in May of 1990. Prior to that date, this selection was administratively controlled.

The following companies did not provide information on lessons learned (N=30):

Alabama Power Company
Baltimore Gas & Electric
Boston Edison
Commonwealth Edison Company
Consolidated Edison Company of New York
Consumers Power Company
Detroit Edison
Entergy Operations, Inc. (Louisiana)
Georgia Power Company
Illinois Power Company
Indiana Michigan Power Company
Iowa Electric Light & Power Company
Nebraska Public Power District
Niagara Mohawk Power Corporation
Northeast Utilities
Northern States Power Company
Omaha Public Power District
Pacific Gas & Electric Company
Philadelphia Electric Company
Public Service Company of Colorado
Sacramento Municipal Utility District
South Carolina Electric & Gas Company
Tennessee Valley Authority
Toledo Edison
Vermont Yankee Nuclear Power Corporation
Washington Public Power Supply System
Wisconsin Electric
Wolf Creek Nuclear Operating Corporation
Yankee Atomic Electric Company