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Fitness for Duty in the Nuclear Power Industry

Annual Summary of Program Performance Reports CY 1991

Prepared by
S. Murphy, T. Fleming, C. Westra, I. Field, N. Durbin/BHARC
R. Moffitt/PNL

Battelle Human Affairs Research Centers

Pacific Northwest Laboratory

Prepared for
U.S. Nuclear Regulatory Commission

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Prepared by
S. Murphy, T. Fleming, C. Westra, I. Field, N. Durbin, Battelle Human Affairs Research Centers
R. Moffitt, Pacific Northwest Laboratory

Battelle Human Affairs Research Centers
4000 NE 41st Street
P.O. Box C5395
Seattle, WA 98105

Pacific Northwest Laboratory
Richland, WA 99352

Prepared for
Division of Reactor Inspection and Safeguards
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555
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ABSTRACT

This report summarizes the data from the semi-annual reports on fitness-for-duty programs submitted to the NRC by 52 utilities for two reporting periods: January 1, 1991 to June 30, 1991, and from July 1, 1991, to December 31, 1991. During 1991, licensees reported that they had conducted 262,597 tests for the presence of illegal drugs and alcohol. Of these tests, 1,722 (.66%) were confirmed positive.

Positive test results varied by category of test and category of worker. The majority of positive test results (983) were obtained through pre-access testing. Of tests conducted on workers having access to the protected area, there were 510 positive tests from random testing, and 167 positive tests from for-cause testing. Follow-up testing of workers who had previously tested positive resulted in 62 positive tests. For-cause testing resulted in the highest percentage of positive tests: about 23 percent of for-cause tests were positive. This compares to a positive test rate of .94 percent of pre-access tests and .33 percent of random tests.

Positive test rates also varied by category of worker. Overall, short-term contractor personnel had the highest positive test rate at .9% percent. Licensee employees and long-term contractors had lower positive test rates (.33% and .56%, respectively).

Of the substances tested, marijuana was responsible for the highest percentage (42.3%) of positive test results, followed by cocaine (31.2%) and alcohol (22.8%).

Positive test results are also reported for NRC administrative regions; for plants experiencing or not experiencing an outage during a six-month period; and for plants located in areas with different rates of population density, crime, and drug and alcohol use.

A comparison of positive test results in 1991 with those found in 1990 found a decrease in the positive test rate for each category of test and worker.

EXECUTIVE SUMMARY

On June 7, 1989, the NRC published a final rule, 10 CFR Part 26: Fitness-for-Duty Programs, in the *Federal Register* (54 FR 24468), 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. As required by 10 CFR 26.71(d), each licensee submits data every six months that summarize the results of the drug and alcohol testing program. This report summarizes the data from the semi-annual reports on FFD programs submitted to the NRC by 52 utilities for two reporting periods: January 1, 1991, to June 30, 1991, and from July 1, 1991, to December 31, 1991.

During the period January 1, 1991 to December 31, 1991, licensees reported that they had conducted 262,597 tests for the presence of illegal drugs and alcohol. Of these tests, 1,722 (.66%) were confirmed positive.

Positive test rates varied by the type of test conducted and the type of worker tested. For-cause testing resulted in the highest percentage of positive tests; about 23 percent of for-cause tests were positive. The positive test rate for pre-access and random testing was .94 percent and .33 percent, respectively. Short-term contractor personnel had the highest positive test rate at .98 percent followed by long-term contractors (.56%) and licensee employees (.33%). Positive test rates were also compared during each reporting period for those plants experiencing or not experiencing an outage. There was a higher positive test rate for plants experiencing an outage during each reporting period.

Positive test rates and substances identified varied by the five NRC administrative regions. Region II had the lowest overall positive test rate (.49%), while other regions had positive test rates ranging from .56 percent to .88 percent. Marijuana accounted for the largest percentage of positive test results in all regions.

Positive test rates were also compared with the population density, incidence of crime, and incidence of drug use in the geographic region surrounding each nuclear power plant. The overall positive test rate was found to be higher for power plants located in more densely populated areas, and to a lesser extent, for those located in areas with a higher incidence of crime.

A comparison of positive test results in 1991 with those found in 1990 showed a decrease in the positive test rate for each category of test and worker. While there are a number of factors that can influence these results (e.g. outages), the continued decline in the positive test rate appears to indicate that the rule is having a positive effect on the nuclear power industry.

Many licensees provided detailed accounts of lessons learned during both reporting periods. A brief summary of lessons learned and management initiatives is presented in Section 6 of this report and a complete compilation is provided in Appendix C.

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

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

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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 from fitness-for-duty (FFD) problems among personnel with unescorted access to the protected areas of commercial nuclear power plants. In response to trends of increased drug use nationwide, and with the cooperation and support of the industry, the NRC published a final rule on June 7, 1989, 10 CFR Part 26, Fitness-for-Duty Programs, in the *Federal Register* (54 FR 24468), 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 requires that power reactor licensees provide semi-annual reports on the results of their drug testing programs. These reports provide the NRC with information on the effectiveness of individual licensee drug testing programs and of the NRC fitness-for-duty program as a whole in minimizing the impact of drugs and alcohol at nuclear power plants. The reports are also of use to the industry as it attempts to improve and refine FFD programs.

A report based on the semi-annual program performance reports from January 3 to December 31, 1990 (NUREG/CR-5758) was published in August of 1991 to summarize licensee experience with fitness-for-duty programs during the first year of rule implementation. This report is the second volume of NUREG/CR-5758 and is based on the semi-annual program performance reports for the period of January 1 to December 31, 1991. This report presents information on positive test results by category of test, drug, and worker; compares positive test results by each NRC administrative region and by population density; compares positive test results for 1991 with those found in the first volume of NUREG/CR-5758; and contains new analyses that were not presented in the first volume of NUREG/CR-5758. The new analyses examine the effects of the incidence of crime and the incidence of drug and alcohol use in the geographic area surrounding each nuclear power plant on positive test rates.

The information contained in this report was supplied by all current power reactor licensees in the United States. Fifty-two utilities submitted 85 reports, representing 75 nuclear power plant sites and 10 corporate offices. These reports pertain to confirmed positive test results. A detailed description of the technical background for the FFD program performance reports is provided in Appendix A. Appendix B contains detailed 1991 testing results for each category of test, worker, drug, and by region. Of particular use to the industry is the compilation of lessons learned and management initiatives reported by licensees and provided in Appendix C.

SECTION 1: OVERALL TEST RESULTS

This section contains information on drug and alcohol test results for each category of test required by 10 CFR Part 26. The results in this section and throughout this report were obtained during the January 1 through December 31, 1991 calendar year (CY). The test results are reported in four categories: pre-access, random, for-cause, and follow-up. The definitions of these categories are given in Table 1. Licensees also reported results from other types of tests when appropriate, but the manner in which these results were reported was not uniform. Because of this, these results are not included in the main body of this report. A complete listing of all categories of results is provided in Appendix B.

The number of tests performed and the number of confirmed positive test results are reported in Table 2.[1] A total of 262,597 tests were reported in 85 FFD program performance reports provided by 52 utilities. The overall confirmed positive rate was .66 percent across all categories of tests administered during 1991. Although this percentage may seem small, in absolute numbers 1,722 workers or applicants tested positive for drugs and/or alcohol. Pre-access testing identified 983 applicants or workers as having positive test results. Of those workers who had unescorted access to the protected area, 510 were identified as having positive test results for drugs or alcohol based on random tests, 167 were found positive based on for-cause tests, and 62 were identified as positive through follow-up testing.

Table 2
Test results for each test category (January 1 through December 31, 1991)

Test Category	Number of Tests	Positive Tests	Percent Positive
Pre-Access	104,508	983	.94%
Random	153,818	510	.33%
For-Cause	727	167	22.97%
Follow-Up	3,544	62	1.75%
TOTAL	262,597	1,722	.66%

Figure 1 provides a graphic representation of the numbers in Table 2. The majority of tests in 1991 were conducted for pre-access and random testing, which accounted for 104,508 and 153,818 tests, respectively. When combined, these two types of tests accounted for 98.4 percent of all tests reported. With regard to positive test results, pre-access testing accounted for the majority of all positive tests (983; 57.1%), followed by random (510; 29.6%) and for-cause testing (167; 9.7%).

[1] These numbers do not include tests completed under the category "Other" or "Periodic." These two test categories included 3,228 tests and 22 positives. Test results for these two categories are not presented in this section, but can be found in Table B-1 of Appendix B.

Table 1
Definitions of test categories

Test Category	Definition*
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, on credible information that an individual is abusing drugs or alcohol, or 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 a worker who previously had a confirmed positive test result is maintaining abstinence from the abuse of drugs or alcohol.

* 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 Nuclear Utilities Management and Research Council (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 Part 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.

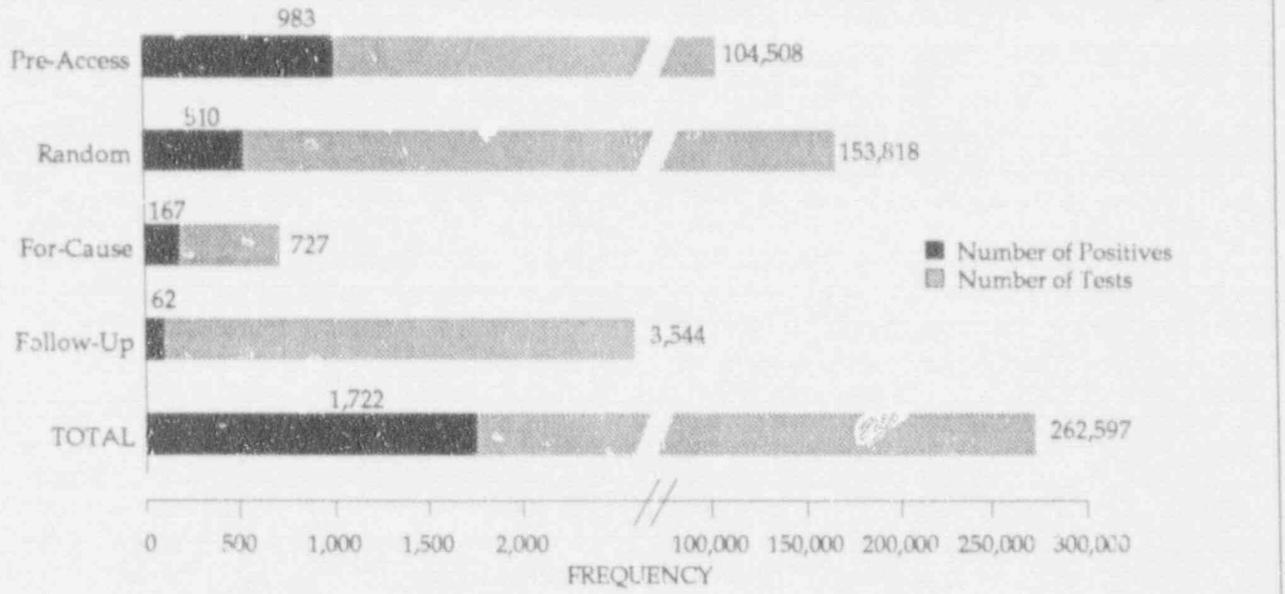

Figure 1
Comparison of results during 1991 for each test category

Figure 2 shows the percentage of confirmed positive tests for each test category. The percentage for each category was calculated by summing the number of positive tests in each test category and dividing that sum by the total number of tests conducted in the category. For-cause testing resulted in the highest percentage of positive tests (22.97%). This result was expected because for-cause tests are based on referrals by supervisors trained in behavioral observation techniques or on credible information indicating inappropriate drug and alcohol use. Post-accident tests were also included in this category, accounting for 155 tests and no positive results. Of the pre-access tests, .94 percent were positive, while .33 percent of the random tests were positive.

There were 237 referrals to Employee Assistance Programs, and 167 licensee employees who had previously been denied access due to a confirmed positive test result had their access to the protected area restored during the one-year period from January 1 to December 31, 1991.

Summary of major findings

- Drug and/or alcohol use in violation of 10 CFR Part 26 was confirmed in .66 percent of the tests.
- Most of the positive tests were among workers who never attained access to the protected area. Nonetheless, 739 tests on workers with access tested positive for illegal drugs or alcohol in 1991.
- There were 237 licensee employees referred to Employee Assistance Programs.
- There were 167 licensee employees who had their access restored during the year.

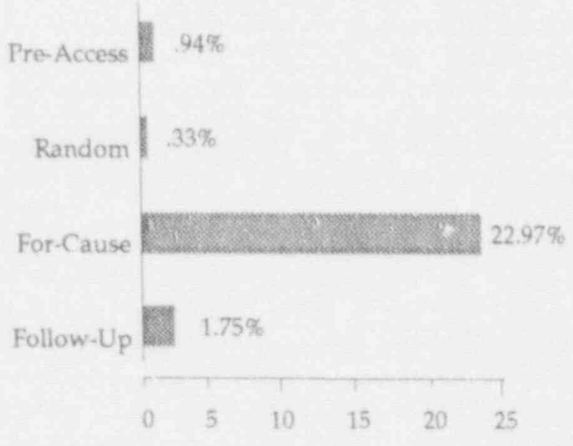

Figure 2
Percent of positive tests during 1991 for each test category

SECTION 2: TEST RESULTS FOR EACH WORKER CATEGORY

This section examines CY 1991 test results for three categories of workers: licensee employees, long-term contractors, and short-term contractors.[1] The basis for the distinction among workers is provided in Appendix A.

For licensee employees, 101,041 tests (83.2%) were performed under the random testing program, while for short-term contractors random testing accounted for only 45,277 tests (35.6%). The majority of tests for short-term contractors (80,610 or 63.4%) were performed under pre-access testing programs (see Table 3). Long-term contractors were subject to roughly similar numbers of pre-access and random tests (6,335 and 7,500, respectively). These differences indicate that licensee employees usually experience one pre-access test and then remain under a random testing program. In contrast, short-term contractors, due to the nature of their work, 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-cause testing and follow-up testing together account for about 2.4 percent of the tests taken by licensee employees and slightly less than one percent (.97%) of the tests taken by contractor personnel.

Figure 4 compares positive test results for licensee employees, long-term contractors, and short-term contractors. In all test categories except follow-up testing, the percentages of positive test results were higher for short-term contractors than for either licensee employees or long-term contractors. For follow-up tests, licensee employees had the highest percentage of positive test results.

In pre-access testing, short-term contractors tested positive more often than did workers in either of the other categories (1.1% of all pre-access tests performed on short-term contractors were positive, compared to .42% for licensee employees and .74% for long-term contractors).

Because of the large number of pre-access tests experienced by short-term contractors and the relatively high percentage of positive test results they produced, positive pre-access test results of short-term contractors accounted for half (862 of 1,722) of positive test results in all testing categories (see Table 3).

Random testing also produced different percentages of positive results across categories of workers.

[1] Reporting units are not required to distinguish between long- and short-term contractors. Those contractors not specified as long- or short-term were placed in the short-term contractor category.

Table 3

Test results* for each test category and worker category (January 1 through December 31, 1991)

TYPE OF TEST	LICENSEE EMPLOYEES	LONG-TERM CONTRACTORS	SHORT-TERM CONTRACTORS	TOTAL	PERCENT POSITIVE
PRE-ACCESS					
Number Tested	17,563	6,335	80,610	104,508	
Number Positive	74	47	862	983	.94%
RANDOM					
Number Tested	101,041	7,500	45,277	153,818	
Number Positive	220	23	267	510	.33%
FOR-CAUSE					
Number Tested	349	43	335	727	
Number Positive	51	6	110	167	22.97%
FOLLOW-UP					
Number Tested	2,560	110	874	3,544	
Number Positive	52	2	8	62	1.75%
TOTAL					
Number Tested	121,513	13,988	127,096	262,597	
Number Positive	397	78	1,247	1,722	.66%

* Other and Periodic not included.

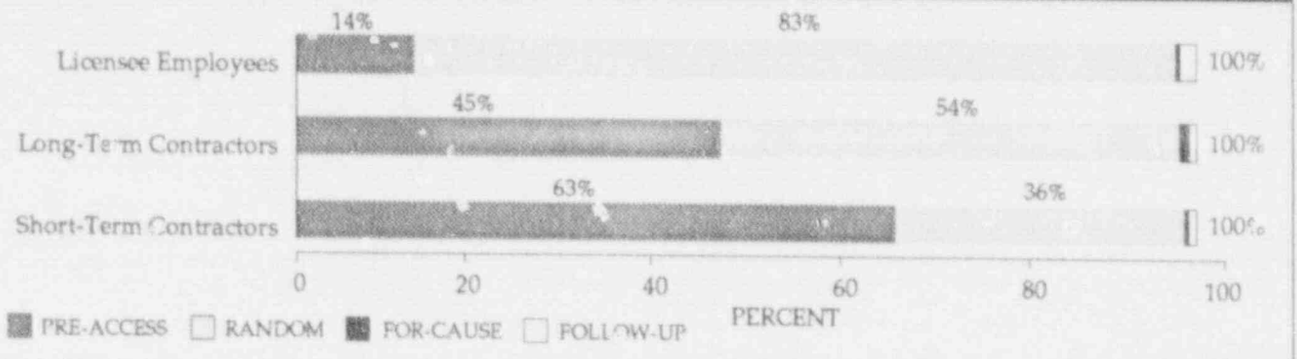

Figure 3
Distribution of tests conducted during 1991 for each worker category

Short-term contractors had nearly three times the rate of random positive test results than that found for licensee employees (.59% and .22%, respectively; see Figure 4). Hence, although licensee employees were subject to more than twice as many random tests as were short-term contractors, the two categories of workers had similar numbers of positive test results (267 for short-term contractors compared to 220 for licensee employees).

The for-cause positive test rate was similar for licensee employees and long-term contractors at 14.6 percent and 14.0 percent positive, respectively. In contrast, short-term contractors had a for-cause positive test rate of 32.8 percent, which is more than two times the positive test rate of the other two worker categories.

Follow-up testing was used primarily for licensee employees (2,560 tests), and infrequently for long- and short-term contractors (110 and 874 tests, respectively). Positive test results for follow-up testing were about two percent for licensee employees compared to a rate of .91 percent for short-term contractors. The 1.8 percent positive test rate for long-term contractors represented two positive test results (see Figure 4).

Summary of major findings

- The majority of tests for licensee employees (83.2%) were performed under the random testing program.
- The majority of tests for short-term contractors (63.4%) were performed under the pre-access testing program.
- Short-term contractors had the highest positive test rates for random, for-cause, and pre-access testing.

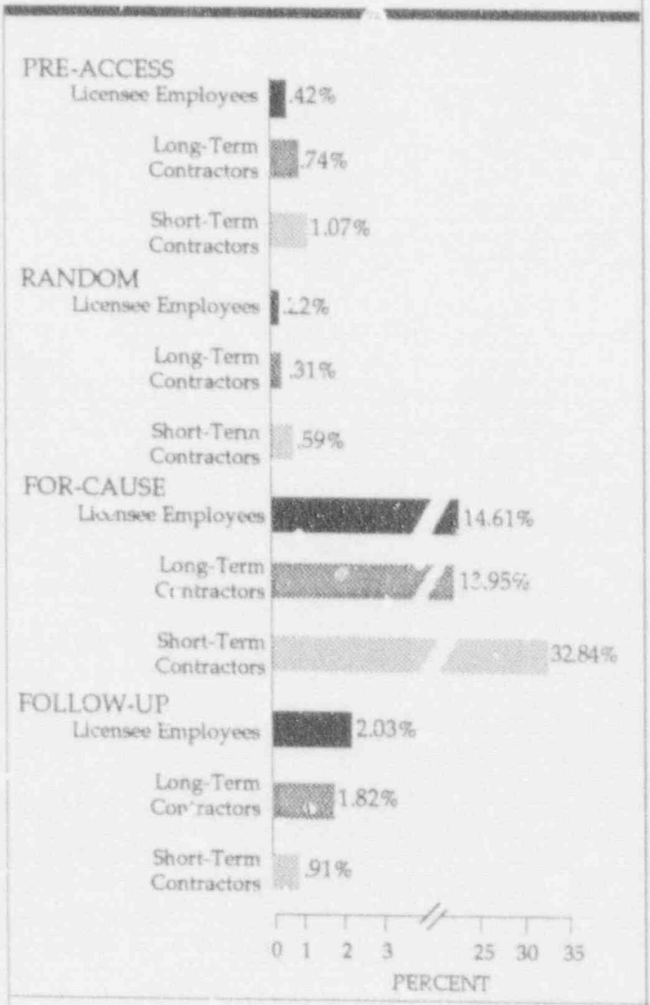

Figure 4
Comparison of positive test rates for each worker category during 1991

SECTION 3: TEST RESULTS FOR DRUGS AND ALCOHOL

The FFD rule requires that the number of confirmed positive test results be reported separately for each type of drug. Section 3.1 examines the number of confirmed positive test results for each of the six substances specified by the rule: marijuana, cocaine, opiates, amphetamine, phencyclidine, and alcohol. Section 3.2 examines the instances of confirmed positive tests for operators, supervisors, and substances found in the protected areas of nuclear power plants reported in accordance with 10 CFR 26.73. Section 3.3 reports the results from tests using screening levels lower than those required by the rule. Section 3.4 reports the results from testing for additional drugs.

3.1 Positive test results for each substance type

This section includes positive test results during CY 1991 for the five illegal drugs specified in the FFD rule and for alcohol. The total number of confirmed positive test results for substances (1,762) differs from the total number of confirmed positive results that were reported by test category in the previous sections. A number of factors contribute to this difference: refusals to take tests are not included in the reports on substances, positive tests for drugs not specified in the rule are not included in this section, and poly-drug use by an individual results in one positive test but more than one detected substance.

Figure 5 shows the percentage of positive test results for each category of illegal drug and for alcohol. Of the total number of confirmed positive tests, the highest percentage was for marijuana (42.3%). Cocaine was next, with 31.2 percent of the total, followed by alcohol with 22.8 percent. Opiates, amphetamine, and phencyclidine together accounted for less than four percent of all positive test results.

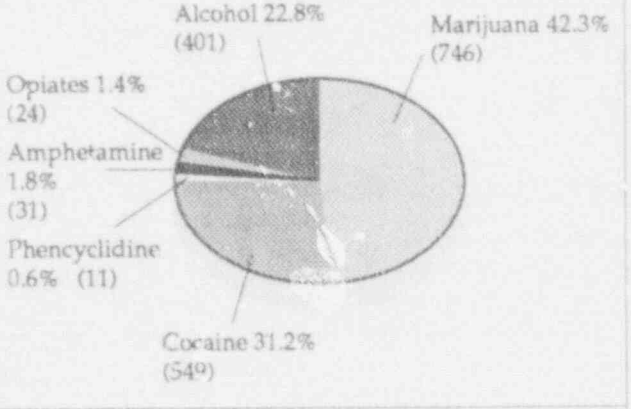

Figure 5
Confirmed positive test results during 1991 for each substance category (n=1,762)

3.2 10 CFR 26.73 reports concerning licensed operators, supervisors, and substances found in protected areas

10 CFR 26.73 requires reporting units to provide the NRC with information on positive test results for licensed operators and supervisors, and on controlled substances that are found in the protected area of the plant. This section describes the results from these reports from 1991 and also discusses other significant events that occurred with regard to fitness-for-duty program administrators. During 1991 there were 16 reports involving licensed operators, 16 reports involving licensee employee supervisors, and 24 reports involving contractor supervisors. There were eight reports of controlled substances found in protected areas and five fitness-for-duty incidents that involved FFD program personnel.

3.2.1 Licensed operators and supervisors

The test results for licensed operators and supervisors include random, for-cause, and follow-up tests, but do not include pre-access tests. Because pre-access tests account for over half of the overall test results reported in 1991, the proportion of substances found for the positive test results reported in this section are not likely to reflect the overall testing results. It is also important to note that the number of positive test results for this group of workers is very small, representing a total of 56 positive test results or 3.3 percent of the positive test results reported in Section 1 of this report. Although this small number does not provide a representative sample of workers, it does provide a picture of the types of substances identified among two categories of badged workers.

Table 4 shows positive test results for licensed operators. Of the approximately 5,000 licensed operators in the nuclear power industry, 16 (.32%) tested positive for drugs or alcohol. Of these positive test results, 13 (81.3%) were the result of random testing, 2 (12.5%) were the result of for-cause testing, and 1 (6.3%) was the result of follow-up testing.

With regard to the type of substance identified, alcohol accounted for the largest proportion with 8 (50%) of the positive test results. Marijuana and cocaine accounted for an additional 4 (25%) and 3 (18.8%) positive test results, respectively. One positive test result was for amphetamine (6.3%).

Table 4
Positive test results for licensed operators

Licensed Operators	Random	For-Cause	Follow-up	Total
Marijuana	3		1	4
Cocaine	3			3
Alcohol	6	2		8
Amphetamine	1			1
Total	**13**	**2**	**1**	**16**

Table 5
Positive test results for supervisors

Licensee Supervisors	Random	For-Cause	Follow-up	Total
Marijuana	2	1		3
Cocaine	3			3
Alcohol	5	5		10
Total Licensee Supervisors	**10**	**6**	**0**	**16**
Contractor Supervisors	Random	For-Cause	Follow-up	Total
Marijuana	1			1
Cocaine	9	1	2	12
Alcohol	2	7	1	10
Other	1			1
Total Contractor Supervisors	**13**	**8**	**3**	**24**
Total All Supervisors	**23**	**14**	**3**	**40**

Table 5 shows the events reported for licensee and contractor supervisors. Of the 40 significant events, 23 (57.5%) were from random testing, 14 (35%) were from for-cause testing, and 3 (18.8%) were from follow-up testing.

Of the 40 positive test results, alcohol accounted for 20 (50%), cocaine accounted for 15 (37.5%), and marijuana accounted for 4 (10%). There was also one test where the substance was not identified.

For both licensed operators and supervisors, half of the positive test results were attributed to drugs and half to alcohol. For both worker groups, there were no positive test results for opiates, phencyclidine, or any of the additional drugs.

A comparison of these event reports with those of 1990 shows similar numbers of positive test results for licensed operators (16 in 1991 compared to 19 in 1990). Event reports for licensee supervisors fell from 26 events in 1990 to 16 in 1991 but increased for contract supervisors from 12 in 1990 to 24 in 1991. The number of reportable events is not large enough to determine whether these increases represent real changes or random variation.

3.2.2 Other reportable events

There were eight event reports submitted for incidents in which reporting units found drugs or alcohol in the protected area. Marijuana was found in three incidents, alcohol was found in three other incidents, and cocaine was found in the remaining two.

10 CFR 26.73 also requires licensees to provide information on fitness-for-duty incidents that involve personnel who are responsible for administering the testing program. These events can include testing positive for drugs or alcohol, subverting testing results, or any other actions that could compromise either the individual's trustworthiness or the testing process. Reporting units interpreted the requirements of 10 CFR 26.73 differently and, as a result, varied in the types of workers on which they reported. Program administrators (e.g., program managers, and MROs), collection staff, and fitness-for-duty clerical staff were generally included under this requirement.

There were five reports provided in 1991 that involved personnel responsible for administrating a fitness-for-duty program. Three of these cases involved program administration personnel who tested positive for drugs or alcohol. Marijuana, alcohol, and cocaine each accounted for one positive test result in these reports. In a fourth case, an MRO self-reported abuse of prescription drugs and alcohol. In the last case, a program administrator falsified records of a worker's drug test.

The results from the reports concerning fitness-for-duty administrative personnel are important for several reasons. First, while the number of such events may seem small, it is likely that these events occur more often than the event reports indicate. The fitness-for-duty rule currently does not clearly require reporting units to test fitness-for-duty administrative personnel. Hence a few licensees do not include these workers in their random testing pool. Second, the number of event reports concerning fitness-for-duty personnel has increased from one in 1990 to five in 1991, which could indicate either that such events are increasing over time or that licensees have improved their ability to detect such events. Finally, while the actual number of cases involving administrative per-

sonnel is relatively insignificant, the potential consequences for a fitness-for-duty program are substantial.

3.3 Lower screening levels

The fitness-for-duty rule provides licensees with the flexibility to use lower, more stringent screening and confirmation cutoff levels than those specified in the rule. Table A-2 in Appendix A shows the current maximum screening and confirmation levels permitted by the rule.

Marijuana was the most common substance for which lower screening cutoff levels were used during 1991. Thirty-nine of the 85 reporting units used levels lower than the NRC level of 100 nanograms per milliliter (ng/ml). Of these reporting units, 35 used a screening level of 50 ng/ml and four used 20 ng/ml. Figure 6 compares the positive test rates found using these three different screening cutoff levels for marijuana. These rates were calculated by summing the number of positive test results for marijuana detected at each cutoff level and dividing the sum by the number of tests using that screening cutoff level. As shown in Figure 6, licensees using lower screening cutoff levels had a higher percentage of confirmed positive test results. At 20 ng/ml, nearly 5 tests out of 1,000 were positive. At 50 ng/ml, about 3 tests out of 1,000 were positive. At 100 ng/ml, about 2 tests out of 1,000 were positive.

These data suggest that use of a screening cutoff level of 20 ng/ml or 50 ng/ml for marijuana results in a higher percentage of confirmed positive test results for marijuana.

Although some reporting units used lower screening cutoff levels for other substances, no reportable differences in the percentage of confirmed positive test results were identified. Levels used for cocaine did not differ for initial screening; all reporting units used 300 ng/ml. One reporting unit used a lower level (50 ng/ml) for confirmation. One reporting unit used a lower screening level of 15 ng/ml for phencyclidine, and eight reporting units used lower confirmation levels. Amphetamine was screened and confirmed at or below 300 ng/ml by five reporting units rather than the maximum levels of 1,000 ng/ml for screening and 500 ng/ml for confirmation specified by the rule.

