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

Dear Sir:

The purpose of this letter is to provide comments on your proposed revisions to and modernization of 10 CFR 20 as announced in the 20 March 1980 issue of the Federal Register. In general I find myself in agreement with the "Function of Radiation Protection Standards" and the "Essential Elements Of The Radiation Protection Standards" statements. However, some of the specific action areas contained in "Areas In Part 20 That Need Improvement" are deserving of special comment.

a.(2) "...Quantitative occupational ALARA guidelines should be established wherever possible for NRC licensed facilities."

The fundamental soundness of the ALARA concept is unquestioned. The Radiation Protection Officer (RPO) is provided with limits which workers shall not be allowed to exceed and is instructed to strive for an optimization between reduction of worker exposure and the usually increased costs of achieving exposure reduction. But the assignment of a numerical objective for this "optimized" operating condition is fraught with difficulties which the local RPO already appreciates and which the NRC cannot address on a scientific basis at this time.

For example, suppose we wish to attempt to establish an appropriate ALARA guideline for nuclear medicine. Depending on the size and complexity of the nuclear medicine program, the guideline must be appropriate for physicians, nurses, nuclear pharmacists, radiation chemists, cyclotron and hot lab technicians, nuclear pharmacy technologists, imaging technologists, technicians, and various other technical and clerical workers. Can a single guideline be appropriate for each of these categories?

A monthly dose-equivalent of 10% of the quarterly maximum permissible dose-equivalent might be perfectly reasonable for a busy nuclear pharmacy technologist, but even the most active nuclear physician should probably not exceed that same level during a period of a year or more. A RIA technologist should certainly not receive even a small fraction of the acceptable dose for an imaging technologist. And the imaging technologist who performs most of the high-dose dynamic studies would be expected to receive a larger dose-equivalent than the imaging technologist who is primarily responsible for thyroid uptake, thyroid imaging, and low-dose static imaging.

The above examples illustrate my contention that quantitative ALARA guidelines are not manageable by the NRC at the national level, nor even at the institutional or job category level. Every radiation worker is exposed to a unique occupational radiation environment and each of these environments by necessity must have its own individual ALARA guideline. Only the local RPO is in a suitable professional position to establish the appropriate guideline for the workers under his supervision. While I was RPO of a 500+ bed major referral teaching medical center, I reviewed the monthly film badge reports on a person-by-person basis for radioactive material workers, assessing each individual's reported dose against my personal knowledge of the work environment during that monitoring period and for that individual alone. The guideline for an average monthly clinic workload would not be appropriate for an exceptionally busy workload or an unusually low workload. These decisions can only be made by the local RPO and in my opinion are not amenable to legislation.

Suppose that it is generally agreed that on the average imaging technologists should not receive more than 100 millirem per month and that this level were adopted as an ALARA guideline. What actions are proposed that must be taken by the local RPO if the guideline were exceeded? I have heard proposals that a written record of the investigation into this "overexposure" would be required. In my estimation this is not a reasonable approach since it should be expected that the average technologist would exceed the average dose-equivalent from time to time, especially in situations of high patient load and reduced availability of technologists (vacations, shortage of funds, etc.). A written report might be reasonable if the guideline were slightly exceeded

two or three months in a row, or if a single monthly dose-equivalent were 200% or 300% of the guideline. But what if the guideline were too restrictive or too lenient? If it is too restrictive, the RPO is going to be spending all of his time at his desk writing reports instead of being out in the work areas observing working conditions. If the guideline is too lenient, the motivation to reduce the dose-equivalent even further may be lost.

I am not in favor of a quantitative ALARA guideline promulgated in 10 CFR 20. I also am not in favor of requiring institutional definition of such a guideline in license applications. The NRC's current position of requiring that ALARA be implemented and aggressively practiced by the individual licensee is the most workable and desirable approach. The licensee should be required to provide documentation of an ALARA program with specific goals and objectives and a general outline of how these goals and objectives are proposed to be accomplished. NRC inspections can then focus on the ALARA "action plan", both on its conceptual soundness and on its demonstrated effectiveness. The local RPO should expect to discuss each work area under his supervision, his operational ALARA guideline for each such area, and his rationale for selecting that guideline. Since the guideline may change from time to time due to changing work patterns, this detailed defense of the ALARA program is too sophisticated and time-consuming to commit to paper and to attempt to keep up to date. Filing of license amendments to keep up with changing work patterns would assuredly constitute an unacceptable paperwork burden for both the RPO and the NRC.

b.(5) "Special provisions for limiting exposures of susceptible groups...should be considered, under applicable law."

