UNITED STATES
NUCLEAR REGULATORY COMMISSION
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May 9, 1994

NOTE TO: Tyrone S. Greene, IRM, RAS

FROM: Loren L. Bush, Chief
PDRS, PSGB, NRR

SUBJECT: RANDOM DRUG TESTING SCOPE STUDY (SECY-94-016)

The attached study was an enclosure to SECY-94-016, which was submitted to the Commissioners as part of a study on the scope of random drug testing. The SECY-94-016 package also included a Federal Register Notice (FRN), which is to solicit public comments as inputs to the drug testing study. The FRN cites the attached study and states that the study is available at the NRC Public Document Room. The FRN will be published May 10, 1994.

Accordingly, please have the attached study (and its Attachments A, B, and C) placed in the Public Document Room.

If you have any questions, you can contact me at 504-2944.

Loren L. Bush, Chief
PDRS, PSGB, NRR

Enclosure:
As stated

(Enclosure to COMSECY-94-016)

EVALUATION OF SCOPE OF PERSONS SUBJECT TO RANDOM DRUG TESTING

PURPOSE:

To evaluate 10 CFR 26.24 random drug testing requiremenis, the interactions among these requirements and other related issues, optional means for ensuring nuclear workforce integrity, and impacts associated with the options.

BACKGROUND:

Staff requirements memorandum (COMSECY-92-018) of August 18, 1992, directed a reevaluation of the 10 CFR Part 26 Fitness-For-Duty (FFD) Rule. Specifically, the staff was requested to examine the justification for imposing random drug tests on workers who have no direct safety functions and, in particular, for those clerks, secretaries, and other non-technical persons who have unescorted access to a nuclear plant's protected area.

The reevaluation was predicated on a decision by the U.S. Court of Appeals for the Ninth Circuit in International Brotherhood of Electrical Workers (IBEW), Local 1245 v. NRC, 966 F. 2d 521 (9th Cir. 1992), pertaining to random drug testing of clerical, maintenance, and warehouse workers who have unescorted access to protected areas (but not to vital areas) at Diablo Canyon.

DISCUSSION:

Evolution of Current Requirements.

Before the January 3, 1990, FFD Rule implementation date, licensees used various programs to control substance abuse -- including (1) preemployment drug testing, (2) for-cause drug testing, (3) employee assistance programs, (4) behavioral observation, and (5) some type of training on the problems associated with substance abuse. However, these programs were not uniform in procedures, standards, testing methods, or sanctions for substance abuse. Not all licensees had random drug testing as an element of their program because of union intervention or prohibition by state laws.

In developing the FFD Rule, the scope of random drug testing was one issue that received considerable attention. In the Federal Register notice for the proposed rule (53 FR 36795 at 36797, September 22, 1988), the Commission solicited comments on the appropriateness of the worker categories identified for testing. At 53 FR 36817, the Commission indicated that it was proposing that the rule apply to all persons who have been granted unescorted access to protected areas because (1) current programs are implemented in accordance with the Commission's Policy Statement on Fitness-for-Duty of Nuclear Power Plant Personnel (51 FR 27921; August 4, 1986), which applies to all persons within protected areas at nuclear power plants; (2) such persons could introduce and sell or distribute drugs in the workplace, and (3) any such person under the influence of any such substance could cause a safety hazard, if not to the general public, to the user and to fellow workers.

Many of the public comments on the proposed rule addressed the scope of random testing. Most comments supported random testing for all persons granted unescorted access to protected areas; however, a considerable number of comments objected to the random testing provisions of the rule. Some of those that opposed random drug testing asserted that random testing was unnecessary and that many of the individuals granted unescorted access to protected areas have no potential for precipitating or escalating a safety-related incident. Some comments recommended that only those workers who could potentially affect the health and safety of the public be tested. For the final rule, the NRC chose not to reduce the scope of persons subject to random testing.

Currently, the FFD rule requires licensees authorized to operate or construct a nuclear power reactor to implement an FFD program that applies to "all persons granted unescorted access to protected areas, and to licensee, vendor, or contractor personnel required to physically report to a licensee's Technical Support Center (TSC) or Emergency Operations Facility (EOF) in accordance with the licensee's emergency plans and procedures." Persons that come under the FFD program are subject to the drug testing provisions that include random drug tests. Licensees authorized to possess, use, or transport formula quantities of nuclear material were recently required to initiate FFD programs; these licensees are not included in this analysis.

Objective of Random Testing.

An overall objective of the FFD program the NRC requires licensees to implement is to provide reasonable assurance that nuclear power plant workers will perform their tasks in a reliable and trustworthy manner and are not under the influence of any substance, legal or illegal, or mentally or physically impaired from any cause that in any way could adversely affect their ability to safely and competently perform their duties. This concept has been recognized by the courts as valid.

Another objective is to implement the national policy of a drug-free workplace and a workplace free from the effects of such substances. Random drug testing is one element of the chemical testing aspect of the NRC-required FFD program. The objective of random testing is to detect and deter substance abuse for persons who have already been initially cleared by other elements of the program.