3.4 Additional drugs

During 1991 twenty-nine of the 85 reporting units tested for a broader panel of drugs than the five required by the rule. All 29 of these reporting units tested for benzodiazepines, 28 tested for barbiturates, 15 tested for methaqualone, 8 tested for methadone, and 7 tested for propoxyphene. Table 6 lists the number of reporting units testing for each additional drug, the total

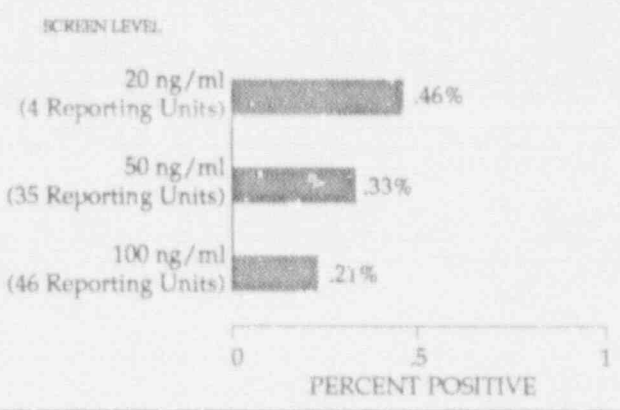

Figure 6
Confirmed positive test rates for marijuana by screen level

number of such tests performed by all reporting units during the year, and the numbers and percentages of confirmed positive test results. There were no positive test results for methadone and a total of 25 confirmed positive test results for the remainder of the drugs.

The most common additional drugs for which reporting units tested were benzodiazepines and barbiturates. Figure 7 shows the test outcomes for the 28 reporting units that tested for both of these additional drugs.[3] At these sites, benzodiazepines accounted for 2.1 percent of positive tests, which is a percentage comparable to that of opiates (1.8%). Barbiturates accounted for .4 percent of positive tests, a percentage comparable to that of phencyclidine (.5%).

Summary of major findings

- Marijuana was the drug most often detected, accounting for about 42 percent of all positive tests.
- Cocaine and alcohol accounted for significant proportions (about 31% and 23%, respectively) of all positive tests.
- Results from event reports for licensed operators and supervisors have decreased slightly from 1990. For each category of these workers the positive test results were split equally between drugs and alcohol.
- Using a screening cutoff level of 20 ng/ml for marijuana more than doubled the confirmed positive test rate that would have been found at 100 ng/ml.

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[3] One reporting unit tested for barbiturates but not benzodiazepines and was therefore not included in this sample. This reporting unit accounted for one positive test result for barbiturates.

Table 6
Test results for additional drugs

	Number of Reporting Units	Number of Tests Performed	Number of Confirmed Positives	Percent Positive
Barbiturates	29	106,364	4	0.004%
Benzodiazepines	28	103,779	17	0.016%
Propoxyphene	7	24,812	3	0.012%
Metnadone	8	29,924	0	0.000%
Methaqualone	15	46,687	1	0.002%

- Among the reporting units testing for additional drugs, barbiturates and benzodiazepines were the drugs most frequently added to the panel. These drugs accounted for small percentages of confirmed positive test results for those reporting units that included them.

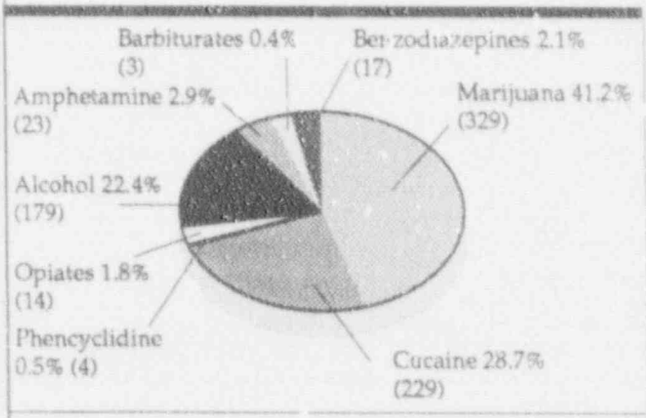

Figure 7
Confirmed positive test results for each substance including benzodiazepines and barbiturates* during 1991 (n=798)

* This analysis includes 28 reporting units testing for both benzodiazepines and barbiturates.

SECTION 4: TRENDS IN THE FIRST AND SECOND YEAR OF RULE IMPLEMENTATION

As 1990 was the first year in which FFD results were reported, it is useful to compare results from 1991 with those of the previous year. The overall positive test rate, which decreased from the first to the second six months of 1990, continued to decline in 1991. The overall positive test rate for 1991 was .66 percent, compared to a rate of .87 percent in 1990.

This section compares outcomes for 1991 with those of 1990 by test type, worker category, and confirmed positive test results for specific substances. It also analyzes the effects of outages on positive test rates. It should be noted that while this section presents data on the differences between the two years, these data are not sufficiently detailed to support conclusive statements as to the reasons for these differences.

4.1 Comparisons of positive test rates for each test type

This section compares the numbers of tests conducted in 1990 and 1991 for each testing category (see Figure 8). There were slightly fewer tests conducted in 1991 than in the previous year (274,531 and 262,442, respectively). Also, while pre-access and random testing accounted for the vast majority of tests conducted in both years, random tests represented a larger proportion of all tests in 1991 than in 1990 (58.6% of all tests in 1991 were random tests compared with 54.2% in 1990).

Figure 9 compares the confirmed positive test rates for pre-access, random, for-cause, follow-up, and total testing for 1990 and 1991. The positive rate declined in each testing category in 1991. The most notable decline was for pre-access testing, where the positive test rate declined by 25 percent. This decrease may have been due to increased awareness of the pre-access testing requirements on the part of contractors, and to the removal from the industry of a number of contractors who tested positive for drugs and alcohol during 1990.

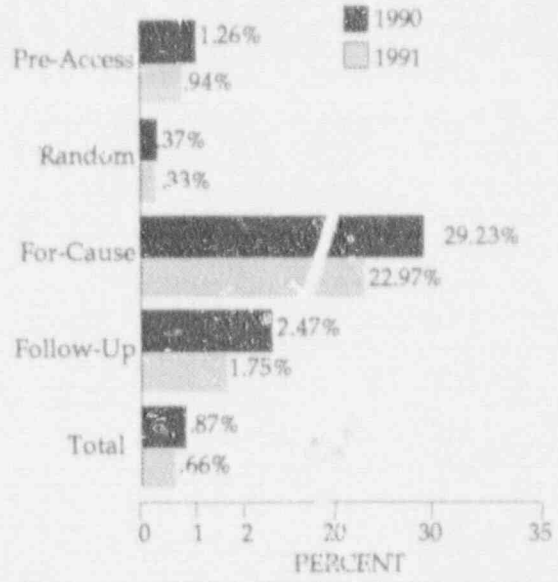

Figure 9
Comparison of confirmed positive test rates for each test category for 1990 and 1991

The positive test rate for for-cause testing also declined considerably. While similar numbers of tests were conducted in each year (732 in 1990 and 727 in 1991), the number of positive test results in 1991 fell to 167 compared with 214 in 1990. This difference is particularly interesting since the for-cause positive test rate had increased from the first to the second six months of 1990. The drop in the for-cause positive test

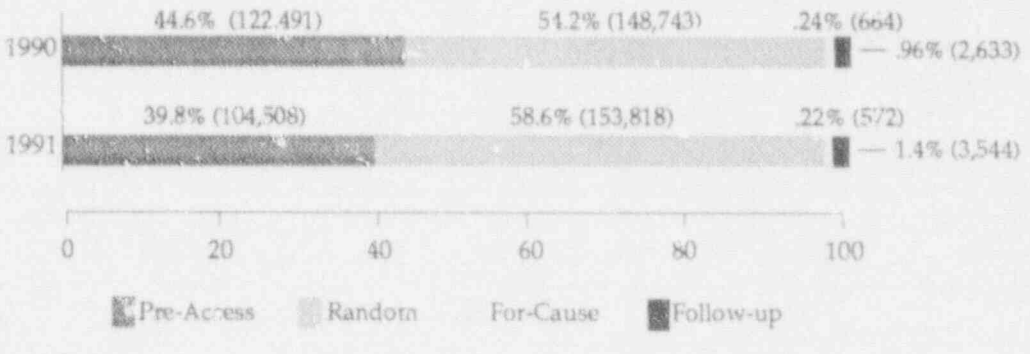

Figure 8
Comparison of tests conducted for each test category for 1990 and 1991

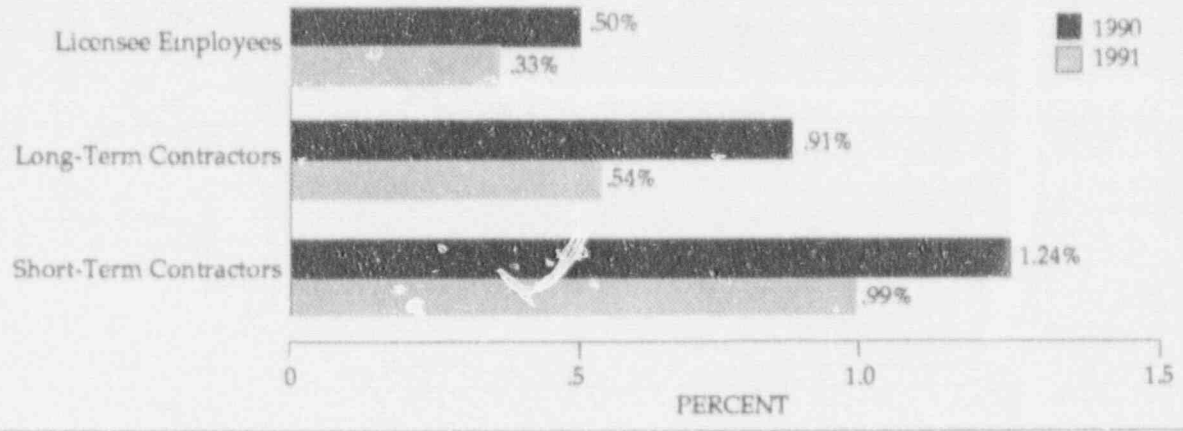

Figure 10
Comparison of positive test rates for each worker category for 1990 and 1991

rate could have been caused by several factors. Available data do not allow determination of the underlying causes of the decrease and it is, therefore, unclear whether this decrease can be considered as a good or a bad sign for the industry. For example, supervisors could be using a lower threshold when referring workers for for-cause testing or could be referring workers with impaired performance that is due to factors other than the use of illegal drugs or the misuse of alcohol (e.g., fatigue). Alternatively, the decreased for cause positive test rate could indicate the possibility that workers are being referred for testing without just cause. No empirical data have been provided to support any of these possible explanations, however. Reporting units should examine their own for-cause testing results to determine those factors that appear to be producing those results.

Similarly, there is insufficient information to conclude whether the nearly 30 percent decrease in the follow-up positive test rate (from 2.47% in 1990 to 1.75% in 1991) is a good development. The number of follow-up tests was higher in 1991 than in 1990 (3,544 compared with 2,633). These data do not, however, indicate whether this increase was due to a greater frequency of testing of roughly the same number of workers in both years or to an increase in the number of workers subjected to follow-up testing.

One potential indicator of the success of follow-up testing is the number of employees who are referred to the EAP and who have their unescorted access restored. In 1991 there were fewer employees referred to the EAP as a result of a confirmed positive test result for drugs or alcohol (237 referrals in 1991 compared to 307 referrals in 1990).

The number of employees whose access was restored, however, was fairly similar for the two years (167 in 1991 compared to 174 in 1990).

4.2 Comparison of positive test rates for each worker category

In addition to changes in positive test rates by test type, changes for different worker categories also were compared. Figure 10 shows the positive test rates for licensee employees, long-term contractors, and short-term contractors for both years. The positive test rate decreased for all groups, but by different percentages. The largest decrease was for long-term contractors, who experienced a positive testing rate decrease of over 40 percent. The positive test rate for licensee employees fell from .50 percent in 1990 to .33 percent in 1991, a 34 percent decrease. The positive test rate for short-term contractors, while decreasing the least, still fell 20 percent to a positive test rate of .99 percent. These decreases resulted in even wider gaps between worker groups than in 1990, with short-term contractors testing positive at a rate three times higher than that for licensee employees.

4.3 Comparison of positive test rates for each substance type

This section compares the proportions of total confirmed positive test results attributable to each drug for 1990 and 1991 (see Figure 11). These proportions changed little over the two years. The proportion of positive test results resulting from marijuana use decreased by five percent (from 47.4% in 1990 to 42.3% in 1991), while the proportion of alcohol and cocaine increased by about four percent and two percent, respectively.

An examination of drug incidence by each of the four six-month periods does not show trends for any of the major drugs. The proportion of all positive tests that were the result of alcohol during the first and second six months of 1990 was 16 percent and 22 percent, respectively. In 1991 it was 19 percent and 27 percent.

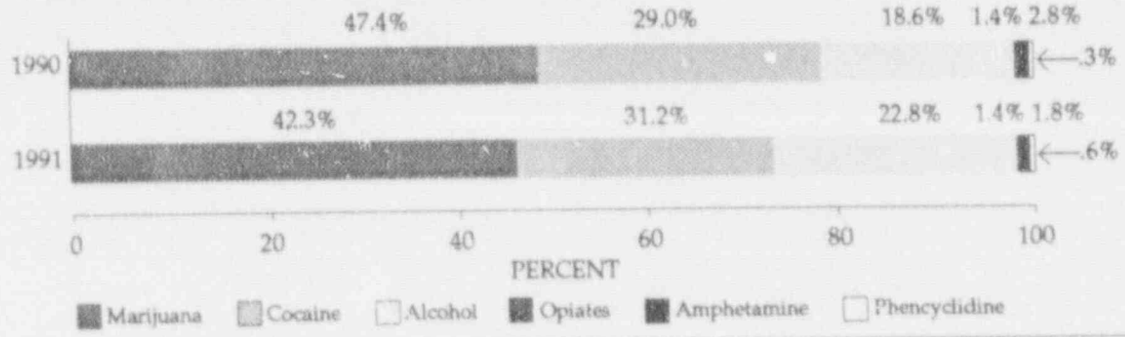

Figure 11

Distribution of positive test results for each substance for 1990 and 1991

4.4 Effects of outages on positive test rates and substances identified during the first and second reporting periods

Outages may have important effects on positive test rates, and reporting units should consider this factor when examining differences in their positive test rates between six-month reporting periods.

The first volume of NUREG/CR-5758 contained an analysis of the effects of outages on positive test rates. That analysis compared positive test results for the first and second six months of 1990 for reporting units in each of the five NRC administrative regions that experienced or did not experience an outage during the given six-month period.

Results for 1990 found that the positive test rate was higher if a reporting unit had experienced an outage than if no outage had taken place. This effect on the positive test rate was especially strong for short-term contractors.

This section replicates the analyses performed in 1990 on the effect of outages on positive test rates. An important difference in the analysis for 1991 is that it includes data from only 42 of the 75 reporting units (the 10 corporate offices were not included in either year). In spite of the limited data, the analyses for 1991 found roughly the same results as those found in 1990.

To understand the effects of outages on the positive test rate, we examined the positive test rate for reporting units in an outage or not in an outage during the first and second six-month reporting periods of 1991. Because only a small number of reporting units do not experience an outage in a given year, an analysis of the positive test rates for plants in an outage or not in an outage during the entire year of 1991 does not accurately portray the effects of an outage on the positive test rate. For example, an extremely high positive test rate for one reporting unit that did not experience an outage could substantially affect the positive test rate for this small group of reporting units. Therefore, the full year data were separated into two six-month periods for this analysis.

Figure 12 shows positive test rates by category of worker for each six-month period in 1991 to examine any differences in positive test rates between the first and second six-month periods. Data displayed in this figure show that the positive test rate for the first six months is only slightly greater than that of the second six-month period. However, the positive test rates for the combined group of long- and short-term contractors decreased in the second six-month period while those for licensee employees were essentially the same. The analyses described in the following section explore the effects outages might have had on these changes in positive test rates.

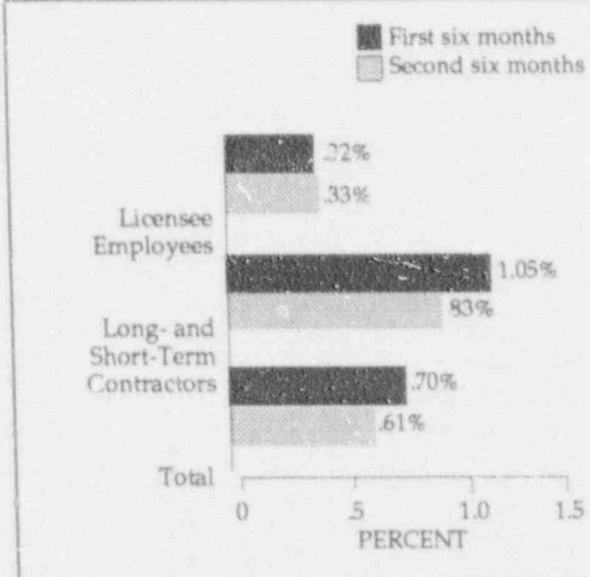

Figure 12

Comparison of positive test rates for each worker category for first and second six-month periods of 1991

4.4.1 Description of outage information

Confirmed outage dates were obtained from three NRC regional offices, but were not available for one region and for over half of the reporting units in another region. As a result, the analyses in this section include only 42 of the 75 reporting units (the 10 corporate offices were not included). While the use of approximate outage dates for reporting units without confirmed outage dates was considered, these approximate outage dates did not adequately reflect confirmed outages and were therefore inappropriate for use in these analyses (see Appendix A for a detailed description of this information and the related analyses). The positive test rates for the 42 reporting units with confirmed outage data were roughly the same as those of the 33 reporting units without outage data. Due to the limited number of reporting units with confirmed outage data, however, the findings in this section should be interpreted carefully.

Of the 42 reporting units included in the analyses, 31 had a scheduled outage in the first six-month period and 22 had a scheduled outage in the second six-month period. Fifteen reporting units had an outage in both periods (often these reporting units had more than one plant, one of which was in outage during the first period, another in outage in the second period). Four reporting units did not have an outage in either the first or second six-month period. The average number of days for an outage was 59 in the first six months and 38 in the second six months. Table A-3 in Appendix A lists each reporting unit included in the analysis and the number of days each was in outage in the first and second six-month periods.

4.4.2 Comparison of positive test rates by outage

The positive test rates for those reporting units in outage during the first six-month period were compared to those with no outage. The mean positive test rate for those reporting units that experienced an outage was .86 percent, while those that did not experience an outage had a mean positive test rate of .35 percent. These comparisons are presented in Figure 13. (Table B-6 in Appendix B provides the numbers used to make these calculations.)

A similar comparison between reporting units in outage and not in outage in the second six-month period found a mean positive test rate of .70 percent for reporting units that experienced an outage compared to a mean positive test rate of .47 percent for those that did not experience an outage. These data indicate that the occurrence of a scheduled outage does appear to substantially increase positive test rates on an industry-wide basis.

While it is inappropriate to compare full year data for reporting units that did and did not experience an outage, it is possible to examine a weighted average of the positive test rates based on data from each reporting period. A weighted average positive test rate by outage status for the year takes into account the positive test rate and the number of reporting units providing data for each six-month period. The weighted average positive test rate for reporting units that experienced an outage during 1991 was .79 percent for reporting units that experienced an outage during the year and .43 percent for those that did not experience an outage.

4.4.3 Comparison of positive test rates for each worker type by outage

To better understand increases in positive test rates during outages, the rates for licensee employees and contractors were compared for those reporting units experiencing an outage versus those not experiencing an outage. These comparisons are presented in Figure 14. Due to the limited number of reporting units included in these analyses, a relatively small number of tests and positive outcomes were reported for long-term contractors. As a result, testing data for long-term contractors and short-term contractors were combined to produce a larger sample of data that is less vulnerable to the effects of extremely large or small positive test rates.

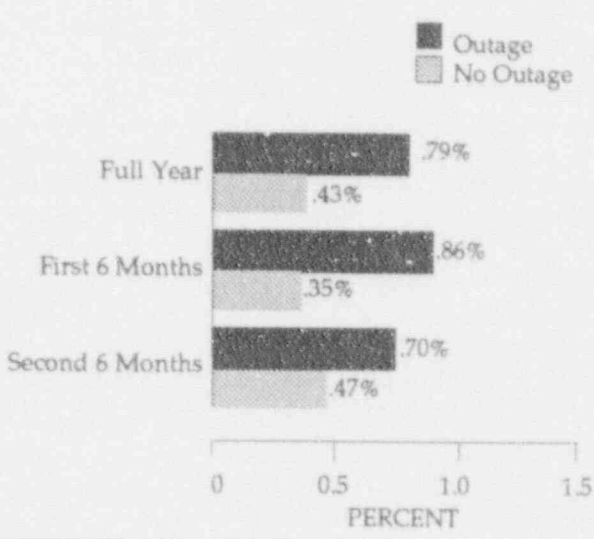

Figure 13
Positive test rates for the first six months, second six months, and full year by outage status during 1991

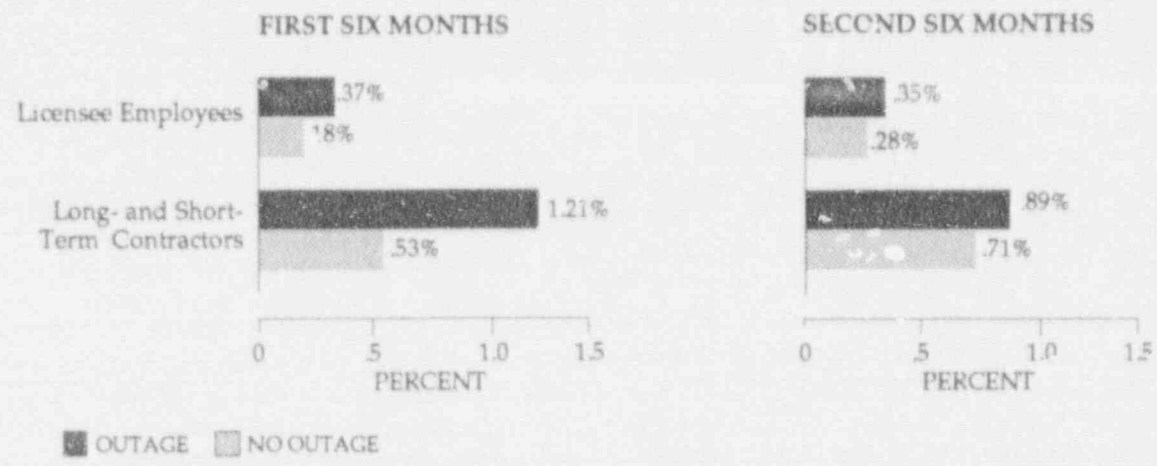

Figure 14
Positive test rates for each worker category by outage status for the first and second six-month periods during 1991

For those contractors from a reporting unit with an outage during the first six months, the positive test rate was 1.21 percent, while contractors from reporting units without an outage had a positive test rate of .53 percent. Licensee employees had a positive rate of .37 percent at reporting units with an outage, and a positive test rate of .18 percent at reporting units with no outage during the first six months.

In the second six-month period, contractors showed differences in positive test rates at reporting units with an outage compared to those without an outage. Contractors had a positive test rate of .89 percent at reporting units with outages and .71 percent at reporting units without outages in the second six months (see Figure 14).

Another way to measure the effects of outages is to examine the distribution of positive test results for reporting units in outage and non-outage among the two worker types. In the first six-month period, positive test results for licensee employees accounted for 18 percent of all positive test results and contractors were responsible for the remaining 82 percent of all positive test results (see Figure 15). The large proportion of positive tests attributable to contractors was due primarily to a high number of short-term contractor positive test results (short-term contractors had about 90% of all contractor positive tests). This pattern is also found in the second six-month period. This suggests that the positive test rate increases for reporting units with an outage because of the large influx of short-term contractors who have a higher positive test rate.

These data indicate that positive test rates for contractors, and primarily among short-term contractors, are substantially higher at reporting units that experience an outage versus those that do not experience an outage. Positive test rates for licensee employees are slightly higher at plants that experienced an outage versus those that did not have an outage. It appears that outages have an effect on positive test rates, primarily among short-term contractors.

4.4.4 Comparison of positive test rates for each test type by outage

To further examine the effect of outages on positive test rates, the positive test rates for pre-access and random tests were compared between those reporting units that did experience an outage and those that did not. Results from this analysis are presented in Figure 16.

For pre-access tests, the mean positive test rate was 1.21 percent for reporting units with an outage and .47 percent for reporting units without an outage during the first six-month period. For random tests during the first six-month period, the positive test rate was .40 percent for reporting units with an outage and .23 percent for those without an outage. In the second six-month period, the positive test rate for pre-access tests was .88 percent if the reporting unit had experienced an outage and slightly lower (.81%) if there had been no outage. The positive test rate for random tests was similar for reporting units with and without an outage (.32% and .24%, respectively).

Because short-term contractors experience a large majority of all pre-access tests, the higher positive test rates for pre-access tests for reporting units with outages supports the belief that increased positive test rates during outages are due primarily to the influx of short-term contractors.

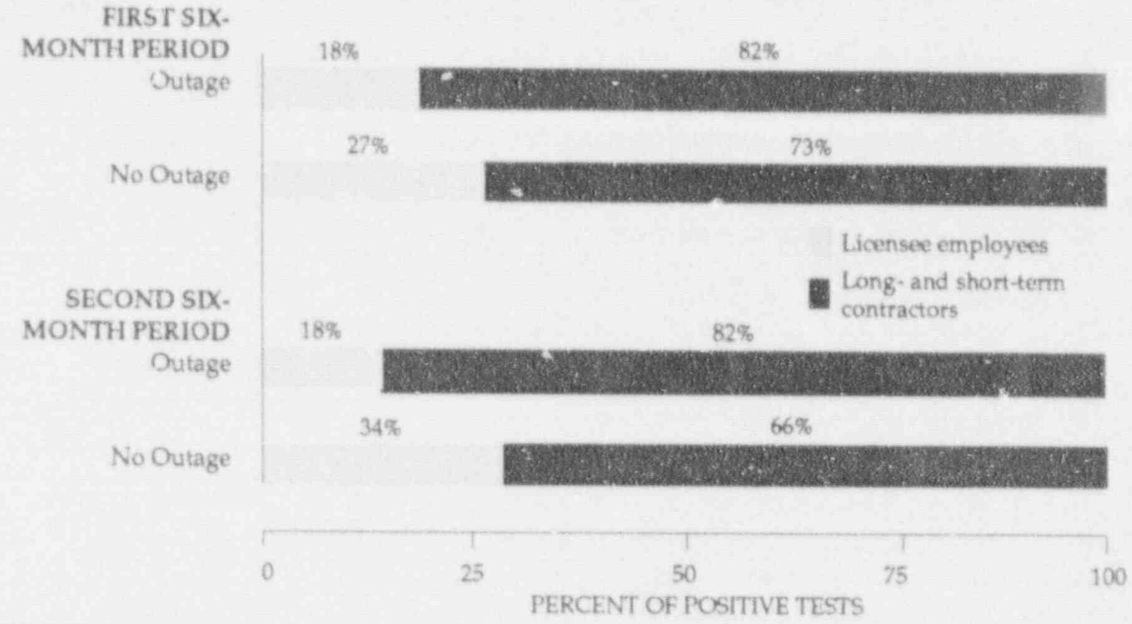

Figure 15
Distribution of positive test results for each worker category by outage and non-outage plants for the first and second six-month periods during 1991

4.4.5 Comparison of positive test rates for each substance by outage

Since the overall positive test rate increases during outages, it is possible that the use of certain types of drugs may also increase during an outage. The proportion of positive test results accounted for by each drug, however, did not differ between reporting units experiencing outages and those not experiencing an outage. This was true in both the first and second six-month periods. Thus, the increase in the positive test rate reported during outages was not related to the increased use of any certain types of drugs.

4.4.6 Comparison of positive test rates by outage by year

The positive test rates by outage for each reporting period of 1991 were compared to those of 1990. In keeping with the trend of decreasing overall positive test rates, plants that experience outages have reported gradually decreasing (and in some cases, stabilizing) rates for each six-month reporting period over the last two years. This was true for each worker and test category. For example, positive test rates have generally decreased for contractors at reporting units with outages during each six-month period, while the positive test rate for licensee employees at reporting units

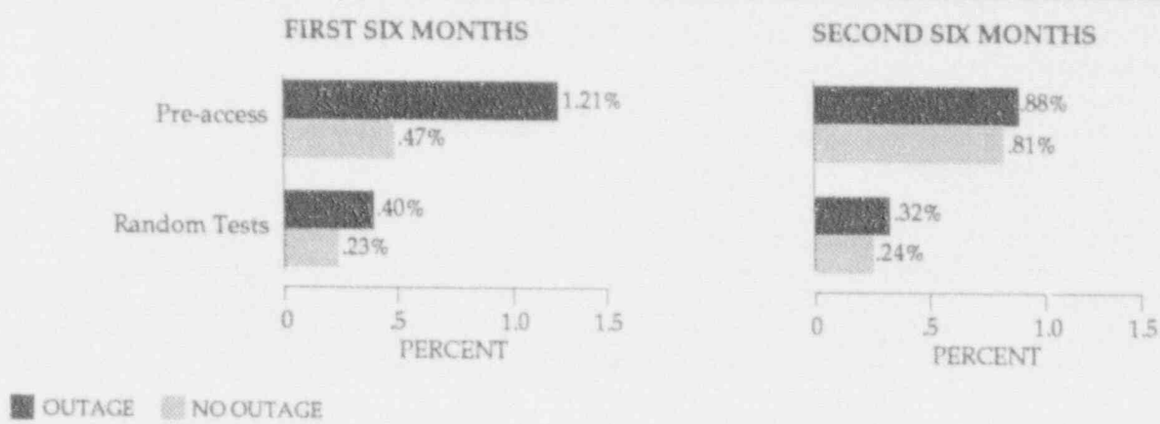

Figure 16
Comparison of positive test rates for pre-access and random tests by outage for the first and second six-month periods during 1991

with outages appears to be stabilizing at about .36 percent. Positive test rates for random and pre-access tests at reporting units with and without outages in 1991 also decreased from those in 1990.

