

'93 FEB -8 P4:13 February 3, 1993
Rockville, MD

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

Ladies and Gentlemen:

Re: Proposed Rule - Siting (10 CFR Part 100)
F.R. October 30, 1992

The proposed rules on siting criteria (10 CFR Part 100) are addressed herein. No comments are included regarding the proposed changes to seismic rules; however, a Note in the proposed seismic rules will be referenced to make a point. The Commission's questions in the F.R Notice will be addressed in an Enclosure; this cover letter contains comments from a general overview perspective. I note that I am a former NRC staff employee who has been deeply involved in all of the issues addressed in the proposed rule.

As a benchmark, it is well to state initially that the current rules and practices have worked well for thirty years. They provide for the basic safety objectives (unstated in the proposed rules):

- o robust, tight containments,
- o moderate standoff distances to populations, and
- o a modicum of flexibility in design and siting.

These objectives have been achieved under the current rules and practices.

As a general overview, the proposed rule should be withdrawn. It adds nothing to the current provisions for safety; everything it tries to accomplish already exists; anything that either the Commission or the NRC Staff ostensibly wishes to accomplish in the way of clarity, uniformity, or ease of accomplishment in applying the current siting rule can be done via revisions to and/or amplifications to current Regulatory Staff Positions, or enlightened staff interpretations of its current Positions - without changing the regulations.

Simple, straightforward alternatives to the proposed rules are suggested at the end of this letter and in the Enclosures hereto, highlighted as RECOMMENDATIONS. Some of the language in this response may seem contradictory in that much of it argues against

the proposed rule, but some of it pertains to the rule as it might be published, anyway. Hopefully the context will make it clear.

By far the most important reasons to withdraw the proposed rule are that it would unnecessarily complicate the rules, and would unnecessarily tie the Commission's hands - in each case without adding to provisions for safety. The proposed three separate rules for older, currently docketed, and new plants is akin to gerrymandering. This contorted proposal is not logical; it would be very difficult for the public to understand, and for the Commission and Staff to defend. It has a clear potential for much unnecessary litigation.

One of the most obvious problems created by the proposed rules was summarized by the Commission itself. An obvious place to put a new plant would be on an existing, previously approved site. All but a few, well known, high density, outlier sites, should be acceptable even today - from a safety standpoint. The outliers would not be proposed, much less approved, at this juncture. Metropolitan siting has been disallowed from the outset. The history of the proposed Douglas Point site is evidence that the Staff's alternative site requirements indeed do work.

Siting is much more a political and emotional issue than a technical issue. Why should the Commission tie its own hands in this regard? As the Commission states in its proposal, currently it has all the authority it needs. Moreover, the proposed population density limits are to be considered as 'guidelines' - which currently exist! So nothing changes.

The elimination of the Low Population Zone (LPZ) and the Population Center distance for a new site adds nothing to safety provisions. In the past the LPZ has been selected by industry rather cavalierly in many instances, which will hardly be the case in the future. It has been rare for the Staff to require changes to exclusion areas, LPZs, and population center distances proposed by industry. The Commission has only rarely rejected a proposed site.

With the imposition of the Emergency Planning Zone in Part 50 (Appendix E) and the attendant requirements for evacuation plans, along with the Staff's environmental positions in the siting area, the Commission has all it needs to enforce the proposed population density 'guidelines', also without a new Regulation - and without tying its hands in this contentious area. As the Commission states, the Staff's 'guideline' population density and alternate site selection trip point(s) have effectively restricted siting in higher population density areas.

The artifact of moving siting dose calculations to Part 50 is not only unnecessary (where they reside in the regulations is immaterial), it is premature, also: for the nonce, the Staff's requirements remain the same. Again, nothing changes.

Staff problems in design areas can be 'fixed' by revising appropriate Regulatory Guides and Standard Review Plans, or by enlightened Staff interpretations. This practice is acknowledged explicitly in Footnote 1 to the proposed Appendix B: "Considerations presented in this regulation are general. Acceptable methods and additional discussion are provided in regulatory guides and standard review plan actions."

