

# The Light company

Houston Lighting & Power

South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

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Secretary, U. S. Nuclear Regulatory Commission  
Washington, DC 20555  
Attention: Docketing and Service Branch

Comments on Proposed Rule:  
Radiation Protection Requirements;  
Amended Definitions and Criteria (59 FR 5132)

Houston Lighting & Power has reviewed the proposed rule dated February 3, 1994 and has determined that the proposed rule has some merit. However, after careful consideration, Houston Lighting & Power has determined that the benefits of the change appear to be outweighed by the disadvantages.

If there are any questions on these comments, please contact Mr. A. W. Harrison at (512) 972-7298.

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General Manager,  
Nuclear Licensing

DNB/esh

Attachment: Comments on Proposed Rule

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Manager on Behalf of the Participants in the South Texas Project

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### Elimination of the Definition of Controlled Area

The definition of controlled area was included in the revised 10 CFR 20. Prior to the revision, there were only two areas defined in 10 CFR 20, restricted and unrestricted. At nuclear power facilities, the nature of the radiation protection program usually meant that there were two areas considered as the restricted area, depending upon the context. If discussing effluents and dose to members of the public, most nuclear power utilities considered everything within the site boundary (or if an extensive site, some large arbitrarily defined area within the site boundary) as the restricted area. If discussing the occupational health physics program, the restricted area was generally smaller, many times contiguous with the security protected area. Thus, the restricted area was not a uniquely defined area. Inclusion of the definition of controlled area in the revised regulations eliminated this ambiguity, allowing the restricted area to be interpreted to pertain to occupational radiation protection concerns and the unrestricted area to pertain (primarily) to dose to members of the public. Within the controlled area, to which members of the public may have access, dose to both members of the public and occupationally exposed individuals needed to be considered. However, if a licensee so chooses, a controlled area is not required. It is not clear that the proposed revision of definitions would permit two restricted areas, one with respect to occupational considerations and one with respect to effluents.

As presented in the current regulations, a restricted area is an area "access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials." A controlled area is an area where access "can be limited by the licensee for any reason." An unrestricted area is "an area, access to which is neither limited nor controlled by the licensee. (This definition does not fit most of the property within a nuclear plant's site boundary because there is limitation and control of access inherent in ownership of property. However, dose to individuals, whether or not they are members of the public, is not generally the reason for the limitation although by limiting occupancy the potential for accruing dose was reduced.) The proposed revised definition for unrestricted area would revise the definition to "any area that is not a restricted area." This would force nuclear plant licensees to make one of two mandatory choices: either the restricted area will extend to the site boundary (or near it) or the restricted area will be a small portion of the site containing typically the same or slightly less "real estate" as the security protected area. For a nuclear plant, neither choice is optimal. If the restricted

area extends to the site boundary, access control (the degree of which is presently undefined) would be required to encompass more area and probably be more rigidly enforced than is done at many sites for this "real estate". If the restricted area is made as small as the site protected area, the calculation of effluent doses becomes tenuous due to the indeterminate nature of  $\chi/Q$  at distances close to the release point. Compliance with the Technical Specification instantaneous dose limits and Appendix I criteria at the boundary of the small restricted area would demand reduction in the setpoints for effluent monitoring instrumentation. Operation with these reduced setpoints may well be beyond the designed capabilities of some plants.

The present controlled area definition contains two important nuances. First, access does not in fact have to be limited, but the licensee can, i.e., has the ability to, limit access. Second, if limitation of access is done, the reason may be other than for radiation protection. (The NRC staff indicated in the questions and answers that if the reason for limitation was for protection of individuals from radiation and/or radioactive material exposure, the area could not be a controlled area but must be considered a restricted area.) At nuclear power facilities, access to the site as a whole is not generally limited for the purpose of protection from radiation and/or radioactive material. If limited, access is limited for security reasons and because as property owners (or leasers), the nuclear plant owners will not permit long term, uncontrolled activities to occur on their site just as any property owner would not permit such an activity on his property. This degree of access limitation, although not for radiation protection purposes, does serve to limit occupancy time and therefore dose.

Because there is no requirement on licensees to have a controlled area, because of the ambiguity resulting in specifying restricted areas at nuclear power plants if there is no controlled area, and because the concept of controlled area is very tractable in a nuclear power plant context, there is no reason to eliminate the definition from regulations.

#### **Modification of the Definition of Occupational Dose and Revision of § 19.12**

There is agreement in principle that whether or not an individual should be considered to be receiving occupational dose or as a member of the public should depend upon what the individual is doing and not where he is. However, the change to the definition of occupational dose proposed is not in the best interest of nuclear power, nor licensees as a whole.

