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NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:

PUBLIC SESSION

Policy Session 78-11

SECY-77-538 - Proposed Amendments to 10 CFR Parts 19 & 20
to Control Radiation Exposure to Transient Workers

Place - Washington, D. C.

Date - Wednesday, 4 January 1978

Pages 1 - 35

Telephone:
(202) 347-3700

ACE - FEDERAL REPORTERS, INC.

Official Reporters

444 North Capitol Street
Washington, D.C. 20001

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

PUBLIC SESSION

Policy Session 78-11

SECY-77-538 - Proposed Amendments to 10 CFR Parts 19 & 20
to Control Radiation Exposure to Transient Workers

Room 1130
1717 H Street, N.W.
Washington, D.C.

Wednesday, 4 January 1978

Hearing in the above-entitled matter was convened
at 1:30 p.m., pursuant to notice, VICTOR GILINSKY, Acting
Chairman, Presiding.

PRESENT:

VICTOR GILINSKY, Commissioner
RICHARD KENNEDY, Commissioner
PETER BRADFORD, Commissioner

R. Minogue
T. Engelhardt
L. V. Gossick
S. Trubatch
A. Kenneke
R. Alexander
W. Kreger
J. Hoyle

P R O C E E D I N G S

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2 COMMISSIONER GILINKSY: We are here to hear about
3 proposed amendments to deal with radiation exposure to
4 transient workers.

5 When this came up to the Commission, there was
6 some sentiment that the cure may be worse than the disease.
7 However, the Staff feels otherwise.

8 Why don't you tell us about it.

9 MR.MINOGUE: Yes, sir.

10 This paper of course deals with just one aspect
11 of the major question, which is that of occupational exposure
12 to radiation. Specifically it is an attempt to recognize a
13 growing trend and to come to grips with it. That trend
14 being one towards increasing use of transient and contract
15 workers to carry out certain types of operations.

16 There is no implication on the part of Staff that
17 there is any major problem that has resulted from this to
18 date. We don't have any data that would indicate some system-
19 atic pattern of overexposures.

20 Before I get into the specific topic of the paper,
21 I think it would be very helpful to make some general observa-
22 tions on the nature of some of the issues involved with
23 occupational exposures, because they have quite a bearing on
24 the regulatory approach that you used to this problem area.

25 First, and I think foremost is that the nature of

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1 the problem is quite different from much of what we do in
2 regulation. We are not dealing here with hypothetical loss of
3 cooling accidents, and certainly we are not even dealing with
4 something that would be analogous to discharges into the
5 environment where even there there is a tendency to use extremely
6 conservative analytical models and extremely conservative
7 dispersion models.

8 And so generally in much of our regulatory program
9 we are dealing in areas where we grossly overestimate the
10 potential hazards involved in formulating the basis of the regula-
11 tory program.

12 Here this is not the case. We are dealing with real
13 people who are being really exposed to radiation and at levels
14 which are quite a bit higher than those that you might expect
15 to occur in terms of general population exposures. That means
16 that some of the questions implicit in the linear extrapolation,
17 linear hypothesis, are perhaps a little more significant. We
18 are getting up to high enough levels that you really should
19 and believe it is right, assume there is some adverse effect
20 to the radiation.

21 This leads to the second point.

22 I think it has to be recognized that there is a
23 great deal of uncertainty as to the precise biological effect
24 of radiation at these low levels. There is a lot of dispute,
25 and even today very current controversy on that. And because

mm 1 of these uncertainties, one has to recognize that there may
2 be shifts up or down in the levels that one would appropriately
3 allow.

4 Such a shift occurred some years ago.

5 COMMISSIONER GILINSKY: When you say low levels, you
6 mean the occupational levels --

7 MR. MINOGUE: The levels that would be involved in
8 occupational exposure, yes, sir. By normal standards, they
9 would still be considered to be low-level exposure. This is
10 below-level exposure.

11 COMMISSIONER GILINSKY: But you are saying at these
12 levels you think that the linear hypothesis is a reasonable
13 approach?

14 MR. MINOGUE: I think at this level it is a very
15 reasonable approach. And in fact, there are many people
16 who say it may underestimate the risk.

17 Certainly, you are much less in a never-never land
18 of going down to lower and lower levels in assuming the things,
19 that there is no recovery mechanism and so on. At these levels
20 you are in kind of an inbetween gray zone. But I think you
21 should feel much more that the linear hypothesis is probably
22 rather sound.

23 COMMISSIONER GILINSKY: And you think it may, in fact,
24 underestimate the --

25 MR. MINOGUE: There are many people who think it may

mm 1 underestimate the effect in these ranges. Yes, sir, this is
2 quite a current controversy.

3 COMMISSIONER KENNEDY: These ranges --

4 MR. MINOGUE: Those that would be involved in
5 occupational exposure. The actual dose rates that we will
6 be talking about today that relate to these transient workers
7 typically are at 100 MR per hour, 1 R per hour. They are decades
8 higher than what you would talk about as potentially general
9 public exposure levels.