At nuclear power reactors, the safety risks from someone using illegal drugs or abusing alcohol arise from the potential for that person to inadvertently or deliberately take actions that could affect plant safety. The safety risks from inadvertent acts primarily involve impairment caused by the illegal drug or alcohol and the effect of that impairment on the person's ability to perform safety-related functions. The safety risks from deliberate acts come from a susceptibility of the individual, because of substance abuse, to deliberately damage a facility. For example, the individual could be coerced into taking some action against the plant by someone aware of that person's substance abuse.

Studies have shown that substance abuse can result in both impairment and inadvertent acts (see Attachment B to this enclosure), but insufficient research has been done to establish a direct link between substance abuse and a susceptibility to deliberately vandalize or sabotage assets. However, the

potential for significant increases in risk, as a result of increased rates of human error, has been clearly demonstrated [NUREG/CR-1879], and a direct link has been shown between substance abuse and increased human error due to impairment of motor skills and judgment [NUREG/CR-5227].

The FFD program, including random drug testing, is intended for use with several other required measures whose objectives are to ensure the reliability and trustworthiness of persons granted unescorted access to protected areas. For example, persons with unescorted access are also subject to background investigations, psychological assessment, and behavioral observation. Except for behavioral observation, however, these measures only assess the person's past behavior up to the time unescorted access is granted; they cannot assess future changes in behavioral patterns. In contrast, random drug testing does allow assessment of changes in behavioral patterns after unescorted access is granted -- and provides a significant deterrent to substance abuse.

Approaches to Scope of Random Testing.

The threat of someone within an organization damaging equipment (either inadvertently or deliberately) that affects plant operations or could result in radiological consequences arises from that person having access to the equipment. Persons whose tasks involve design, operation, or maintenance of that equipment represent a greater potential threat (because of their familiarity and more direct access to that equipment). Safeguards measures that protect against someone from inside the organization are intended to counter this threat by ensuring, among other things, that persons who have an opportunity to operate or manipulate any equipment affecting plant functions are not impaired and are trustworthy and reliable. Random drug testing is one means to detect and deter persons who may or could be influenced by the use of illegal drugs or abuse of alcohol.

The fundamental approaches for selecting those to be included in a random testing program are to either test everyone (the "universal" approach) or to test only those in "safety-sensitive" positions. Proponents of the universal approach contend that the safety-sensitive approach tends to be discriminatory in that blue-collar workers are tested but management is not. Proponents of the safety-sensitive approach contend that random testing should be limited to only workers in positions where a direct link to safety exists. The NRC's current approach is a combination of these fundamental approaches -- it tests everyone who has unescorted access to a protected area and thus has an opportunity to operate or manipulate important systems and equipment that could challenge the safe operation or emergency shutdown capability of a nuclear power plant.

To satisfy the intended objective of random drug testing, one approach would be to base the decision on who should be randomly tested on a person's access to equipment that could, if manipulated, cause a safety problem. This is a conservative approach and does not account for the skills and abilities of persons who may have access. For someone who has access and whose tasks do not include safety-related activities, the approach assumes they present some risk of either inadvertently or deliberately causing safety problems.

Nuclear power plant security requirements provide convenient, distinct security boundaries where personnel access is controlled. The lists for authorizing access

within these boundaries provide a simple and convenient basis to establish security measures, including identification of persons subject to random testing. The nuclear power plant protected area is one of these boundaries and is defined as an area encompassed by physical barriers to which access is controlled (10 CFR 73.2). Protected areas contain components and systems that are important to plant operations and whose failure could result in challenges to more critical plant systems and components. Attachment A to this enclosure provides some examples of operational risks associated with equipment located in the protected area. Within protected areas are vital areas. Vital areas contain equipment, systems, devices, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation. Access from protected areas to vital areas is controlled and limited to persons who need access in order to perform their duties.

An approach based on unescorted access to protected areas results in a large variation among sites in the number of people subject to random testing. Many power reactor sites have few administrative or technical work stations inside their protected areas. At such sites, most workers who have unescorted access also have job functions directly related to plant operations and thus require access to one or more vital areas. However, a number of power reactor sites have administrative and technical support buildings located inside protected areas. At these sites, many workers who have unescorted access to protected areas (and not to vital areas) also do not have tasks directly related to plant operations or maintenance.

Another approach to designating who would be subject to random testing would be to base the decision on tasks the person performs. This approach recognizes that people whose tasks directly involve plant safety have the access, the opportunity, and the knowledge to cause a safety problem. This approach addresses more directly the safety problems that might be caused by a person who is impaired due to substance abuse. Many positions and tasks are fairly well defined at nuclear facilities. A core of individuals, such as plant operators, maintenance personnel, and quality control inspectors, have tasks that are clearly subject to NRC regulations and directly involve safety-related activities. However, the relationship of some positions to plant safety is more difficult to establish.

Legal Considerations

The courts have established legal precedents (case law) with respect to drug testing programs in general and to random testing programs in particular. For Federally-mandated FFD programs that require random testing of workers, the cases focus (from a constitutional perspective) on the nexus between an employee's assigned tasks and the impact that a failure in performing that task would have on the health and safety of other workers and the general public. The U.S. Supreme Court has upheld drug testing of public employees in the absence of individual suspicion where special governmental needs are held to outweigh an individual's privacy expectations, and the drug test was rationally related to a legitimate public interest -- protecting public safety.