This is simply an explicit acknowledgement of long-standing standard AEC and NRC practices. When Part 100 was promulgated, it was followed immediately by Safety Guides 3 and 4, now Regulatory Guides 1.3 and 1.4. These Guides set out the mechanics of the so-called siting dose calculations that were acceptable to the Staff. This was a package deal. It was a way, not the way. In most applications since the early 1960s these calculations have been used by the staff predominantly as leverage for design improvements, rather than for siting (where can we put this reactor). Major siting restrictions have been related to the Commission's concerns regarding possible core melt-failed containment accidents, however unlikely. Siting dose calculations pertain to intact, but leaky, containments.

The siting dose calculations, per se, are highly stylized by now, such that in many ways they are crank turning operations familiar to all in the industry. They pertain to engineered safety features of the containment systems, principally. Today, acceptable sets of containment features are well known and are almost standard.

RECOMMENDATION: By now, one could just as well specify the acceptable attributes of new containment systems and eliminate the siting dose calculations. The 120, or so, operating plants and the new 'beyond the design basis' attributes of the advanced reactors should provide an acceptable envelope. The historical, well known 'game' played by the Staff and license applicants regarding acceptable containment ESFs is no longer needed. Many anecdotes could be told of how the Staff has used Part 100 dose criteria to require certain containment ESF attributes it desired. Why not just say what these are? (Is the Commission aware that the Staff has some ESF requirements based on only fractions of the Part 100 dose criteria?)

The most significant current change in the proposed crank-turning aspect of design evaluation dose calculations is the possibility of using revised source terms for future plants. This can be accommodated very easily by revising or adding a Standard Review Plan. Footnote 1 in Part 100.11 covers this very well. The Note to this Part can be ignored, deleted, or changed to reference the proposed NUREG on source terms. Simple! Additionally - and this is extremely important - a footnote in Regulatory Guides 1.3 and 1.4 has long provided for the staff to consider special design features. Any new information (acceptable to the Staff) resulting from new research results can be accommodated by this footnote.

This includes source terms, models of the effectiveness of ESFs, and insights from risk assessments.

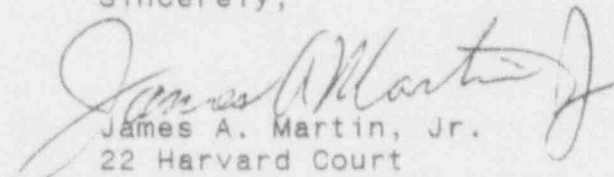
It is common staff practice today to incorporate industry reports and Standards acceptable to the Staff in its acceptance criteria. This system works! It ain't broke. There is no need to change it. The current attempt to do so leads to completely unnecessary contortions, as evidenced by the proposed rule. Why have three sets of rules for licensing actions for old plants, current applications, and future applications, when the one (current) set is o.k.? The Commission has enough to do without bogging itself down in this completely unnecessary exercise.

In a nut-shell, the current rules work! The fundamental safety objectives are accomplished under the current rules and practices. In the words of former Chairman Joe Hendrie: "If it ain't broke, don't fix it!" And Part 100 ain't broke.

Now, perceptions must exist that Part 100 is broke - else the proposed rule would not have been published. I argue that where staff problems have existed, these have been caused by rigorous (bureaucratic?) Staff adherence to sometimes arcane Staff Technical Positions, rather than the current rule. The Staff tied its own hands. So, let the Staff change their positions! But why get the Commission involved?