10 The average level that the limits would allow, 40
11 hours a week, would be 2 1/2 MR per hour. But the bulk of the
12 exposure which I will touch on in a moment, comes from
13 operations involving maintenance, or operating on equipment
14 at much higher levels.

15 It's short duration exposure at levels in a range
16 that are typically well over 100 MR per hour.

17 COMMISSIONER GILINSKY: Why is the rate significant
18 here?

19 MR. MINOGUE: Well, the higher the rate, the less --
20 and the higher the total exposure, the less you are making this
21 very extreme extrapolation that is involved when you look at
22 general public exposure at miniscule exposure rates.

23 COMMISSIONER GILINSKY: But I thought when we use
24 the linear hypothesis, we are really looking at total doses.

25 MR. MINOGUE: That's correct.

1 COMMISSIONER GILINKSY: Why does the rate, the MR
2 per hour matter here?

3 MR. MINOGUE: When you use the linear hypothesis down
4 to very low dose rates, in effect, is a matter of good sound
5 regulatory practice, and we do do this, of course, you assume
6 the effect is constant, is not rate dependent. The effect is
7 related to the total exposure in manrem. But I think there is
8 a general feeling among many experts in the area, the NCRP
9 and ICRP types, that when you do that, you are overestimating
10 the actual effect.

11 I think that feeling is less clearcut as you get
12 up to somewhat higher levels. As you get into these somewhat
13 higher levels, there is less of a feeling that the linear
14 hypothesis is an overestimate effect. And in fact, many feel
15 it is an underestimate.

16 This uncertainty on these effects has some real
17 significance. I think the tendency has been to make people in
18 the program, both the regulators and the industry alike emphasize
19 the ALARA concept, because of this. So that you find if you
20 look at the patterns of actual exposure, that people generally
21 get exposures that are well below these limits. And that re-
22 flects to some extent efforts on the part of the -- not just
23 the regulators, but the industry to design the plants and operate
24 the plants in a manner that keeps the exposures comfortably
25 below those limits. There is always a feeling that those limits

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1 may not be all that accurate.

2 This was certainly true, as I mentioned a moment
3 ago, back in the early '50s the limits were dropped by a factor
4 of three, as there came a growing awareness that there were
5 non-threshold effects here. And because that approach had been
6 used in the design of the various plants it didn't require much
7 of a change in the way things were done. These people generally
8 had been very gunshy of designing right up against those limits.

9 That also is found in our regulations. The
10 regulations emphasize the application of the ALARA concept.
11 And the licensing review in cases puts a great deal of emphasis
12 on taking steps to reduce the total exposure of all the workers
13 by the application of ALARA principles to occupational exposure.

14 You will see that as I go on. Some of the slides
15 will show the exposures that result from this.

16 I really touched on the next point in response to
17 your question, so I won't cover that.

18 Another matter that one has to recognize in looking
19 at these questions of occupational exposure is the several
20 sources that there are. One source of occupational exposure is
21 just the day-in, day-out operation of the plant, where you are
22 dealing with the potential exposure of workers to equipment
23 they can rather readily be shielded.

24 That exposure can be controlled readily and at
25 relatively low cost, and typically is kept to very low values.

mm 1 The other two categories are exposures that relate
2 to work that is where you are in direct contact with the
3 material. Either you are handling some radioactive material,
4 or you are working on equipment that is radioactive, or you are
5 doing maintenance work, doing in-service inspection or whatever.

6 And in the last group of exposure, it is exposure
7 to process equipment that handles radioactive materials, such
8 as waste treatment systems.

9 Both of these second two categories involve exposures
10 that it is much harder to reduce the exposure rates. And
11 because of that, this is where most of the exposure comes from.

12 So if you look at a record of where people get their
13 occupational dose, they get it from these two sources rather than
14 from --

15 COMMISSIONER GILINSKY: Is most of the exposure
16 planned exposure, or is it inadvertent exposure?

17 MR. MINOGUE: It is planned in the sense that the
18 maintenance operation is planned typically with a recognition
19 that the levels are high. And there are a number of things
20 developed in the maintenance program to reduce the exposure
21 to workers either by minimizing occupancy time, temporary
22 shielding, the use of automatic or semi-remote equipment,
23 things of that type.

24 The licensing people focus on this in their review
25 to make sure that the applicants have an ALARA program to make

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1 sure that the exposures are lower in these maintenance opera-
2 tions.

3 Many of these, as I will touch on in a moment, are --
4 the exposures are actually imposed by regulatory requirements;
5 in-service inspection, tube plugging, things of that type.