Positive test rates overall and by worker category for reporting units with outages follow a slightly different pattern. These rates have generally decreased in each six-month period in 1990 through the first six months of 1991. Data for the second six-month period demonstrate a slight increase in these positive test rates. The trend in decreasing positive test rates established for the first three reporting periods makes this finding rather unusual. Due to the limited number of reporting units with data for these analyses, however, only 11 reporting units did not experience an outage in the first six months and 20 did not experience an outage in the second six months. These relatively small sample sizes, particularly for the first six-month period, may not be representative of the entire population. As a result, the changes in the positive test rate for reporting units without outages should be interpreted carefully.

The overall trend, however, appears to be one of steadily decreasing positive test rates among contractors and for random and pre-access tests at reporting units with outages. Licensee employee positive test rates appear to have stabilized at reporting units with outages.

Summary of major findings

- There was a decrease in the overall positive rate from 1990 to 1991.
- Outages did have a major effect on the positive test rate.
- The difference in positive test rates between outage and non-outage situations was due mostly to the greater use of short-term contractors during outages.
- Short-term contractors had a higher positive test rate during outages compared to their rate during non-outage periods.
- Positive test rates for reporting units that experienced an outage decreased from 1990 to 1991.

SECTION 5: TEST RESULTS BY REGION AND LOCAL CHARACTERISTICS

This section summarizes information on testing programs for each of the five NRC administrative regions (identified in Appendix A). This information includes overall positive rates, regional comparisons by type of drug, and variations by population density. In addition to these analyses, this section introduces two new analyses that may help to explain regional variations. These analyses correlate the incidence of drug use and crime rates in the geographic areas surrounding nuclear power plants. This section also compares results by region with those found in 1990. Because minor variations can be expected to occur from year to year, and because the test results are relatively small to begin with, results discussed in this section should be interpreted with care.

5.1 Test results by region

Figure 17 shows the overall positive test rate for each of the NRC regions. Region II had the lowest positive test rate at .49 percent. In the other four regions, positive test rates varied from .56 in Region IV to .88 percent in Region V. Appendix B provides detailed results by region in Tables B-8, B-9, B-10, B-11, and B-12.

While each of the five regions experienced a decreased positive test rate from 1990 to 1991, the size of this decrease varied. In Region II, for example, the positive test rate fell from .78 to .49 percent, a decrease of nearly 40 percent, while Regions I, IV, and V each decreased by less than 10 percent. Figure 18 compares positive test rates by region for 1990 and 1991.

Figure 19 shows the positive test rates for each region by worker category. Of the three worker categories, short-term contractors had the highest positive test rate in each region. Licensee employees had the lowest positive test rate in every region except for Region IV, where the long-term contractor positive test rate was slightly lower. Positive test rates also decreased for nearly all worker categories from 1990 to 1991. For licensee employees, the largest decrease occurred in Region II where the rate fell by over 50 percent from the previous year (.31% in 1991 compared with .63% in 1990). Contractor positive test rates either fell or remained virtually the same.

One important point to consider when assessing regional positive test rates is the positive test rates of the short-term contractor population. There are several reasons why this is important. First, short-term contractors have a higher positive test rate than that of other worker groups so that regions in which reporting units make greater use of this type of worker may expect higher positive test rates. Second, as discussed

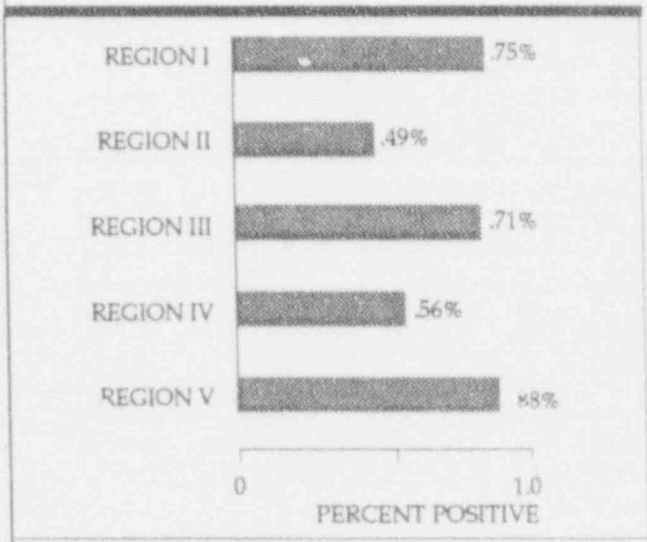

Figure 17
Confirmed positive test rates for each NRC region during 1991

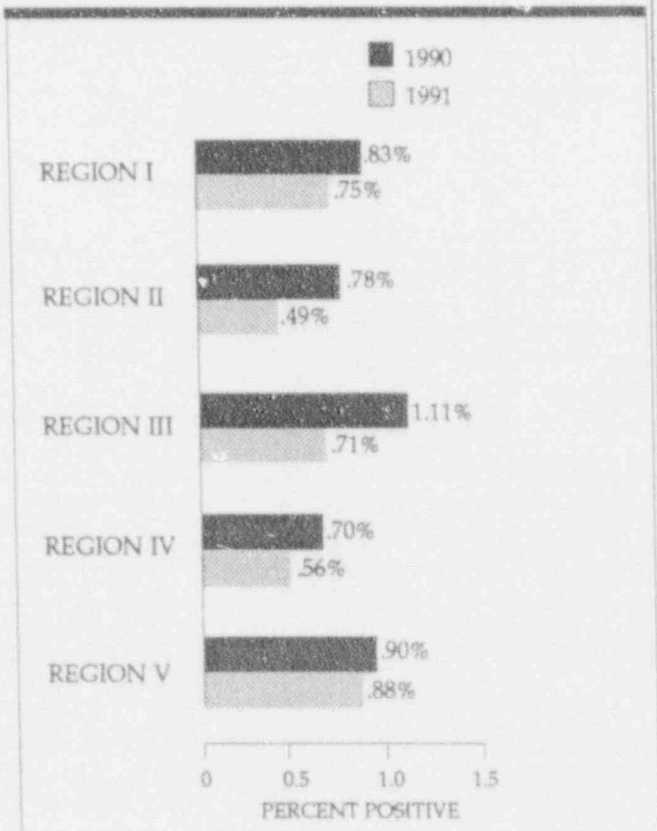

Figure 18
Comparison of positive test rates for each NRC region for 1990 and 1991

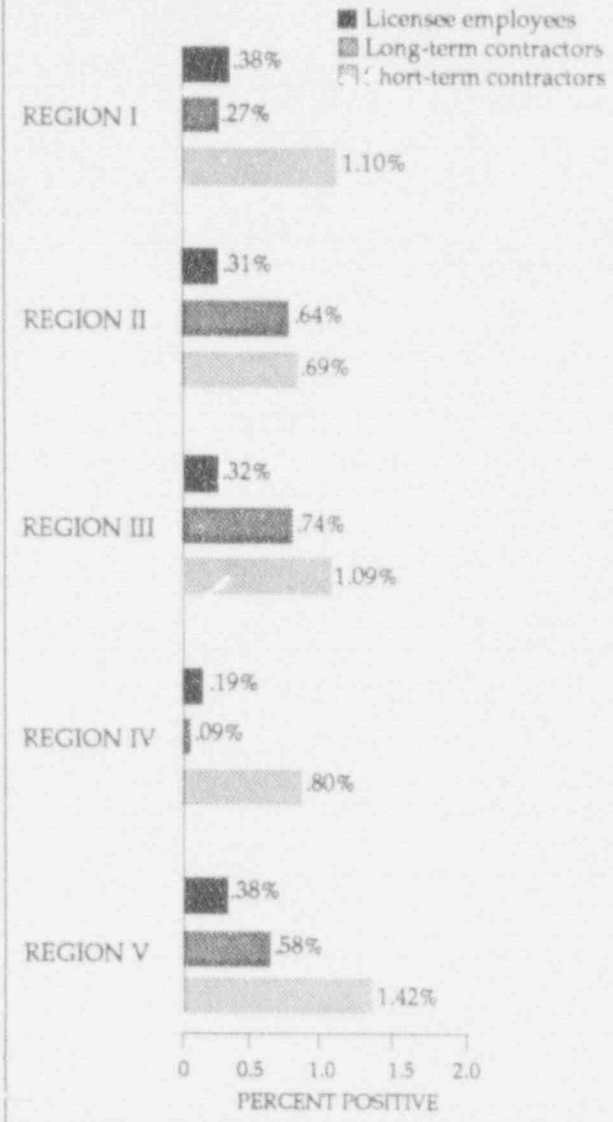

Figure 19
Confirmed positive test rates for each worker category by NRC region during 1991

in Section 4, short-term contractors have an even larger impact on positive test rates during an outage, so that regions with greater numbers and durations of outages can expect this to affect their positive test rates.

Short-term contractors accounted for between 40 and 58 percent of the total tests conducted in each region (see Figure 20). Because a relatively large percentage of each region's total tests are attributable to short-term contractors, even a moderate increase in the positive rate of short-term contractors can significantly affect the overall positive rate for the region.

As shown in Figure 18, Region III experienced the largest absolute decrease in its overall test rate (from 1.11% in 1990 to .71% in 1991). This decrease can be largely attributed to an absolute decrease of .53 percent in the positive rate for short-term contractors (from 1.62% to 1.09%). Similarly, Region V had an absolute decrease of only .02 percent, the smallest decrease of all of the regions. This relatively small decrease is at least partially attributable to the relatively high positive test rate for short-term contractors in Region V (see Figure 21).

The percentage of total positive test results accounted for by a particular substance varied by region. Figure 22 summarizes these data by region for each substance. Marijuana accounted for the highest percentage of positive test results in each region, ranging from a high of 53 percent of all confirmed positive test results in Region V to 36 and 38 percent of positive test results in Regions II and I, respectively.

Cocaine accounted for the second largest share of positive test results in all regions except for Region V, where it was third (alcohol was the second most frequently detected substance in Region V).

Amphetamine represented a substantially smaller percentage of positive tests than did marijuana and cocaine. As it the previous year, amphetamine accounted for a larger percentage of tests in Region V than in any of the other regions (representing 7% in Region V compared with 1-2% in the other regions). This difference was not as marked as in 1990, however, when amphetamine accounted for 16 percent of positive results in Region V.

The percentages of positive test results accounted for by alcohol ranged from 19 percent in Region IV to 27 percent in Region II.

In general, the distribution of total positive test results among the various substances did not change significantly within regions from 1990 to 1991. Further, with the exception of Region V, these distributions were roughly similar for each region in 1991. In Region V the percentage of positive test results for cocaine was only about 60 percent of the next lowest region's percentage (19% of total positive test results in Region V versus 30% in Region III). This relatively low percentage for cocaine was accompanied by relatively higher percentages of positive test results for marijuana and amphetamine relative to other regions.

Differences in positive rates by region may be affected by the average number of days of outage that the plants in each region had over the course of the year. The average number of days of outage varied somewhat across regions. Region V had the highest average days of outage at 161, while Region IV had the lowest average days of outage at 74. Region III had an average of 83 days, and the eight sites in Region II for which outage information was available had an average of 104 days in outage. Outage data was not available for Region I. In addition to having the fewest number of days in outage, Region II had the lowest positive test rate.

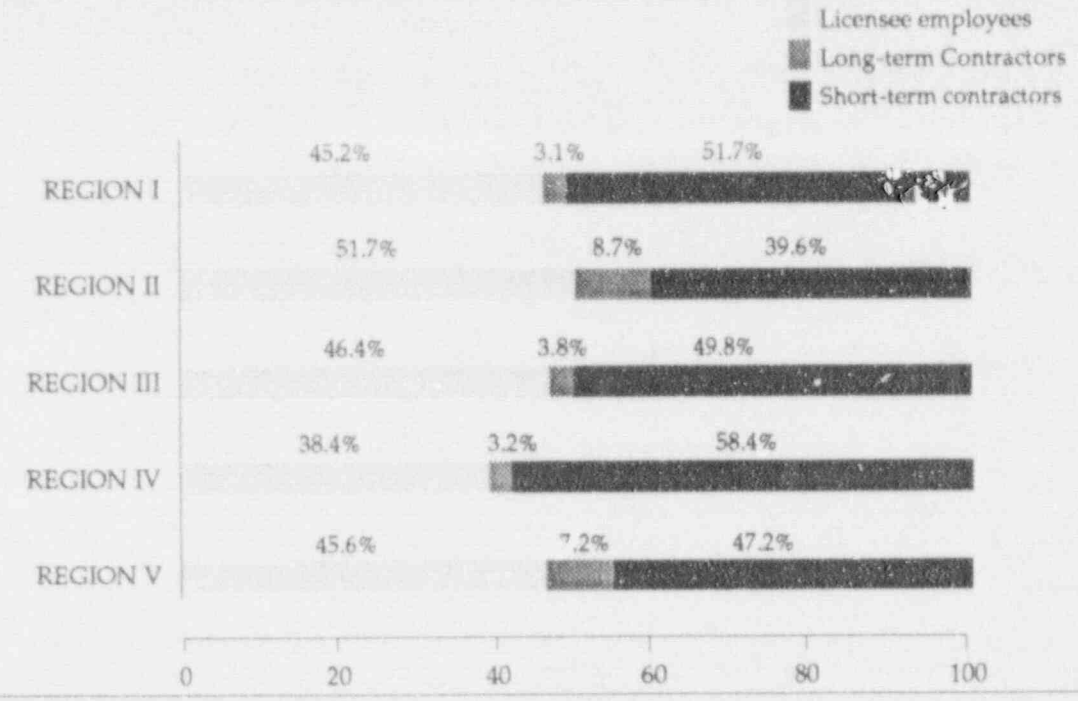

Figure 20
Distribution of tests conducted for each worker category by NRC region during 1991

In conclusion, each of the five regions experienced decreases in its overall test rate and in the positive test rates for most worker categories. The changes in the relative positive rates by region appear to be connected to some extent to short-term contractor positive rates. There was no identifiable pattern of change with regard to the incidence of specific substances by region.

5.2 Differences in positive test rates by population density

This section replicates an analysis performed in the first volume of NUREG/CR-5758 on the effect that the population density in the area surrounding a nuclear power plant has on the overall positive test rate and the positive test rates for specific substances. The analysis for 1990 found measures of population density to be associated with higher overall positive test rates and positive test rates for cocaine. Section 5.2.1 presents results found for 1991. Section 5.2.2 compares these results with those of 1990 and discusses the effect of overall decreased positive test rates on population density analyses.

5.2.1 Results for 1991

The analysis for population density analyzed the data using the same six measures that were considered in 1990. A description of these measures appears in Appendix A. The same two measures selected to

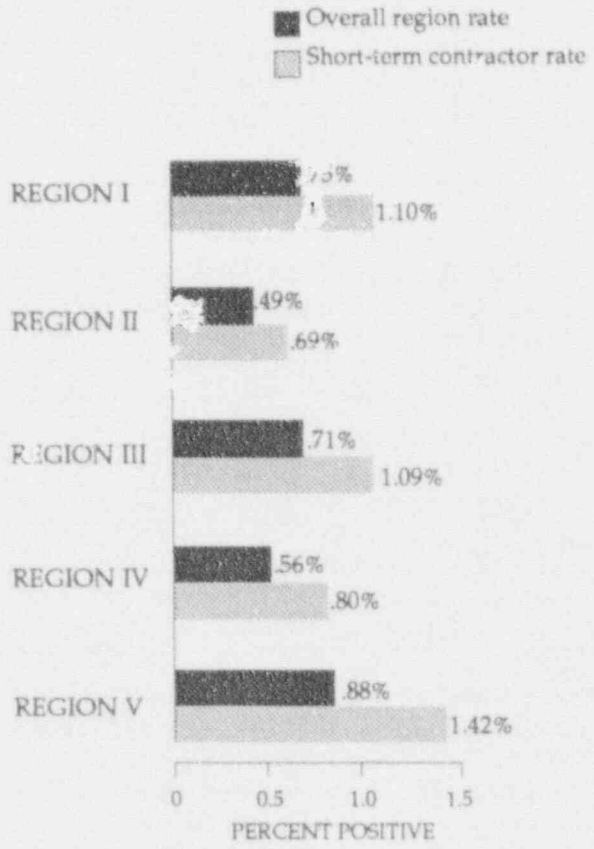

Figure 21
Comparison of positive test rates for short-term contractors and the total region during 1991

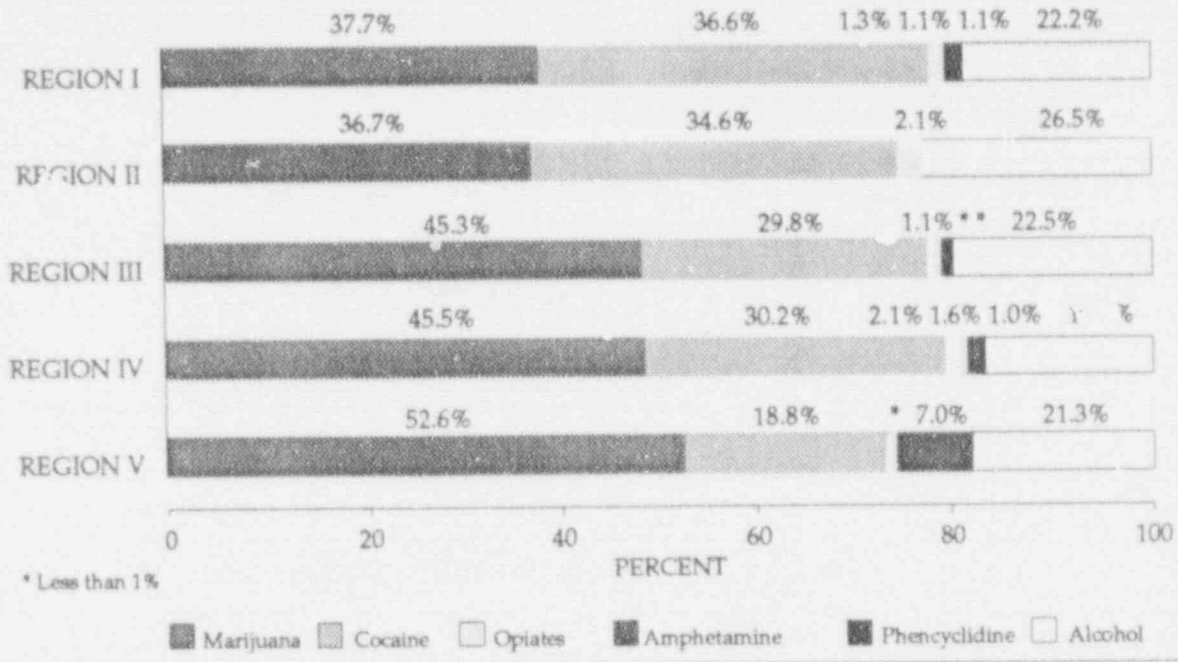

Figure 22

Distribution of positive test results by substance category for each NRC region during 1991

represent population density in 1990 were also found to be the best predictors in 1991. These measures were the population density of the county in which the nuclear power plant is located and the number of miles from the nuclear power plant to a city with a population of 300,000 or greater. Table 7 describes these two measures.

The population density for the area in which a nuclear plant is located was calculated for each power plant by dividing the county population by the number of square miles in the county. The density measure was divided into five density categories. The number of miles to a city of 300,000 or greater was also divided into five categories (see Table 7).

Analyses of mean positive test rates using county density as a measure of population density found overall positive test rates to be higher for power plants in densely populated areas than for those in less densely populated areas. Figure 23 shows the overall positive test rates for each of the five density categories. Power plants located in counties with a density of 47 or fewer persons per square mile had an mean positive test rate of .50 percent. This rate is nearly 40 percent (38.27%) lower than those plants in the most densely populated counties which had an overall positive test rate of .81 percent.

Results from analyses using the number of miles to the nearest city with a population of 300,000 or greater as a measure of population density found similar results to those using the measure of county density with regard to the overall positive test rate. Figure 24 shows the positive test rates for each of the five mileage categories. One minor difference between the two measures that occurred using this analysis is that the

Table 7

Descriptions of population density measures

COUNTY DENSITY

County density was determined by dividing county population by the number of square miles in that county. This information was gathered from the 1988 County and City Data Book. This density measure was divided into five density categories:

- 47 or fewer persons per square mile
- 48 to 94 persons per square mile
- 95 to 208 persons per square mile
- 209 to 528 persons per square mile
- 529 or greater persons per square mile

NUMBER OF MILES TO A CITY OF 300,000 OR GREATER

The distance from each plant to the outskirts of the nearest city with a population of at least 300,000 people was determined using the 1990 Rand McNally Road Atlas. City populations were taken from the 1988 County and City Data Book. The number of miles to the nearest city of 300,000 or greater was divided into five distance categories:

- Greater than 125 miles
- 81 to 125 miles
- 51 to 80 miles
- 25 to 50 miles
- 24 or fewer miles

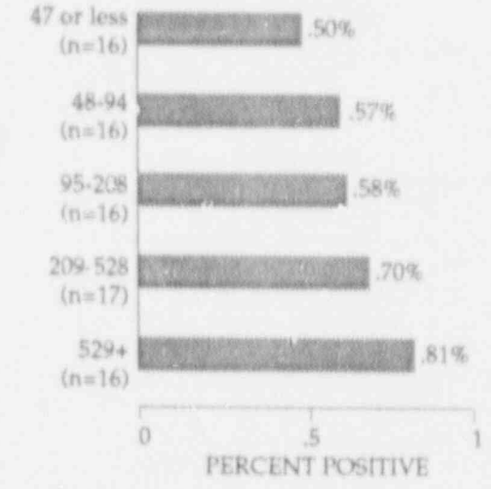

Figure 23
Confirmed positive test rates by county density during 1991

two top categories, 24 or less miles and 25-50 miles, had similar positive test rates (.77% and .76% respectively). This finding suggests that regardless of the specific number of miles, plants located within 50 miles of a large city are likely to have a higher positive test rate.

Analyses for the incidence of particular drugs were performed using both measures of population density. As in 1990, cocaine was the only drug found to differ by rates of population density.[4]

Figure 25 shows positive test rates for cocaine for each of the five county density categories. Power plants located in counties with 47 or fewer persons per square mile had a positive test rate of .15 percent for cocaine, while those in counties having a density of 529 or more persons per square mile had an mean positive test rate that was nearly twice as high (.28%).

Distance to a city of 300,000 or greater was also related to positive test rates for cocaine. Figure 26 shows positive test rates for cocaine for each of the five distance categories. The distribution of positive test rates varies somewhat from that of the analysis using county density as a measure. Specifically, the top three categories of distance to a city of 300,000 or greater (24 or less miles, 25-50 miles, and 51-80 miles) had roughly similar positive test rates for cocaine (.25%, .20%, and .23%, respectively). The positive test rate for cocaine decreased markedly to .14 percent for each of the remaining categories (81-125 miles and 126 or more miles).

[4] While rates of amphetamine also showed differences, the total incidence of amphetamine for 1991 was only 31 positive test results making this finding somewhat difficult to interpret.

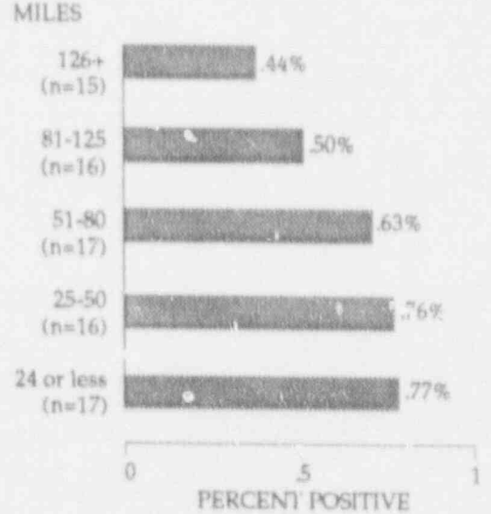

Figure 24
Confirmed positive test rates by number of miles to a city of 300,000 or greater during 1991

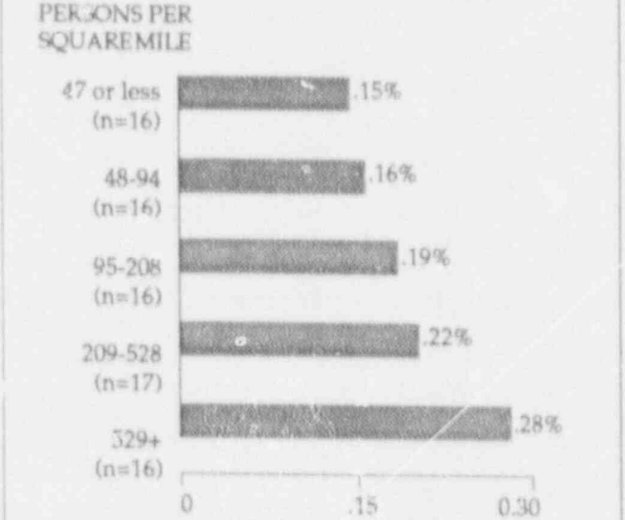

Figure 25
Confirmed positive test rates for cocaine by county density during 1991

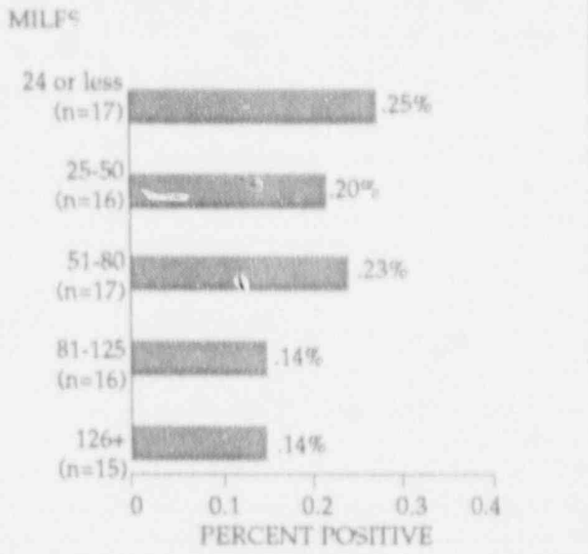

Figure 26
Confirmed positive test rates for cocaine by number of miles to a city of 300,000 or greater during 1991

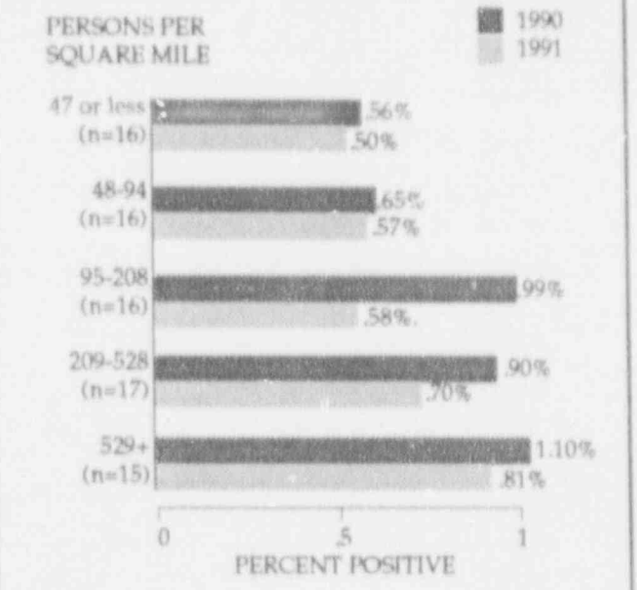

Figure 27
Comparison of positive test rates by county density for 1990 and 1991

5.2.2 First and second year comparisons

This section compares population density results for 1990 and 1991. Due to the decrease in the overall positive test rate from 1990 to 1991 (from .87% to .66%), it is useful to examine the extent to which this decrease affects the distribution by population density. In other words, were the decreases in the positive test rate evenly distributed among the population density categories or were they more likely to occur in more densely populated areas where the positive test rate is generally higher?

Figure 27 compares the overall positive test rate for 1990 and 1991 using county density as a measure of population density. Positive test rates fell by roughly twice as much in the two most dense categories (by 26% and 22%, respectively) as they did in the least dense categories (48-94 persons and 47 or less persons), where the decrease was 12 and 11 percent. The middle category, 95-208 persons per square mile, had the largest decrease, dropping from a positive test rate of .99 percent to .58 percent, a 41 percent decline.

Comparisons of positive test rates for cocaine show more marked changes between 1990 and 1991. Figure 28 shows positive test results for each of the two years. While the first four categories changed only slightly to moderately, the last category, 529+ or more persons per square mile fell steeply from .42 percent in 1990 to .28 percent in 1991, a decrease of 33 percent.

In conclusion, overall positive test rates are likely to be higher in areas that are more densely populated, as are positive test rates for cocaine. Decreases in positive test rates were greater in more densely populated areas. The largest decreases in positive test rates for cocaine occurred in the most densely populated areas. At this time the data available are not sufficiently detailed to determine the cause of these variable rates of decline.