As far as I am aware, the Commission has not had recent problems in the siting area. Again, why tie your hands unnecessarily, let alone plan to give yourself headaches trying to implement this contorted, three headed monster?! RECOMMENDATION: If the Commission wants to impose population density restrictions, and/or establish alternative site selection rules, it should merely add the appropriate criteria to Part 100.10 "Factors to be considered when evaluating sites." It thereby avoids the gerrymandering (generational) problem, and it won't tie its hands unnecessarily. Keep it simple and straightforward (KISS). This suggestion is elaborated upon in Enclosure 2.

Sincerely,


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ENCLOSURES: 1. Responses to Commission questions.
2. Meteorological Programs.
3. Editorial Comments.

RESPONSES TO COMMISSION QUESTIONS ON
PROPOSED REVISIONS TO
REACTOR SITING CRITERIA (NONSEISMIC)
RE: PROPOSED REVISIONS TO 10 CFR PART 100
F.R. OCTOBER 20, 1992

1. Should the Commission grandfather existing reactor sites having an exclusion area distance less than 0.4 miles (640 meters) for the possible placement of additional units, if those sites are found suitable from safety consideration? (sic)

RESPONSE: Yes. But then why have the rule change? Since siting is such a political and emotional issue, rather than a technical one, the Commission should not tie its own hands in this regard. There is no need for a contorted generational set of rules. The proposed rule(s) should be withdrawn.

2. Should the exclusion area distance be smaller than 0.4 mile (640 meters) for plants having reactor power levels significantly less than 3800 megawatts (thermal) and should the exclusion area distance be allowed to vary according to power level with a minimum value (for example 0.25 miles or 400 meters)?

RESPONSE: Yes. But this is covered adequately by current rules and practices, so the rules need not be changed in this regard.

3. The Commission proposes to codify the population density guidelines in Regulatory Guide 4.7 which states that the population density should not exceed 500 people per square mile out to a distance of 30 miles at the time of site approval and 1000 people per square mile 40 years thereafter. Comments are specifically requested on questions 3A, 3B, and 3C given below.

A. Should numerical values of population density appear in the regulation or should the regulation provide merely general guidance, with numerical values provided in a regulatory guide?

RESPONSE: Either way, but only with regard to alternative site selection criteria for new sites, and for applicants that currently do not possess a construction permit, or for reactors having a CP which are in only the very earliest stages of construction on a currently approved site. Codifying the alternative site selection criteria would provide a modicum of leverage for the Commission and Staff to announce that putting a new reactor on a currently approved high density site would not be allowed. But this is well known, anyway.

B. Assuming numerical values are to be codified, are the values of 500 persons per square mile at the time of site approval and 1000 persons per square mile 40 years thereafter appropriate? If not, what other numerical values should be codified and what is the basis for these values?

RESPONSE: This depends on the objective(s). Assuming (further) that the Commission would no longer approve certain current higher density sites, it could peruse the graphs in NUREG-0348, "Demographic Statistics Pertaining to Nuclear Power Reactor Sites", select those it would outlaw in the future, and pick the number that falls out. Figure 4 of NUREG-0348 is attached as an example.

C. Should population density criteria be specified out to a distance other than 30 miles (50 km), for example, 20 miles (32 km)? If a different distance is recommended, what is its basis?

RESPONSE: A choice of ten (10) miles would provide for harmonization with the Latent Cancer Safety Goal and Emergency Planning Zone distances. As the Commission notes, studies have shown that little is gained from a safety perspective with population restrictions beyond 10 miles. From a person-rem perspective, over half the person-rem from atmospheric releases arises beyond 50 miles, so whatever is done within 50 miles can't make more than a factor of two difference - barring extremely remote siting, of course. (For long lived noble gases, world-wide person-rem are another factor of two over the 50 mile person-rem.) A statement reiterating the Commission's objections to metropolitan siting may be needed if ten miles is chosen.

As a separate matter, the Commission should not use its proposed averaging method for population density. A coastal site would get a factor of two reprieve with the proposed formula, whereas the Commission seems to be quite concerned over a factor of two. The averaging should be applied to each 45 degree sector, rather than to 360 degrees. Also, a peninsula site like the old TVA Yellow Creek site should not be allowed because of evacuation (toward a plant) concerns.