6 COMMISSIONER GILINSKY: How accurate are the dosi-
7 meters?

8 MR. MINOGUE: The dosimeters at these dose rates
9 are quite accurate.

10 I wouldn't want to give you a percentage off the
11 top of my head.

12 COMMISSIONER GILINSKY: Like 1 percent, or 10
13 percent?

14 MR. MINOGUE: No, they are not 1 percent.

15 MR. ALEXANDER: 30 percent.

16 MR. MINOGUE: 30 percent.

17 COMMISSIONER GILINSKY: So if somebody is getting
18 100 MR per hour, he might be getting 130 or 70?

19 MR. MINOGUE: Yes.

20 I think that as you get down to lower levels, it is
21 my impression -- I may be wrong, but my impression is as you
22 get up to the 100 to 1 R per hour range, that the accuracy is
23 better than that. But the accuracy in the relatively low level,
24 30, 40, 50 MR is not at all good. As Bob says, you can be way
25 off.

mm 1 COMMISSIONER KENNEDY: What is it at 100, roughly?

2 MR. MINOGUE: Well, my expert says 30 percent. I
3 thought it was better than that, but I would have to defer to
4 the expert.

5 A lot of people in the business think it is better
6 than that, too.

7 I will go on to the first slide.

8 (Slide.)

9 Let me get to the specific topic of this paper, which
10 is transient workers.

11 There are three types of transient workers in the
12 regulated program.

13 The first is something that is almost a thing of the
14 past. I hope it is. And that is the use of what -- not in a
15 joking manner -- I'll call warm bodies. This is the approach,
16 for example, that was used on the cleanup of the Chalk River
17 reactor back in the '50s, which President Carter participated
18 in.

19 And that is an approach where you just bring in very
20 large groups of people to do the job, and they stay as long as
21 they have to to do something, and then you bring somebody else
22 in.

23 I think that is pretty much a thing of the past. It
24 doesn't speak at all to the real safety questions. We discussed
25 it earlier. That is a function of the total manrem exposure.

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1 And you don't really reduce any safety problems if you bring
2 three more bodies. That, I think, is a thing of the past. I
3 mention it for the sake of completeness and openness on the
4 issue.

5 The things this paper is aimed at, are a group of
6 workers who represent highly specialized skills. These are
7 the kind of people who do in-service inspection, specialty
8 welding and so on, who quite often are not utility employees,
9 but are brought in as employees of some contractor, with that
10 contractor often standing in relationship to them more like a
11 hiring hall or a body shop type of contractor.

12 This Vugraph shows this rather clearly. This is
13 based on reactor data because that is the best data we have.

14 We have broken the various areas of exposure into
15 five groups; reactor operations, which I really won't discuss
16 much; and then a group of routine maintenance, this being
17 maintenance that will be done in the normal course of events
18 on any complex thing like a power plant; and then special
19 maintenance, this being maintenance that is directly related
20 to regulatory requirements, or requirements that arise from
21 observations of problems on operating plants.

22 COMMISSIONER GILINSKY: Can I stop you.

23 When you say numbers of workers exposed to radiation,
24 what does that mean?

25 MR. MINOGUE: In an effort to not slant the figures,

mm 1 these are the numbers of workers who are in radiation levels
2 that are high enough to get really meaningful measurements.

3 You look at the bottom of the page, we have got
4 larger numbers for each of these years. This being all of the
5 people who have had enough of a measurement to read something
6 on their film badge. But if we folded those in you would get a
7 picture that would be biased by secretaries and clerical people
8 and people like that who really weren't exposed.

9 COMMISSIONER GILINSKY: What is your threshold?

10 MR. MINOGUE: That, I'm not sure.

11 MR. ALEXANDER: For gamma radiation we would probably
12 say on the order of 20 millirem.

13 COMMISSIONER GILINSKY: So basically this is the
14 number of workers who have received more than 20 millirems as
15 a consequence of being associated with the nuclear industry.

16 COMMISSIONER KENNEDY: Over what period?

17 MR. ALEXANDER: One month.

18 COMMISSIONER KENNEDY: 6200 received more than 20
19 millirems in a month --

20 MR. MINOGUE: In 1974.

21 COMMISSIONER KENNEDY: -- in 1974.

22 MR. MINOGUE: Yes.

23 23,000 in 1976.

24 In any event, if you look at the two rows on routine
25 maintenance and special maintenance, in each case we have broken

mm 1 out the contract workers. And you can see the trend here
2 developing quite sharply in both of these where the number
3 of contract workers has gone up quite substantially.

4 COMMISSIONER GILINSKY: Well in fact the amount of
5 maintenance -- that's right, the number of contract workers
6 has gone up tremendously.

7 Is that as a consequence to our requirements, or
8 what?

9 MR. MINOGUE: Yes.

10 Well, much of what is under special maintenance is
11 either because of our requirements, or identified problems
12 like the pipe crack problems, steam generator problems, and
13 so on.

14 So they have arisen either because of regulatory
15 requirements, or operating difficulties.

16 (Slide.)

17 The next Vugraph shows much the same data, but
18 now we are looking at total exposures in manrem.

19 As you can see, again the same trend relatively in
20 small exposures of contract workers in '74. But in 1976, the
21 last year of complete data, very substantial fraction of the
22 total exposure in manrem is to the contract workers.

23 Commissioner Gilinsky, this kind of touches on what
24 you were discussing.

25 Let's have the next Vugraph.

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(Slide.)