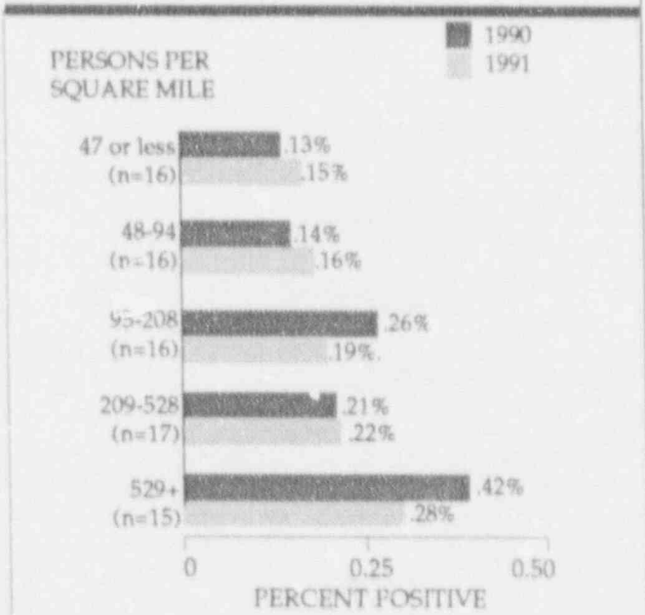

Figure 28
Comparison of positive test rates for cocaine by county density for 1990 and 1991

5.3 Differences in positive test rates by crime rate

This section examines the relationship between the crime rate in the area surrounding each nuclear power plant and the overall rate of positive tests at each site. Crime has often been correlated with drug use. It was postulated that those areas experiencing a higher crime rate may also have a higher incidence of drug use that would influence the population of workers who work or apply for work in the protected area.

Two separate measures were used to measure the crime rate. These were the crime rate of the county in which in the nuclear power plant is located and the crime rate of the largest city within sixty miles of the plant. Both indicators are based on serious crimes known to police and are measured per 100,000 population. Appendix A contains a description of each of these measures and the sources from which they were taken.

Analyses of mean positive test rates indicate that there is at least a partial correlation between crime rates in surrounding areas and overall positive test rates. Figure 29 shows the overall positive test rates by county crime rate. The results using this crime measure are not entirely linear. That is, the category with the highest crime rate reports a lower positive test rate than that of the second highest crime rate. In general, however, the two higher categories have higher positive test rates (.85% and .62%) than the two categories with lower crime rates, which are .47 percent and .53 percent.

Figure 30 shows mean positive test rates by the crime rate of the largest city within sixty miles of a given plant. This analysis produces findings similar to those of the previous one: the two categories of lower crime rates have a lower positive test rate than the two higher crime rate categories.

Figure 31 shows the positive test rates for cocaine by the crime rate of the largest city within sixty miles. Results from this analysis show more marked differences than those found in the analysis of the overall positive test rate. The positive rate for cocaine was lowest (.17% and .13%) in the two categories with the lowest crime rates, and highest (.27%) for the category with the highest crime rate. As in the analysis for population density, cocaine was the only substance that showed differences that at least partially correlate with crime rate.

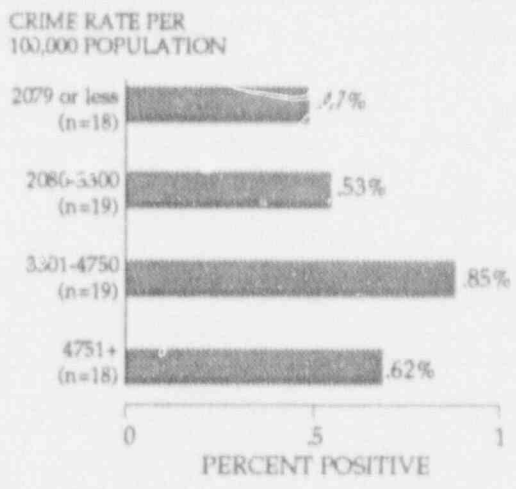

Figure 29
Confirmed positive test rates by county crime rate

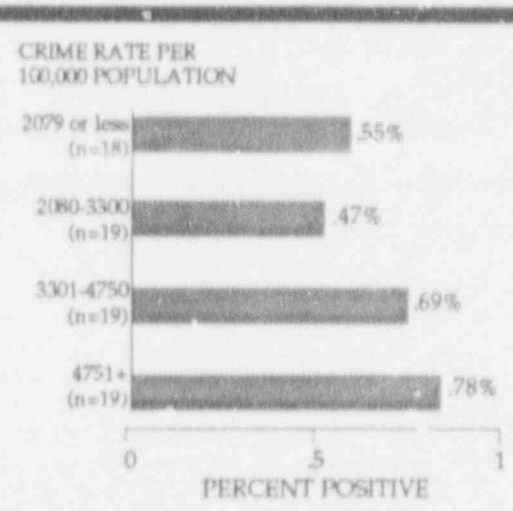

Figure 30
Confirmed positive test rates by crime rate of largest city within 60 miles

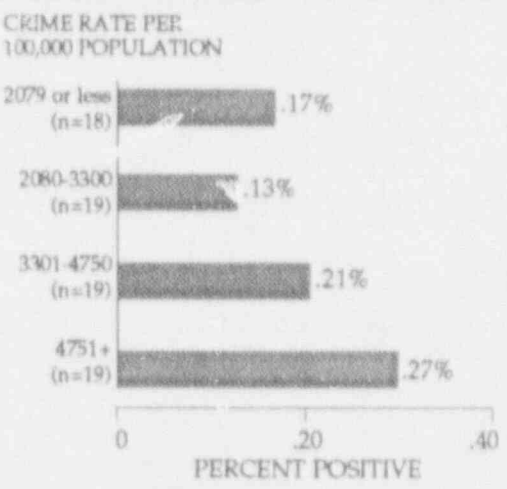

Figure 31
Confirmed positive test rates for cocaine by crime rate of largest city within 60 miles

In conclusion, the results of these analyses tend to confirm the expectation that reporting units' positive test rates are positively correlated with crime rates in the areas surrounding nuclear power plants. This seems to be true at least in a broad sense in that power plants that are located in areas with very high or very low crime rates can expect these rates to be reflected somewhat in their overall positive test rates. These results do not, however, provide conclusive information about how positive test rates vary with small differences in crime rates.

Cocaine was the only drug found to be associated with the measures of crime rate. There are several possible factors that could explain this relationship. The first possible reason is that cocaine is a highly addictive and expensive drug; addiction to cocaine has been found to induce people to criminal acts (e.g., theft) to support their habit. Cocaine is also the most expensive of the drugs tested and has been associated with major drug trafficking activities. Finally, as discussed in the previous section, cocaine use is generally higher in more densely populated areas, which are also likely to experience higher rates of crime.

5.4 Differences in positive test rates by incidence of drug and alcohol use

In Section 5.2, population density was related to the positive test rate for cocaine and amphetamine. Section 5.3 discussed the relationship between positive test rates and crime rates in the areas surrounding nuclear power plants. Although density and crime rates are useful predictors of positive test rates, other indicators such as drug and alcohol arrest rates in the areas surrounding nuclear power plants may be more effective predictors. This section examines the relationship between the incidence of drug and alcohol use in the general area of a nuclear power plant and positive test rates. Three measures were chosen to measure this relationship. These were the rate of alcohol arrests, the rate of drug arrests, and the rate of enrollment in drug and alcohol treatment centers. Appendix A contains a detailed description of each of these measures and the sources from which they were taken.

The first measure used was the rate of arrests attributed to alcohol by state. It was expected that high incidences of arrests would be related to higher positive test rates for alcohol. The second measure used was the total number of arrests for drugs. Areas in which drugs are more prevalent may have higher positive test rates for illegal substances. This information was available for the major city nearest to each power plant. The third measure used was the number of people enrolled in a drug or alcohol treatment program in the state in which a nuclear power plant is located. Enrollment in treatment centers could indicate the level of drug and alcohol abuse in a given state and could thus correlate with positive test rates. It is also possible, however, that increased enrollment in treatment programs could indicate a proactive state policy toward drug and alcohol rehabilitation rather than a high level of drug and alcohol abuse.

Unfortunately, these three measures did not predict positive test rates once the effects of population density were taken into account. There are several difficulties that may have contributed to this absence of results. First, although many other appropriate sources of data exist to measure the incidence of drug and alcohol use, these data sources are aggregated in such a way that they could not be used in this context. Second, a more general problem with drug and alcohol use measures is that they are difficult to isolate from other factors. For example, measures of arrest rates for alcohol- and drug-related offenses are likely to be highly correlated with other types of crimes. In conclusion, while more research into the exact relationship between drug and alcohol use of a general area and positive test rates would be useful, it is unlikely that conclusive results regarding this relationship would be found in the absence of more reliable data.

Summary of major findings

- The overall positive rate decreased in every region.
- Licensee employees had similar positive test rates across regions.
- The short-term contractor positive test rate influences overall region positive test rates.
- Population density was related to positive test rates in general and was related to positive test results for cocaine and amphetamine.
- Although not as strongly related as population density, crime rate in an area was a useful predictor of positive test rates.
- The incidence of drug and alcohol use in a general area could not be correlated to positive test rates.

SECTION 6: LESSONS LEARNED AND MANAGEMENT INITIATIVES

As part of completing the FFD program performance reports, many reporting units[5] included information about lessons learned and program initiatives that occurred during 1991. Actions identified in the reports were often taken to address specific problems, but some were also implemented to improve program effectiveness. These lessons learned and management initiatives are summarized in Section 6.1 and the lessons and initiatives during 1991 and 1990 are compared in Section 6.2. Section 6.3 discusses additional information provided by utilities that provide useful insights with regard to FFD program effectiveness. These sections are provided to assist licensees but do not necessarily reflect the opinion of the NRC. Table A-5 in Appendix A contains a list of fitness-for-duty contact names and phone numbers for each of the reporting units.

6.1 Summary of lessons learned

This section provides a brief overview of the problems noted, solutions suggested, and management initiatives that were identified in licensee program performance reports during 1991. It is not intended to be a full summary of the reports and readers may wish to review the many additional and useful suggestions in the full compilation of reported lessons learned provided in Appendix C. In addition to the material presented in this section, the NRC is aware of other actions by utilities that are either planned or in progress. These actions were not included in the 1991 program performance reports and thus were not analyzed in this report.

Several utilities took actions to improve the effectiveness of HHS-certified labs and strengthen relationships with the labs. These actions included:

- using computers and improved procedures to record blind and regular specimen test results to avoid clerical errors,
- contracting with labs in closer geographic proximity to the site in order to shorten test result turnaround time and specimen shipment time (which in turn mitigates specimen degradation)
- establishing a contract with a backup lab.

Utility efforts to assure that all covered personnel are included in the testing pool and that testing is unpredictable led to several initiatives. These included:

- adding or increasing testing on weekends, holidays and backshifts,
- increasing oversight, improving computer programs, and establishing faster turnaround in data entry to ensure that random test pools include all personnel (especially new personnel), and
- analyzing trends in collection times to identify periods that may be perceived as "safe" or free from testing, and adjusting schedules accordingly.

A number of utilities reported modifications in collection and testing procedures to improve their ability to identify drug use and subversion attempts. Procedural changes included:

- requiring personnel to empty pockets before providing a specimen,
- using refractometers to measure specific gravity levels,
- testing for an expanded panel of drugs in for-cause or suspected subversion cases, and
- assigning the same collector for an individual's follow-up tests in order to create consistent observation of that individual's behavior.

Several utilities improved their collection and onsite testing facilities. These initiatives included:

- increasing the amount of privacy in collection, testing, and interview areas,
- installing alarms to monitor refrigerator temperature, and
- enlarging facilities to increase efficiency and improve service.

Some utilities also improved their FFD training and education to ensure that relevant personnel received training in a timely manner. These improvements included:

- implementing administrative controls and tracking mechanisms to identify licensee and contractor/vendor supervisors who require initial or refresher training,
- updating and clarifying training materials and videotapes,

[5] In most cases, this information is submitted by the utility and applies to all reporting units under that utility. In this section, therefore, reporting units refer to utilities.

- distributing information to increase awareness of the FFD program and its goals among licensee and contractor employees,
- updating and communicating information concerning reportable medications, and
- assuming responsibilities for training contractor supervisors.

Several utilities noted the need for improved or new procedures and guidelines in several program areas. These included:

- maintenance of testing equipment,
- fitness-for-duty of personnel called in,
- MRO guidelines,
- BACs below the cutoff level,
- blood alcohol testing procedures for both medical and FFD staff, and
- chain-of-custody.

A number of utilities reported both difficulties and initiatives relating to FFD program management and administration. Relevant actions included:

- installing or upgrading computer equipment to track maintenance needs, personnel changes, and individuals who require training,
- hiring additional MROs and other FFD management staff to ensure adequate staffing flexibility,
- developing plans to meet increased program demands during outages,
- developing or attending conferences with other utility FFD program personnel to share information,
- providing in-house training for FFD staff,
- participating in a nationwide database of testing dates and results designed to assist utilities in determining personnel access reinstatement, and
- monitoring information on local drug use and subversion techniques.

A small number of utilities took initiatives to better assist employees with fitness-for-duty problems and to increase employee awareness of EAPs. These actions included:

- developing mechanisms to monitor and assist employees who have measurable BACs below FFD policy violation levels,
- improving services to assist rehabilitating employees, including frequent follow-up testing and increased meetings with EAP counselors,
- distributing literature to inform employees about substance abuse, and
- disseminating information on the EAP to increase employee awareness of that resource.

A few utilities took actions to improve the security of collection site facilities and records. These actions included:

- installing alarms and motion detectors at primary and satellite facilities, and
- establishing a separate secure area to further protect test result information and random test lists.

Several utilities addressed problems with the quality assurance element of the FFD program. Problems included:

- the degradation of blind performance test specimens, and
- inadequate numbers of blind performance test specimens submitted due to inadequate oversight of procedures.

6.2 Comparison of semi-annual lessons learned

As in 1990, a number of utilities described lessons learned and initiatives in their 1991 program performance reports. This section provides a comparison of the types of problems, lessons, and management actions described for each year. The purpose of this comparison is to identify whether the frequency of problems identified in 1990 is declining, increasing, or remaining the same. This comparison provides a concise overview of the problems and solutions encountered during the two-year period.

The lessons learned fell into several categories:

- Certified laboratories
- Random testing
- Collection and on-site testing procedures and facilities
- Training
- Procedures
- Program management and administration
- Worker welfare and rehabilitation

- Security
- Quality assurance

In general, while utilities noted many of the same problems, solutions, and initiatives in 1990 and 1991, there are dramatic differences in those issues which were dominant for each period. The following provides a summary of comparisons between 1990 and 1991 according to the categories listed above.

6.2.1 Certified laboratories

In 1990 a number of utilities reported inadequate performance by and monitoring of certified labs as a central problem. Issues that arose included the handling and storage of samples, unsatisfactory testing performance, and inadequate communication between licensees and labs. In response, licensees increased their monitoring of lab performance and criteria and established various procedures to improve lab performance and communication. None of these problems were noted by utilities in 1991. In fact, the only issue related to lab performance was that of occasional errors in recording test results. Therefore, it appears that laboratory performance has improved as the relationship between laboratories and licensees has stabilized and procedures, standards, and communications have been refined.

One new initiative that several utilities noted in 1991 is that of contracting with new labs in closer proximity to the site. This action decreased the shipment time of test results and was more conducive to maintaining communication.

6.2.2 Random testing

Utilities reported fewer and less varied initiatives in the area of random testing in 1991 than in the previous year. Improvements reported in 1990 were focused on ensuring that all personnel were equally available for random testing, and included adding collection facilities at corporate offices and conducting off-site testing. Many 1990 reports cited modifications to ensure the unpredictability of testing by testing daily and more frequently on weekends, holidays, and backshifts, while other reports noted improved techniques for random selection through computer enhancements and selection methods.

While fewer utilities noted lessons or initiatives related to random testing in 1991, several utilities added or increased testing on weekends, holidays, and backshifts. In addition, some utilities improved the unpredictability of collection by analyzing trends in collection times and adjusting schedules to eliminate any perceived "safe periods." Finally, some utilities reported correcting random test pools that previously did not include all personnel covered by the FFD policy.

6.2.3 Collection and on-site testing procedures and facilities

Although utilities noted more management initiatives to improve collection and on-site testing procedures and facilities in 1991, few of these related actions responded to deficiencies that had an impact on program quality. Utility reports in 1990 noted problems in specimen handling, storage, and packaging. These issues were not widely addressed during 1991. Utilities did note a variety of initiatives in 1991 including improving privacy in collection, testing, and interview areas, enlarging facilities, and modifying procedures to improve FFD staff ability to identify drug use and subversion attempts. These actions focused on strengthening the program, however, rather than addressing fundamental program weaknesses.

6.2.4 Training

Utility lessons learned and initiatives related to training were somewhat limited in 1991 compared to those reported in 1990. In 1990 training issues focused on ensuring that licensee and contractor supervisors received appropriate and timely training, identifying newly promoted supervisors eligible for training, tracking employees who completed FFD training, providing training to security and FFD staff, and distributing information to clarify program elements.

Although utilities reported fewer training-related problems and initiatives in 1991, the issues that they did note were similar to those of the previous year. Several utilities cited the need to implement tracking mechanisms to identify licensee and contractor supervisors who require initial or refresher training. They also noted initiatives to distribute information to clarify elements of the program or increase program awareness. Finally, some utilities updated training materials and improved the training opportunities that were available to FFD staff.

6.2.5 Procedures

Utilities reported a number of similar issues in the area of procedures in both 1990 and 1991. In both years, utilities developed and improved procedures to ensure the proper maintenance of site facility equipment and addressed guidelines for workers who are called in.

Utilities also reported new initiatives in 1991. A number of utilities modified procedures to improve the

ability to identify drug use and subversion attempts, while others revised procedures to address workers with BACs that are measurable but below violation levels. Other actions in 1991 included the development of guidelines for MROs and modifications to chain-of-custody procedures.

Although the types of issues in the area of procedures have changed somewhat between 1990 and 1991, the number of issues and related actions have remained relatively constant over time.

6.2.6 Program management and administration

Utilities also reported similar numbers of lessons learned and initiatives relating to management and administration of FFD programs in 1990 and 1991. While they reported some similar problems and management actions for both years, there were also some notable differences.

Utilities continued to mention some of the issues that were most widely cited in 1990. For example, an increasing number of utilities hired additional FFD managers and specialists in 1991 in order to improve program oversight. This included two utilities that hired additional or part-time MROs to ensure that a back-up MRO was always available if the primary MRO was absent. Utilities also implemented computer-related improvements to improve program effectiveness (e.g., establishing programs to record test results, monitor blind test specimen submittal rates, and track use of testing equipment to identify maintenance needs). One item that utilities mentioned less frequently was taking action to increase program awareness among contractor employees.

In 1990, several utilities noted problems in calculating and reporting test results, rates, and other data to the NRC in a proper and timely manner. Utilities did not report this to be a problem in 1991. Utilities did cite new initiatives related to program management and administration in 1991, however. Some reorganized their program structure to improve efficiency or centralize operations, while others developed or attended FFD information-sharing conferences.

6.2.7 Worker welfare and rehabilitation

As in 1990, utilities made few references to Employee Assistance Programs and worker welfare or rehabilitation in 1991. In 1990 the primary lesson learned was the need for improved dissemination of information about the EAP. In 1991 one utility reported an aggressive plan to meet this need by distributing EAP brochures to all personnel, making literature readily available, and sponsoring brown bag lunches with EAP representatives.

Utilities also reported new initiatives in 1991. Two utilities developed procedures to monitor and assist workers who have had measurable BACs below violation levels. Two additional utilities developed measures to assist rehabilitating workers in reaching their goal of remaining drug-free.

6.2.8 Security

Utilities reported similar actions to improve the security of facilities in 1990 and 1991. Three utilities took actions to secure collection facilities (using alarms and motion detectors) or record storage areas in 1991. In 1990, a similar number of utilities reported initiatives to improve locks and establish a security log.

6.2.9 Quality assurance

Utilities identified two problems during 1991 related to quality assurance in the FFD program. Four utilities reported that some blind performance test specimens had degraded before arriving at their certified labs for quality control tests. One utility concluded that an unstable drug used to spike the specimens had caused the problem; another utility switched suppliers. A second problem involved an inadequate number of blind performance test specimens being submitted to labs due to insufficient oversight and procedures. In 1990 the primary problem related to quality assurances involved the unsatisfactory performance of certified labs.

6.3 Summary of additional data submitted by utilities

In addition to the lessons learned and management initiatives submitted by utilities, there are two additional sources of data that provide useful information on fitness-for-duty programs. The first source consists of reports on investigations into unsatisfactory testing results and other matters associated with the testing process that licensees are required to investigate and report under the provisions of Section 2.8 (e) of Appendix A to 10 CFR Part 26. Licensee reports under this requirement were forwarded to the National Institute on Drug Abuse (NIDA) for analysis. The section below summarizes the information contained in the letter report to the NRC written by NIDA, which is provided in its entirety in Appendix D of this NUREG/CR.

The second source consists of supplementary information that some licensees included in their semi-annual program performance reports. This section describes results from each of these data sources and discusses relevant lessons that can be learned from this information.

6.3.1 Investigations of unsatisfactory testing results and other matters

The following is a summary of the unsatisfactory testing results that occurred between January 3, 1990 and March 30, 1992 and that are discussed in NIDA's letter report (Appendix D). During this period there were over 640,000 specimens tested under the NRC FFD regulation. Forty-four of the 52 utilities reported a total of 175 unsatisfactory testing results to the NRC. Of this total, 167 resulted from the testing of double blind performance specimens and 8 from the testing of specimens provided by licensee or contractor personnel. Results from double blind performance specimens are not reported in any other section of this NUREG/CR. The 8 unsatisfactory testing results on personnel specimens were reported in categories based on their final resolution and included in the testing results reported in previous sections of this report and in the first volume of this NUREG/CR. In several cases multiple unsatisfactory specimen reports were caused by a single error. For example, one administrative problem led to false negative results for 27 double blind specimens. Therefore, the number of unsatisfactory specimens is not to be equated with the number of testing process errors or other problems that have occurred in the industry.

To better understand the factors contributing to unsatisfactory testing results, NIDA categorized these results into four categories: improper manufacture of blind performance specimens, improper processing of specimens, false negative test results, and false positive test results. About half of the unsatisfactory testing results were attributed to the defective manufacture or formulation of blind performance specimens, while an additional 11 percent resulted from improper handling or processing of specimens. False negative laboratory results accounted for 38 percent of the unsatisfactory test results, and administrative false positive laboratory results were found in the remaining 2 percent of unsatisfactory results. Licensees reported that they have taken a number of steps to reduce these problems.

Of particular concern are the 8 unsatisfactory testing results on specimens provided by personnel. Due to the serious nature of unsatisfactory test results for worker-provided specimens, each of these occurrences is described in greater detail. In three cases worker-provided specimens were processed or handled in an unsatisfactory manner and were not determined to be either positive or negative. Three test results, first questioned during the MRO's review of laboratory reports, were determined to be false negative results due to laboratory administrative errors. The remaining two unsatisfactory test results were false positive test results caused by administrative errors. One of these errors occurred during the transcription of the confirmation results of two specimens that were being confirmed for barbiturates. In the other, a blind performance specimen was switched with a worker-provided specimen. Due to prescription medications, the MRO interpreted the laboratory result as negative prior to the investigation of the false negative quality control specimen. Although all these instances related to worker-provided specimens were eventually resolved in an appropriate manner, one worker did suffer short-term consequences due to a delay in the resolution of a false positive test result.

In conclusion, the nature and extent of these unsatisfactory testing results provide several important lessons for the industry. First, while instances of unsatisfactory testing results are low relative to the number of total tests performed, they are sufficiently high to justify continued monitoring of laboratory performance. Second, the instances of both false positive and false negative test results support the need for MROs to routinely review both positive and negative test results. Third, quality control problems stemming from several different factors have been demonstrated for blind performance test specimens. Fourth, although all of the unsatisfactory testing results were ultimately resolved in a satisfactory manner, the negative effects of even short delays in resolving unsatisfactory testing results may have consequences both for the individuals involved and for the credibility of fitness-for-duty programs. Finally, licensees have taken active steps to reduce the number of unsatisfactory test results (e.g., bar code labeling of specimens to reduce data entry errors). There is evidence that these initiatives are having a beneficial effect on the industry's testing program but that continued efforts are needed to ensure the integrity of fitness-for-duty testing programs.

6.3.2 Supplementary information

In addition to the items that the FFD rule requires to be reported, a number of reporting units included additional information regarding the effectiveness of their fitness-for-duty programs. Because this supplementary information is not required by the rule, the types of information submitted and the form in which they were provided varied substantially among reporting units. There were three categories of information, however, that were submitted by a sufficient number of reporting units to warrant detailed analysis. Still, the results from this section are based on small samples of the population and may not be representative of all reporting units. The categories available for more detailed analysis include the type of substance by worker category, type of substance by test category, and random testing statistics.

Twelve utilities representing 16 of the 85 report-

Table 8

Positive test results for each substance and worker category: Supplementary utility data

	Marijuana	Cocaine	Amphetamine	Alcohol	Additional Drugs	Refusal to Test	Total
Licensee Employees	20	14	2	19	0	1	56
Long-and Short-Term Contractors	74	42	5	40	2	0	163

ing units provided information on the type of substance found by worker category. Table 8 shows the results of this analysis for the 12 utilities. Figure 32 shows the relative proportions of positive test results by type of substance for each worker category. Of the substances represented in the sample, the most marked differences by worker category occurred for marijuana and alcohol. For licensee employees, 35.7 percent of positive test results were for marijuana, and 33.9 percent were for alcohol. Positive test results for contractor personnel showed higher rates of marijuana positive test results (45.4%) than for licensee employees, while the proportion of positive test results for alcohol was lower at only 24.5 percent. The incidence of other substances was similar for each of the worker categories.

It should be noted that the 219 positive test results reported by substance and worker category account for only 12.4 percent of the total positive test results reported by substance in 1991. As a result, these numbers may be limited in the extent to which they can be generalized to the total population. There is some evidence, however, that the sample used is somewhat representative of the population. Results from this sample found about one-fourth of the positive test results attributable to licensee employees while contractor personnel accounted for the remaining three-fourths. This is similar to the overall proportion of positive test results among worker categories (23.4% and 76.6% for licensee employees and contractors, respectively). The overall proportion of substances (combining licensee employees and contractor personnel) was also similar to that found for the entire population (see Figure 4).

Far fewer utilities submitted information on the other two categories of information. A total of six utilities reported the type of substance detected by testing category. This information represented approximately 6 percent of the total positive test results, which was not a sufficient number to warrant the detailed reporting of results.

Six utilities also provided information relating to random testing. While much of this information was not quantitative in nature, and could not therefore be summarized, a great deal of useful information was described. For example, one utility reported that several of the workers who had tested positive on a random test had tested negative on pre-access or random tests shortly prior to that time (i.e. between 120 and 180 days prior to the test). Other information submitted by utilities included the number of times individual workers were selected for random testing, percentages of workers who were excused from random testing because of absence or other valid reasons, random testing frequency by day of the week, and the total percent of workers who were selected at least once for random testing within a given year.

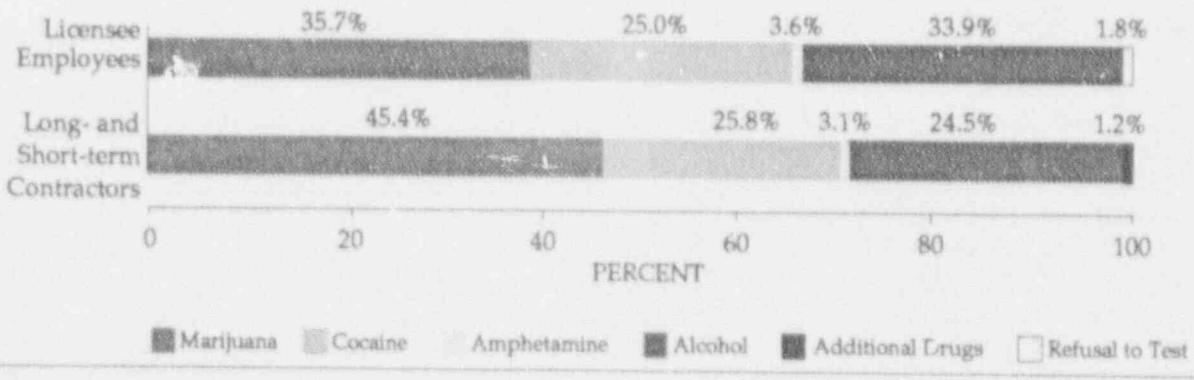

Figure 32

Distribution of positive test results by substance for each worker category

APPENDIX A

TECHNICAL BACKGROUND

This section includes:

- a description of the data that were used as the basis of this report
- a list of the utilities and reporting units providing data for this report
- additional detail on the definitions of test categories used in this report
- information used in the analysis of the effects of an outage on positive test rates
- information used in the analysis of the effects of population density on positive test rates
- information used in the analysis of the effects of crime rate on positive test rates
- information used in the analysis of the effects of the incidence of drug use on positive test rates
- contact names of persons responsible for submitting semi-annual program performance reports
- 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 reporting units authorized to operate or construct a nuclear power reactor. Eighty-five program performance reports were received from 52 utilities (75 from sites and 10 from corporate offices) for each of the six-month reporting periods of CY 1991. Table A-1 shows a list of each reporting unit by NRC region. The form used was a standardized data collection form developed by the Nuclear Utilities Management and Research Council (NUMARC) to fulfill Part 26.71(d) of the FFD rule. This part of the rule specifies that the data reported shall include:

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

The number of positive tests results and the number of specific substances identified are not expected to be equal. A total of 1,762 positive test results were reported and a total of 1,744 substances were identified. There are several reasons for this difference:

- A refusal to test produces a positive test result but does not identify a substance as positive.
- 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, for example, would be counted as two substances.
- 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 came from the same sample.