4. Should the Commission approve sites that exceed the proposed population values of 10 CFR 100.21, and if so, under what conditions?

RESPONSE: Maybe. If an alternate site selection criterion is triggered, so be it. But the Commission should not tie its own hands unnecessarily. Suppose it's only a factor of two? Or 1.2? Suppose it's 1.2 now, but the 40 year projection is only a 1.5 increase? Why tie your own hands? The alternative site selection criterion should provide adequate leverage and not tie your hands.

5. Should holders of early site permits, construction permits, and operating license permits be required to periodically report changes in potential offsite hazards (for example, every 5 years within 5 miles)? If so, what regulatory purpose would such reporting requirements serve?

RESPONSE: Yes. The answer is so obvious it's a wonder it hasn't been a requirement before. In addition, major changes in population distribution within the 10 mile EPZ should also be reported, if such is not normally reported in revisions to emergency plans. In addition, any new dams on local rivers that could change the site flood protection requirements should be reported. Also, any new airports, etc., for which the offsite hazards have not been analyzed, should be reported.

6. What continuing regulatory significance should the safety requirements in 10 CFR part 100 have after granting the initial operating license or combined operating license under 10 CFR part 52?

RESPONSE: 6.1 From a resident and transient population density and perspective, little to none. It's a free country - people can choose to live and work where they like. If the Commission wanted to control this, it would have to institute zoning restrictions, which might fly in Low Population Zones, but hardly elsewhere. (Another argument for keeping the LPZ?) Technically, and perhaps legally, it is worth noting that Part 100 pertains to the Construction Permit application, not the Operating License.

6.2 See 5., above.

7. Are there certain site meteorological conditions that should preclude the siting of a nuclear power plant? If so, what are the conditions that can not be adequately compensated for by design features?

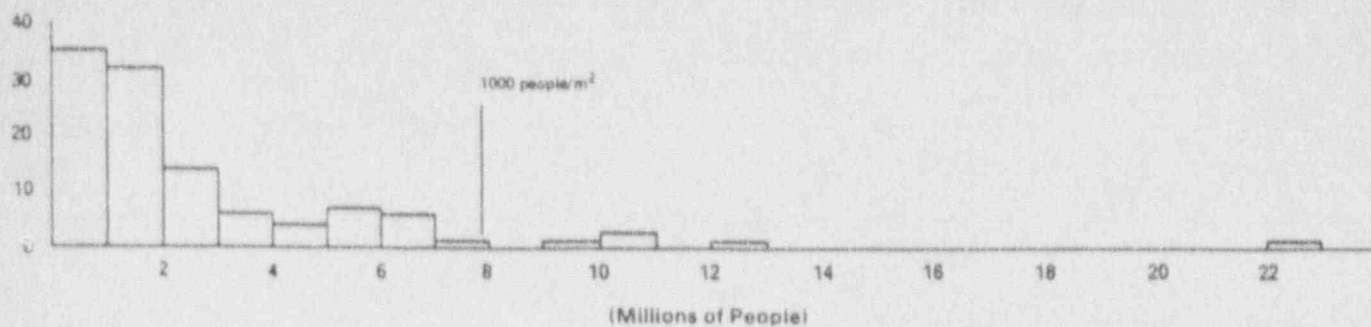
RESPONSE: No obvious ones that can't be accommodated by spending lots of money. However, the current unnecessary Staff Positions regarding meteorological programs required by the Staff are discussed in a separate Enclosure 2 to this response.

8. In the description of the disposition of the recommendations of the Siting Policy Task Force Report (NUREG-0625), it was noted that the Commission was not adopting every element of each recommendation. Are there compelling reasons to reconsider any recommendation not adopted and, if so, what are the bases for reconsideration?