I am in agreement with the NCRP recommendation that the embryo/fetus should be considered as a member of the general public and that the appropriate guideline is therefore 0.5 rem during the 40-week gestation period. The impracticality of accurately and easily assessing in utero dose dictates that a more feasible approach is to limit the mother's abdominal dose to 0.5 rem or less, thus insuring that the fetal dose will be no more than that amount due to absorption in maternal tissue. Our approach to the problem of a pregnant radiation worker has always been to counsel the mother fully as to the current state of knowledge with regard to sequelae of fetal irradiation; a regulatory guide designed especially for this purpose and similar in concept to Regulatory Guide 8.13 would be very useful for this counseling. The mother is then given the option of continuing in her current job or being transferred to a job with less inherent radiation risk during the term of the pregnancy. If she elects to continue

as a radiation worker, we ask her to wear her film badge on her waist and we (at least initially) provide her with self-reading dosimeters. We brief her supervisor and co-workers on any special modifications to the mother's normal work routine which are necessary to minimize her potential radiation exposure. We finally have the mother sign a statement that she has been counseled and has requested to either continue in her job or be reassigned. The RPO then writes a memo to the top management of the hospital requesting concurrence in the actions taken by all parties. The RPO carefully monitors the monthly film badge reports and makes periodic reports to the institutional Radiation Safety Committee. Thus, this process involves the pregnant worker, her supervisor and co-workers, the worker's obstetrician (who is asked for his advice throughout the pregnancy), the Chief of Radiology and/or the head of the worker's department, the RPO, top hospital management, and the Radiation Safety Committee. Our experience with this system has been excellent and we believe it to be economically and morally workable in any setting.

b.(6) "Controls for 'moonlighters', contract workers, and transient workers should be strengthened."

As a former Army health physicist I am intimately familiar with the problems of dealing with these classes of workers. There are several aspects to this problem which merit discussion. First, in instances where a worker's previous and current employers are NRC-or Agreement State-licensed, 10 CFR 20 should state that the former employer is required to provide the employee's radiation exposure records to the current employer at no charge to either the employee or the current employer. If an employer maintains proper records, it is not at all expensive to retrieve the necessary information and mail it to a new employer. Second, in instances where a former employer or a contractor or a current "moonlight" employer are not under NRC purview, it would seem that NRC would require new legislative authority to require that the radiation dose history be provided, again at no charge to the current employer or the employee.

Third, the problem of transient workers is always going to be a problem as long as commercial film badge and TLD badge services are used. For example, suppose a welder works for employer A during the month of April and then moves on to employer B in May, then employer C in June. If the turnaround time for dosimetry results in 3-4 weeks (a typical value), the employee will have left employer B before the dosimetry

report could reasonably have been made available to him. Would it be reasonable in such a case for B to even be required to obtain the report when the employee is known to be leaving before it could be received?

Fourth, it would seem reasonable to exclude certain categories of low-risk workers or work environments from any requirements promulgated in pursuit of the stated objective. Examples might be research labs working only with tritium and carbon-14, radioimmunoassay workers, and others with demonstrated historical low risk. Examples of high-risk workers for whom a dose-tracking system would be valuable are nuclear power plant workers and industrial radiographers. In my opinion the only effective way to control these high-risk situations is the establishment of a national clearinghouse or repository of radiation dose data. Each employer would be required to identify to his dosimetry service those workers who fall into NRC-specified categories. The dosimetry service would furnish the monthly results for each such worker to the clearinghouse, which would initially set up and then maintain a cumulative lifetime record on the worker. A new employer would then need only to report the change in employment to the clearinghouse and request a summary report on the worker's dose history. But the clearinghouse concept has two serious shortcomings: (1) the worker's dose from employment not included in the specific categories might not be considered, and (2) it would require the addition of a new level of federal bureaucracy or expansion of an existing one. It would take a very substantial benefit-cost ratio to convince me of the necessity of achieving greater control over these types of workers. I am firmly opposed to any new requirements on medically-related workers and work activities since there are virtually no medical radiation workers who can be assumed to be high-risk workers, especially in the environment of an adequate institutional ALARA program.

c.(3) "Special provisions for limiting exposures of susceptible groups...should be considered..."

In the context of susceptible groups in the general public, I feel that existing regulations are more than sufficient and very adequately protect these individuals.

e.(1) "Reporting of routine internal exposures should be required."

If the intent of this requirement is that the NRC should be provided with bioassay data on individuals who have not been involved in an emergency situation or whose body burden has

not exceeded published MPBB's (which should be included in 10 CFR 20 in addition to MPC's), then I am opposed to this requirement. It would impose an extra paperwork burden on the RPO and NRC and would not appreciably improve the worker's radiation exposure environment. Internal exposures within regulatory limits should be an item of interest for NRC inspectors. The NRC should more fully describe the extent of information to be required under this provision and should defend its cost-effectiveness and its plans for utilization of this information. It is not clear to me that this reporting requirement would be worthwhile as currently stated.

Thank you for this opportunity to comment on what I agree will be a "complex and controversial" rule-making procedure. I will be pleased to provide any further assistance or information.

Sincerely,

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