Table A-1
Plants/Utilities by Region

REPORTING UNIT/ OPERATING UTILITY	REPORTING UNIT/ OPERATING UTILITY	REPORTING UNIT/ OPERATING UTILITY
REGION I	Farley 1 & 2 Alabama Power Company	Monticello Northern States Power Company
Beaver Valley 1 & 2 Duquesne Light Company	Grand Gulf 1 & 2 Entergy Operations, Inc.	Palisades Consumers Power Company
Calvert Cliffs 1 & 2 Baltimore Electric & Gas Company	Harris 1 Carolina Power & Light Company	Perry 1 & 2 Cleveland Electric Illuminating
FitzPatrick New York Power Authority	Hatch 1 & 2 Georgia Power Company	Point Beach 1 & 2 Wisconsin Electric Power Corporation
Ginna Rochester Gas & Electric Company	McGuire 1 & 2 Duke Power Company	Prairie Island 1 & 2 Northern States Power Company
Haddam Neck Northeast Utilities	North Anna 1 & 2 Virginia Power Company	Quad Cities 1 & 2 Commonwealth Edison Company
Indian Point 2 Consolidated Edison Company	Oconee 1, 2 & 3 Duke Power Company	Zion 1 & 2 Commonwealth Edison
Indian Point 3 New York Power Authority	Robinson 2 Carolina Power & Light Company	**REGION IV**
Limerick 1 & 2 Philadelphia Electric Company	Sequoyah 1 & 2 Tennessee Valley Authority	Arkansas 1 & 2 Entergy Operations, Inc.
Maine Yankee Maine Yankee Atomic Power Company	St. Lucie 1 & 2 Florida Power & Light Company	Comanche Peak 1 & 2 Texas Utilities Electric Company
Millstone 1, 2 & 3 Northeast Utilities	Summer South Carolina Electric & Gas Company	Cooper Nebraska Public Power District
Nine Mile Point 1 & 2 Niagara Mohawk Power Corporation	Surry 1 & 2 Virginia Power Company	Fort Calhoun 1 Omaha Public Power District
Oyster Creek GPU Nuclear Corporation	Turkey Point 3 & 4 Florida Power & Light Company	Fort St. Vrain Colorado Public Service Company
Peach Bottom 2 & 3 Philadelphia Electric Company	Vogtle 1 & 2 Georgia Power Company	River Bend 1 Gulf States Utilities Company
Pilgrim 1 Boston Edison Company	Watts Bar 1 & 2 Tennessee Valley Authority	South Texas 1 & 2 Houston Lighting & Power Company
Salem 1 & 2/Hope Creek 1 Public Service Electric & Gas	**REGION III**	Waterford 3 Entergy Operations, Inc.
Seabrook 1 Public Service Company of New Hampshire	Big Rock Point Consumers Power Company	Wolf Creek 1 Wolf Creek Nuclear Operating Corporation
Shoreham Long Island Lighting Company	Braidwood 1 & 2 Commonwealth Edison Company	**REGION V**
Susquehanna 1 & 2 Pennsylvania Power & Light Company	Byron 1 & 2 Commonwealth Edison Company	Diablo Canyon 1 & 2 Pacific Gas & Electric Company
Three Mile Island 1 GPU Nuclear Corporation	Callaway Union Electric Company	Palo Verde 1, 2 & 3 Arizona Public Service Company
Vermont Yankee Vermont Yankee Nuclear Power Corporation	Clinton Illinois Power Company	Rancho Seco Sacramento Municipal Utility District
Yankee-Rowe Yankee Atomic Electric Company	Cook 1 & 2 Indiana Michigan Power Company	San Onofre 1, 2 & 3 Southern California Edison Company
REGION II	Davis-Besse Toledo Edison Company	Trojan Portland General Electric Company
Bellefonte 1 & 2 Tennessee Valley Authority	Dresden 2 & 3 Commonwealth Edison Company	Washington Nuclear 1, 2 & 3 Washington Public Power Supply System
Browns Ferry 1, 2 & 3 Tennessee Valley Authority	Duane Arnold Iowa Electric Light & Power Company	
Brunswick 1 & 2 Carolina Power & Light Company	Fermi 2 Detroit Edison Company	
Catawba 1 & 2 Duke Power Company	Kewaunee Wisconsin Public Service Corporation	
Crystal River 3 Florida Power Corporation	LaSalle 1 & 2 Commonwealth Edison Company	

Testing Categories

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

Pre-access Testing

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 reporting units 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 Testing

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 being selected for testing.

For-cause Testing

For-cause testing is performed based on behavioral observation programs or on credible information that an individual is abusing drugs or alcohol. This category also includes post-accident testing.

Follow-up Testing

Follow-up testing refers to chemical testing at unannounced intervals to ensure that a worker who previously had a confirmed positive test result is maintaining abstinence from the abuse of drugs or alcohol.

Tables B-1, B-2, and B-3 in Appendix B present the number of tests, number positive, and average percent positive for each of the test categories requested on the NUMARC form. Also included are test results for the "Other" category. This category includes results from the periodic testing conducted by some reporting units coincident with annual physicals or similar periodic events. Results reported in the NUMARC form's "Other" category are not included in all sections of this report. Instructions accompanying the NUMARC form do not define what testing should be included in this category. Although some reporting units specified the exact nature of the "other" tests (e.g., return to work), most reporting units did not provide this information.

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 FFD rule. This category includes both nuclear power plant workers and corporate or support staff. Utilities were asked to report the results for corporate or support staff separately. Ten of the 52 utilities reported separate corporate results. On average, there were 2,260 licensee employees included in each report.

Long- and short-term contractors: The instructions accompanying the NUMARC form suggest that any contractor working for six months or less be considered short-term. Reporting units were not required by the rule to distinguish between long- and short-term contractors in the program performance reports, however. Reporting units that did not divide contractors into short- and long-term were instructed to report test results for all contractors under the short-term category. As a result, 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 reporting units varied in their definitions of long- and short-term contractors, any comparisons between rates of positive test results for the two groups should be interpreted carefully. On average, there were 121 long-term contractors and 907 short-term contractors included in each report.

Tables B-2 and B-3 present the number of tests, number positives, and average percent positive by each test category included in the NUMARC form for licensee employees and contractor employees (B-2) and for long- and short-term contractors (B-3) separately.

Drug Categories

The rule requires testing for five drugs and alcohol. Table A-2 shows the maximum screening levels and confirmation levels required by the rule. These levels are consistent with those set by the National Institute of Drug Abuse (NIDA).

Reporting units are permitted to set cutoff levels lower than those specified in the NIDA guidelines. Many reporting units chose to do so for at least one category of drug, as indicated by their program performance reports. Several reporting units using lower cutoff levels failed to estimate the number of positive test results for NIDA guidelines as well as reporting results for their own cutoff levels.

Additional Drugs

Many reporting units also tested for drugs other than the six (five illegal drugs and alcohol) substances

required by the rule. Information on the number of reporting units testing for additional drugs is presented in Table B-5. This information is categorized by region. The table indicates that the additional drugs most often included in testing were barbiturates and benzodiazepines.

Regions

The NRC has five administrative regions, which are shown in Figure A-1. Tables B-8 and B-9 show the results of overall testing and testing for specific drugs (alcohol, marijuana, cocaine, amphetamine, opiates, and phencyclidine) by NRC region. Table B-10 shows results by worker category for each region.

Outage Data

Data regarding plant outages were gathered for each site in three of the five regions and a limited number of sites in a fourth region. For each plant, the approximate outage start date and duration were gathered from the January and July 1991 editions of "Nuclear News." This information was recorded for each plant, and a list of all plants in a given region was compiled and sent to the regional inspector for that region. Inspectors confirmed approximate start dates and durations for plants in Regions III, IV, and V. The inspector in Region I was unable to confirm outage information for any plants, and confirmed outage data was available for less than half of the plants in Region II. Table A-3 shows the confirmed outage information for the first and second six months of 1991.

Since confirmed outage information was available for only 42 of the 75 reporting units (the 10 corporate offices were not included), we considered using the approximate outage dates for those reporting units with unavailable confirmed outage dates. Using this data would have allowed us to include all 75 reporting units in the outage analysis. An analysis comparing confirmed outage dates for the 42 reporting units with their

Table A-2
Maximum Screening and Confirmation Levels Required by 10 CFR Part 26

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

NOTE: Alaska and Hawaii are included in Region V.

Figure A-1
Geographic Location of NRC Regions I-V

corresponding approximate outage dates was performed to examine how well approximate outage data predicted actual data. Correlations between the predicted and actual outages in the first and second six months produced coefficients that were moderate in strength (.58 and .72, respectively). The relationship between approximate and confirmed outage days during each six-month period was also examined, with similar results. Finally, positive test rates using confirmed outage data were compared to rates using approximate outage data. There were substantial differences in the positive rates for each of the two sets of data, indicating that approximate outage dates are not an adequate predictor of confirmed outage dates. As a result, the outage analyses performed included only those reporting units for which confirmed outage data were available.

Outages that started in 1991 but continued into 1992 were recorded as ending December 31, 1991, as this was when data on fitness-for-duty testing was ended. Outages that started in the first six months of 1991 but continued into the second six months of 1991 were counted as two outages, one ending on June 30th, the second beginning on July 1st. This was because program performance data for the first six months of the year ended on June 30th. Information regarding unscheduled outages was not included, as complete, verified information on these outages was not available in a timely manner., and the manner in which this information is reported is inconsistent among plants.

Due to the limited amount of confirmed outage data, the analyses and findings related to outages must be interpreted carefully.

Another limitation with the outage data is that plants have different criteria for when they consider themselves to have started an outage and when it has been officially completed. Future use of outage data will require these criteria to be standardized across all plants.

Population Density Data

Section 5.2 of this report analyzes the relationship between the population density of an area surrounding a plant and the positive test rate for drugs and alcohol. Six separate measures were used to analyze the effect of population density. Each captured a slightly different aspect of the concept of population density in the vicinity of a nuclear power plant. The six measures are summarized in Table A-4.

The two measures used in the analysis were the county density and the distance to a city of 300,000 or more people. These measures were chosen because they capture both density and proximity to a major urban center.

The measures were each broken into five categories for data reporting. These categories represented five equal intervals which incorporated 20 percent of the plants in each. Thus, the 20 percent of the plants that were located in the least dense county were in category 1, the next least dense 20 percent were in category 2, etc. This method captured the highest amount of variance. Thus, using this information minimized information lost due to categorizing the variable.

Crime Rate Data

Section 5.3 of this report analyzes the relationship between the crime rate of a general area surrounding a nuclear power plant and the overall test rate and rate for specific drugs at each site. Two measures were used to assess this relationship. The first measure was the crime rate of the county in which the nuclear power plant is located. Information for this measure was gathered from the 1989 County and City Data Book, the contents of which are based on the 1980 U.S. Census. Crime rate from this source was based on serious crimes known to police and measured by number of crimes per 100,000 population.

The second measure used in this analysis was the crime rate of the largest city within 60 miles of each nuclear power plant. This particular distance was selected because it proved to be a good predictor in the 1990 analysis for population density (see NUREG/CR 5758) and because it represents a logical commuting distance (about one hour). Distance to the largest city was calculated by using the 1990 Rand McNally Road Atlas. Distance was calculated using a straight-line method. Crime rates for each of the identified cities were taken from two sources: the 1989 County and City Data Book, and the 1991 State and Metropolitan Area Data Book. Both sources base crime rates on serious crimes known to police, and per 100,000 population.

Each of the two measures were broken into four categories for analysis. These categories were equal (each category contained either 18 or 19 reporting units) and proceeded from reporting units with the lowest crime rate to those with the highest. Corporate offices were not included in the crime analysis. As a result, there are fewer reporting units included in this analysis than in other analyses (e.g., regional analyses).

Drug Use Data

Section 5.4 of this report analyzes the relationship of the incidence of drug use in the general area of a nuclear power plant and the overall confirmed positive testing rate. Three measures were used to assess this relationship. The first measure used was the rate of alcohol-related arrests that occurred in the state in which each nuclear power plant was located. This information was obtained from the 1990 Sourcebook of Criminal

Table A-3
Outage Information for first and second six months of 1991*

Plant Name	Number of days in outage in first six months	Number of days in outage in second six months
REGION II		
Catawba 1 & 2	61	68
Farley 1 & 2	54	0
Hatch 1 & 2	61	61
Oconee 1, 2 & 3	54	0
Shearon Harris	60	0
Surry 1 & 2	60	0
Turkey Point 3 & 4	181	127
Vogtle 1 & 2	0	43
REGION III		
Big Rock Point	0	33
Braidwood 1 & 2	138	75
Byron 1 & 2	0	63
Callaway	0	0
Clinton	67	0
Cook 1 & 2	42	0
Davis Besse	0	68
Dresden 2 & 3	40	115
Duane Arnold	16	0
Fermi	76	11
Kewaunee	63	0
LaSalle 1 & 2	80	0
Monticello	64	0
Palisades	69	0
Perry 1 & 2	0	0
Point Beach 1 & 2	45	43
Prairie Island 1 & 2	30	0
Quad Cities 1 & 2	175	0
Zion 1 & 2	181	46
REGION IV		
Arkansas 1 & 2	82	0
Comanche Peak 1 & 2	0	69
Cooper	5	73
Fort Calhoun	0	36
Fort St. Vrain	0	0
River Bend	9	28
South Texas 1 & 2	78	96
Waterford	80	0
Wolf Creek	0	109
REGION V		
Diablo Canyon 1 & 2	63	55
Palo Verde 1, 2 & 3	117	76
Rancho Seco	0	0
San Onofre 1, 2 & 3	83	96
Trojan	119	184
WNP 1 & 2	171	0

* Outage information was unavailable for all Region I plants and several Region II plants.

Justice Statistics and referred to the total number of alcohol-related arrests in 1990. This data was adjusted by state population to arrive at an alcohol arrest rate.

The second measure used was the number of drug-related arrests. These data were also taken from the Sourcebook of Criminal Justice Statistics, and represent 1989 data. The third measure used was the total number of persons enrolled in drug or alcohol treatment programs in the state in which each nuclear power plant is located. This measure was obtained from a 1989 report from the National Drug and Alcoholism Treatment Unit Survey. This survey reported the total number of clients enrolled in drug or alcohol abuse treatment, which was again adjusted by state population to produce a client enrollment rate.

Reporting Unit Contacts

Table A-5 provides a list of contact persons and phone numbers for each reporting unit by region. This information is provided to allow reporting units to contact other sites to share information about lessons learned or other items that may be of interest in this report. The names of the contact persons listed in Table A-5 were obtained from the semi-annual program performance reports submitted in the second six month period of CY 1991. It is important to note that the persons listed in this table are not necessarily in a position to be responsible for the accuracy of the data submitted or the overall testing results that occurred at their site.

Table A-4
Population Measures

County Population

One common population measure is that of county population. This information was gathered from the 1988 County and City Data Book, which is based on the 1980 U.S. Census. One problem with this measure is that it does not account for county size. This is particularly noticeable between East and West coast counties.

County Density

County density is calculated by dividing the population of a county by the number of square miles in the county. This measure avoids the problems inherent in the previous measure by adjusting for county size. This information was also gathered from the 1988 County and City Data book.

Number of Miles to a City of 100,000 or Greater

Population density can also be conceptualized as the distance to a large city. This measure was taken by using the 1990 NRC Information Digest to locate each plant. The distance from each plant to the outskirts of the nearest city of at least 100,000 people was then determined using the 1990 Rand McNally Road Atlas. Because it is difficult to determine distance along roadways, distance was calculated using a straight-line method. City populations were taken from the 1988 County and City Data Book.

Number of Miles to a City of 300,000 or Greater

The distance to a major metropolitan area can sometimes be more predictive of drug or alcohol problems than just distance to a large city. Thus, the above procedure was used to determine the distance from each plant to the outskirts of the nearest city of at least 300,000 people.

Population of the Largest City within 30 miles

Another useful measure of population density is the largest city within a short drive. While it may be over 200 miles to a city of 100,000 for a given plant, it might only be 20 miles to a city of 85,000. Thus, this measure provides information that might be missed by the previous measures. Again, a straight-line method was used to measure the largest city within 30 miles of each plant. The 1988 County and City Data Book provided information on city populations.

Population of the Largest City within 60 miles

Because a distance of 60 miles represents a logical commuting distance, the procedure explained above was used to determine the population of the largest city within 60 miles.

Table A-5
Reporting Unit Contacts by Region

REGION I

Beaver Valley 1 & 2
William Roy
(412) 393-5238

Calvert Cliffs 1 & 2
F. Bruce Martenis
(410) 234-5162

FitzPatrick
Carol A. Soucy
(315) 349-6412

Ginna
Lynn I. Hauck
(716) 771-2232

Haddam Neck
David J. Heritage
(203) 721-2306

Indian Point 2
J. Mark Drexel
(914) 526-5418

Indian Point 3
Joe Dube
(914) 736-8191

Limerick 1 & 2
D. M. Sarley
(215) 841-5703

Maine Yankee
Paul R. Cooper
(207) 882-5836

Millstone 1, 2 & 3
David J. Heritage
(203) 721-2306

Nine Mile Point 1 & 2
Charles I. Craigmile
(315) 349-7574

Oyster Creek
S. A. Babczak
(201) 316-7011

Peach Bottom 2 & 3
D. M. Sarley
(215) 841-5703

Pilgrim 1
Jacqueline E. Hess
(617) 424-3478

Salem 1 & 2/Hope Creek
Mary Samuels
(609) 339-5600

Seabrook 1
Bruce R. Seymour
(603) 474-9521

Shoreham
Robert W. Grunseich
(516) 929-8300

Susquehanna 1 & 2
Chris D. Lopes
(717) 542-3888

Three Mile Island 1
S. A. Babczak
(201) 316-7011

Vermont Yankee
Mark Varno
(802) 275-7711

Yankee-Rowe
Peter R. Fowler
(508) 779-6711

REGION II

Bellefonte 1 & 2
Pamela C. Hamilton
(615) 751-5024

Browns Ferry 1, 2 & 3
Pamela C. Hamilton
(615) 751-5024

Brunswick 1 & 2
Vic Grose
(919) 457-2138

Catawba 1 & 2
Jill W. Wells
(803) 831-3214

Crystal River 3
Ronald S. Kline
(813) 866-5277

Farley 1 & 2
J. A. Ripple
(205) 868-5075

Grand Gulf 1 & 2
Paul Speyerer
(601) 437-2481

Harris 1
Steve Allen
(919) 362-3546

Hatch 1 & 2
Don M. Crowe
(205) 877-7248

McGuire 1 & 2
Kimberly S. Laws
(704) 875-4148

North Anna 1 & 2
W. R. Runner, Jr.
(804) 273-2735

Oconee 1, 2 & 3
Marlene Rogers
(803) 885-3895

Robinson 2
Greg Newsome
(803) 383-1207

Sequoyah 1 & 2
Pamela C. Hamilton
(615) 751-5024

St. Lucie 1 & 2
J. G. West
(407) 694-4253

Summer
Janet Thiel
(803) 345-4272

Surry 1 & 2
W. R. Runner, Jr.
(804) 273-2735

Turkey Point 3 & 4
J. G. West
(407) 694-4253

Vogtle 1 & 2
Vince Agro
(205) 868-5094

Watts Bar 1 & 2
Pamela C. Hamilton
(615) 751-5024

REGION III

Big Rock Point
J. A. Smith
(517) 788-7072

Braidwood 1 & 2
G. J. Toleski
(708) 515-7544

Byron 1 & 2
G. J. Toleski
(708) 515-7544

Callaway
Donna M. Knoepflein
(314) 676-8211

Clinton
Robert Derbort
(217) 935-8881

Cook 1 & 2
K. E. Alexejun
(616) 465-5901

Davis-Besse
Robert W. Schrauder
(419) 249-2366

Dresden 2 & 3
G. J. Toleski
(708) 515-7544

Duane Arnold
Diane Englehardt
(319) 851-7280

Fermi 2
Joseph H. Korte
(313) 586-1095

Kewaunee
Richard P. Pulec
(414) 433-1332

LaSalle 1 & 2
G. J. Toleski
(708) 515-7544

Monticello
Randall D. Cleveland
(612) 330-7999

Palisades
J. A. Smith
(517) 788-7072

Perry 1 & 2
Michele Benedict
(216) 259-3737

Point Beach 1 & 2
Thomas R. Eells
(414) 221-2698

Prairie Island 1 & 2
Randall D. Cleveland
(612) 330-7999

Quad Cities 1 & 2
G. J. Toleski
(708) 515-7544

Zion 1 & 2
G. J. Toleski
(708) 515-7544

REGION IV

Arkansas 1 & 2
Kenneth D. Jeffrey
(501) 964-3253

Comanche Peak 1 & 2
J. E. Brown/H. R. Hutchison
(817) 897-8912/(817) 897-8940

Cooper
Debra Anne Jones
(402) 825-5481

Fort Calhoun 1
Darrell D. Roberts
(402) 636-3039

Fort St. Vrain
Donald R. Alps
(303) 620-1282

River Bend 1
Robert P. Carter
(504) 381-4328

South Texas 1 & 2
John W. Odom
(512) 972-7626

Waterford 3
Robert F. Sumicek
(504) 739-6307

Wolf Creek 1
Gary D. Burchart
(316) 364-8831

REGION V

Diablo Canyon 1 & 2
William D. Drake
(805) 545-4772

Palo Verde 1, 2 & 3
David Heler/Mary Maddix
(602) 393-7465

Rancho Seco
Steve Redeker
(916) 452-3211

San Onofre 1, 2 & 3
J. M. Calloway
(714) 368-9554

Trojan
Maureen Shaw
(503) 556-7874

Washington Nuclear 1, 2 & 3
M. M. Monopoli
(509) 377-8473

APPENDIX B

SUPPORTING DATA

Table B-1
Test results by NUMANEC form test category
(January through December, 1991)

TEST CATEGORY	FIRST SIX MONTHS	SECOND SIX MONTHS	YEAR
PRE-EMPLOYMENT			
Number Tested	13,575	11,438	25,013
Number Positive	123	86	209
Average Percent Positive	0.91	0.75	0.84
PRE-BADGING			
Number Tested	40,658	38,837	79,495
Number Positive	444	330	774
Average Percent Positive	1.09	0.85	0.97
PERIODIC			
Number Tested	951	443	1,394
Number Positive	0	0	0
Average Percent Positive	0.00	0.00	0.00
FOR-CAUSE			
Number Tested	248	324	572
Number Positive	79	88	167
Average Percent Positive	31.85	27.16	29.20
POST-ACCIDENT			
Number Tested	76	79	155
Number Positive	0	0	0
Average Percent Positive	0.00	0.00	0.00
RANDOM			
Number Tested	78,983	74,835	153,818
Number Positive	275	235	510
Average Percent Positive	0.35	0.31	0.33
FOLLOW-UP			
Number Tested	1,731	1,813	3,544
Number Positive	31	31	62
Average Percent Positive	1.79	1.71	1.75
OTHER			
Number Tested	909	925	1,834
Number Positive	11	11	22
Average Percent Positive	1.21	1.19	1.20
TOTAL			
Number Tested	137,131	128,694	265,825
Number Positive	963	781	1,744
Average Percent Positive	0.70	0.61	0.66

Table B-2

Test results by NUMARC form test category by licensee employees and contractor personnel

(January through December, 1991)

TEST CATEGORY	LICENSEE EMPLOYEES			CONTRACTOR (Long-term/Short-term)		
	FIRST 6-MONTHS	SECOND 6-MONTHS	YEAR	FIRST 6-MONTHS	SECOND 6-MONTHS	YEAR
PRE-EMPLOYMENT						
Number Tested	4,910	2,172	7,082	8,665	9,266	17,931
Number Positive	14	4	18	109	82	191
Average Percent Positive	0.29	0.18	0.25	1.26	0.88	1.07
PRE-BADGING						
Number Tested	5,707	4,774	10,481	34,951	34,063	69,014
Number Positive	28	28	56	416	302	718
Average Percent Positive	0.49	0.59	0.53	1.19	0.89	1.04
PERIODIC						
Number Tested	798	343	1,141	153	100	253
Number Positive	0	0	0	0	0	0
Average Percent Positive	0.00	0.00	0.00	0.00	0.00	0.00
FOR-CAUSE						
Number Tested	99	130	229	149	194	343
Number Positive	27	24	51	52	64	116
Average Percent Positive	27.27	18.46	22.27	34.90	32.98	33.82
POST-ACCIDENT						
Number Tested	58	62	120	18	17	35
Number Positive	0	0	0	0	0	0
Average Percent Positive	0.00	0.00	0.00	0.00	0.00	0.00
RANDOM						
Number Tested	51,703	49,338	101,041	27,280	25,497	52,777
Number Positive	108	112	220	167	123	290
Average Percent Positive	0.21	0.23	0.22	0.61	0.48	0.55
FOLLOW-UP						
Number Tested	1,284	1,276	2,560	447	537	984
Number Positive	27	25	52	4	6	10
Average Percent Positive	2.10	1.96	2.03	0.89	1.12	1.02
OTHER						
Number Tested	622	411	1033	287	514	801
Number Positive	5	2	7	6	9	15
Average Percent Positive	0.80	0.49	0.68	2.09	1.75	1.87
TOTAL						
Number Tested	65,181	58,506	123,687	71,950	70,188	142,138
Number Positive	209	195	404	754	586	1,340
Average Percent Positive	0.32	0.33	0.33	1.05	0.83	0.94

Table B-3

Test results by NUMARC form test category by long-term and short-term contractor personnel

(January through December, 1991)

TEST CATEGORY	LONG TERM CONTRACTOR			SHORT-TERM CONTRACTOR		
	FIRST 6-MONTHS	SECOND 6-MONTHS	YEAR	FIRST 6-MONTHS	SECOND 6-MONTHS	YEAR
PRE-EMPLOYMENT						
Number Tested	414	228	642	8,251	9,038	17,289
Number Positive	7	0	7	102	82	184
Average Percent Positive	1.69	0.00	1.09	1.24	0.91	1.06
PRE-BADGING						
Number Tested	4,062	1,631	5,693	30,889	32,432	63,321
Number Positive	33	7	40	383	295	678
Average Percent Positive	0.81	0.43	0.70	1.24	0.91	1.07
PERIODIC						
Number Tested	136	100	236	17	0	17
Number Positive	0	0	0	0	0	0
Average Percent Positive	0.00	0.00	0.00	0.00	0.00	0.00
FOR-CAUSE						
Number Tested	22	21	43	127	173	300
Number Positive	2	4	6	50	60	110
Average Percent Positive	9.09	19.05	13.95	39.37	34.68	36.67
POST-ACCIDENT						
Number Tested	0	0	0	18	17	35
Number Positive	0	0	0	0	0	0
Average Percent Positive	0.00	0.00	0.00	0.00	0.00	0.00
RANDOM						
Number Tested	4,350	3,150	7,500	22,930	22,347	45,277
Number Positive	20	3	23	147	120	267
Average Percent Positive	0.46	0.10	0.31	0.64	0.54	0.59
FOLLOW-UP						
Number Tested	56	54	110	391	483	874
Number Positive	1	1	2	3	5	8
Average Percent Positive	1.79	1.85	1.82	0.77	1.04	0.92
OTHER						
Number Tested	58	46	104	229	468	697
Number Positive	0	0	0	6	9	15
Average Percent Positive	0.00	0.00	0.00	2.62	1.92	2.15
TOTAL						
Number Tested	9,098	5,231	14,329	62,852	64,958	127,810
Number Positive	63	15	78	691	571	1,262
Average Percent Positive	0.69	0.29	0.54	1.10	0.88	0.99

Table B-4
Number of confirmed positives by substance
(January through December, 1991)

TYPE OF SUBSTANCE	FIRST 6-MONTHS NUMBER	FIRST 6-MONTHS PERCENT	SECOND 6-MONTHS NUMBER	SECOND 6-MONTHS PERCENT	TOTAL	TOTAL PERCENT
MARIJUANA	486	49.34	260	33.46	746	42.34
COCAINE	269	27.30	280	36.04	549	31.16
OPIATES	15	1.52	9	1.16	24	1.36
AMPHETAMINE	23	2.34	8	1.03	31	1.76
PHENCYCLIDINE	4	0.41	7	0.90	11	0.62
ALCOHOL	188	19.09	213	27.41	401	22.76
TOTAL	985		777		1,762	

Table B-5

Test results for additional drugs

(January through December, 1991)

TYPE OF DRUG	REGION I	REGION II	REGION III	REGION IV	REGION V	TOTAL
BARBITURATES						
Number of Licensees Testing	11	8	3	3	4	29
Number of Tests Performed	34,243	27,218	7,879	9,700	27,324	106,364
Number of Positives	2	2	0	0	0	4
Percent Positive	0.006	0.007	0.000	0.000	0.000	0.004
BENZODIAZEPINES						
Number of Licensees Testing	11	7	3	3	4	28
Number of Tests Performed	34,243	24,633	7,879	9,700	27,324	103,779
Number of Positives	6	8	1	0	2	17
Percent Positive	0.018	0.032	0.013	0.000	0.007	0.016
PROPOXYPHENE						
Number of Licensees Testing	3	0	1	2	1	7
Number of Tests Performed	8,145	0	2,655	6,742	7,270	24,812
Number of Positives	1	0	0	1	1	3
Percent Positive	0.012	0.000	0.000	0.015	0.014	0.012
METHADONE						
Number of Licensees Testing	5	0	1	1	1	8
Number of Tests Performed	17,041	0	2,655	2,958	7,270	29,924
Number of Positives	0	0	0	0	0	0
Percent Positive	0.000	0.000	0.000	0.000	0.000	0.000
METHAQUALONE						
Number of Licensees Testing	7	4	1	2	1	15
Number of Tests Performed	19,328	9,947	2,655	7,404	7,353	46,687
Number of Positives	0	0	0	0	1	1
Percent Positive	0.000	0.000	0.000	0.000	0.014	0.002

Table B-6
Test results for outage and non-outage periods by worker category*
(January through December, 1991)

WORKER CATEGORY	OUTAGE IN FIRST 6-MONTHS		OUTAGE IN SECOND 6-MONTHS		OUTAGE DURING YEAR	
	YES n=31	NO n=11	YES n=22	NO n=20	YES n=38	NO n=4
Number of Tests	62,667	12,810	49,198	22,008	141,885	4,798
Number of Positives	539	45	343	103	1,018	12
Percent Positive	0.86	0.35	0.70	0.47	0.72	0.25
LICENSEE EMPLOYEES						
Number of Tests	26,152	6,574	17,514	12,494	59,185	3,549
Number of Positives	97	12	62	35	201	5
Percent Positive	0.37	0.18	0.35	0.28	0.34	0.14
LONG-TERM CONTRACTORS						
Number of Tests	5,659	540	2,007	1477	9,239	444
Number of Positives	47	2	2	7	56	2
Percent Positive	0.83	0.37	0.10	0.47	0.61	0.45
SHORT-TERM CONTRACTORS						
Number of Tests	30,856	5,696	29,677	8,037	73,461	805
Number of Positives	395	31	279	61	761	5
Percent Positive	1.28	0.54	0.94	0.76	1.04	0.62

*Includes data from 42 of the 75 sites.