This Vugraph identifies the specific things that we labelled as special maintenance. These figures were based on an effort by Staff to estimate the number of workers involved specifically in these areas. And you will recognize these as being some that are big, current problem areas.

I wanted to apply particularly the radiation level associated with each of these operations.

On the BWR pipe cracks, typically we are talking one rem per hour; a tenth of a rem on the nozzle cracks; ten rem per hour on plugging steam generator tube leaks, and because of this the industry itself has taken a lot of steps to do that operation automatically, or to try to come to grips with the problems both in the redesign of steam generators and better water quality.

For a steam generator replacement, we have an estimate of 1000 manrem.

Snubber test relates to difficulties that people have had with the operability of the snubbers associated with the seismic design. There the rate varies all over the place, and in some areas would be quite high, comparable to numbers --

COMMISSIONER GILINSKY: Let me ask you, how do these numbers compare with, say, the manrems to which the entire population is subject to?

MR. MINOGUE: From nuclear power plants?

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1 COMMISSIONER GILINSKY: Yes.

2 MR. MINOGUE: I don't have that. I wouldn't want to
3 give you a guess off the top of my head.

4 MR. KENNEKE: There is a table that indicates the
5 manrems in medical workers.

6 MR. MINOGUE: Yes. this is only reactors. Yes, I
7 have later on a table for medical workers where you see very
8 high manrem doses there.

9 I just don't have the figures for the general popu-
10 lace. Sorry.

11 Because you have been looking at reactor data, the
12 next Vugraph is an attempt in the numbers -- as we get out
13 of the reactor area, the numbers become less and less solid.

14 (Slide.)

15 It is an attempt to -- from another perspective, to
16 put a handle on it. This is across the whole range of regulated
17 activities. It is a broader base.

18 It shows the number of workers who have had two or
19 more terminations within a single quarter, not just one termina-
20 tion.

21 There is a bit of difficulty here because the
22 regulations are somewhat ambiguous.

23 COMMISSIONER GILINSKY: What is a termination?
24 Reaching the limits?

25 MR. MINOGUE: No. Termination means that they

1 have left the employ -- for sure the licensee. And many licensees
2 have read it to mean, have left the employ of some contractor
3 of his for whom they were working within a radiation area under
4 his control. Recognize that when a worker enters a radiation
5 area under the control of a licensee in a sense he is under
6 his jurisdiction in terms of his exposures.

7 Now some licensees have reported these contract
8 workers as they left, and some have not.

9 One of the things this proposed regulation would do
10 would clarify the definition of termination to make it clear
11 that it includes workers, not just of the licensee directly but
12 also of contractors of his.

13 There are two points to this Vugraph. First, again,
14 it reflects the same trend. And second, it also indicates that
15 the people who are transients have been tending to get somewhat
16 higher doses. That is there is a comparison here which would
17 indicate that there is a factor of four greater exposure of these
18 transient workers. Now granted this is a very small sample, and
19 I am not trying to propose to read too much into that, just an
20 indication.

21 (Slide.)

22 MR. GOSSICK: Can we go back to Commissioner
23 Gilinsky's question. Were you asking what the general populace
24 exposure is?

25 COMMISSIONER GILINSKY: Yes, from reactors.

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1 MR. GOSSICK: Oh, just from reactors, not the total.

2 MR. MINOGUE: I really don't know. I can furnish it
3 to you.

4 MR. KREGER: Yes. Based on measurements last year,
5 a study just completed by P&L for us, showed that the measured
6 population dose resulting from effluents, was probably about
7 5 to 20 manrem per reactor for the existing operating reactors.

8 Our assessed value for a conservative basis on
9 reactors yet to be built, is more like 20 to 40 manrem per
10 reactor here for the 50-mile population.

11 COMMISSIONER GILINSKY: Well, but see, you are talking
12 something like 1000 manrems per year for the existing reactors,
13 roughly speaking, as opposed to 20-some-odd thousand.

14 MR. KREGER: Yes.

15 MR. MINOGUE: With the trend toward the number of
16 manrem per reactor going up, whereas it is going down as far
17 as effluents are concerned.

18 COMMISSIONER GILINSKY: That is quite a difference.

19 MR. MINOGUE: Okay, this next Vugraph summarizes
20 briefly what the present regulatory requirements are.

21 The basic limit today is 1 1/4 rems per quarter,
22 or 5 rem per year, with some provisos in the regulation that
23 permit -- they were originally intended to apply to rather
24 extraordinary cases and actually are applied quite commonly --
25 that permit higher exposure rates if certain specific

1 requirements are met regarding recordkeeping, reporting, and
2 so on.

3 COMMISSIONER GILINSKY: How do you keep these
4 records?

5 Are there records for each individual worker that
6 go along with him in some way?

7 MR. MINOGUE: There are records of overexposures.
8 I'm not -- nothing in this rule change will change the
9 reporting requirements to NRC. I'm not that familiar with
10 them in detail.