The definition of occupational dose in the present regulations is very similar to that contained in the former 10 CFR 20. The portion of the definition which states that dose received while in a restricted area is considered occupational dose is contained in the definition in the former 10 CFR 20. The NRC and licensees have had no problems with that concept for thirty years, and the stated justification for the change does not demand the change. The provision in § 20.1101(b) for licensees to keep both occupational doses and doses to members of the public ALARA should preclude any postulated abuse of "members of the public" in restricted areas by licensees by subjecting them to significantly more dose than is normally obtained by a member of the public who does not enter the restricted area. On this basis alone, the proposed change to the definition is unwarranted.

There is a subtle difference between the definition of occupational dose in the former 10 CFR 20 and in the current version. The former definition included as occupational dose that dose received "...in the course of employment in which the individual's duties involve exposure to radiation ...". The revised 10 CFR 20, currently effective, modifies this definition to dose received "...in the course of employment in which the individual's assigned duties involve exposure to radiation and/or radioactive materials...". The discussion provided by the NRC in the Federal Register indicates that the duties are those assigned by the licensee. This is fallacious logic because there are those present within the restricted area whose duties are assigned by others, e.g., NRC inspectors. The proposed definition change as presented would mean that these individuals would be subject to the dose limits for members of the public, a situation which might well interfere with the performance of their function.

In response to question 26 in the NUMARC sponsored questions and answers, part of NRC staff response included the following statements:

... Generally, this part of the definition does not mean that any dose received by an individual while working, regardless of the type of work, is an "occupational dose". Doses received by an individual while working outside a restricted area (in a controlled or unrestricted area) usually would be categorized as public dose when the dose received is within the public dose limit (and is not likely to exceed that limit) and the work being done is not closely connected (i.e., is only casually connected) to the licensed activity

... In determining whether an individual in a controlled area is to be categorized as an individual who receives an occupational dose, or as a member of the general public, the more difficult decisions concern individuals who may be occasionally exposed or whose assigned duties are not closely connected to the licensed activity. Such individuals include messengers, delivery men and women, custodial workers, secretaries, clerical workers, hospital volunteers, etc.. Usually, such individuals are considered to be members of the public and the doses they receive are well within the limits for members of the public. However, if the assigned duties of these individuals are closely and frequently connected to the licensed activity, and their doses may approach or exceed the limits for members of the public, the doses such individuals receive are better treated as occupational doses.

From question 444, the following response is quoted:

As emphasized in the answer to question 26(a) [in the fourth set of questions and answers under section 20.1003], whether the dose to an individual outside a restricted area is occupational dose or a public dose depends on what the individual is doing and not on what area (controlled or unrestricted area) the individual is in when the dose is received. Furthermore, it is possible, and acceptable (as indicated in many previous questions and answers), for the licensee to consider the dose (other than background, etc.) that the individual receives in a controlled area to be an occupational dose, even though, as stated in the question, the dose the individual receives in the controlled area is less than 100 mrem per year. Regardless of the magnitude of the dose, the dose is an occupational dose if it is received (in accordance with the definition of occupational dose) "...in the course of employment in which the individual's assigned duties involve exposure to radiation and to radioactive material..." For example, an individual who performs a radiation survey, in any area, of a vehicle loaded with radioactive material prepared for shipment would be receiving occupational dose as a result of exposure to the radiation from the radioactive material on the vehicle regardless of the magnitude of the dose. However, the dose (other than background, etc.) received by a worker performing office work in a controlled area could be considered to be either an occupational dose or a public dose; either choice would be considered consistent with the definition of "occupational dose." See question 26 and answer for additional information concerning licensee options with respect to area designations and dose categories. See question 126 (in the fifth set of questions and answers on 10 CFR 20.1502) concerning the use of individual monitoring of occupational doses from effluents. (References: 10 CFR 20.1502, 20.1003)



In the context, the discussion centered on individuals in controlled and unrestricted areas. However, if the definition of occupational dose is modified as proposed, the discussion becomes germane to individuals in restricted areas as well. Although the NRC staff acknowledges in these responses the "difficult decisions" associated with those "occasionally exposed or whose assigned duties are not closely connected to the licensed activity", there is (and can be) no definitive guidance for individuals in this category. This is left to licensee discretion. The gist of the guidance provided is that if a licensee expects an individual's dose to be less than 100 mrem in a year, consider the individual to be a member of the public unless there is a good reason to consider the individual occupationally exposed by virtue of his assigned duties. The proposed change would increase the number of "difficult decisions" the licensee must make by removing from the definition of occupational dose the reference to restricted area.

In the discussion of the proposed changes, the NRC considers two predicaments under the current wording of the regulations: the delivery man who may occasionally enter a restricted area and a worker who is exposed due to his duties outside the restricted area. The current wording of the regulations would require the first individual to be trained while no training is required for the second. This is clearly an undesirable situation albeit one which is not insurmountable. However, the proposed remedy contains inherent ambiguities and creates more problems than it solves.