Table B-7

Test results by pre-access and random tests for outage and non-outage periods*

(January through December, 1991)

TEST CATEGORY	OUTAGE IN FIRST 6-MONTHS		OUTAGE IN SECOND 6-MONTHS		YEAR	
	YES n=31	NO n=11	YES n=22	NO n=20	YES n=38	NO n=4
PRE-ACCESS						
Number of Tests	26,879	3,638	21,343	6,687	57,833	714
Number of Positives	326	17	187	54	581	3
Percent Positive	1.21	0.47	0.88	0.81	1.00	0.42
RANDOM						
Number of Tests	33,676	8,779	26,474	14,440	79,575	3,794
Number of Positives	134	20	84	34	265	7
Percent Positive	0.40	0.23	0.32	0.24	0.33	0.19

*Includes data from 42 of the 75 sites.

Table B-8

Test results by region and by substance: First and second six-month periods

(January through December, 1991)

	REGION I n=24				REGION II n=24				REGION III n=23				REGION IV n=8				REGION V n=6			
TEST RESULTS	FIRST SIX MONTHS		SECOND SIX MONTHS		FIRST SIX MONTHS		SECOND SIX MONTHS		FIRST SIX MONTHS		SECOND SIX MONTHS		FIRST SIX MONTHS		SECOND SIX MONTHS		FIRST SIX MONTHS		SECOND SIX MONTHS	
Total Tests	39,828		31,592		39,154		40,482		25,921		25,475		15,952		16,636		16,276		14,511	
Total Positive*	294		242		224		164		190		174		89		95		166		106	
Percent Positive	0.74		0.77		0.57		0.41		0.73		0.68		0.56		0.57		1.02		0.73	
CONFIRMED POSITIVES BY SUBSTANCE																				
Type of Substance	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Marijuana	128	42.67	77	31.56	98	44.75	39	25.32	102	49.28	65	37.79	52	55.91	34	35.42	106	60.23	45	40.54
Cocaine	102	34.00	97	39.75	72	32.88	57	37.01	58	28.02	52	30.23	18	19.35	39	40.63	19	10.80	35	31.53
Opiates	5	1.67	2	0.82	5	2.28	3	1.95	2	[illegible]	2	1.16	3	3.23	1	1.04	0	0.00	1	0.90
Amphetamine	2	0.67	4	1.64	0	0.00	0	0.00	0	0.00	2	1.16	3	3.23	0	0.00	18	10.23	2	1.80
Phencyclidine	2	0.67	4	1.64	0	0.00	0	0.00	0	0.00	3	1.74	2	2.15	0	0.00	0	0.00	0	
Alcohol	61	20.33	60	24.59	44	20.09	55	35.71	35	21.74	48	27.91	15	16.13	22	22.92	33	18.75	28	25.23
TOTAL	300		244		219		154		197		172		93		96		176		111	

*Total positive test results and total positive results for specific substances are not expected to be the same. These numbers include testing results for "periodic" and "other tests."

Table B-9

Test results by region and by substance: Total year

(January through December, 1991)

	REGION I n=24		REGION II n=24		REGION III n=23		REGION IV n=8		REGION V n=6	
TESTS	TOTAL YEAR		TOTAL YEAR		TOTAL YEAR		TOTAL YEAR		TOTAL YEAR	
Total Tests	71,420		79,636		51,396		32,587		30,787	
Total Positive*	536		388		364		184		272	
Percent Positive	0.75		0.49		0.71		0.56		0.88	
CONFIRMED POSITIVES BY SUBSTANCE										
Type of Substance	#	%	#	%	#	%	#	%	#	%
Marijuana	205	37.68	137	36.73	167	45.26	86	45.50	151	52.61
Cocaine	199	36.58	129	34.58	110	29.81	57	30.16	54	18.82
Opiates	7	1.29	8	2.14	4	1.08	4	2.12	1	0.35
Amphetamine	6	1.10	0	0.00	2	0.54	3	1.59	20	6.97
Phencyclidine	6	1.10	0	0.00	3	0.81	2	1.06	0	0.00
Alcohol	121	22.24	99	26.54	83	22.49	37	19.58	61	21.25
TOTAL REPORTED	544		373		369		189		287	

*Total positive test results and total reported positive results for specific substances are not expected to be the same. These numbers include testing results for "periodic" and "other" tests.

Table B-10

Test results by region and by worker category

(January through December, 1991)

WORKER CATEGORY	REGION I			REGION II			REGION III			REGION IV			REGION V		
	FIRST 6-MOS	SECOND 6-MOS	YEAR	FIRST 6-MOS	SECOND 6-MOS	YEAR	FIRST 6-MOS	SECOND 6-MOS	YEAR	FIRST 6-MOS	SECOND 6-MOS	YEAR	FIRST 6-MOS	SECOND 6-MOS	YEAR
LICENSEE EMPLOYEES															
Number of Tests	16,999	15,290	32,289	21,658	19,584	41,242	12,813	11,401	24,214	6,310	5,582	11,892	7,401	6,649	14,050
Number of Positives	55	69	124	76	52	128	43	32	75	12	12	24	23	30	53
Percent Positive	0.32	0.45	0.38	0.35	0.27	0.31	0.34	0.28	0.31	0.19	0.21	0.20	0.31	0.45	0.38
LONG-TERM CONTRACTORS															
Number of Tests	1,169	1,077	2,246	4,496	2,381	6,877	1,443	449	1,892	723	385	1,108	1,267	939	2,206
Number of Positives	3	3	6	35	9	44	13	1	14	1	0	1	11	2	13
Percent Positive	0.26	0.28	0.27	0.78	0.38	0.64	0.90	0.22	0.74	0.14	0.00	0.09	0.87	0.21	0.59
SHORT-TERM CONTRACTORS															
Number of Tests	21,660	15,225	36,885	13,000	18,517	31,517	11,665	13,625	25,290	8,919	10,668	19,587	7,608	6,923	14,531
Number of Positives	236	170	406	113	103	216	134	141	275	76	83	159	132	74	206
Percent Positive	1.09	1.12	1.10	0.87	0.56	0.69	1.15	1.03	1.09	0.85	0.78	0.81	1.74	1.07	1.42
TOTAL															
Number of Tests	39,828	31,592	71,420	39,154	40,482	79,636	25,921	25,475	51,396	15,952	16,635	32,587	16,276	14,511	30,787
Number of Positives	294	242	536	224	164	388	190	174	364	89	95	184	166	106	272
Percent Positive	0.74	0.77	0.75	0.57	0.41	0.49	0.73	0.68	0.71	0.56	0.57	0.56	1.02	0.73	0.88

Table B-11

Test results by region and by test category: First and second six-month periods*

(January through December, 1991)

TEST CATEGORY	REGION I		REGION II		REGION III		REGION IV		REGION V	
	FIRST 6-MOS	SECOND 6-MOS	FIRST 6-MOS	SECOND 6-MOS	FIRST 6-MOS	SECOND 6-MOS	FIRST 6-MOS	SECOND 6-MOS	FIRST 6-MOS	SECOND 6-MOS
PRE-ACCESS										
Number of Tests	17,613	12,053	13,855	15,759	9,260	9,501	6,423	7,328	7,082	5,634
Number of Positives	197	130	103	82	111	95	52	61	104	48
Percent Positive	1.12	1.08	0.74	0.52	1.20	1.00	0.81	0.83	1.47	0.85
RANDOM										
Number of Tests	21,529	18,774	24,231	23,842	15,290	14,791	9,336	7,124	8,597	8,304
Number of Positives	72	83	90	54	52	48	28	17	33	33
Percent Positive	0.33	0.44	0.37	0.23	0.34	0.32	0.30	0.17	0.38	0.40
FOR-CAUSE										
Number of Tests	60	80	119	137	51	50	26	47	68	89
Number of Positives	15	19	20	21	15	19	5	12	24	17
Percent Positive	25.00	23.75	16.81	15.33	29.41	38.00	19.23	25.53	35.29	19.10
FOLLOW-UP										
Number of Tests	410	457	407	432	404	493	140	95	370	336
Number of Positives	8	10	8	6	8	5	3	4	4	6
Percent Positive	1.95	2.19	1.97	1.39	98	1.01	2.14	4.21	1.08	1.79
TOTAL										
Number of Tests	39,612	31,364	38,612	40,170	25,005	24,835	15,925	16,594	16,117	14,363
Number of Positives	292	242	221	163	186	167	88	94	165	104
Percent Positive	0.74	0.77	0.57	0.41	0.74	0.67	0.55	0.57	1.02	0.72

*Numbers of tests and positive test results differ from those presented in Tables B-8, B-9, and B-10 because the results in this table do not include results for "other" or "periodic" testing

Table B-12

Test results by region and by test category: Total year*

(January through December, 1991)

TEST CATEGORY	REGION I	REGION II	REGION III	REGION IV	REGION V
PRE-ACCESS					
Number of Tests	29,666	29,614	18,761	13,751	12,716
Number of Positives	327	185	206	113	152
Percent Positive	1.10	0.62	1.10	0.82	1.20
RANDOM					
Number of Tests	40,303	48,[illegible]	30,081	18,460	16,901
Number of Positives	155	149	100	45	66
Percent Positive	0.38	0.30	0.33	0.24	0.39
FOR-CAUSE					
Number of Tests	140	256	101	73	157
Number of Positives	34	41	34	17	41
Percent Positive	24.29	16.02	33.67	23.29	26.11
FOLLOW-UP					
Number of Tests	867	839	897	235	706
Number of Positives	18	14	13	7	10
Percent Positive	2.08	22.15	1.45	2.98	1.42
TOTAL					
Number of Tests	70,976	78,782	49,840	32,519	30,480
Number of Positives	534	384	353	182	269
Percent Positive	0.75	0.49	0.71	0.56	0.88

*Numbers of tests and positive test results differ from those presented in Tables B-8, B-9, and B-10 because the results in this table do not include results for "other" or "periodic" testing.

Table B-13
Mean density by region

REGION	MEAN DENSITY*
REGION I	655
REGION II	266
REGION III	225
REGION IV	79
REGION V	309

*Measured as the number of persons per square mile in each county containing a nuclear power plant.

APPENDIX C
COMPILATION OF LESSONS LEARNED

In addition to providing numeric testing results in their semi-annual program performance reports, a number of reporting units included information on lessons learned and program actions taken. This appendix presents this information as submitted and is intended to serve as a reference to other utilities who wish to improve their program or avoid common difficulties.

Of the 52 utilities, 30 provided lessons learned during the first reporting period (January-June, 1991). During the second reporting period (July-December, 1991), 31 of the utilities provided such information.

Alabama Power Company

July through December, 1991

Joseph M. Farley Nuclear Plant

Management actions during this reporting period involved one individual. This individual was randomly selected and randomly selected again four days later. The first positive test had not yet been confirmed when the second random selection occurred. The individual tested positive for Marijuana both times. The employee was removed from duty and placed in a rehabilitation program when the second random test was confirmed. An administrative decision was made to consider both positive tests as one policy violation; therefore, the employee was not terminated. The employee has successfully completed a rehabilitation program, has returned to full access and is entered in the follow-up testing pool.

Arizona Public Service Company

January through June, 1991

There was one occurrence where a performance test specimen (certified by supplier to be positive) was reported as negative by Arizona Public Service's (APS) Department of Health and Human Services (DHHS) certified laboratory. An investigation was conducted regarding this occurrence. It was determined that the certified blind specimen contained d-methamphetamine (1,196 mg/ml) but did not contain the required levels of amphetamine, per the DHHS notice of December 19, 1990. This notice states that in order to be reported positive on a methamphetamine the specimen must also contain amphetamine at a concentration of 200 ng/ml. or greater. Since the specimen did not meet this requirement, it was reported as negative.

The blind performance specimen was purchased in January 1991, shortly after the publication of the DHHS notice. The vendor did not make the necessary changes to its test specimens at the time the specimen was shipped to APS. This situation was corrected by the vendor and there have been no other problems reported.

During this time period, APS recognized that the Fitness-for-Duty policy concerning the consumption of alcoholic beverages offsite while on Company time, in training sessions or representing APS at a business function needed clarification. This was accomplished by a memorandum from executive management to all employees with unescorted access.

Three photometers were purchased to assist APS in measuring the specific gravity of specimens.

The Fitness-for-Duty Department published an article in the Company newsletter on the use and effects of over-the-counter (OTC) medication in an effort to educate employees on these effects and the requirement to report use of OTCs.

July through December, 1991

A Quality Assurance audit was conducted in November 1991. A consulting group was utilized to provide technical guidance during the audit. Results from the audit indicated that APS has a comprehensive Fitness-for-Duty Program which meets the requirements of 10 CFR 26. Many of the recommendations that were made during the audit are being incorporated into the program.

Three performance test specimens (certified by the supplier to be positive) were reported negative by the APS primary Department of Health and Human Services (DHHS) certified laboratory. Two of the occurrences were the result of a urine matrix structure using a reagent designed to have a sensitivity to a wide range of drugs. The standards utilized by the laboratory were appropriate for this particular drug. However, upon closer investigation of the standards, it was determined that the use of another standard was more sensitive. Therefore, changes were made in the standards utilized by the laboratory.

In the other occurrence it was determined that the certified blind specimens deteriorated during the shipping and handling process. The type of drugs used to spike the specimens have a tendency to be unstable and may contribute to the deterioration of the specimen. The Medical Review Officer reviewed APS's process for preparation of all specimens and determined the process acceptable.

The following are changes that have been made to the Fitness-for-Duty Program in an effort to improve overall effectiveness of the program:

- In an effort to provide readily accessible guidance on the call-out requirements set forth in the Fitness-for-Duty Program, an informational card which can be affixed to a badge was sent to all supervisors. The card provides instructions to assist supervisors in the event it is necessary to call an individual out for unscheduled work or for an emergency situation.
- A collection facility became operational inside the protected area during this reporting period. The purpose of the facility is to reduce the impact on licensed operator shift manning and overall site productivity.
- During this reporting period, APS began using two new chemical analyzers (Syva ETS+ model) to perform on-site drug screening. The utilization of this equipment was identified as a strength during our November audit. Performance results from this equipment is favorable.
- A random drug test "Notification Checklist" was developed and disseminated to supervisors as a tool to assist them in completing the necessary notification steps. This effort is part of APS's commitment to provide ongoing assistance and information to supervisors.
- APS has reviewed and revised some of its procedures and training material to incorporate changes and program requirements in accordance with 10 CFR 55.

Carolina Power and Light

January through June, 1991

An electronic data transfer system has been developed and implemented to transfer the names of individuals in the random selection system from the plant sites to the mainframe in the General Office. The effect of this is to minimize the amount of time from badging to actually being eligible to be selected for random testing.

Additional emphasis has been placed on conducting random tests on Saturdays and Sundays.

Substance abuse literature was placed in all the FFD Collection Facilities. Signs have been posted in the collection facilities to remind workers that there are no "safe periods" and that testing is conducted seven days a week, at all hours of the day.

Because the definition of an unsatisfactory performance test is not clearly defined for reporting purposes to the NRC, the Company has developed its own internal guideline as to what an unsatisfactory performance test is and when the test should be reported to the NRC. Of the 22 FFD testing violations during this reporting period, 18 were in the months of January and February. The conclusion is that the Christmas and New Year's holidays probably contributed to the increase in substance abuse.

Our FFD Collection Facilities utilize the Intoxilyzer 5000 for Alcohol Breath Tests. We have found the breath alcohol test results and the blood tests results to be virtually the same. It is an extremely accurate instrument but it is also extremely sensitive to the operating environment. Therefore, regular scheduled maintenance should be performed at least once every 6 months.

EAP utilization continues to be a strength of our Program. Approximately 1.6% of Carolina Power and Light (CP&L) employees within the scope of FFD are self referrals. In addition, 8 employees were referred by their supervisor to the EAP.

July through December, 1991

While reviewing the testing records of a second random positive alcohol test on the same CP&L employee, it was discovered that the individual had previously registered levels of alcohol on the breathalyzer that were less than .04 percent.

This is considered an indicator of a continuing problem, however, CP&L's program did not have adequate checks and balances in place to address such a problem. As a result of this situation, the following practice has been added to CP&L's program: Any employee who has an alcohol violation and is subsequently reinstated in his job, and who continues to register any alcohol on the breathalyzer during future tests, will not only be counseled by the collection facility staff, but the EAP will be informed of the situation and may intervene in the follow-up or after-care of the employee.

On July 3, 1991, a FFD contract nurse retained by CP&L to collect specimens and administer alcohol breath tests failed to complete an alcohol breath test in accordance with the Company's collection site procedures. Specifically, paperwork concerning the alcohol breath analysis test was destroyed by the nurse. An investigation into this incident confirmed irregularities in the administration of an alcohol breath test by both a contract nurse and the CP&L employee. As a result of the investigation, the contract nurse was removed from the Brunswick plant site on July 8, 1991 and the employee's employment was terminated on July 11, 1991.

A review of the Brunswick FFD nursing staff's chemical testing records was completed with no other irregularities identified. Therefore, this incident is considered to be an isolated occurrence.

The staff at all the collection facilities have been counseled, as well as the Fitness-for-Duty administrator's staff, concerning the potential consequences of this type of incident (regulation 10 CFR 26 reference - 26.90 - violations). In addition, this discussion will be included as a part of their orientation when new key individuals are assigned collection/administrative duties within the scope of the Fitness-for-Duty Program.

As a result of self assessment of the program, it was discovered that the correct number of blind samples (as required by 10 CFR 26) was not being submitted due to an error interpretation of the regulation. This was reported by telephone to the NRC Region II Office on September 30, 1991. Corrective action was implemented immediately.

Cleveland Electric Illumination

January through June, 1991

During the reporting period, initiatives were taken to increase Fitness-for-Duty policy communication. The initiatives included postings of the company's FFD policy in several additional locations throughout the plant site, posting a sign in the main badging area describing major requirements of the company's FFD policy, and the publication of various FFD related topics in the plant's weekly site news article.

These initiatives were taken to increase the awareness of the FFD program among employees, contractors, and visitors of the plant.

Colorado Public Service Company

January through June, 1991

The preparation and submittal of the blind specimens was transferred from the MRO's office to the site collection facility to increase efficiency.

Drug/Alcohol Awareness posters are being prominently displayed at several locations within the site.

Effective communication of Program goals to the population is vital for cooperation and program success.

Commonwealth Edison

January through June, 1991

Based upon two deficiencies noted in a February 1991 Quality Assurance audit conducted at one nuclear station, the office of the Fitness-for-Duty Administrator conducted a full review of the non-station assigned random test pool. Five additional deficiencies were noted during the review. Immediate corrective action was taken to place the omitted/deleted names into the random test pool and to protect the names in the pool from inadvertent deletion. This deficiency was discussed with Region III USNRC representatives on May 13, 1991. Long term corrective action included development of a computer program, which does not rely on automatic data transfer, but requires manual entry and deletion of corporate E[illegible] Responder's names to the non-station random te[illegible] pool. Additionally, program administration is conducting more frequent comparisons of the non-station random test pool.

A monthly computer printout provides the number of random tests conducted at each nuclear station during each hour on the 24 hour clock. Using this information, future random test schedules are developed to assure there are no "safe times" from random drug and alcohol testing.

Corrective action was initiated by the NIDA Certified Laboratory subsequent to a failure during receipt inspection to identify two specimens intentionally submitted by Commonwealth Edison with inadequate tamper evident seals. Although specimens with tampered seals have been submitted since, no additional failures have occurred.

July through December, 1991

The remaining two "Administrative Services Specialist" management positions were filled during the second reporting period. This position was created to provide a dedicated utility point of contact at each of the six nuclear stations for contractor Fitness-for-Duty and Access Authorization issues. Standard practice of the Commonwealth Edison MRO is to review all on-site presumptive positive reports which do not confirm against the information contained in the laboratory reports. Specimen #328569, which screened on October 8, 1991 as presumptive positive for cocaine, was not confirmed for the presence of Benzoylecogonine by the laboratory. The MRO reported this to the laboratory Scientific Director and requested an investigation.

During an administrative process associated with GC/MS testing, a laboratory screening technologist reviewed Specimen #328559 which screened as negative and #328569 which screened positive for cocaine. The reviewer/certifying scientist failed to detect the error which resulted in #328569 being reported as negative to Commonwealth Edison.

Additionally, the negative GC/MS result led laboratory personnel to initiate a review of the initial screening data to explain the discrepancy between the screening and GC/MS results for Specimen

#328559. This review was in progress when the MRO initiated the request for the laboratory to begin an investigation.

The laboratory review of all results is structured in levels to minimize clerical errors in the screening process. This error should have been detected by the next level of review and in this instance, the system failed.

The corrective actions taken by the laboratory are:

- Technologist and reviewer were counselled and instructed in proper laboratory reporting procedures.
- Technologists were instructed to annotate requisition /chain-of-custody forms from the instrument print-out rather than the worksheet to avoid multiplication of transcriptional errors.

The current system employed at the laboratory relies on manual entry of presumptive positive screening results into the laboratory database. Computer interfaces that download screening results into the computer directly from the Hitachi 717 have been purchased by the laboratory. This improvement will obviate manual entry and would have detected the clerical error automatically at the point of review. This computerized interface is scheduled for implementation by mid-year in 1992.

LaSalle County Nuclear Power Station

In December of 1991, LaSalle Station implemented FFD testing from a second on-site facility dedicated to pre-access processing of contractor personnel.

Consolidated Edison

July through December, 1991

An incident involved the misreading of a social security number on a chain-of-custody form, requiring a random specimen to be declared invalid. Corrective action has been taken to preclude the recurrence of a similar misreading.

Of the 848 random tests conducted during the reporting period, nine or 1.06% were found positive. Of these nine, seven involved alcohol consumption. This is the third consecutive reporting period percentage increase in positive testing, evidencing an increase in random positive alcohol tests. When interviewed, several of the individuals who tested positive for alcohol revealed a misunderstanding of NRC and Company regulations requiring abstinence from alcohol for at least five hours preceding any scheduled working tour. They believed that cessation of consumption during that five hour period would result in a negative test. This misunderstanding has been corrected in personnel training, and a revision has been made to the Fitness-for-Duty Station Administrative Order (SAO) identifying this issue. The Station SAO now advises personnel that additional factors can result in positive alcohol tests despite compliance with the five hour abstinence requirement, including the volume of alcohol consumed in relation to an individual's body size and metabolism.

Consumers Power Company

January through June, 1991

Contractors/vendors have not been consistently identifying their personnel who are assigned supervisory functions, making it difficult for Consumers Power Company to meet the Fitness-for-Duty supervisory training requirement. As a result, contractors/vendors are now required to submit a Supervisory Notification Form along with an individual's access request. Failure to provide accurate information will result in immediate revocation of an individual's access.

A backup NIDA laboratory was selected, which will be used primarily by individuals requesting a retest of a positive specimen.

Enhancements were made to the computerized random selection program in order to add individuals who do not maintain unescorted access (e.g., MROs, EOF support staff, etc.).

In response to a concern identified in the 1991 Quality Assurance audit of the Fitness-for-Duty Program, the program has been revised to require that any specimen not having a specific gravity between 1.003 and 1.030 automatically have a creatinine test performed and the results reported to the MRO along with the screen results.

The recent reorganization of Consumers Power Company's Nuclear Operations Department has resulted in the establishment of the Nuclear Performance Assessment Department, which includes a specialist responsible for developing performance indicators following internal and external concerns and audits associated with the Fitness-for-Duty program.

July through December, 1991

An MRO Guideline procedure was developed to provide detailed administrative expectations to the MRO, in order to maintain consistency when reviewing and interpreting drug test results.

Ongoing interactions between Fitness-for-Duty and Security organizations resulted in incorporat-

ing Fitness-for-Duty and the new Access Authorization requirements for badging of employees and contractors into one procedure.

Fitness-for-Duty All-Employee/Escort Training has been expanded to include Supervisory Training. Effective the first quarter of 1992, the revised course is being presented as part of the General Employee Training program. This will eliminate recurring problems with meeting the initial/refresher Supervisory Training requirements.

Detroit Edison

July through December, 1991

DER 91-0630 documents that on-site medical staff work instructions differed from approved site program procedures in the conduct of blood alcohol testing. The medical staff work instructions failed to require a confirmatory breath analysis alcohol test upon receiving a presumptive positive test. The use of medical work instructions was stopped and direction was provided to use only site approved program procedures. A review was performed and it was determined that twelve (12) individuals had received sanctions imposed, as required by 10 CFR 26.27, where a confirmatory test had not been conducted. The twelve individual's records have been corrected to reflect this error and the data in Section 2 of our report has been modified to reflect these changes. This issue is currently under evaluation by Region III.

DER 91-0679 documented during an NQA Surveillance that several licensee and contract supervisors had not received Continual Behavior Observation Program (CBOP) training within the required 90 days. During the recent refuel outage (second quarter, 1991) several contractors were brought on site. Some of those were made supervisors, completed their jobs, and terminated employment (less than 90 days) before receiving CBOP training. Site procedures were revised to require that new-to-site supervisors (both licensee and contractor) receive CBOP training prior to receiving their unescorted access. Department Heads were advised of the need to have supervisors receive initial/requalification CBOP training.

DER 91-0935 documented during an NQA Audit a failure to maintain a calibration program for devices used to perform blood alcohol test analysis. Work practices have been changed and procedures are in the process of being strengthened to correct the deficiency. This issue is currently under evaluation by Region III.

DER 91-0943 documented during an NQA Audit a problem of not submitting blind sample specimens with actual specimens to the laboratory for analysis and not sending an adequate number of blind specimens per quarter for analysis. Work practices have been changed and procedures are in the process of being strengthened to correct the deficiency. This issue is currently under evaluation by Region III.

In addition, DER 91-0943 documents an error made in counting the number of specimens collected during the first half of 1991 and reported in the semi-annual FFD report for that period. Work practices have been changed to strengthen tracking numbers of specimens collected.

Duke Power Company

January through June, 1991

Specific for-cause testing guidance was implemented effective 1/1/91, which includes a questionnaire for supervisors to complete to determine if a drug/alcohol screen should be performed after an accident. Twelve (12) post-accident tests have been performed, all with negative results.

Employees have been given guidance on notifying management of drug/alcohol-related concerns on behalf of co-workers along with an assurance that any concerns will be handled with sensitivity and confidentiality.

Entergy Operations

July through December, 1991

Action was taken within Entergy Operations, Incorporated to further strengthen and clarify company policy regarding the Fitness-for-Duty Program. A revised management directive was implemented which is equally applicable at all three nuclear sites operated by the company. This action provides a more uniform and consistent approach toward FFD within the Entergy Operations, Incorporated system. Major changes include:

- Centralized chain-of-command for FFD staff between the three nuclear sites,
- Clarification regarding FFD Supervisory training,
- Inclusion of a list of prescription/over-the-counter medications which have been exempted from our internal medication reporting requirements.

An Entergy Operations, Incorporated, FFD conference for medical technologists/ laboratory technicians and an Abbott Laboratories (drug test-

ing equipment manufacturer) representative was conducted. The focus of the conference was to update and strengthen the technologists' and technicians' knowledge on drug testing methodology. This conference also provided the opportunity to exchange experiences and ideas which promote consistency between the Entergy Operations, Incorporated nuclear sites.

A training session was conducted by Bensinger, Duport and Associates for personnel responsible for conducting FFD training for the three nuclear sites. Training included discussion of emerging trends in drug abuse, along with effective methods of increasing employee awareness of the Fitness-for-Duty Program and their responsibilities.

Grand Gulf Nuclear Station

Management took action at Grand Gulf Nuclear Station (GGNS) to resolve problems concerning the administration and tracking of people requiring Fitness-for-Duty Supervisor (FFDS) training. After the start of the Fitness-for-Duty Program it became apparent that there were weaknesses in verifying three areas of FFDS training:

- Ensuring supervisors received FFDS requalification training before their training had expired.
- Ensuring new supervisors received FFDS training within their first three months of supervisory duties.
- Ensuring new contractors needing FFDS training received it before assuming supervisory duties.

To correct these deficiencies, management agreed to realign existing personnel resources to establish a single point of contact in training to schedule, track and verify all general training, especially FFDS training. A system to identify the status of incoming contract personnel to determine if the individual requires FFD Supervisor training has been established as part of the key card application process.

There were no positive random drug tests at GGNS and only one positive drug test to report for the reporting period. This is a significant decrease over the last reporting period. Two reasons can be attributed to the decrease:

- There was no outage during this reporting period.
- The random drug screening program appears to be identifying the few individuals at GGNS who elect to abuse drugs of alcohol and continue to work in the nuclear industry.

Arkansas Nuclear One

Work began during December, 1991 to modify and enlarge the Fitness-for-Duty (FFD) specimen collection area. The redesign offers more effective control and flow of individuals through the testing process. During the six month period, certain FFD forms were revised to streamline our work processes.

Work also began in December to upgrade the computer hardware/software capabilities associated with Fitness-for-Duty. These upgrades will enhance our management of FFD records as well as improve our ability to compile statistical FFD information.

Florida Power and Light

January through June, 1991

In order to increase the frequency of weekend testing, a program was implemented establishing an annual target of 24 weekend days for testing to be conducted. Additionally, the program put into effect performance monitoring for this activity to ensure the testing frequency objective was met. Results through the first half of 1991 indicate that both Turkey Point and St. Lucie are on target, having conducted random testing on 12 weekend days.