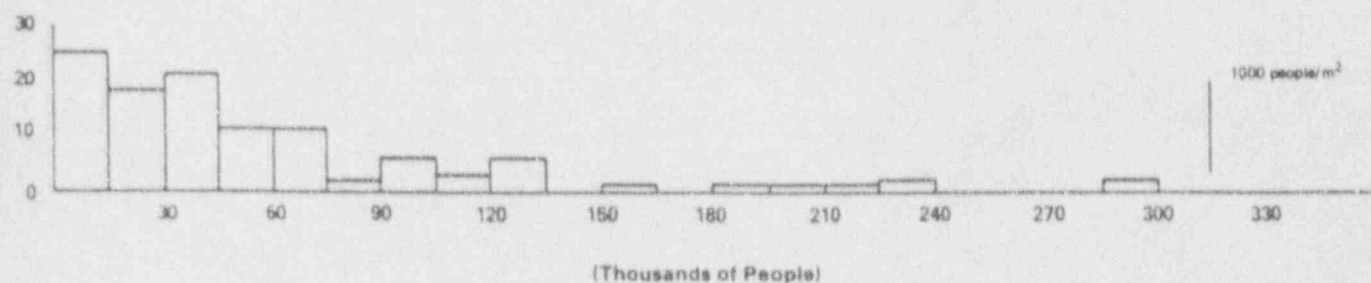
RESPONSE: Task Force Recommendation 2 should be re-reviewed. The Commission's (Staff's) answer is specious. On the one hand you can't do it, but on the other hand you will! (Separation distances are not readily quantified, but they can be adequately considered - bureaucratic gobbledygook!) Zoning laws in the LPZ can be required as a condition of a license if a safety consideration is involved. It would just cost the licensee money. On the other hand, the ugly third party rears it's head here. This ain't a technical question. Never-the-less, a requirement that off-site hazards be identified periodically is so obvious it's a wonder that it wasn't in place long ago (see 5., above).

As a parting comment, "...the Commission retains the right to order restrictions on a case-by-case basis." So why the convoluted rule? The discussion in the cover letter of this Enclosure is incorporated by reference.

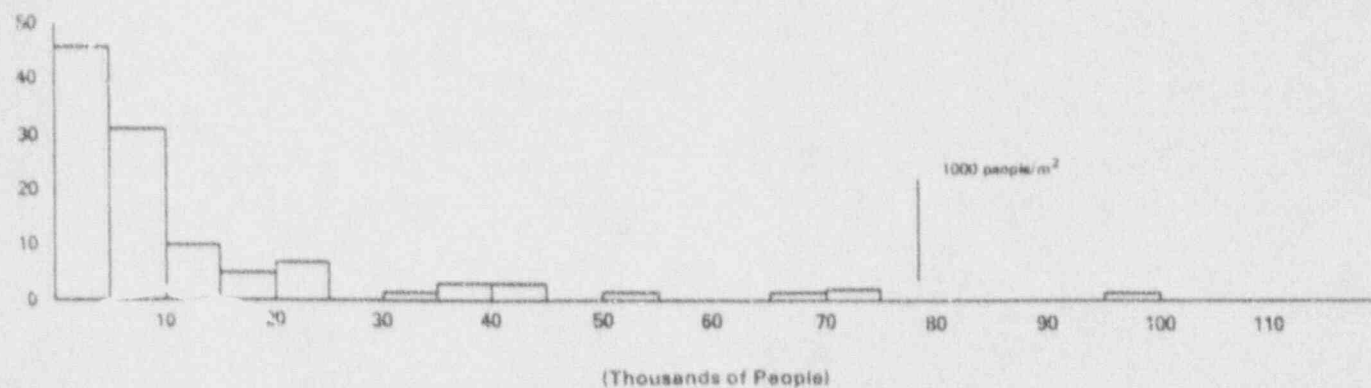
NUMBER OF PLANTS WITH SURROUNDING POPULATIONS WITHIN THE [POPULATION INCREMENTS INDICATED]