When establishing a random testing scope based on "safety-sensitive" tasks, there is an assumption that the tested workers have access to or control over items which can significantly affect public health and safety. This approach was used

by the Department of Energy (DOE) in defining some of their "safety-sensitive" positions to include those that have access to special nuclear materials or nuclear explosives and unescorted access to the control areas of certain DOE nuclear reactors. Note that even with a "task-dependent" approach, it was necessary to define the tasks in terms of access to finite items. By themselves, neither the workers nor their tasks are "safety-sensitive." Instead, the workers and their tasks must interact with items that are "safety-sensitive." It appears that a key element of the definition of a "safety-sensitive" position is that there must be access to "safety-sensitive" devices.

The current phrasing of the NRC's random drug testing scope may not be in consonance with prevalent legal opinions. It may be possible to re-phrase the current testing scope (10 CFR 26.2 or 26.24) into terminology that would be more legally acceptable by adopting the approach described above.

OPTIONS AND IMPACTS:

Five options for the scope of random testing were selected for evaluation and comparison. The first option is maintaining the existing random drug testing scope, which is based on personnel access to a particular location. Option 2, which would exclude certain groups of workers from the random testing pool, and Option 3, which would apply random testing to persons who have vital area access, represent relatively simple variations to the current program. Both Option 2 and 3 would narrow the pool of individuals subject to random testing. Option 4 proposes that the scope of random testing be based on the tasks an individual performs. Option 5 provides an alternative testing method for persons in defined positions. For all five options, it is assumed that other elements of the FFD program, such as suitable inquiries, preaccess testing, and for-cause testing, remain applicable to all workers granted unescorted access to protected areas.

One ongoing activity that could affect the results of the following assessment, at least with respect to safety impact, is the reassessment of security requirements associated with the insider threat. That reassessment is considering possible reductions in the safeguards that control access into vital areas from protected areas. A substantial reduction in the controls for access into vital areas would alter the safety impact assessment for Options 2, 3, and 5. This assessment is partially based on the access controls segregating workers with access to protected areas from those with access to vital areas. Depending on the importance afforded concerns over deliberate acts arising from substance abuse, future relaxation of safeguards that control access into vital areas from protected areas could invalidate an important justification for narrowing the scope of persons subject to random testing.

Each of the five options is evaluated with respect to safety, economic, and legal impacts. The safety and economic impacts of Options 2 through 5 are derived using the existing program (Option 1) as a baseline.

OPTION 1 -- Maintain the Existing Random Drug Testing Scope.

Concept. Continue the existing approach whereby workers who have unescorted access to protected areas are subject to random drug testing.

Safety Impact. This approach provides an incremental measure of assurance that persons granted unescorted access to protected areas are trustworthy, reliable, and not under the influence of drugs or alcohol, whether legal or illegal. The approach assumes that any person who has unescorted access to the protected area presents some potential to either accidentally or deliberately compromise plant safety. The approach does not distinguish between categories of workers based on their assigned tasks, technical knowledge, and work station locations. The approach also recognizes that important systems and equipment are located in protected areas and that, if these systems and equipment are disrupted, the results could challenge safe plant operations and emergency shutdown capabilities (see Attachment A).

Economic Impact. Since this option maintains the existing approach, there would be no economic impact.

Legal Impact. The current approach may be vulnerable to a legal challenge by workers whose job functions do not directly involve safety functions on the grounds that the nexus between that person's tasks and plant safety cannot be adequately established. The argument revolves around the degree of risk posed by the workers versus the degree of encroachment into the workers' privacy expectations. All sites have some employees who perform tasks inside protected areas (but have no tasks inside or access to vital areas) and whose tasks do not directly affect plant safety. Adopting Option 1 will not reduce the risk of a successful challenge to the scope of the NRC's FFD Program.

OPTION 2 -- Exclude Certain Groups of Workers from Random Drug Testing.

Concept. Allow certain groups of workers to be excluded from random drug testing when they have unescorted access to protected areas only (i.e., no access to vital areas) and do not perform any safety related functions.

Safety Impact. Compared to the existing approach (Option 1), this approach would result in a slightly greater risk of potential acts by workers who would be excluded from random testing. However, because excluded workers only have unescorted access to protected areas (and not to vital areas), because their tasks do not directly involve safety-related activities, and because their expertise in plant operations is limited, the likelihood of their accidentally or deliberately compromising plant safety is small.

The final results of the ongoing analysis of security requirements related to the insider threat could affect this safety impact. The insider study is considering possible reductions in the safeguards that control access into vital areas from protected areas. Reducing the access controls for vital areas would significantly alter the safeguards conditions, which include the use of access controls to segregate persons having access to protected areas from those having access to vital areas. Depending on the importance given to concerns about deliberate acts based on influence from illegal drug or alcohol abuse, future relaxation of controls for access into vital areas could invalidate an important justification for narrowing the scope of persons subject to random testing.

Because some workers with unescorted access to protected areas would not be subject to random testing, it is possible that they might attempt to bring

illegal substances or alcohol into the site (either for their own use or for use by workers who were still subject to random drug testing). Several cases are cited in Attachment A to this enclosure where workers not only brought illegal substances into protected areas but operated a "drug ring" that sold illegal substances within the site. The mere chance of random selection for drug testing may exert a deterrent to both use and possession of illegal substances. The safety impact of this option might thus be contrary to the Commission's goals of achieving a drug-free workplace and maintaining a workplace free of the effects of drugs.