Data analysis of positive test results indicated a substantial percentage of the personnel involved were employed by two major contractors. Meetings were held with the management of these companies to inform them of the situation. In response, actions have been taken by contractor management to meet with employee groups to provide Fitness-for-Duty Program information in an effort to reduce the number of random positive test results.

A review of our 1990 test results indicated no positives that exceeded Part 26 requirements for barbiturates, benzodiazepines, and methaqualone. As a result, testing for these substances was discontinued effective January of this year.

The services of a full-time Medical Review Officer was obtained to improve the review and disposition of test results. Based on an analysis of Fitness-for-Duty Training Program data, a tracking program was implemented to review personnel changes and provide appropriate notifications.

On January 7, 1991, notification was received from Roche Biomedical Laboratory, the contracted DHHS approved laboratory, confirming an unsatisfactory performance testing incident. The incident involved the reporting of a false negative test result for a submitted blind sample due to a clerical error. Roche Biomedical Laboratory took corrective action by developing computer programming to integrate

its equipment and eliminate the manual posting of results. An interim QC program has been implemented to accomplish this pending completion of the totally integrated system.

July through December, 1991

Turkey Point Plant

During this reporting period, Roche Biomedical Laboratories issued two false negative test results for blind specimens submitted by the Turkey Point Plant. One incident resulted from a transcription error and the other from an improper identification of an accession number. Although Roche's false negative rate of 1.5% for 1991 is well below the 10% error rate allowed by the Department of Health and Human Services standards for NIDA certification, they were instructed to take steps to eliminate the type of human errors which caused these false negatives.

Florida Power Corporation

January through June, 1991

The audits conducted on three contractors' programs identified the following discrepancies: failing to transport samples in the required shipping containers, failing to perform an in-house audit of their program, failing to submit the correct number of quarterly blind samples, failing to use the 10 drug panel as required by the licensee, failing to conduct a Continual Behavior Observation evaluation on collection personnel, failing to conduct an MRO evaluation of a possible specimen being diluted, failure to have a certified toxicologist sign a drug test, and recording a wrong social security number for a tested individual. These discrepancies are explained in the audit reports and have been corrected.

July through December, 1991

In accordance with 10 CFR 26.80, Florida Power Corporation (FPC) conducted annual Fitness-for-Duty audits from October 1990 to October 1991 on two contractors.

FPC's Quality Programs Department performed an audit on Contractor #1 and discovered that the contractor did not perform an annual audit of their testing laboratory.

FPC's Quality Programs Department performed an audit on Contractor #2 and discovered that the contractor did not perform an internal audit and did not submit any blind samples.

As of July 1, 1991 FPC will perform all contractor pre-access testing.

GPU Nuclear Corporation

July through December, 1991

Three Mile Island Nuclear Station Units 1 and 2

10 CFR, Section 26.2, reads in part as follows: "...The provisions of the fitness-for-duty program must apply to all persons granted unescorted access to protected areas,...". Contrary to this requirement on 9/12/91 at TMI, 69 individuals were identified as not being entered into the Check-In/Check-Out database in timely manner. The Check-In/Check-Out database contains eligibility data for random selection. As a result, these individuals were not eligible for random selection.

Data entry delay was, in some cases, as long as thirty (30) days. However, the individuals involved were not aware of the delay in the data entry process and in all likelihood, were unaware of the gap which existed in their eligibility for random selection. On September 12, 1991, TMI Security committed to same day/next work day turnaround for badging information as an interim corrective action. Procedure 1000-ADM-2624.01 (Nuclear Employee Access Center) was revised accordingly and made effective December 23, 1991 to specify that time frame for data entry (e.g., badging information).

10 CFR, Section 26.24 (a) (2) reads in part as follows, "To provide a means to deter and detect substance abuse, the licensee shall implement the following chemical testing programs for persons subject to this part: ...Unannounced tests imposed in a random manner...". NUREG-1385, Section 4.6 states "Any scheme that would contain unfairness in the selection or that provides "safe periods" is not acceptable." Contrary to the above, a TMI supervisor refused to send a randomly selected employee for drug/alcohol testing on October 29, 1992 because it was within one hour of the end of the selected individual's shift. This action was referred to the Plant Operations Director who concurred with the decision. This action caused a randomly selected individual, who was present and available at the site, not to be tested. Therefore, a documented deviation from the random selection process, i.e., a "safe period" in the Fitness-for-Duty Program, existed. This action was contrary to established Fitness-for-Duty procedures. A Quality Deficiency Report (QDR) was issued identifying this program weakness.

Corrective action was implemented by the TMI-1 Division in response to the above deficiency. FFD testing will be conducted at all times during an employee's shift; however, during the last hour of a

shift there will be a reduction in the number of FFD tests performed. Under this approach no "safe periods" will exist.

Oyster Creek Nuclear Power Plant

10 CFR, Section 26.2, reads in part as follows: "...The provisions of the fitness-for-duty program must apply to all persons granted unescorted access to protected areas,...". Contrary to this requirement, 95 employees with unescorted access to Oyster Creek were inadvertently omitted from eligibility in the random pool from 2/15/91 until 8/9/91. This omission resulted from a modification of the random selection system made on 2/15/91, which included a program error. However, the affected individuals were not made aware of the delay in the data entry process, and as a result, in all likelihood were unaware of their ineligibility for random selection. The problem was identified on 8/2/91 and Information Services began researching the deficiency to determine the cause and extent of the problems. The incorrect programming was identified and corrected on 8/9/91.

Gulf States Utilities

January through June, 1991

Due to an increase in the MRO-recommended retests because of low creatinine, FFD has procured refractometers to measure specific gravity of each specimen prior to its being shipped from RBS.

Because of a weakness cited in recent RBS QA and NRC audits, FFD now generates a random testing list for select weekends and holidays throughout the year.

July through December, 1991

In order to meet the increased screening needs and to support both planned or unplanned outages, the Fitness-for-Duty Department has been relocated into a larger facility thereby increasing productivity and improving the overall image of the Fitness-for-Duty Department.

River Bend Station site procedure was revised to enhance the notification process of randomly selected individuals. The revision allows the supervisor four hours from the time FFD makes notification to him to arrange the donor's work accordingly. Once FFD notifies the supervisor, he has the discretion to delay notification to the selected individual until such time as that individual's work is at a point where the individual may be released to report to FFD for testing. Once the individual has been advised by his supervisor that he has been randomly selected to report to FFD, the individual must immediately report to the FFD facility.

Houston Lighting and Power Company

January through June, 1991

An effectiveness evaluation of the South Texas Project Electric Generating Station (STPEGS) FFD Program determined there was a need for increased monitoring and tracking to ensure employees receive the required initial and refresher supervisory CBOP training. Additionally, there was a finding regarding the need to identify and train all new-hire contract supervisory personnel prior to badging for unescorted access.

To ensure the identification of and training for supervisors, the STPEGS New-Hire Form has been revised and now requires self-identification if the individual is in a supervisory position. The individual is scheduled for training by the staff. Additionally, a monthly notification is sent to each cost center manager who identifies all Houston Lighting and Power (HL&P), contractor and vendor employees who have been promoted to a supervisory position within the last 30 days. These individuals are then scheduled for the training required.

In the event a newly promoted supervisor does not complete the initial supervisory CBOP training, the cost center manager is notified of the failure to complete training. Notification is also made to the Nuclear Security Department who suspends the individual's unescorted access badge until training is completed.

July through December, 1991

To support the change to 10 CFR 55 and how it relates to the FFD program, there was an increase in communications with Plant Operations to provide guidelines on reportable medications.

Indiana/Michigan Power Company

January through June, 1991

To ensure continued employee confidence in our contract laboratory, a decision has been made to include all lab technicians in the plant's random testing pool. Special provisions have been made for the collection of samples and processing of specimens by an independent National Institute for Drug Abuse (NIDA) certified lab.

The plant has retained the services of a second NIDA certified laboratory to act as backup for our primary lab. This lab has been audited by another

licensee and a copy of the audit report has been received and reviewed by the Cook Nuclear Plant program administrators.

July through December, 1991

A Fitness-for-Duty (FFD) Specialist has been added to the Security Section as of July, 1991. This position provides undivided attention for the purpose of addressing the state of the Plant's FFD program and to ensure continued regulatory compliance.

A third Medical Review Officer (MRO) has been added to support the Plant's FFD Program. This addition ensures MRO coverage under all circumstances and alleviates concerns regarding vacations, illness, and other special conditions.

Quarterly meetings continue to be held bringing together the program administrators, the MRO, the laboratory service personnel, Employee Assistance Program personnel and the collection site supervisor to discuss the state of the program and any issues or incidents of mutual interest.

The number of FFD incidents in 1991 was 16% of the total incidents accrued in 1990. The FFD administrators feel this reduction was accomplished through continued reinforcement of the Plant's FFD policy, training of security officers in the area of behavior observation and odor identification, by maintaining a highly visible program through the K-9 program, and information supplied to company and contractor personnel. It should be noted that Plant outages were not conducted during 1991, and therefore unescorted access was not requested nor granted to increased numbers of personnel. The relatively stable number of contractor personnel contributed to the reduction of FFD incidents.

Drug testing dates and results are being entered into the Integrated Nuclear Data Exchange (INDEX) system to assist in determining personnel access reinstatement for the D.C. Cook Plant and other INDEX member utilities.

A FFD Supervisor training video tape was developed. It is provided to contractor supervisory/management personnel to enhance the Continued Behavior Observation Program of their employees during their absence from the Plant. This is in addition to the required FFD Supervisor training conducted on-site prior to granting unescorted access to those persons performing supervisory responsibilities. Further training enhancement is the continuation of the eight hour behavior observation training program offered to all supervisory personnel.

Computerized data bases have been established to enhance the effectiveness of program implementation in the areas of personnel monitoring programs, blind test specimen submittal statistics, chemical test result reporting and Contractor FFD manual distribution.

Iowa Electric Light and Power Company

January through June, 1991

The MRO recommended retests on several individuals whose specific gravity and creatinine levels were below the normal cutoff levels. It was determined that the employees were on a diet that required them to drink large quantities of water.

July through December, 1991

The NRC conducted an inspection of the Iowa Electric (IE) Fitness-for-Duty program in October 1991. The inspectors concluded that IE is satisfying the general performance objective of Part 26. One severity Level IV violation was identified which related to inadequate completion of several "suitable inquiries". The failure to send NRC documentation of the results of an unsatisfactory blind performance test by an HHS-certified laboratory was termed a weakness. Both of these items were corrected before the inspection was completed.

In response to the findings of the NRC inspection, we have strengthened our procedures to assure that unsatisfactory blind performance tests are reported and that suitable inquiries are correctly completed. We also provided additional instructions to the Medical Review Officer in order to assure that Fitness-for-Duty program managers are notified of positive test results promptly, even during other-than-normal business hours. We are also revising procedures to emphasize that managers and supervisors are encouraged to seek assistance from Fitness-for-Duty program managers in unusual situations or when questions arise.

IE also established a security specialist position to provide direct review and oversight of the Fitness-for-Duty and access authorization programs at the Duane Arnold Energy Center.

Long Island Lighting Company

July through December, 1991

Periodic surveillances continue to be scheduled and performed by the Nuclear Quality Assurance Department (NQAD). During this period, the training and qualification of supervisory personnel was surveyed. It was determined that several supervisors had not received the required supervisory

training within the 3 month period after assignment, and that several supervisors had not received supervisory requalification training within the nominal 12 month period. Each department reviewed a listing of their personnel, and personnel requiring the training will complete it by 2/28/92. Additional administrative controls are being implemented to prevent recurrence.

An audit was also performed by NQAD. As a result of this audit, improvements were made in the following areas:

- Binding of log books and future use of bound logbooks at the off-site urine specimen collection center.
- Documentation of service checks and history log of intoxicants.
- Updating of notification list at offsite urine specimen collection center.

There were four contractor pre-badge positive tests. These personnel were removed from the Shoreham site and unescorted access was denied. Contractor management met with labor personnel to reinforce the importance of effective screening of their personnel.

Maine Yankee Atomic Power Company

July through December, 1991

The following list is a synopsis of initiatives by Maine Yankee:

- Developed and initiated a Contractor Supervisory Training video.
- Continued in-house FFD program performance assessment.
- Renegotiated and enhanced NERO contracted services.
- Completed annual audit of FFD program and made corrective actions necessary to enhance program effectiveness.
- Renegotiated with on-site bargaining unit to make clarifications to the program.

The lessons learned by Maine Yankee continue to reinforce the necessity of continual program review with a focus on enhancements to program effectiveness.

The Maine Yankee FFD program is very effective in meeting both the requirements and intent of 10 CFR 26. The continual self-evaluation program increases the effectiveness and efficiency of the program. Monitoring the program and continually communicating with employees proves beneficial in assuring an effective program.

Nebraska Public Power District

January through June, 1991

To date for 1991, the District implemented three measures to enhance the overall effectiveness of its program. These proactive measures included:

- Reducing the predictability of random testing. In doing so, a Quarterly Trend Analysis Report was developed to identify trends relative to random testing times during the various shifts. This enabled Fitness-for-Duty staff members to identify trends and take action by altering test times throughout the 24 hour period.
- Accelerating the random testing rates during weekends and holidays to ensure persons subject to the program did not have "safe periods."
- Implementation of a contract with a closer NIDA certified laboratory to facilitate quicker drug result turnaround time.

New York Power Authority

January through June, 1991

Indian Point Three Nuclear Power Plant

The contract services provided by the Power Authority's satellite collection facility vendor were discontinued during this reporting period. The vendor had been responsible for collection of samples from Power Authority corporate employees. The Indian Point 3 medical staff has assumed these corporate Fitness-for-Duty responsibilities.

James A. FitzPatrick Nuclear Power Plant

The licensee and Bensinger DuPont Associates conducted an investigation following the Metpath Laboratory's report of two false negative results of amphetamine spiked blind test specimens. There was no evidence to suggest that the false negatives were the result of any laboratory systemic problem. In order to determine Metpath's expertise in identifying amphetamines, the Authority submitted two special panels of methamphetamine and amphetamine blind samples. Metpath passed these two separate challenges, indicating the laboratory's ability to correctly identify amphetamines based on recent guidance from the National Institute on Drug Abuse.

July through December, 1991

James A. FitzPatrick Nuclear Power Plant

Prior to specimen collection all individuals are now required to empty pockets, pulling pockets inside out. The tops of boots and socks are also checked. Lockers are provided for belongings. This procedure was adopted to minimize the possibility testing could be compromised.

WACP 10.1.26 was revised to limit the right of appeal of a confirmed positive pre-access to within seven (7) working days.

Niagara Mohawk Power Corporation

January through June, 1991

During the first year of operation it became clearly apparent that the new drug testing requirements contained two critical problems. First, we found that the direct costs associated with conducting drug testing using our HHS-certified laboratory was well over $100,000 a year. Secondly, we found that the inevitable 2-4 day delay in receiving test results from HHS laboratory ended up to be not only financially costly but also created significant operational barriers in granting timely unescorted access authorization. In considering these two significant problems, we decided to implement an on-site drug screening component using EMIT technology. It is expected that this one program component could reduce our drug testing budget by as much as 50% while also allowing us to have test results within a number of hours as opposed to a number of days.

The security alarm system was upgraded at the FFD collection area at Nine Mile Point. The enhancement included installation of infrared motion detectors to further secure the collection area where samples are stored, the waiting area, and the new on-site screening laboratory which also accommodates our confidential records.

A security system was installed at the FFD satellite collection area at Salina Meadows including door alarms, infrared motion detectors and an alarm to monitor refrigerator temperature. This new system at our satellite facility offers the same protection and security as our on-site facility, insuring the integrity of samples stored overnight as well as monitoring refrigerator temperature in case of a prolonged power outage.

The Fitness-for-Duty (FFD) group designed, published and distributed a new FFD pamphlet to further enhance general employee awareness concerning the FFD program. The pamphlet was designed to offer a concise quick reference for all new Niagara Mohawk Power Corporation (NMPC) employees or contractors regarding program procedures and individual responsibilities. The pamphlet is distributed as a training handout in all FFD training classes and available at the FFD collection sites.

July through December, 1991

During this 6 month performance period, the Fitness-for-Duty Program was audited and assessed by several groups.

Throughout the entire performance period FFD Program practices and procedures were reviewed and audited by the Security Department's Commitment to Excellence Program. This is a Regulatory Self Assessment process designed to identify any programmatic weaknesses or areas for programmatic improvement from a Regulatory Compliance perspective. Throughout the entire performance period, the FFD group internally was also undergoing a self assessment process in order to find more efficient and cost-effective ways to carry out program requirements. An NRC inspection and NMPC audit were also conducted during the period.

Based on information received, recommendations made, and lessons learned during these audits and assessments we have implemented numerous programmatic changes in order to be more efficient and compliant with Regulatory Requirements. The most noteworthy of these changes are as follows:

- Based on the NRC inspectors' recommendation we formalized a procedure to evaluate the conditions of persons who provide an alcohol test with a BAC between .015% and .039%. Our procedure includes a personal interview and the option for additional alcohol testing in order to establish current fitness, and whether or not the alcohol level is increasing or decreasing.
- In order to provide more privacy in our alcohol testing area, we redesigned the room layout so that the outcome of one person's alcohol test results cannot be seen by other people being tested.
- Based on comments by all audit and assessment groups, we initiated some major changes to the way we track and train persons requiring Behavioral Observation Training. Our new process involves a joint effort between our Human Resource group and our In-processing group, our Training group, and our Fitness-for-Duty group. This new process will assure that new supervisors receive training within 90 days of a promotion and that all current supervisors receive this training prior to receiving unescorted access authorization.

- The QC process in our in-house testing facility is a critical element in our day-to-day operations. We have decided to exceed NRC QC requirements by participating in an inter-laboratory comparison program as a monitor for Quality Assurance. As a member of the College of American Pathologist Program Fitness-for-Duty receives samples four times yearly for testing and comparison. After thorough evaluation of the sample results by the highly accredited CAP organization a determination is made for yearly accreditation. The quarterly comparison program is an excellent Quality Assurance measure for the accuracy and precision of our analytical results.

Northern States Power Company

January through June, 1991

Two Northern States Power Company (NSP) blind specimens submitted to MEDTOX Laboratories, Inc. during the semi-annual period ending June 1991 did not yield results consistent with the supplier's, BIO-RAD Corporation, claim for spiked concentration level. The first specimen was submitted on June 11, 1991 from a lot spiked positive for opiates at a concentration level greater than 300 mg/ml. The second specimen was submitted on June 18, 1991 from a lot spiked negative for cocaine metabolites at a concentration level greater than 300 ng/ml. MEDTOX Laboratories reported to the NSP Medical Review Officer negative results for both specimens.

Part of NSP's investigation into the discrepant results included submitting both specimens to NSP's NIDA certified back-up lab. The results of both retests were negative and consistent with MEDTOX results. NSP believes the investigation and the MEDTOX retest results and back-up laboratory results support the conclusion of possible degradation from supplier source.

July through December, 1991

Three NSP blind specimens submitted to MEDTOX Laboratories, Inc. during the semi-annual period ending December 31, 1991 did not yield results consistent with the supplier's, BIO-RAD Corporation, claim for spiked concentration levels.

The first two specimens were submitted on September 11, 1991. One was spiked positive for opiates at a concentration level greater than 300 ng/ml. The second was spiked positive for amphetamines at a concentration level greater than 1000 ng/ml. MEDTOX Laboratories reported to the NSP Medical Review Officer negative results for both specimens.

Part of NSP's investigation into the discrepant results included submitting both specimens to NSP's NIDA-certified back-up lab. The results of both retests were negative and consistent with MEDTOX results. NSP believes the investigation and the MEDTOX retest results and back-up laboratory results support the conclusion of degradation from supplier source. These results were not ruled as false negatives by NSP but true negatives. Consequently, NSP did not submit an investigative report to the NRC in accordance with 10 CFR 26 Appendix A (2.8) (e) (4).

The third blind specimen was submitted on December 4, 1991 from a lot spiked positive for opiates at a concentration level greater than 300 ng/ml. This specimen was properly destroyed by MEDTOX Laboratories prior to NSP requesting a retest at its backup lab. An investigative report was submitted in accordance with 10 CFR 26 Appendix A (2.8) (e) (4) on January 13, 1992.

NSP is revising procedures addressing blind specimen unsatisfactory performance test reporting. Our current procedure does not require the reporting of unsatisfactory performance test, which our investigation concludes were true negatives related to metabolite degradation. U.S. NRC Region III Inspection Report 50-331/91018(DRSS) identified this practice as a program weakness.

NSP procedures will be revised to require reporting all blind specimen unsatisfactory performance test results in accordance with 10 CFR 26 Appendix A (2.8) (e) (4).

Pacific Gas and Electric Company

January through June, 1991

Management actions to improve the FFD program continue to be proactive. Substance abuse recovery groups at Diablo Canyon Power Plant (DCPP), based on the model 12-Step program, continue to support the recovery process for individuals with previous substance abuse problems. FFD question and answer handouts and other printed material are distributed to reinforce drug and alcohol abuse education. The Fitness-for-Duty management/Labor Audit and Review Committee continues to look for ways to improve the effectiveness of the Fitness-for-Duty Program by reviewing procedural issues in terms of operating the program in the most efficient and consistent manner possible.

Pacific Gas and Electric Company (PG&E) continues to maintain an open liaison with local law enforcement agencies, including the San Luis Obispo Drug Task Force, and communicates with local drug and alcohol treatment facilities to monitor drugs of

current abuse in geographical proximity to Diablo Canyon.

The FFD Organization is aggressively monitoring and evaluating information concerning techniques that individuals may use to adulterate or otherwise subvert the chemical testing process. Working with the PG&E contract Medical Review Officer and the contract "blind" specimen provider, tests are conducted as necessary to assess information concerning potential adulteration methodologies that may mask the presence of illegal drug metabolites in a person's urine specimen.

July through December, 1991

PG&E continues to maintain an open liaison with local law enforcement agencies, including the San Luis Obispo County Drug Task Force and Drug Enforcement Agency (DEA), and routinely communicates with local drug and alcohol treatment facilities to monitor drugs of current abuse in geographical proximity to Diablo Canyon. The FFD organization is closely monitoring the local usage of lysergic acid diethylamide (LSD) based on information provided by these agencies and other national sources which indicate a resurgence of this illicit drug.

The FFD organization continues to make enhancements to the program through its own operational experience and the operational experiences of other nuclear facilities. For example, PG&E developed the Region V FFD Coordinators' Conference, which meets annually to share pertinent information between the Region V facilities (e.g., new techniques used in subversion of the chemical testing process). PG&E also maintains open communications with the Region V inspectors to facilitate the exchange of relevant FFD information.

During 1991, five individuals (two in the first reporting period and three in the second reporting period) tested positive in the follow-up testing program. Each individual tested positive for the same drug for which they initially tested positive (two for alcohol and three for cocaine). These individuals tested positive within approximately one year of their initial positive test result.

As a result, several follow-up program enhancements have been implemented to aid individuals in their rehabilitation for alcohol and cocaine dependency. These enhancements include, but are not limited to:

- Increased frequency of follow-up tests past the initial four months, i.e., testing at least once per month for the entire three years.
- Increased frequency of meetings with an Employee Assistance Program (EAP) Counselor.
- Periodic meetings with the Medical Review Officer.
- Training by the EAP Counselor of the individual's immediate supervisor to emphasize the need for specialized behavioral observation during the rehabilitation period.
- Assigning a specific specimen collector to each individual in the follow-up program so that changes in behavior may be observed at the time of collection and appropriate notifications made to the Medical Review Officer or the EAP Counselor.

Pennsylvania Power and Light Company

January through June, 1991

We have implemented the following measures to strengthen our FFD Program:

- Created and filled a new FFD Administrator position, and a Confidential Secretary position. (Both positions report directly to the Site Access Services Supervisor.)
- Re-aligned the FFD Program under the Nuclear Security section for ease of operation and additional support.
- Completed an $85,000 modification project to the General Office dispensary, which now provides additional privacy for those individuals being tested.
- Implemented a notification process concerning trace amounts of alcohol based on discussions with Messers, Bush, Albert, King and DellaRatta during their 1990 FFD Program inspection.

Philadelphia Electric Company

January through June, 1991

The Philadelphia Electric Company (PECo) Human Resources Department is being reorganized. As part of this process, the position of FFD Program Manager is being established. The FFD Program Manager will have clear responsibility for the FFD Program and will report to the Director, Occupational Health and Safety.

All collection site personnel have been retrained with additional emphasis placed on attention to details.

A separate secured access area has been established to ensure that access to test results and random testing lists is restricted.

A review of confirmed random positive tests did not indicate a pattern of higher Monday/Friday positive rates, increased sick leave usage, age group differences, or job classification differences.

During this reporting period, it was noted that there was a slightly higher occurrence of specimens found to be out of acceptable range for specific gravity and/or creatinine. An explanation for this may be overhydration. Overhydration can be attributed to an increased awareness of the health benefits of consuming large quantities of water (i.e., weight reduction) or the dilution of a specimen in an attempt to subvert the chemical testing process. This situation is being closely monitored and data is being collected to track the cause(s) for this increase.

During a routine check of training records on January 22, 1991, PECo identified that a number of individuals, listed as supervisors, may not have completed either the initial FFD Supervisory Training within three months of assignment, or the annual refresher training. Immediate notification was made to the Site Support Managers, Security Coordinator, and the Nuclear Support Manager. Resolution of the issue was accomplished through the following actions: supervisory designation was removed from those not actually performing supervisory duties; access was temporarily suspended for those actually involved in supervisory duties until training was completed; and in some cases, posting completed training to the tracking system.

On February 26, 1991, the contractor performing on-site immunoassay screening notified the FFD Coordinator that screening for the chemical "PCP," had not been completed properly. The contractor had been using a PCP screen (i.e., Emit-d.a.u.) calibrated at 75 ng/ml as opposed to 25 ng/ml. The contractor identified the problem on February 22, 1991 and immediately ceased PCP screening until the correct calibrator was received from the manufacture (i.e., Syva). Contact with PECo's certified laboratory (i.e., DrugScan, Inc.) indicated that DrugScan was using the proper screen.

Investigation revealed that the contractor began using the Emit d.a.u. calibrator at our Limerick Generating Station (LGS) on August 21, 1990, and at Peach Bottom Atomic Power Station (PBAPS) on October 24, 1990, in an attempt to ensure consistency between the on-site lab and the certified lab. Investigation revealed that the on-site lab supervisors failed to recognize the different calibration levels indicated within the literature accompanying the calibration reagents.

During the period, the on-site testing facility had correctly identified all blind proficiency specimens submitted. We also noted that one of the quality control specimens (i.e., 10% of negative screens) submitted to the certified lab was identified as a false negative.

All on-site testing technicians were retrained in the proper methods of calibration reagent preparation and in following instructions contained in the accompanying literature.

On February 19, 1991, a collection site was established at the Nuclear Group Headquarters in Wayne, Pennsylvania. This facility was established to reduce the lost-time impact for individuals selected to participate in the random testing program.

Portland General Electric Company

January through June, 1991

The Nuclear Quality Assurance Department conducted an internal audit of the FFD program in February 1991 with the assistance of external management consultants. Auditors found the program to be effectively implemented. Three areas of concern were noted:

- the initial FFD training video for supervisors, while adequate in content, needed to be upgraded in presentation,
- a need for facility-specific guidelines was identified for the program's Contract Collection facility located in downtown Portland, and
- several program procedures and practices were identified as needing to more effectively implement 10 CFR 26.

In response to these concerns a new training video is being developed, a facility-specific procedure for the Contract Collection facility has been developed and implemented, and several other program procedural changes have been completed or are in process.

During the reporting period, FFD staff also upgraded two program directives applicable to Plant personnel. Medication reporting guidelines at Trojan were expanded to provide more specific guidelines to both employees and supervisors to ensure Fitness-for-Duty with regard to prescription and over-the-counter medications. In addition, the procedure to ensure the Fitness-for-Duty of personnel called in for unscheduled work was revised to expand the intent of the policy.

In April 1991, a contractor was confirmed to have tampered with the urine collection process. The contractor was identified by FFD collection staff and Portland General Electric (PGE) Medical Review Officer to have substituted two surrogate urine specimens during a random collection. A third,

witnessed collection was confirmed positive for illegal drugs. Upon discovery, the contractor was immediately denied unescorted access to Trojan. An investigation of the incident by the Nuclear Security Department determined that it was an isolated event, and that no other Trojan Plant personnel were involved. A lesson learned summary regarding this incident was distributed to Plant personnel on June 6, 1991.

The FFD program subscribed to two elective proficiency testing programs during the reporting period, one at the contract HHS-certified laboratory and one at Trojan Drug Testing Facility (TDTF). In April 1991, the FFD program submitted a special proficiency panel to the contract laboratory which included five over-the-counter cross reactants and five amphetamine/methamphetamine challenges. In each case, laboratory results were within expected ranges. During the first two quarters of 1991, the TDTF participated in the American Association of Bioanalysts Proficiency testing service in preparation for onsite screening implementation. In all cases, TDTF results were within expected ranges. This program is a continuous program of quality control to which the TDTF will continue to subscribe in addition to its regular quality control program.

In November 1990, Region V inspectors noted a weakness in backshift random test rates. In response to these concerns, backshift populations and random testing probability were reviewed. It was determined that while the intent of 10 CFR 26 for random screening administration had been met, there was a need to increase the screening of backshift selectees during backshift duty time, rather than when they rotated onto days. A minimum backshift screening guideline of five percent was established. In order to trend and analyze backshift random screening rates, the following data fields were implemented in the FFD computer tracking system (FFDT): (1) time of random notification, (2) time of reporting, (3) shift worked, (4) day of the week, and (5) holiday code. Back shift random test rates are tracked and trended by the FFD program on a monthly basis.