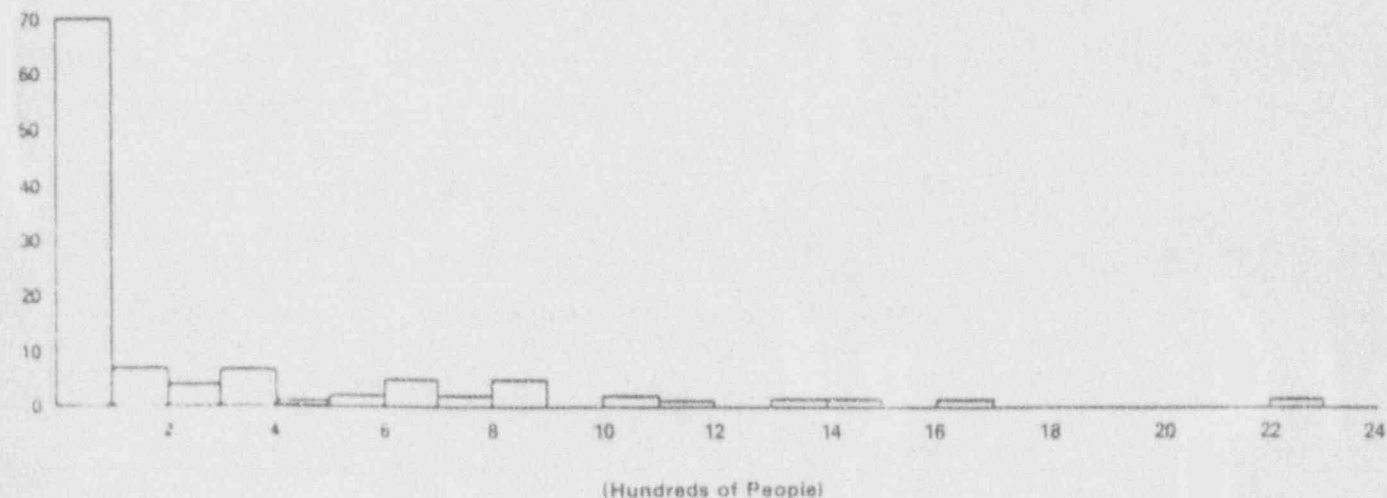
YEAR 2000 PROJECTED POPULATION WITHIN FIFTY MILES AT 111 NUCLEAR PLANT SITES



YEAR 2000 PROJECTED POPULATION WITHIN TEN MILES AT 111 NUCLEAR PLANT SITES



YEAR 2000 PROJECTED POPULATION WITHIN FIVE MILES AT 111 NUCLEAR PLANT SITES



YEAR 2000 PROJECTED POPULATION WITHIN ONE MILE AT 111 NUCLEAR PLANT SITES

Population data normalized to year 2000 by estimating projected population increases.

FIGURE 4

NURGE-0348

METEOROLOGICAL PROGRAMS

There is a seemingly minor change proposed with regard to meteorological assumptions for siting and design evaluations for future plants. But the proposed rule is unclear, misleading, and equivocal in this regard. "Physical characteristics of the site, including meteorology...." must be considered. Apparently dose calculations would no longer be necessary, but actuarially rare adverse conditions such as tornados would need to be considered. Yet the same old siting dose calculations will still be required under Part 50. Additionally, site met data is used in Level 3 PRAs. (See the last paragraph in 2. of Enclosure 3, also.)

Apparently, the staff requirement for several years worth of meteorological data to be obtained before a plant is granted a construction permit, and for continuous meteorological monitoring after an operating license is granted, are to be deleted. This is a worthwhile objective as the current meteorological monitoring requirements add little to nothing to public health and safety provisions. But these requirements would still be required explicitly under Part 20, also, so nothing of value is achieved by this part of the proposed rule.