11 There are requirements to report exposures over some
12 limit; and there are other requirements to keep records on
13 people in exposures in a lower range, but I don't have those
14 at my fingertips. I'm sorry.

15 COMMISSIONER GILINSKY: Well, but you say the basic
16 limits are 3 rems per quarter if it is known that 5 times N to
17 the minus 18 is not exceeded.

18 MR. MINOGUE: That is just a formulat that relates
19 to the age of the workers.

20 COMMISSIONER GILINSKY: Right.

21 MR. MINOGUE: It really relates to his age.

22 COMMISSIONER GILINSKY: But 5 times that N to the minus
23 18 is the total dose, isn't it?

24 MR. MINOGUE: Well, but the effect of that is really
25 to say that younger people can't be exposed to these levels.

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1 COMMISSIONER GILINSKY: Let me understand. 5 times
2 N to the minus 18 is what?

3 MR. MINOGUE: This is a formula that reduces the
4 level for younger employees. And N is the worker's age, isn't
5 it?

6 MR. ALEXANDER: N is the worker's age. And 5 times
7 N minus 18 formula simply says that each worker can get 5 rems
8 each year.

9 COMMISSIONER GILINSKY: Right.

10 MR. MINOGUE: Unless he is young.

11 COMMISSIONER GILINSKY: So how have you kept the
12 records to know that?

13 MR. ALEXANDER: These are kept on forms that the
14 NRC provides.

15 COMMISSIONER GILINSKY: And when a worker moves
16 around from job to job, does he carry these along with him?

17 MR. MINOGUE: He gets the information, but it is not
18 prompt reporting. It may be some time before the information
19 comes to him.

20 COMMISSIONER GILINSKY: But I mean, who keeps that
21 record?

22 MR. MINOGUE: That record is kept by the licensee.
23 But it is available, as I understand it, to the employees. Not
24 promptly.

25 COMMISSIONER GILINSKY: And when he moves somewhere

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1 else, how does that record move with him?

2 MR. MINOGUE: It doesn't.

3 COMMISSIONER GILINSKY: It doesn't?

4 COMMISSIONER KENNEDY: Does new licensee have any
5 obligation to go to the old licensee to get that information?

6 MR. KENNEKE: If it goes over 1 1/4 he has to get
7 that information. He has to go back into the occupational
8 history.

9 MR. MINOGUE: I am not sure on that specific. If
10 he is under 1 1/4, even under the proposed regulation, he is
11 under no obligation to go back to the employee's previous
12 employer. Even this regulation that we are proposing would
13 have him just ask the employee what, if any, previous occupa-
14 tional exposure record he had.

15 COMMISSIONER GILINSKY: But would you verify that
16 record?

17 I mean, how would you know?

18 MR. MINOGUE: Under this proposed regulation you
19 would not attempt to verify it. You would take the employee's
20 word for it.

21 It should be recognized, of course, in some cases
22 he may not tell you the truth, because it affects his job.
23 That was one of the points you raised as a written question.

24 I think the answer is that you don't get 100 percent
25 coverage. What you are doing is exchanging the burden, a

mm 1 regulatory burden, which should be quite substantial, to tell
2 each utility or other licensee hiring people afresh, that
3 they have an obligation to go back to the guy's prior employer,
4 previous employer directly, to get a report of his exposure.
5 That is a big burden of making inquiries.

6 With this regulation as we propose it, they would
7 ask the new hire, or employee, whether he had previous exposure,
8 and they would accept his answer at face value. Sometimes
9 these guys might not tell the truth. In that case --

10 COMMISSIONER GILINSKY: Would he necessarily know the
11 answer?

12 MR. MINOGUE: Yes.

13 Another part of the rule would be a requirement that
14 if he asks his employer -- let's say that he is leaving company
15 A for work assignment at company B which also would involve
16 radiation. If he asks his employer to furnish him with a prompt
17 estimate, and if his exposure exceeded one quarter of the 1 1/4
18 quarterly limit, his employer or the licensee would be obliged
19 to provide this information to him promptly so that he can carry
20 it with him.

21 COMMISSIONER GILINSKY: Well, why don't you go on.

22 COMMISSIONER KENNEDY: How does he know that he is
23 entitled to this?

24 MR. MINOGUE: Well, he can ask for it. He is entitled
25 to it in any event. If he has not been exposed to these levels

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1 and he asks for it --

2 COMMISSIONER KENNEDY: What prompts him to ask for
3 it?

4 MR. MINOGUE: The fact that he is going to work for
5 another company that would send him to work for a licensee,
6 because he knows he will be asked the question.

7 COMMISSIONER GILINSKY: Would it be too burdensome
8 to have some great central computer storage that would simply
9 keep track of all this?

10 MR. MINOGUE: I think that is more burdensome than
11 what this rule would propose.

12 COMMISSIONER GILINSKY: Have a little address and
13 memory for each --

14 MR. MINOGUE: Well, that's a lot of paperwork flowing
15 back and forth.

16 This is a system that a guy is leaving, and knows
17 he is going to be assigned to another utility --

18 COMMISSIONER GILINSKY: This would be maintaining
19 a data bank on 36,000 people in the power reactor field alone,
20 looking at these data.