Economic Impact. This option would allow licensees to remove some workers from the random testing pool, thereby slightly reducing overall costs. The decrease would not be very significant because most of a licensee's testing costs are relatively fixed (e.g., collection facilities and equipment, training, salaries of the personnel who conduct and administer the testing program) and the number of persons excluded from testing may be large. There may be some increase in costs related to access controls. Changes in the badging system or keycard access control system (e.g., a new badge color-coding scheme or new access category for excluded workers) may be needed to include this new category of worker.

Legal Impact. This option may eliminate from the testing pool a large group of workers who have unescorted access to protected areas (but not to vital areas) and whose work activities are not directly linked to plant safety. Thus, this option would significantly reduce the chance of a legal challenge to the NRC's FFD Program. However, a small risk still remains for a legal challenge by other categories of workers who have unescorted access to protected areas (but not vital areas) and are not excluded from testing. The NRC would likely prevail in any such challenge.

OPTION 3 -- Apply Random Drug Testing Only to Persons Having Unescorted Access to Vital Areas.

Concept. Only persons who have unescorted access to vital areas would be subject to random testing.

Safety Impact. For this approach, the risk to plant safety is greater than that for Options 1 and 2. The main determinant of this risk level is that the number of workers with unescorted access who are excluded from random testing is greater than those excluded under Options 1 and 2. (This option would exclude a larger number of workers than excluded under Option 2, which in turn would exclude more workers than Option 1.) The staff notes that this is a subjective judgement and deals with relatively small risk level variations.

Because the size of protected areas and the locations of work stations in protected areas varies greatly among power reactor sites, the number of workers excluded from random testing would vary significantly from site to site. Because the workers excluded from testing are only authorized access to protected areas (and not to vital areas), the likelihood of their accidentally compromising plant safety is small, even when considering the spectrum of systems and equipment in protected areas that could challenge safe plant operations or emergency shutdown. However, unlike Option 2, workers excluded

from random testing under Option 3 may have both technical knowledge and be familiar with the facility (e.g., engineering staff).

The final results of the ongoing study of security requirements associated with the insider threat could affect this assessment. The insider study is considering possible reductions in the safeguards that control access into vital areas from protected areas. A substantial reduction in the measures to control access to vital areas would alter the safety impact of Option 3, which is based in some degree on using access controls to segregate persons having access to protected areas from those having access to vital areas. Depending on the importance afforded concerns about deliberate acts arising from illegal drugs or alcohol abuse, future relaxation of safeguards that control access into vital areas from protected areas could invalidate an important justification for narrowing the scope of persons subject to random testing -- or it could strengthen the justification if such concerns ultimately turn out to be relatively small.

Implementation of this option could negatively affect plant safety in other, less direct, ways. Persons granted unescorted access who did not fall into the excluded category could feel discriminated against, therefore affecting worker morale. Also, because some workers would not be subject to random testing, the chance would increase that illegal substances or alcohol would be introduced on site. This safety impact would be contrary to the Commission's goal of achieving a drug-free workplace and a workplace free of the effects of such substances.

Economic Impact. Some initial startup costs would be needed to convert from the existing approach to this option. Each licensee would have to create and maintain two separate and distinct categories of worker access: (1) persons with unescorted access to vital areas and subject to random drug testing and (2) persons with unescorted access to protected areas only (no vital area access) and not subject to random drug testing. Reducing the size of the random drug testing pool would reduce the costs of testing and the costs of maintaining the associated records. However, such savings might be marginal at many sites, because most persons who have unescorted access to protected areas also have access to vital areas.

Legal Impact. Because most, if not all, workers requiring unescorted access to vital areas perform tasks directly related to safety or security, the nexus between their job functions and plant safety is more clearly apparent. Even if workers having unescorted access to vital areas could demonstrate that their job functions did not directly involve safety- related activities, the court in the IBEW case appeared receptive to the argument that the critical aspect of equipment in a vital area by itself provided an adequate nexus to support random testing. Although Option 3 is similar to the existing approach (i.e., access to areas containing systems or equipment that could challenge safe plant operations), it would be substantially less susceptible to legal challenges than Option 1 -- and the NRC would likely prevail in any such litigation.

OPTION 4 -- Apply Random Drug Testing Only to Safety-Related Job Functions.

Concept. Persons whose jobs involve tasks with direct safety or security

functions would be identified and be subject to random drug testing.

Persons would be subject to random drug testing only if their jobs involved safety or security functions. Thus, some people who have unescorted access might not be subject to random drug testing because their jobs are not directly linked to safety or security functions. Conversely, some people who do not have unescorted access might be subject to random drug testing because their jobs have safety or security links (e.g., persons located off site who design, specify, procure, or inspect/accept safety or security items or procedures). The NRC would need to identify job categories to specify those positions that would be subject to random testing. For this evaluation, the staff assumed that the categories would be narrowly defined for persons who do tasks which subject them to random testing (e.g., those who perform or directly supervise tasks involving operation, maintenance, inspection, or procurement of safety-related systems or components).