It has been well known for many years to practitioners of the art (pseudo-science, actually) of offsite dose calculations that one cannot predict the wind. This has been well known to the public for a much longer period of time. There are three reasons given for the Staff requirements for the current meteorological program: siting dose calculations under Part 100, individual dose and person-rem calculations under Part 20, and emergency response planning under Appendix E to Part 50. Each of the reasons given is specious.

As explicitly noted in the proposed rule, meteorological conditions from place to place across the U.S. are not so different as to make a significant difference in risk estimates. The major siting restrictions extant relate to the concerns regarding core melt-failed containment accident potential, no matter how small. Such accidents have nothing to do with siting dose calculations as these deal with intact, albeit leaky, containments.

Since the proposed rule ostensibly removes the Staff requirements for met towers for new sites, this aspect will not be discussed here. But they'd still be required under Parts 20 and 50, so nothing changes. Again! So why the new rules?

Although it is not well documented, it is common knowledge of dose practitioners that the person-rem calculations required under Part 20 can be done back of the envelope just as well as by computer. Indeed, and this is what is principally undocumented, there is an almost constant relationship between a noble gas source term, total population within a large distance (e.g., 30 miles), and calculated person-rem, regardless of the local annual average meteorological wind rose and population distribution. If anything, this relationship needs to be well documented to provide a foundation for the Staff to relax its meteorological requirements. Nearest resident doses are estimated best from environmental monitoring data, rather than from atmospheric dispersion model predictions (re: Appendix I to Part 20).

For emergency response purposes, the on-site meteorological station required by the Staff is almost useless and the data from it could be quite misleading during an emergency. This is fairly well documented in NUREG 1210, but it could be done better. As is well known to the public and practitioners, winds do not normally blow in straight lines and the wind direction at any instant is likely to be significantly different at locations only a few miles apart. So the great detail obtainable from a given point in space and time (e.g., the on-site met tower) likely has little to do during an accident with the wind conditions where the people are! So what good is the met tower information? Likely misleading, at best. An example of this is the ARAC plume pictures, computer generated, not in real time, that were so notorious during the TMI accident, especially the ones that showed the TMI plume taking a sharp right angle turn only a few miles from the site. This was not predictable from the on-site met tower information (recovered later).

Moreover, where calculations and data disagree, radiological monitoring data must govern, especially during an emergency - and none of the data gathering requirements are affected by the proposed rule. Thus, the current staff requirements for the current meteorological program have little to do with public health and safety. And the Staff requirement for continuous met monitoring throughout the life of a plant (every 15 minutes!) is an expensive, unnecessary, wasteful expense for the public. RECOMMENDATION: It would be better to have wind socks in the environs than a single met tower. These could be located at schools, fire stations, etc., and using them could be part of emergency exercises.

Now, how does this relate to the proposed rule? It's difficult to say because the proposed rule is so equivocal (opaque, actually). But it does relate to the Staff practices. There are many arguments that can be put forth for changing Staff practices and 'requirements' in Regulatory Staff Positions to improve the regulatory process - without changing the regulations. There's nothing

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ENCLOSURE 2

in the rules, present or proposed about five percentile anything! The proposed changes to the regulations in this regard are neither more nor less than current regulatory requirements. So why the proposed change? No particular reason, apparantly. Any necessary or desireable improvements in the licensing process in this regard can be achieved by changing Staff practices - if the Staff can be enlightened. All under the current regulations. The proposed contortions are unnecessary.

EDITORIAL COMMENTS

1. If the proposed rule is promulgated, then par. 100.21(c) should be changed to add "... and eliminated." It does little good to merely identify egress (evacuation) limitations in the area surrounding a site. However, this should apply to the 10 mile emergency planning zone, only. It could even be limited to the LPZ.