Public Service Company of New Hampshire

January through June, 1991

The following items are a summary of initiatives taken by New Hampshire Yankee based on program reviews and identified weaknesses:

- Designed and implemented plan to meet drug and alcohol screening demands of first plant outage. Scheduled technicians to conduct screenings and ordered necessary materials.
- Developed computer based system to track persons initially excused from testing.
- Redesigned screening facility waiting room to provide greater confidentiality for persons waiting to be interviewed by Medical Review Officer.

July through December, 1991

The following items are a summary of initiatives taken by New Hampshire Yankee (NHY) based on program reviews and identified weaknesses:

- Installed additional facsimile machines to minimize delay in receiving test results during refueling outage period.
- Recertified all collection personnel in the operation of the RBT III, evidential grade breath analysis unit. Recertified Screening Facility Supervisors and Technicians in the calibration of this unit. A factory representative conducted all training and certification.
- Enhanced FFD computer program to track use of individual breath analysis machines to better forecast maintenance and replacement of units.
- Developed administrative process to track and revoke access for persons unavailable for behavior observation and testing.
- Completed annual inspection and records audit of contracted testing laboratory. The laboratory was found to be in compliance with all NRC requirements.

During the last six months of 1991, NHY submitted 179 blind performance test specimens to SmithKline Beecham Clinical Laboratories with the following results:

Negative:	143 (80%)
Positive:	36 (20%)

This total includes five samples containing a high concentration of the over-the-counter stimulant ephedrine that were sent to challenge the laboratory on its ability to distinguish this drug from methamphetamine. This was prompted by a number of false positive reports generated in three other laboratories. All five samples were correctly reported negative. One of the blind specimens, containing cocaine metabolite, was incorrectly reported as negative. Duo Research conducted an unannounced inspection and record audit and de-

termined that this incorrectly reported result did not constitute unsatisfactory performance.

Another blind specimen submitted during this period containing d-methamphetamine and d-amphetamine was incorrectly reported by the contracted laboratory as positive for both substances. The correct result should have been positive only for d-methamphetamine. Duo Research conducted an unannounced inspection and determined the cause to be a protocol violation and an administrative false positive. The inspection report emphasizes that the consequence of a similar error on a real specimen would not place the donor in any jeopardy, since amphetamine must be present in order for methamphetamine to be reported as positive.

Rochester Gas & Electric Company

July through December, 1991

An internal audit of the Company's Fitness-for-Duty Program was conducted during October 9-15, 1991. The one audit finding identified that Awareness Training was not provided for employees who do not have unescorted site access but participate in the EOF/ESC. Accordingly, controls have been established for identifying these employees and annual Awareness Training will be provided.

Sacramento Municipal Utility District

July through December, 1991

Procedures were upgraded for establishing a second check sample tracking system to assure program administrators and the MRO report and take action on test results in a timely manner.

Southern California Edison

January through June, 1991

Pursuant to 10 CFR 26, Appendix A, Section 2.8(e), a submittal was made on June 17, 1991 summarizing a Southern California Edison (SCE) investigation concerning unsatisfactory blind drug performance test results.

Two blind samples were reported negative by the NIDA-certified testing laboratory used by SCE on May 19, 1991, and May 24, 1991. These specimens should have been reported positive. Although SCE submitted these samples in accordance with the supplier specified shelf life, the specimens had degraded to below the SCE established cut-off level, thus resulting in the negative laboratory report. Additional testing by the specimen supplier later confirmed the sample degradation to below the cut-off level.

SCE has discontinued processing blind performance samples provided by this supplier and has technically qualified two separate blind performance specimen providers.

Tennessee Valley Authority

January through June, 1991

The FFD procedure was revised effective July 5, 1991, and includes the following:

- For persons who have a blood alcohol content of .02 to .039, the Medical Review Officer will refer the person to the Employee Assistance Program (EAP). The supervisor will be notified to determine whether the person should be allowed to return to duty that day or shift.
- The department manager is responsible for determining if a review of work is needed for persons with confirmed positive test results.

A procedure has been developed for handling drugs and suspected contraband found on nuclear plant sites. This procedure gives instructions for chain-of-custody of the substance and sending the substance to the contract laboratory for analysis.

As stated in the Tennessee Valley Authority's (TVA) response to a Notice of Violation dated July 11, 1991, the FFD coordinator makes unannounced quarterly visits to all collection facilities for the purpose of ensuring that drug and alcohol testing is properly performed.

Physical modifications are currently being made to the Browns Ferry Health Station collection facility to decrease the likelihood of human error in the collection process.

On June 7, 1991, a day-long refresher "Train the Trainers" course was held for FFD training instructors. Members of the FFD Task Force met with the trainers to update them in the areas of the FFD procedure revision, annual audit, NRC inspection, security, EAP, and medical procedures. In addition, a nationally-certified substance abuse counselor from the community spoke with the trainers regarding the drugs of choice in the 1990s.

The TVA EAP has developed an EAP Marketing Plan for 1992. The plan includes:

- Sending EAP brochures to each TVA employee.
- Feature articles in the "Inside TVA" newspaper.
- Setting up a mobile display booth with literature on EAP services in high traffic areas of each site.

- Brown bag lunch meetings with representatives from the EAP.

July through December, 1991

As permitted by Section 2.1(b) of Appendix A, in for-cause testing situations or where there is suspicion of adulteration or dilution, TVA tests for other substances in addition to the "NIDA 5" panel of drugs. This expanded panel may change from time to time based on information provided by local law enforcement officials, drug and alcohol treatment professionals, and TVA's NIDA-certified contract laboratory. The expanded panel has consisted of barbiturates, benzodiazepines, methadone, methaqualone, and propoxyphene. During this reporting period, TVA added LSD to the expanded panel.

Texas Utilities Electric Company

July through December, 1991

Texas Utilities (TU) Electric has contracted with a local HHS- certified laboratory to perform drug tests on specimen collected at Comanche Peak. On July 25, 1991, TU Electric was notified by the laboratory that the certification for testing was suspended. This was due to a routine periodic NIDA inspection which resulted in several contested deficiencies.

While these deficiencies were being resolved, arrangements were made through a secondary HHS-certified laboratory to provide testing with no break in service. Upon notification, the secondary laboratory was audited by the TU Electric Quality Assurance Department. The audit indicated that the new laboratory had developed and effectively implemented a program meeting the requirements established by 10 CFR 26 and NIDA. The audit also satisfied the 10 CFR 26, Appendix A, Section 2.7(m) requirements that the licensee conduct an inspection of the laboratory testing facility.

Currently, TU Electric has not received notification that the certification has been reinstated to the original laboratory and testing has continued through the secondary laboratory.

TU Electric feels that there are advantages in contracting with a company with more than one NIDA-certified testing facility. This enables the laboratory to continue testing at a certified facility should the other laboratory's certification be suspended.

Currently, TU Electric is in the process of awarding a contract to a multi-facility laboratory for testing under the Fitness-for-Duty Program

Union Electric Company

January through June, 1991

Union Electric purchased additional blind samples spiked with ephedrine to ensure the DHHS Laboratories providing services to Union Electric are not mis-identifying ephedrine in the urine for amphetamines.

Because of reports (within the transportation industry) of some laboratories, during their testing process of urine specimens, mis-identifying ephedrine in the urine for amphetamines, and in discussions between Union Electric's Medical Review Officer and Dr. Willett of Duo Research, it was decided Union Electric would purchase these additional blind samples. These blind samples are structured to challenge the capabilities of laboratories we use to determine if this error, or potential for this error, does exist.

To date, four (4) samples have been utilized for this purpose, three (3) of which have been returned with final results and one (1) of which is still pending.

All four (4) samples were spaced out in the testing process at approximately monthly intervals. All three (3) specimens for which test results to date are available were tested in our on-site testing facility and at both DHHS Laboratories providing services to Union Electric, and the results have all been negative for amphetamines at all three (3) testing facilities (i.e. the correct result).

During this reporting period, we experienced an occurrence in which the temperature of a urine specimen measured outside of the acceptable range (low side) of 90.5 F - 99.8 F.

The container in which the specimen is provided holds 120 ml and is a wide base type container. The amount of specimen provided in this case was 10 - 15 ml. This was not an adequate amount of urine specimen to completely submerge the temperature probe.

Fitness-for-Duty Program Management determined the unacceptable temperature measurement was not due to the specimen being altered or diluted, but that the amount of specimen provided was insufficient to obtain an accurate measurement.

Since an accurate temperature measurement could not be obtained, the specimen could not continue to be processed as a partial specimen and was discarded. The individual providing the insufficient specimen was required to repeat the process and did provide an ample specimen approximately 2-3 hours later. The specimen was within the acceptable temperature range and no trace of drugs was indicated in the test results.

At the time of this occurrence, our procedure did not address how this type of situation should be handled.

Subsequent to this occurrence, Fitness-for-Duty Program Management requested our Medical Review Officer to evaluate our specimen containers, temperature measuring device, and provide us with a recommendation as to the minimum amount of specimen required in order to obtain an accurate temperature measurement. The specimen can be retained and processed as a partial specimen until 60 ml of urine specimen is collected. The MRO's recommendation is 30 ml.

Our procedure is currently being revised to provide Collection Site Personnel the following guidance:

- Added definition for Partial Specimen. It is a urine specimen that contains, at a minimum, 30 ml of urine, but less than 60 ml of urine.
- Added note in procedure concerning urine specimens. Provided that they do not meet the definition of a Partial Specimen (minimum of 30 ml), they cannot be processed in accordance with this procedure. In these cases, the insufficient specimen must be discarded and the employee instructed to repeat the process until a sufficient urine specimen can be provided.
- Added paragraph to identify urine specimens. If they measure at a minimum of 30 ml but less than 60 ml, they are considered partial specimens and are processed as such.

July through December, 1991

Initiatives taken during this reporting period have been minor in nature. Program changes implemented were to gain efficiency in the FFD Program and/or to correct weaknesses identified in the program. These initiatives taken were a result of Quality Assurance Audits/Surveillances and areas that were self-identified by FFD Program Administration.

Reviewing NRC Inspection reports of other utilities' FFD programs has helped Union Electric to identify areas of strengths and weaknesses in our program. One specific area of note in which Union Electric implemented action as a direct result of these reviews was to accelerate weekend/holiday testing and focus on void time slots during backshifts when testing was not being performed.

Exchanging information with other utilities at the FFD seminar last October in Houston, Texas, and reviewing NRC (1991) inspection reports of other utilities' FFD Programs has provided Union Electric with data that may initiate additional changes during 1992 to enhance our current program and ensure full compliance with 10 CFR 26.

Vermont Yankee Nuclear Power Corporation

January through June, 1991

During this reporting period, the annual Quality Assurance audit of the Vermont Yankee (VY) FFD Program was performed. This effort utilized technical specialists from other New England licensees' FFD Programs in assessing implementation and the effectiveness of our program. The audit identified a number of enhancements which are currently being pursued for implementation.

As a result of a concern identified in the NRC FFD inspection conducted in late 1990, we have taken the necessary measures to further secure the collection site facility at the plant.

Additionally, recognizing the benefit of training and peer discussion unique to Medical Review Officers, we sponsored our MRO's attendance at such a conference earlier this year. His capabilities in this important role were further enhanced by attending this seminar with his colleagues.

Virginia Electric and Power Company

January through June, 1991

A Quality Assurance audit of the Fitness-for-Duty Program identified strengths in the program management, professionalism, program involvement and support, and the certification of the Virginia Power Employee Assistance Program personnel by the EAP Association.

Inquiries to law enforcement officials regarding potential forms of substance abuse have resulted in no changes to the substances for which testing is performed by the FFD program.

July through December, 1991

Virginia Power has established new contractor/vendor requirements that allow contractor/vendor supervision to be trained by Virginia Power. This will eliminate problems in this area which were identified by our Quality Assurance Department during audits of contractor/vendor FFD programs.

Computer programs were developed and implemented to randomly select backshift, weekend, and holiday testing dates and to select follow-up testing dates.

Locking sample carriers were provided by the HHS-certified laboratory for transport of specimens

between Virginia Power facilities and the HHS-certified lab.

Inquiries to local hospitals and law enforcement officials regarding potential forms of substance abuse have resulted in no changes to the substances for which testing is performed by the FFD program.

Wisconsin Electric Power

July through December, 1991

Our program of submitting specimens for blind performance tests continues to prove the reliability of our primary laboratory. There have been no unsatisfactory performance tests since the beginning of the program. We did, however, fail to meet the required 10% sample submission rate in the last quarter of 1991. We exceeded the required rate in the first three quarters such that, by the end of 1991, we were only four specimens short of meeting the annualized rate, having submitted 182 blind specimens for the year rather than 186. A revision was made to the FFD Program Procedures Manual requiring increased oversight by the Program Administrator to prevent recurrence.

Wisconsin Public Service

January through June, 1991

Personnel changes were made at a collection facility to improve patient service and procedure compliance.

Based on the result of a QA audit, the computerized random date selection program was modified to increase the number of night shift and weekend tests.

July through December, 1991

A meeting was held with the collection site and testing lab personnel to ensure uniformity and procedure compliance. New chain-of-custody forms were put in place to improve collection, testing, and reporting processes. An alternate MRO was utilized during the leave of absence of the company's regular MRO. A modification to the random date selection program initiated during the previous reporting period resulted in a satisfactory increase in the number of backshift and weekend tests selected.

Wolf Creek Nuclear Operating Corporation

January through June, 1991

The following initiatives were taken:

- Enhanced off-shift testing.
- Added one staff member, an LPN, as a collection site person.
- Temporary modifications have been completed as a result of a June, 1991, NRC FFD inspection, changing a public restroom to a secure collection site.
- Changed NIDA laboratories to Clinical Reference Laboratories of Lenexa, Kansas. Their close proximity to the plant (90 miles) is intended to provide quick turnaround and good communication.
- Enhanced screening of contractors with infrequent access.

July through December, 1991

Revisions were begun to the Wolf Creek Nuclear Operating Corporation (WCNOC) FFD escort training program in 1991 and it is anticipated that the revised program will be implemented in 1992. Prior training made use of multiple videotapes purchased or filmed by WCNOC in 1989 that provided all necessary training information. The new program represents an effort at better organization of the materials, incorporation of lessons learned and procedural changes, and the use of new and better commercial videotapes on such subjects as behavior observation and the effects of drugs and alcohol upon persons. The new training program incorporates all the materials into one comprehensive videotape that could be administered in any location, and uses an examination to measure comprehension of materials.

APPENDIX D

LETTER REPORT

Letter report submitted by Dr. Michael R. Baylor and Dr. Donna M. Bush, Division of Applied Research, National Institute on Drug Abuse to Mr. Loren Bush, Division of Reactor Inspection and Safeguards, Nuclear Regulatory Commission

The following letter report was submitted by Dr. Michael R. Baylor and Dr. Donna M. Bush, Division of Applied Research, National Institute on Drug Abuse to Mr. Loren Bush, Division of Reactor Inspection and Safeguards, Nuclear Regulatory Commission.

This letter report describes the nature of the unsatisfactory testing results that have occurred in the nuclear industry to date and have been reported to the NRC pursuant to Section 2.8(e) of Appendix A to 10 CFR Part 26. This section requires licensees to investigate and report unsatisfactory performance testing results to the NRC within 30 days of completion of the investigation. As this information was not discussed in Volume 1 of NUREG/CR-5758, the letter report discusses unsatisfactory testing result reports for both 1990 and 1991. It also describes unsatisfactory testing that occurred through March of 1992. It is important to note that all of the unsatisfactory testing results described in this letter report were ultimately satisfactorily resolved. Except for one instance in which an employee suffered consequences due to a delay in resolution of a false positive, none of these unsatisfactory results caused unfairly damaging consequences to any person employed by or under contract to a NRC licensee. It is also important to note that the unsatisfactory test results from tests on blind performance specimens described in this letter report are not included in the confirmed positive test results reported in NUREG/CR-5758, Volumes 1 or 2. It should also be noted that while the NRC requires its licensees to use HHS certified laboratories to perform the analytical testing, 10 CFR Part 26 allows licensees to: (1) implement testing for drugs in addition to those specified in the "HHS Mandatory Guidelines" and (2) utilize cutoffs that are lower than those specified in the "HHS Mandatory Guide.

Unsatisfactory testing results include both false negative and false positive results. A false negative test result refers to a specimen that is reported to be negative although the actual concentration of drug in the specimen is above the level used to determine whether a specimen is positive or negative. A false positive test result is defined as a specimen that does not contain any drugs that either tests positive for drugs (analytical false positive) or that is reported to be positive for drugs (administrative false positive). Unsatisfactory testing results also include other general problems in the drug testing process that by investigation have been linked to the improper manufacture/formulation/packaging of the quality control specimens, the improper processing of the specimens on-site prior to their shipment to the laboratory for testing, or inappropriate handling/actions by the Medical Review Officer (MRO). It should be noted that this is a double blind performance testing program (i.e., the laboratory does not know the identity or the content of the quality control specimens that are submitted to them by the licensees).

The following is a description of the unsatisfactory testing results that occurred between January 3, 1990 and March 30, 1992. Forty-four of the 52 utilities reported a total of 175 unsatisfactory testing results to the NRC during this time period. These included 167 double blind performance specimens and 8 specimens which were provided by licensee or contractor personnel. Table D-1 shows the unsatisfactory testing results by the year in which they occurred.

To better understand the factors contributing to unsatisfactory testing results, the types of problem can be categorized into four general areas that are related to the definitions that were previously set forth. These categories include false negative test results, false positive test results, other-improper manufacture of blind performance specimens, and other-improper processing of specimens. As depicted in Figure D-1, a significant majority (i.e., 60 percent) of the unsatisfactory

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IMAGE EVALUATION
TEST TARGET (MT-3)

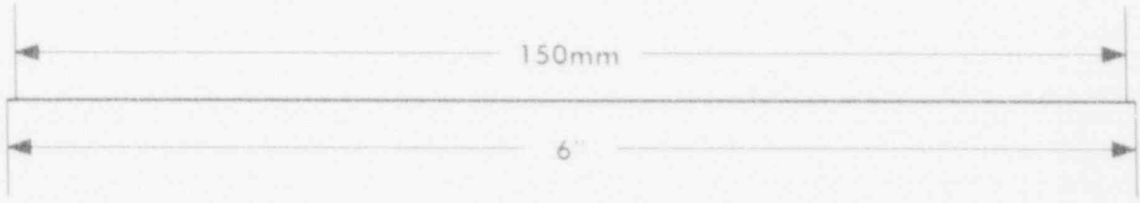

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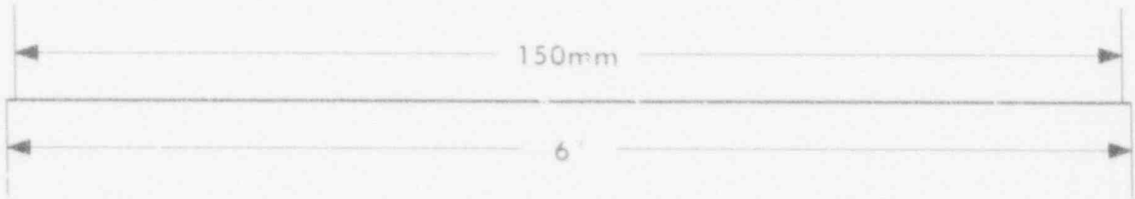
IMAGE EVALUATION
TEST TARGET (MT-3)



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testing results involved either the improper manufacture of blind performance specimens (86 specimens) or the improper processing/handling of specimens (19 specimens). False negative laboratory results were linked to 38 percent of the unsatisfactory testing results (66 specimens). Administrative false positive laboratory results were found in 2 percent of the unsatisfactory testing results (4 specimens). There were no analytical false positive results reported by the HHS certified laboratories. We are aware that the NRC does not formally categorize unsatisfactory testing results; this categorization was performed in order to summarize and evaluate the program data.

Table D-1 exhibits a declining trend in the total number of unsatisfactory specimen results from 99 specimens in 1990 to 75 in 1991. This trend is even more significant if the unsatisfactory results related to improper manufacture/formulation are excluded. The decrease in deficiencies then drops by almost 50%: from 58 specimens in 1990 to only 30 in 1991.

The 86 unsatisfactory testing results in the Other-Manufacturing category were found to involve general problems in the drug testing process that by investigation were linked to the improper manufacture, formulation, or packaging of the blind quality control specimens. There was a great deal of variation in the types of problems that produced unsatisfactory testing results in this category. The purpose of double blind performance testing is to challenge the routine, day-to-day operation of the entire drug testing process - from the collection site to the MRO review. It is an assessment of total function with a focus on administrative procedures. It also documents the program's ability to report a correct result through the system. Although it provides useful information the ability of a laboratory to identify urine specimens free of drugs and those containing drugs above cutoff levels, it was never intended to be an analytical challenge to assess a laboratory's ability to quantitate drugs.

One type of problem that was observed concerned the use of control materials for which there appeared to be insufficient or incorrect validation. One example involved 27 specimens which evidenced the use of a "negative" urine matrix that was a contaminated with codeine. During the investigation process, data were examined which indicated that the GC/MS certification of the lot prior to use was deficient. Other problems that were frequently encountered (59 specimens) involved the manufacture of "positive" controls which did not consistently produce a positive response. These were characterized as: (1) the use of concentration too close to cutoff values which rendered inconsistent performance over time in the different immunoassay procedures; (2) the use of drugs or an isomer of a drug for which the spiked concentration did not elicit a positive response in the testing procedure; and (3) improper labeling of positive controls with reference to drug content.

The improper processing/handling of the blind quality control specimens at the collection site (prior to their shipment to the laboratory for testing) appeared to be the cause of 10 unsatisfactory results. Human error associated with the improper transfer or labeling of specimens into containers accounted for most of the errors. The use of controls that were beyond their expiration date was also associated with unsatisfactory results in this group. Two personnel specimens experience Other - Processing/Handling problems. One specimen had the "split bottle" retested but was reported negative when the analytical result was compared to the primary cutoff value instead of the Limit of Detection

(LOD). In the other case the "split bottle" was lost during transit to the second laboratory for retesting.*

Inappropriate actions by the MRO were noted in 8 cases involving unsatisfactory results. Six of these involved inappropriately requiring the laboratory's quantitative values on positive blind quality control specimens to be within 20% of the theoretical quantitations. In another blind quality control specimen, the temporary amphetamine reporting rule (which requires the confirmed presence of amphetamine in order to report a positive methamphetamine) yielded a correctly reported negative result. This was not an unsatisfactory result. The significant contributing factor in the eighth case was the unacceptable processing instructions which were requested by MRO which directed the laboratory to bypass the screening procedure because of suspected adulteration of the specimen. This inappropriate breech of procedures produced a valid positive result for THC, but also allowed an administrative false positive result for benzodiazepines to also be reported. From the investigation, it appears that the administrative aliquoting error would not have occurred if the initial immunoassay testing had been performed. Because there was admission to the use of THC, a valid result for THC, and because the significant, precipitating factor appeared to be the inappropriate instructions of the MRO; this unsatisfactory result has been classified as an Other-Processing/Handling error as opposed to an administrative false positive.

There were a total of 66 unsatisfactory false negative results. Of these, 63 were associated with blind performance testing specimens and, by investigation, did not appear to be linked to problems in their manufacture, formulation, or packaging. These were characterized by both analytical and administrative problems in the laboratories. Analytical problems were identified in 26 of these false negative specimens. The most commonly observed difficulties in the specimens were: (1) eliciting a screening response less that cutoff; (2) quantitating by GC/MS at a value less that cutoff; (3) Failing Mass Ratio criteria (FMR) in the confirmation testing; and (4 interferences in the chromatographic peaks. Administrative errors were documented in the investigations conducted with the other 37 false specimens. Errors which were addressed in corrective actions included the following: (1) data entry in "posting" results to the laboratory computer system; (2) clerical errors in transcribing results; (3) data entry errors in testing for additional drugs; (4) using higher cutoffs; and (5) misidentification of the specimen aliquots (i.e., small volumes of the specimen) being tested.

False negative results were identified with 3 personnel specimens. These were all administrative laboratory errors that were first questioned during the MROs' review of the laboratory's negative results. In two cases the specimens had documented presumptive positive results on-site prior to shipment to the laboratory. Upon investigation, it was determined that the laboratory had confirmed positive results on both of the specimens. The confirmed positive result had not been correctly entered and verified for reporting to the MRO. The third case was a specimen that was reported positive for amphetamine that was request to be retested by the MRO. The specimen, however, reconfirmed positive for both amphetamine and methamphetamine. An investigation showed

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** In this instance, the original specimen was retested by the first laboratory and the positive test results were rechecked several times. The result was declared a confirmed positive but, pursuant to an agreement between the employee and the NRC licensee, the test result was deemed not to be the employee's first positive test result under the licensee's disciplinary procedures. Subsequently, this employee had two more confirmed positives for cocaine and was terminated.*

that the original GC/MS confirmation was also positive for methamphetamine and had bee overlooked by the laboratory's certifying scientist.

Two false positive results were associated with double blind performance testing specimens. In one case the quality control specimen was fortified with both codeine and morphine which was correctly reported to be positive by the laboratory. The laboratory, however, also reported the specimen to be positive for 6-monoacetylmorphine (6-MAM). It appears from the investigation report that the technician during the process of adding 6-MAM to a calibration sample in the procedure, erroneously added 6-MAM to the specimen. The second false positive double blind performance specimen was a positive quality control that had been certified by the manufacturer to contain oxazepam (a benzodiazepine). The laboratory incorrectly reported the specimen to be positive for both oxazepam and nordiazepam. The investigation and review of the data suggested that there may have been an inadvertent switching of two adjacent specimens during the confirmation procedure.

Two administrative false positive results were associated with personnel specimens. In one personnel specimen that contained a barbiturate and a benzodiazepine, an error was make in the transcription of the confirmation results of two specimens that were being confirmed for barbiturates. This error resulted in a false positive result for barbiturates as the correct quantitation for the individual's specimen was below the cutoff for barbiturates. The specimen was correctly reported to be positive for benzodiazepines.

In the other false positive specimen, it appears from the investigation that two specimens screened presumptive positive for amphetamines by on-site testing. Both specimens were forwarded to the laboratory for testing. One of these was a double blind quality control specimen that was fortified with amphetamine and the other was personnel specimen. In the process of GC/MS confirmation testing (i.e., aliquoting, extraction, or transfer to GC/MS vials) it appears that there was an inadvertent switching of these two specimens. The double blind specimen was erroneously reported to be negative and the personnel specimen was reported as a false positive. Due to prescription medications, the MRO interpreted the laboratory result as a negative prior to the investigation of the false negative quality control specimen.

In conclusion, the data examined over the past 27 months indicate that the NRC's performance monitoring program is functioning as it was intended to. It has been adept not only in identifying the numerous unforseen problems that have occurred in the drug testing process of NRC licensees' fitness-for-duty programs, but also in initiating corrective actions. The types of problems that have been dealt with by the industry to date provide several important lessons. First, licensees have reported initiative (e.g., bar code labeling of specimens, additional review steps, procedural modifications, etc.) that should avoid the recurrence of specific problems that have been associated with unsatisfactory testing results. Second, there is a significant trend evidenced with the data in Table D-1 to indicate that the corrective actions ar effectively decreasing the frequency of unsatisfactory testing results over time. The exception to this observation may be the errors associates with the inappropriate manufacture, formulation, or packaging of quality control materials. This may require the establishment of some uniform criteria that would specifically address the manufacture and formulation of blind performance testing materials that are purchased by licensees. Finally, the small number of documented discrepancies (175 specimens) in comparison to the approximately 640,000 licensee specimens that are estimated to have been drug tested during this time interval is very encouraging.

Table D-1

Summary of unsatisfactory testing results (January 3, 1990 through March 30, 1992)

YEAR	PERSONNEL SPECIMENS				BLIND PERFORMANCE SPECIMENS				TOTAL
	False Negative	False Positive	Other		False Negative	False Positive	Other		
			Manufact.	Processing			Manufact.	Processing	
1990	3	1	0	1*	39	1	41	13	99
1991	0	1	0	2	23	1	45	3	75
1992**	0	0	0	0	1	0	0	0	1
Total	3	2	0	3	63	2	86	16	175

* No immunoassay testing directed by MRO. True positive THC, administrative positive benzodiazepine.

** Only one report had been received at the time of data compilation.

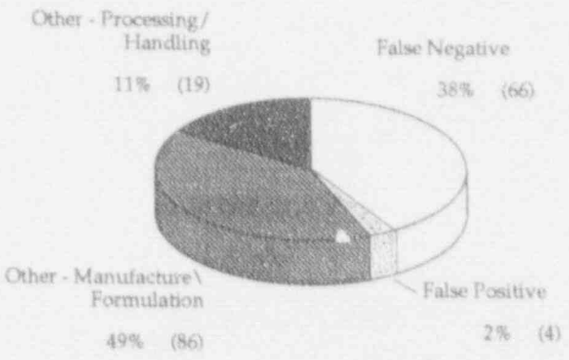

Figure D-1

Unsatisfactory performance testing results by reported cause (January 3, 1990 through March 31, 1992)

NRC FORM 335 (2-89) NRCM 1102, 3201, 3202

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11. ABSTRACT (200 words or less)

This report summarizes the data from the semiannual reports on fitness-for-duty programs submitted to the NRC by 54 utilities for two reporting periods: January 1, 1991 to June 30, 1991, and from July 1, 1991, to December 31, 1991. During CY 1991, licensees reported that they conducted 262,597 tests for the presence of illegal drugs and alcohol. Of these tests, 1,721 (.66%) were positive. Positive test results varied by category of test and category of worker. The majority of positive test results (983) were obtained through pre-access testing. Of tests conducted on workers having access to the protected area, there were 509 positive tests from random testing, and 167 positive tests from for-cause testing. Followup testing of workers who had previously tested positive resulted in 62 positive tests. Positive test results also varied by category of worker. Overall, short-term and long-term contractor personnel had the highest rates of positive tests. Licensee employees had lower rates of positive test results.

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