#### **Possible Alternative to the Proposed Change**

To alleviate the intrinsic ambiguities associated with the definition of occupational dose, e.g., "in the course of employment" and "assigned duties involve", the following alternative definition is offered. *Occupational dose is dose received by an individual who is anticipating an economic benefit from his presence in a controlled or restricted area. Occupational dose does not include dose received from background radiation, as a patient from medical practices, from voluntary participation in medical research programs, or as a member of the public. This would mean that, irrespective of his employer, if the purpose of an individual's presence is to receive an economic benefit, whether employed by the licensee at a facility, or salesmen coming to the facility, or delivery personnel from other companies, occupational limits would apply. No specific consideration of assigned duties would be necessary, and the number of judgement calls reduced. Assigned duties do not seem to make a difference. If an individual has made an informed choice to engage in his occupation at a location where radiation and/or radioactive materials are present,*

then it seems that the individual should be considered occupationally exposed, irrespective of actual or projected amount of exposure. As stated previously, adequate protection of individuals who should not by the nature of their duties receive much dose can be accomplished through enforcement of §20.1101(b). Tourists and similar individuals would remain members of the public irrespective of their location. These individuals do not frequent the facility and provisions to maintain their dose below 100 mrem should be simple.

Combined with this definition, the following change is recommended for §19.12(a). *All individuals receiving occupational dose as defined in §20.1003 who are likely to receive a dose greater than 100 mrem in a year shall, as applicable, be -- ...* The requirement for training would then be independent of area (except for unrestricted areas), as desired by the NRC and logical, and would be tied to the dose limit for members of the public from §20.1301. Training should not be necessary for individuals likely to receive less than 100 mrem in a year due to (1) the limited individual risk associated with 100 mrem dose and (2) the 100 mrem in a year is equivalent to the limiting dose for members of the public who require no training. This approach would solve the problem of the two individuals cited in the NRC example and eliminate the difficulty associated with deciding whether a dose is occupational or public. Dose received in an unrestricted area should be considered public dose.

#### **Addition of § 20.2205**

With respect to the inclusion of language in § 20.2205 to ensure that individuals, including members of the public, who receive an exposure in excess of the dose limits for which a report to the NRC is required also receive a notification of that exposure from the licensee, no comment is offered. This provision is reasonable.

### Impacts on South Texas

If the proposed change is implemented, the impacts on South Texas are as follows.

1. Technical Specifications would need to be revisited. The current version of Technical Specifications were prepared to implement the existing 10 CFR 20 and incorporate the concept of controlled area. Resources would be expended to examine and, if required, modify the Technical Specifications.
2. The radiation protection program procedure would require revision to eliminate controlled area. This would expend resources for no perceived added value.
3. Training would require revision. A special effort was made beginning in October of 1993 to train site personnel on the 10 CFR 20 differences, including a discussion of various plant areas and occupational dose. This training would need to be modified and repeated.
4. Research would need to be performed for each individual who enters the restricted area based upon job description to determine which of these individuals would be considered members of the public and which would be considered occupationally exposed. This would be an expenditure of resources for no savings in dose or other anticipated benefit.
5. A mechanism would need to be developed to demonstrate compliance with the limit for individual members of the public in restricted areas. Currently, no individual in the restricted area is a member of the public and demonstration in that area is not necessary. Demonstration of compliance with the limit of § 20.1301 for members of the public in a controlled area is governed by the provisions of § 20.1302. In lieu of identifying the highest exposed individual member of the public, a virtually impossible task when there is no recording of duration of stay time in the controlled area, a licensee may demonstrate compliance by calculating an annual average concentration of effluents at the boundary of the restricted area and combining this with direct radiation measurements from environmental dosimeters located at this boundary. However, this approach is insufficient for members of the public in a restricted area. This is expenditure of resources for no dose savings or other anticipated benefit.



6. If South Texas chooses to extend its restricted area to the site boundary, the level of access control we presently have may not be adequate. This is unknown at this point, not being made clear by the NRC. It is possible that additional access control measures will be needed.

### Summary

Except for the addition of §20.2205, the proposed changes create more problems for nuclear plants than they solve. In an attempt to address a perceived problem with "members of the public" in restricted areas being subject to occupational limits and lack of training for some occupationally exposed workers in controlled and/or unrestricted areas, more problems are created. The alternative proposed herein would ensure training for individuals whose individual risk warrants training while removing ambiguity from the definition of occupational dose. Any abuse by licensees, i.e., giving individuals up to the occupational limit without regard for reasonableness of the dose, should be addressed under §20.1101(b).

Any substantial change in the concepts of 10 CFR 20, which established controlled area initially, at this point in time is ill advised unless it provides a perceived benefit for the health and safety of the public. Nothing in these changes provides such a benefit.