21 COMMISSIONER GILINSKY: Well, we maintain some data
22 banks --

23 MR. MINOGUE: Well what we are trying to do here is
24 keep the burden low. This does not -- at no point have I
25 tried to allege that we have got a lot of overexposures. What

mm 1 we are trying to do here is recognize a trend towards growing
2 work, use of these transient workers and create a framework
3 where the utility or the other licensee in whose area they are
4 working, is made aware, with some reasonable assurance, of
5 their previous exposure record, and is also under some obliga-
6 tion to limit their total exposures, and under an obligation to
7 inform employees promptly of what their probable exposures
8 were when they changed employment.

9 But to try to do all that, without creating some
10 gigantic empire of paper flowing back and forth.

11 There is not much paper flowing back and forth
12 here. There is a question on an employment application, and a
13 piece of paper that the guy is handed if he asks for it, as he
14 walks out the door, and that's it.

15 There was a fairly conscious effort here on the part
16 of the staff to keep the burden low, because there is no over-
17 whelming evidence that a lot of people are -- there is no
18 evidence at all that people are getting overexposed to any
19 significant degree, because they are transient workers. It is
20 more a matter of looking at this pattern of employment and
21 the growth in these workers, and recognizing the kind of
22 requirements that we are imposing and the kind of difficulties
23 that are arising, the highly-specialized skills these are
24 calling for.

25 Just recognizing, there is only so many of these

mm 1 guys around. And we are going to see, we are likely to see
2 more and more people working in multiple licensees. We are
3 just trying to come to grips with this problem before it gets
4 big. Right now there really is no problem.

5 But, recognizing there is no real problem, we are
6 trying to keep the burden as small as we can.

7 Let me go on to the next Vugraph.

8 (Slide.)

9 This really seconds what I was just saying.

10 Again, and throughout, these are the workers exposed
11 to fairly hefty levels. You know, this isn't the trivial
12 exposures included.

13 You can see here that the average quarterly exposure
14 compared to a limit of 1 1/4, of workers in these four fields
15 which, except for the medical licensees, is the major exposure
16 groups, is consistently a nice small fraction of the limits.
17 But as reflected, the present program has in effect been working.

18 The next Vugraph is on the medical workers themselves.

19 (Slide.)

20 And at this point, our data bank gets pretty fuzzy. We have a
21 very limited sample from a voluntary program of several years
22 ago where we got some replies, and this is based on that sample.
23 So these are really rough estimates, but give some flavor of
24 first, the large number of workers involved in the medical
25 field who are exposed, the relatively low average dose, and the

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1 relatively small percentage of these, but it is not zero by any
2 means. It gets over .3 rem per quarter. It is 1/4 of 1.25,
3 which is the threshold for the system in this rule falling
4 into place.

5 And in the medical area, if these figures are
6 correct, we would expect only about 4 percent of the workers to
7 be affected by this regulation.

8 (Slide.)

9 This next Vugraph -- and you have anticipated some
10 of these, Commissioner Gilinsky -- this tries to summarize the
11 total exposure in each of these areas, and gives a pretty
12 fair picture that we are dealing here really primarily with
13 power reactors and medical licensees, in terms of where the
14 big manrem exposures have occurred..

15 Patterns of employment that would lead one to expect
16 a high percentage of transient workers. You would expect
17 a lot of that in the commercial power reactors and industrial
18 radiography areas and much less of it in the remaining three
19 areas. We don't have hard figures on the turnover, but probably
20 the highest turnover of any of these groups would be medical
21 workers, and we have some estimates on that, in the range of
22 10 to 20 percent.

23 And of course, now the people turning over, some of
24 them would be affected, 4 percent of them would be affected
25 by this regulation.

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1 COMMISSIONER GILINSKY: Now mining is not included
2 here?

3 MR. MINOGUE: Mining is not regulated by us.

4 COMMISSIONER GILINSKY: By the NRC. It is the Labor
5 Department?

6 MR. MINOGUE: Yes, sir.

7 The exposure in mining is pretty hefty.

8 MR. KENNEKE: Bob, how does that 22.9 compare with
9 the previous 13.5 on prior chart medical?

10 MR. MINOGUE: Well this is everything else, so the
11 13.5 is part of it. But it is the biggest single block. The
12 rest of it is bits and pieces here and there.

13 MR. KENNEKE: You mean it is nonradioactive material,
14 like X rays and --

15 MR. MINOGUE: No it is licensees involved in distribu-
16 tion of radioactive material and so on, who were not --

17 MR. KENNEKE: I see what you mean.

18 MR. MINOGUE: Research facilities and so on.

19 (Slide.)

20 The next Vugraph summarizes the essence of the
21 regulation. Let me just summarize.

22 I have touched on this, but what it really requires;
23 first, it requires a licensee to ask a new employee or a new
24 assignee into a radiation area about his exposure in previous
25 job assignments. He is permitted to accept the answer he gets

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1 at face value.