Safety Impact. This approach, for most licensees, would include most of the persons who have tasks in, and therefore require unescorted access to, vital areas. The approach would also include a number of individuals who have access to protected areas only and some who do not have unescorted access at all (e.g., certain quality assurance and maintenance personnel). This approach would result in persons with unescorted access to protected areas, and in some cases to vital areas, not being subjected to random drug testing, thereby incrementally increasing the risks from malevolent acts to plant operations. Conversely, workforce integrity might increase, because additional workers with safety-related jobs would be included in the random drug testing population, even though their jobs may not require unescorted access to protected or vital areas.

Economic Impact. Initial startup and long-term costs would be incurred in changing over from the existing approach to this option. These costs apply to both the licensees and the NRC. The process of devising criteria to determine what constitutes tasks that have a direct safety or security link could take considerable time to develop. The process would involve difficult subjective issues such as how <u>frequently</u> a job must involve safety or security functions. Depending on how "safety-related" jobs are defined and whether unescorted access remains a factor, the testing pool could be larger or smaller than under the present approach.

Legal Impact. This option is the least vulnerable to legal challenges, because the Commission would be "leaning over backwards" in an effort to safeguard individual rights -- as opposed to its responsibility to protect public health and safety. Of course, the potential would still exist for legal challenges from specific categories of workers who might dispute the NRC's criteria for the categories of workers subject to random testing. However, the Commission's designation of "safety-sensitive" job categories would clearly receive deferential treatment by the courts. Such challenges would be unlikely, and the Commission would likely win any such case.

<u>OPTION 5 -- Allow Use of Performance-Based Testing</u>.

Concept. Allow use of alternative <u>testing</u> methods in lieu of urinalysis for certain groups of workers with unescorted access to protected areas. The

existing random process would be used to select persons to be tested, and for-cause testing used if alternative testing found probable cause.

Currently, random drug testing detects the presence of certain chemicals and measures the quantities present in urine; it does not measure the impairment resulting from substance abuse. The relationship between the amount of chemicals present and the degree of job impairment is variable. However, certain testing methods can directly measure the amount and type of job performance degradation suffered by an individual, although some issues do remain on the validity of some of these testing methods. NUREG/CR-5227 (and Supplement 1 thereto) and NUREG/CR-5784 discuss various types of tests and their limitations (primarily varying degrees of detectability, reliability, sensitivity, and accuracy). A more recent review (publication pending) indicates that although the technology is improving, it has not overcome the limitations. The claimed advantages of a performance test are that it can (1) detect a broader range of worker fitness-for-duty problems than can urinalysis, (2) be relatively simple to take and administer, (3) be non-intimidating to the worker, and (4) not encroach into individual privacy expectations. Performance tests measure impairment, but generally do not determine or measure the cause of the impairment (e.g., drugs, fatigue). For this reason, performance tests are not presently sufficient for assessing the probability that nuclear workers will consistently perform their tasks safely. To wit, if impairment is due to fatigue, then the impairment may be a "one-time" or infrequent event that only briefly increases risk factors. Conversely, if impairment is due to substance abuse, then the impairment is more likely a persistent problem that greatly extends the period of increased risk. Because of current limitations, performance assessment methods are not recommended for testing the entire workforce or as a general replacement for urinalysis. Instead, this option considers performance assessment technology to be suitable only for an initial screening test of low-risk groups of workers.

Safety Impact. Compared to the existing approach (Option 1), this approach would result in little, if any, increased risk of potential acts by persons excluded from random drug testing. Because workers that may be excluded from random drug testing only have access to protected areas (and not to vital areas), because their tasks are not directly related to safety functions, because their expertise in plant operations is limited, and because they would still be subject to random testing (alternative tests), the likelihood of their accidentally compromising plant safety is small. Arguably, the alternative testing method may better assess a person's impairment and thus, for those using the alternative testing method, reduce risks from accidental acts -- and some may argue for a broader application of this approach. However, the alternative testing method would not detect illegal substance abuse where there was no measurable impairment. Thus, in the absence of impairment, alternative testing would not detect degradation of a worker's dependability to safely perform their job (e.g., by substance abuse at levels just below the measurable impairment point). Further, alternative testing would not assess any increased risk that such workers might perform or support deliberate acts against the plant.

Adopting this option might negatively affect plant safety in other, less direct, aspects. Workers with unescorted access who remained subject to random drug testing might feel discriminated against, perhaps even feeling they were

distrusted. This, in turn, might adversely affect worker morale and increase safety risks. Conversely, licensees could institute special training programs to enhance the images of workers who were still subject to random drug testing -- e.g., attempt to create a pride in being "safety-sensitive" workers. Unfortunately, this "safety-sensitive" approach might also result in worker demands for higher wages as a "special" class!

Since some workers with unescorted access to protected areas would not be subject to random drug testing, it is possible that they might attempt to bring illegal substances or alcohol into the site (either for their own use or use by workers who were still subject to random drug testing). Several cases are cited in Attachment A to this enclosure where workers not only brought illegal substances into protected areas but operated a "drug ring" that sold illegal substances within the site. The mere chance of random selection for drug testing does exert a powerful deterrent to both use and possession of illegal substances. This option might thus exert a negative safety impact on the Commission's goals of achieving a drug-free workplace and maintaining a workplace free of the effects of drugs.