2. The language in the proposed paragraph 100.21(a)(2) is much too loose. One can easily make up a scenario in which an accident at one reactor would initiate an accident in another reactor - especially considering external and sabotage scenarios. Probabilities must be incorporated, somehow. Also, the last part of this paragraph appears to mean that one must have a 0.8 mile exclusion radius for two adjacent reactors, 1.2 miles for three, etc. Surely, the time it may take for one reactor to cause an accident in an adjacent one should be considered. Moreover, isn't a core melt accident the concern, not just any old accident? The noted paragraph needs work.

If this rule is promulgated, this paragraph should include a conditional probability of an accident in one reactor causing a core melt accident in another reactor on the same site. This is tricky, though. A 1% or less chance of a core melt accident in one reactor causing a core melt accident in an adjacent one should be acceptable. But the acceptable conditional probability of a core melt accident in a reactor being caused by any old accident in an adjacent reactor is not patent. (Actually, isn't this covered adequately in the Safety Goal under the E-4 core melt frequency goal, considering all possible causes?)

RECOMMENDATION: As a practical matter, could not the dose guidelines in Part 100 be evaluated for new sites using PRA results for contained core melt accident sequences? Part 100 doesn't say how one has to do it - it's the Regulatory Guides that impose the five percentile met requirement. Why not substitute five percentile dose for five percentile met? A minimum set of containment ESFs, and minimum exclusion area and LPZ radii, would all have to be part of the package, tho', because the doses should be low and encroachment is to be avoided. This package should be studied.

3. There is one bit of phraseology in the current rules and in the proposed rules that is worthwhile correcting. This relates directly to public health and safety during a response to an accident, and pointedly to the evacuation matter. In brief, the public, itself, would evacuate, as it (they) deems necessary or desireable. The current and proposed rules imply that somebody

would evacuate the people. Evacuate means 'to leave', in this instance. So to evacuate somebody means to leave them! - hardly the meaning intended, to be sure. So the phrase "...site related characteristics would not prevent the development of a plan to carry out suitable protective actions for members of the public..." would be said better and to the point as follows: "... site related characteristics would not prevent or unnecessarily impede rapid egress of the 10 mile Emergency Planning Zone by residents therein in the event of an emergency."

This wording puts the attention where it belongs - on the people and the site environs - rather than on the emergency organization. An organization can always develop an evacuation plan, regardless of the siting. But the plan isn't the point - serious evacuation impediments are the point. With the new wording, low population density siting (within 10 miles) is virtually guaranteed for new sites. But new roads and bridges may have to be constructed in the environs of some old sites with this new wording. So be it if the Commission is really serious about this.

There is one problem that is not resolved by this new wording - what about sites in the north where it snows heavily about ten percent of the time? The risk assessments had better take this into account to assure that the Commissions Safety Goals are accommodated if people who want to can't evacuate expeditiously all the time. Of course, it would be much better to emphasize early (vs fast) evacuation within 2 to 3 miles as the planned, initial protective action recommendation to the public in the event of a General emergency (core melt). As shown by various risk assessments, early shelter elsewhere, with a possible more leisurely relocation later, is a very rational emergency response plan that should be workable and defensible in the northern sites - or for any site, for that matter. (The planned warning time [EALs] is the sine qua non of either an evacuation or shelter plan.)

But all of this can be done without a rule change - except, perhaps, requirements for the building of new roads and bridges in the vicinity of old sites.

4. In paragraph 100.22, the phrase "...man related ..." is sexist and should be changed. (External hazards, perhaps?) Change 100.20(b), also - same reason.

5. In proposed paragraph 100.20(b), precede "accommodate" by "safely".

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ENCLOSURE 3

6. In proposed paragraph 100.22(b) safety of the plant is not defined; neither is very low probability; and neither is affecting. What means all this? One can only guess. This is a very open-ended rule - perhaps unconstitutional! It says no more than paragraph 100.22(a); it creates unnecessary confusion; and is a potential source of much litigation. If the Staff can't do better, par. (b) should be eliminated.