2 Second, it requires a licensee to take the employee's
3 total exposure history into account in making work assignments.
4 So, in effect, to carry forward the previous exposure burden
5 from the previous job.

6 And it restricts your ability as a licensee to
7 exposed the man forever.

8 And third, it requires licensees to promptly inform
9 a man who is terminating, who asks for it, what his exposure
10 was in working within the radiation area. Estimates are per-
11 mitted. Estimates might be obtained by analyses of the
12 various types of operation, measured radiation levels, times
13 exposed and so on. Or, I think in most cases would be more
14 likely obtained by use of self-reading dosimeters.

15 In fact, if you were to ask what is the main impact
16 of this regulation likely to be, I think one is to even further
17 encourage what is already widespread, which is the use of self-
18 reading dosimeters by people who are working in radiation
19 fields high enough that they are likely to go over one-fourth
20 of the quarterly limits.

21 COMMISSIONER KENNEDY: Is there any reason why that
22 shouldn't be required?

23 MR. MINOGUE: I, personally, think it is a very
24 good practice.

25 When I worked in the Navy program, we required it

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1 of people who were working in such fields.

2 COMMISSIONER KENNEDY: Why don't our regulations
3 require it?

4 MR. MINOGUE: I don't have a good answer for that.
5 Maybe they should. This is kind of doing it through the back
6 door. Maybe we should do it through the front door.

7 Myself, I think it is a very good practice because
8 a guy in that kind of situation, if he suspects something
9 wrong, or the equipment is not of condition he expects -- and
10 I've done it myself -- you just whip the thing off and look
11 through it, and you can look at what your exposure has been.
12 And if it is higher than it ought to be, you know to get the
13 hell out of there.

14 When I worked in the Navy program there were two
15 people on one of the submarines whose lives were saved because
16 of wearing these self-reading dosimeters. They looked at them,
17 they were off scale, they got out of there. They got exposures
18 of one or two R instead of being killed.

19 So I think it is very good. A very large percentage
20 of the licensees -- we are really talking here only about
21 the higher levels, you certainly don't need this kind of equip-
22 ment for lower levels -- but a very large percentage of
23 licensees already do this just as a matter of good engineering
24 practice. So maybe we should require it.

25 I want to look into some of the impacts of that.

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1 COMMISSIONER KENNEDY: Independent of this, would
2 you do that, please?

3 MR. MINOGUE: Yes, sir, I will.

4 The other effect that I think this regulation will
5 have, is that because it puts more of a burden on a licensee
6 to be concerned about the guy's total exposure, I think it
7 should reduce some of the exposure of people in this transient
8 worker group. I think that will have some effect at reducing
9 exposure. I don't think it will be dramatic, but it will be
10 an effect.

11 The next Vugraph may be missing from the projector.
12 Do you have the one on costs?

13 Okay, we have the one on costs, which is in the
14 stack the public has. These costs were really obtained
15 through the operations of an AIF special task force which has
16 taken a hard look at this question as it relates to some of
17 these activities integrated on the Vugraph, and has come up
18 with an estimate of costs.

19 These costs are quite low. I think that reflects
20 the very careful effort we have made to minimize the undue
21 regulatory burden. And in fact I would describe these as really
22 di minimus costs. They are low enough that they are almost
23 indeterminate.

24 COMMISSIONER KENNEDY: Less than \$1000 a reactor.

25 MR. MINOGUE: Yes.

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1 (Slide.)

2 The next Vugraph gives some summary of this AIF
3 participation.

4 I will say a good word for AIF for a change. I
5 think that the general attitude that they have taken as an
6 organization towards many of these questions involved in
7 radiation exposure and occupational work, has been very
8 constructive. They have done a lot of very good work trying
9 to come to grips with some of the problems, come up with
10 alternate approaches and so on. And this certainly is an example.

11 They have attempted to give us an input to this
12 proposed regulation. And as I understand it, they have been
13 quoted to me, that they feel that what we have proposed here
14 is a good, workable solution.

15 COMMISSIONER GILINSKY: Have you had any discussions
16 with any other groups that are --

17 MR. MINOGUE: There were some discussions with AILMA --
18 I'm sorry, sir, I didn't hear the end of your question.

19 COMMISSIONER GILINSKY: That have been concerned with
20 occupational doses, or labor groups, or --

21 MR. MINOGUE: Yes. There was a union representative
22 on this AIF group from the International Brotherhood of
23 Electrical Workers.

24 That struck me as a little odd. But in preparing
25 for this briefing, I am assured by some of my associates, that

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1 many of the workers involved in doing this kind of work are, in
2 fact, members of that union.

3 So I think that is a reasonable effort to get some
4 input from the workers.

5 COMMISSIONER GILINSKY: What about other groups?

6 I think we had a petition here, was it from the NRDC,
7 on occupational doses?

8 MR. MINOGUE: Yes, sir.

9 The NRDC petition speaks to an issue we have touched
10 on peripherally through this briefing, which is what the limits
11 should be.