Economic Impact. Initial startup costs will be necessary to implement the alternative testing approach. These costs will include training for licensee personnel who administer the tests, plus the acquisition costs for any special equipment or supplies needed to perform the testing. The time required for an employee to take the test could be about the same as is now spent in providing a specimen, marking the specimen containers, etc., so that costs in "employee time" would probably be equivalent to random drug testing. Over time, licensee costs should go down, because the laboratory urinalysis costs would be eliminated for workers now subject to alternative testing (unless alternative testing dictated a for-cause urinalysis).

Legal Impact. The basis for most legal challenges to random drug testing is perceived encroachment into worker privacy expectations. Performance-based testing is not invasive and, accordingly, is not a privacy invasion. Thus, adoption of Option 5 would remove that basis for such a challenge by a large number of workers whose privacy rights may outweigh any risk that their job may present to public health and safety. As discussed in the legal impact for Option 2, a risk would still remain of legal challenges for other categories of workers who had unescorted access to protected areas (and not to vital areas) and who were not covered by the alternative testing method. However, as also pointed out above, the NRC would likely prevail in any such litigation and adoption of Option 5 would significantly reduce the prospect of a successful challenge to the NRC's FFD Rule.

FINDINGS:

The central issue in determining an appropriate scope for random testing remains the need for a proper balance between safeguarding individual rights and the NRC's responsibility to protect public health and safety. In this evaluation, the staff found no one option clearly better than another in achieving this desired balance. Each option had unique advantages and disadvantages.

The five options were assessed from the viewpoint of their safety, economic, and

legal impacts. With respect to plant safety, risks arising from personnel actions were evaluated from the perspective of inadvertent acts (more of a impairment concern) and deliberate acts (more of a trustworthiness and reliability concern). On one hand, the staff found that each option offers a substantial basis for reducing plant operational risks from inadvertent acts. On the other hand, the staff found that the options varied significantly in their capability to reduce operational risk due to deliberate acts. However, this finding is very subjective, because little data is available to establish a direct relationship between substance abuse by a worker and the propensity of a worker to deliberately vandalize or sabotage assets.

Regarding economic impact, two of the options (Option 2 and 3) would not have significant costs associated with initial implementation and would probably result in some long-term savings in periodic costs. Options 4 and 5 would require substantial development and startup costs but would then cost about the same as the current program in long-term periodic costs.

With respect to legal impact, all the options that provide alternatives to the existing approach would provide less risk from litigation. Certain groups of workers (e.g., clerical and administrative) who did not have access to vital areas would be excluded from random testing in each of the alternatives.

One ongoing activity that could affect the results of the assessment, at least with respect to safety impact, is the staff's study of security requirements associated with the insider threat. That insider study, which was sent to the Commission as SECY-93-326, proposes reductions in certain safeguards that control access into vital areas from protected areas. A substantial reduction in the vital area access controls would alter the safety impact assessment for Options 2 and 3 -- which are based in some degree on using access controls to segregate workers with access to protected areas (and not to vital areas) from workers with access to vital areas. Depending on the importance given to concerns about deliberate acts arising from substance abuse, future relaxation of access controls into vital areas from protected areas could invalidate an important justification for narrowing the scope of persons subject to random testing. Therefore, these changes to access controls and this reevaluation of random drug testing must be considered together.

In consideration of safety, economic, and legal impacts, Options 2 and 3 are assessed as preferable to the existing requirements for the scope of random testing. However, benefits would be gained by further exploration and consideration of several related issues. These issues include (1) the threat from deliberate acts by individuals who may be influenced by substance abuse, (2) the impact on changes in the scope of random drug testing if controls for access into vital areas from protected areas are reduced, and (4) the validity of performance testing measures as an alternative to urine drug testing. To better assess these issues for all five options, the NRC could significantly benefit from obtaining further review and comment from the public.

RECOMMENDATION:

That the public be provided an opportunity to review and comment on the proposed alternative approaches and the associated issues. Following receipt and analysis

of public comment, the staff would complete its reevaluation and decide whether to recommend proceeding with rulemaking to revise the existing regulations.

Attachments:
A. Challenges to Safe Plant Operations From Components in Protected Area
B. Studies/Events Related to Substance Abuse and Illegal Sale of Substances
C. References

Attachment [A]

CHALLENGES TO SAFE PLANT OPERATIONS FROM COMPONENTS IN PROTECTED AREA

1. REACTOR TRIPS

The following table shows the number of Licensee Event Reports (LERs) that involved reactor trips and the major subsystems that caused the reactor trips. Note that many of the plant systems which initiated reactor trips are normally located in protected areas (i.e., are not in vital areas). For example, the Electrical System, Feedwater, and Turbine Trip events usually originate from equipment located within protected areas. These trips accounted for 1,186 reactor trips, or 57.7 percent of the 2,056 total reactor trips over a period of six years.

CATEGORY	1987	1988	1989	1990	1991	1992	1993	TOTAL
REACTOR TRIPS FROM:								
Turbine Trip	64	47	42	33	37	35	10	268
Feedwater	212	137	102	113	78	99	24	765
Service Water	1	3	3	1	4	4	2	18
Steam Side (flow, etc.)	16	6	16	7	6	3	3	57
Electrical System Transients	29	21	31	20	30	20	2	153
Other Reactor Trips	200	151	136	108	100	76	24	1063
TOTAL REACTOR TRIPS	522	365	330	282	255	237	65	2056

TOTAL NUMBER OF LERs	2902	2500	2367	2151	1875	1782	452	14029

NOTES:

1. Above data provided by the Oak Ridge National Laboratory. Extracted from the Sequence Coding and Search System (SCSS); 1987 through mid-April 1993.
2. The term "Electrical System Transients" includes loss of offsite power.