12 There are kind of two ways you can come out with
13 occupational exposure. You can look at the speed limit. That
14 is, you can look to changing the limit without giving that
15 much concern as to how many people are exposed; or you can put
16 emphasis on ALARA, that is the concept of trying to reduce the
17 total exposure.

18 The approach reflected in this rule is really more
19 the ALARA type of approach, and I think the NRDC people
20 generally have put much more emphasis on the speed limit
21 approach, reduce the exposure limits.

22 COMMISSIONER GILINSKY: But, did you contact them
23 at all in getting comments from them?

24 MR. MINOGUE: On this paper? No, sir, I don't
25 believe so. Not to my knowledge.

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1 We have discussed the limit question with them, of
2 course, on a number of occasions.

3 COMMISSIONER KENNEDY: It is proposed -- this paper,
4 as I understand it, it is proposed by the Staff that this paper
5 be put out for comment in any event, is that correct?

6 MR. MINOGUE: Yes, sir.

7 Without faulting them, I don't think that they have
8 generally shown much interest in this approach to the problem
9 of reducing exposures. This is not the way they think you do it.

10 It happens to be the way I think you do it. So we
11 just have a difference of opinion.

12 (Slide.)

13 The last Vugraph discusses, in an effort to be
14 responsive, some of the questions that we have gotten back
15 from various Commissioners; discusses some of the alternatives.

16 The first one is an entirely different approach.
17 This was one that Chairman Hendrie raised, which is, couldn't
18 we just set a daily or a weekly dose limit for transient
19 workers.

20 The Staff's view on that is that this is much too
21 complicated to use as a basis for regulation. You would need
22 a data base where you really knew all the operations, what the
23 dose rates are, what the times of exposure are.

24 You know, there are so many commutations and
25 permutations, it seems to us that you are better off if you

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1 basically put this burden on the licensee, who is more
2 directly involved with the operation of the plant rather than
3 try to do it through tech specs.

4 COMMISSIONER KENNEDY: If I understand this
5 correctly, this would not limit or eliminate the burden
6 either, of ascertaining what exposure the man had already
7 received? You still have the same problem?

8 MR.MINOGUE: That's right, it doesn't change that at
9 all. It doesn't change that at all.

10 But if I understood the comment, and I got it
11 indirectly, what Chairman Hendrie was talking about would be
12 more a matter of trying to establish some specific requirement
13 that you would really implement to the licensing process in
14 terms of your review of the man's ALARA program.

15 Of course we do a lot of that already, put the
16 emphasis there. But specifically geared to the question of
17 transient workers. And I think the consensus of Staff is that
18 that just gets too complicated, and it would require more
19 detailed information about the details of the plants than we
20 really have at hand.

21 It also would eliminate some flexibility that I
22 do think you need. Many of these operations involve very
23 high levels of particular skills, and you need a framework
24 where you can make a decision to permit exposure of some
25 worker because he is the only guy that is qualified to do some

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1 particular operation, rather than have somebody do it that
2 isn't really qualified. I think you need some flexibility in
3 the area of occupational exposure.

4 The other three items on this Vugraph reflect three
5 possible approaches to the coverage of this rule. In presenting
6 it I have made no effort to gloss over the fact that our data
7 gets softer and softer as we get away from reactors.

8 What we have recommended here is to apply this
9 regulation to all licensees. But there certainly are viable
10 alternatives. That is the second one.

11 The third one would be to apply only to the reactor
12 licensees, where we have got a good hard data base, and a good
13 impact assessment, and where clearly a major problem exists
14 where you have both high manrem exposures and a large number of
15 transient workers involved.

16 Another possibility would be to broaden that some-
17 what and cover the radiographers, the processing plants, and the
18 manufacturers of radioactive products -- this being a group that
19 already has special reporting requirements imposed on it. It
20 would basically expand these somewhat.

21 And then, of course, the final, which is what the
22 Staff people paper recommends, is to cover all licensees, which
23 would also pick up the medical licensee. If there is any con-
24 troversy that would develop out of putting this regulation out,
25 it would be in the medical area. Our data base is a bit soft,

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1 and generally speaking the medical profession does not welcome
2 this type of action on the part of this agency.

3 So I think I can predict what we recommended may
4 raise some controversy in the area of medical workers.

5 COMMISSIONER KENNEDY: Presumably, if that arises,
6 we will hear from them on public comment?

7 MR. MINOGUE: Yes, sir, this is going out for
8 comment.

9 (Laughter.)

10 Well, that terminates it.

11 COMMISSIONER GILINSKY: Is that about it?

12 MR. MINOGUE: Yes, sir, that's it.

13 COMMISSIONER GILINSKY: Are there any other comments
14 on this?

15 (No response.)

16 Well, why don't you let us think about this.

17 Thank you very much.

18 (Whereupon, at 2:20 p.m., the hearing in the
19 above-entitled matter was concluded.)

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