Some representative examples of the types of actual events that originated in the protected area and that resulted in threats to the safe operation of a nuclear power plant are described in the following paragraphs.

a. Main Turbines.

Unplanned trips of the plant turbine at power can result in a reactor trip in order to prevent excessive heat buildup in the reactor. Such sudden interruptions exert mechanical and thermal stresses on the plant and challenge the operations of plant

safety systems. Although the reactors are in vital areas, the main turbines are in protected areas (at most plants) -- and there are many devices in the protected area that will trip the main turbine (and reactor) if these devices are disrupted or tampered with. Since 1987, 268 turbine trips have occurred that resulted in reactor trips. Examples: Beaver Valley Plant, November 1987; Beaver Valley Plant, October 1987; and Limerick Plant September, 1987.

b. Condensate and Feedwater Pumps.

Disruption of condensate/feedwater pumps often result in a reactor trip to prevent overheating of the reactor core. Often these reactor trips initiate the operation of safety systems to provide makeup water to the steam generators. There are many devices in the protected area that monitor, control, and affect the operation of these condensate/feedwater pumps -- and thus these pumps are vulnerable to persons having unescorted access to protected areas. Note that the largest category of the reactor trips delineated in the previous table was the result of some disruption of condensate/feedwater pump functions (765 reactor trips out of 2,056 total, or 37.2 percent). Examples: Millstone Plant, November 1991; Diablo Canyon, July 1987; Surry Plant, December 1986; Trojan Plant, July 1985; and Palisades Plant, December 1977.

c. Steam System.

Steam lines run extensively throughout the protected areas of plants; their main function is to deliver high-energy steam to the main turbines. In addition, steam lines also go to smaller turbines that drive pumps, to water reheaters, and to shaft seals. A major plant disruption and reactor trip can be done fairly easily simply by opening or closing a steam valve in the protected area. Closing a steam supply valve can stop or slow down a steam-driven water pump and cause insufficient reactor cooling, inadequate pump seal lubrication and cooling, low water levels, and similar problems. A steam line rupture can cause extensive damage to adjacent equipment, jeopardize the lives of workers, cause a loss of steam line pressure and excessive steam flow rates (extracting heat too quickly from the reactor), stop essential functions such as the operation of steam-driven pumps, and similar disruptions. Examples: North Anna Plant, April 1993; Palo Verde, April 1993; and Susquehanna Plant, May 1981.

d. Electrical Distribution System/Offsite Power Loss.

A nuclear power plant's electrical system must ensure uninterrupted power to all systems important to plant safety. This includes both the systems that are essential for safe operation of the plant and the systems essential for a safe shutdown in an emergency. This sophisticated electrical distribution system is interconnected by many switches, circuit breakers, sensors, and wires or cables -- many of which are in a plant's protected areas and are vulnerable to disruption. Examples: Kewaunee Plant, March 1988; Crystal River Plant, October 1987; and Braidwood Plant, September 1987.

2. OTHER RISKS ORIGINATING IN THE PROTECTED AREA

A. Explosive Gas Hazards.

Normal operation of a nuclear reactor generates hydrogen gas, which is collected and stored in tanks. Opening a valve, a very simple manual task requiring no unique skills or knowledge, can release this hydrogen gas. If released into plant buildings, the gas can easily accumulate in explosive concentrations. Potential ignition sources include sparks from electrical switches or motors and workers on a "smoke break." Such an explosion or fire can cause major damage to critical plant equipment, challenge plant safety and emergency shutdown systems, and seriously injure or kill workers. To date, approximately 25 hydrogen gas explosions have occurred at offgas systems of BWR sites, causing extensive damage to equipment and structures and injuring workers. Five of these explosions caused uncontrolled release of radioactive materials. Examples: San Onofre Plant, July 1981; Millstone Plant, December 1977. (See IE Bulletin 78-03, "Potential Explosive Gas Mixture Accumulations Associated with BWR Offgas System Operations," February 8, 1978.) While it is possible to secure certain valves (using a chain and padlock, for example), a number of cases exist where workers have deliberately broken the padlocks or cut the chains and then mis-positioned the valves. (See "Vandalism/ Deliberate Acts," below.)

B. Inert Gas Hazards.

As with hydrogen and oxygen, nitrogen gas is also stored in tanks at nuclear power plants. Unlike hydrogen and oxygen, however, the nitrogen is neither explosive nor flammable. Instead, nitrogen gas can cause asphyxiation, because it is heavier than air and will displace the air from low, enclosed places. Opening a valve to a nitrogen tank can fill an area with the heavy nitrogen gas, displacing the air and asphyxiating anyone entering the area. Other inert gases pose similar hazards that can disrupt safe plant operation and endanger plant workers. These other inert gases also displace oxygen and can cause asphyxiation. In several instances, inert gases have endangered or killed plant workers. In September 1985, at the Hope Creek plant, a carbon dioxide fire-suppression system was activated inadvertently, filling an area with the gas and injuring 23 workers (one seriously). In September 1976, at the Cook plant, two workers were killed when argon gas entered their work area and asphyxiated them.

3. EVENTS CAUSED BY HUMAN ERRORS

Human errors can cause events that challenge a reactor's safety and protection systems. These error-caused events can be inadvertent "accidents" (i.e., the act was unintentional and resulted from carelessness, inattention, or reduced awareness). Alternately, such events can occur from properly-intended acts that were incorrectly executed because of inadequate skills or training, improper tools, inadequate instructions, or poor comprehension.

The NRC has received many reports describing events caused by human errors. A study by the NRC Office for Analysis and Evaluation of Operational Data noted that more than 200 events of this nature have occurred since 1981. [NUREG/CR-1192.]

a. Accidents.

A number of nuclear power plant events have been caused by such accidents as bumping a sensitive switch, sensor, or circuit breaker. These accidents have sent reactors into unstable conditions and have challenged the reactor safety systems. Examples: Vogtle Plant, March 1990; Catawba Plant, November 1988; Crystal River Plant, October 1987; LaSalle Plant, May 1986; and St. Lucie Plant, January 1986.

b. Incorrect Positioning of Switches, Controls, Valves, and Other Equipment.

Several reactor trips have been caused by workers who put switches, valves, and controls into incorrect positions that seriously challenged both the plant safety systems and the operating staff. Most of this support equipment and controls are located throughout the protected areas and are not designated as vital equipment. Thus, the instrumentation and control switches and circuit breakers for these major plant systems are vulnerable to everyone who has unescorted access to protected areas. An unskilled worker can easily put these switches or circuit breakers in incorrect positions that cause a loss of feedwater, placing the reactor in a very unstable and unsafe condition and thereby threatening the public health and safety. Examples: North Anna Plant, April 1993; Davis Besse Plant, June 1985; and Three Mile Island Unit 2, March 1979.

STUDIES/EVENTS RELATED TO SUBSTANCE ABUSE AND ILLEGAL SALE OF SUBSTANCES

A. SUBSTANCE ABUSE

A number of studies have shown that substance abuse can impair an individual's ability to perform their job reliably and competently. Impairment resulting from substance abuse degrades the individual's behavioral, physical, and cognitive functions and can persist for several hours (a "hangover" effect) after the direct effects of the substance have worn off.

As stated in NUREG/CR-3916, "... The important role that nuclear power plant workers play in ensuring safe operations has been demonstrated by events in nuclear power plants where even unimpaired employees have committed errors that challenged plant safety systems. Impaired workers with unescorted access may not only act in ways that could lead to additional events, but are unlikely to be able to respond appropriately to potentially dangerous situations that arise."

During the first 3 years that licensees implemented FFD Programs under 10 CFR Part 26, licensees reported a total of 5,916 positive test results. Of these, 3,641 were from pre-access tests, 1,520 from random tests, 559 from for-cause tests, and 196 from followup tests. Of the approximately 150,000 persons who were granted unescorted access to protected areas, 2,275 (the last three test categories) were found to have some sort of a substance-abuse problem for which licensees were able to take appropriate actions to protect public health and safety. The effectiveness and significance of random drug testing is shown by the fact that 67 percent of all workers found to be abusing drugs or alcohol were discovered through random testing.

B. SALE AND DISTRIBUTION OF ILLEGAL SUBSTANCES

The sale and distribution of illegal substances at nuclear power plants is a real problem validated by a number of actual cases. At one site, drugs could be ordered via the plant's telephones for delivery to the purchaser inside the plant. In this case, 6 workers were arrested, 10 were suspended, and 22 had their employment terminated. Of the 22 persons terminated, there were 6 clerks, 6 custodial workers, 7 craftpersons, and 3 engineers. The "drug ring" was apparently making over 100 sales per week, with most being cocaine sales. In another case, undercover agents arrested 6 workers for possession, sale, and distribution of drugs at a nuclear power plant. Later, the licensee reported that 218 persons had been confirmed as or suspected of being involved in controlled substances. Of these, 8 were arrested on site, 6 were arrested off site, and 54 were found in possession of controlled substances on site. At another site, 5 current employees and 4 former employees were arrested for selling marijuana, cocaine, and LSD at the plant. Another investigation resulted in the arrests and/or employment terminations of 13 persons, including 8 guards, 2 former guards, a maintenance contractor worker, and a watchman. These cases clearly show that illegal substances have been sold and distributed <u>inside</u> nuclear power plants. Accordingly, the staff believes that these events illustrate valid risks to the safe operation and emergency shutdown capabilities of nuclear power plants. Random drug testing is a powerful tool that detects the drug use, identifying that a problem exists and precipitating an

investigation that leads to the other workers involved. In other cases, the possibility of being selected for random drug testing exerts a strong deterrent effect that prompts some drug users to seek help from the licensee's Employee Assistance Program (a program required by the FFD Rule). Specific examples of events involving sale and distribution of illegal substances include: Catawba, April 1991; Limerick, August 1988; Rancho Seco, June 1987; Sequoyah, April 1987; Shearon Harris, January 1985; Midland, September 1983; and Trojan, November 1979. Note that (1) only one case of this nature has been reported since the FFD Rule was implemented, and (2) the key change in licensee programs caused by the FFD rule was the addition of random drug testing.

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