March 18, 1961

Files

Clifford K. Beck, Assistant Director
Nuclear Facilities Safety, DLAR

INFORMAL NOTES ON LONDON MEETING OF ISO WORKING PARTY
ON REACTOR SITING

The following persons were present at the meeting:

Clifford Beck, U.S. (Chairman)
George Laurence, AECL, Canada
Milan Osredker, IAEA - Division of Reactors
Erich Stauber, Frankfurt, Germany (AEG)
A. Manoux, French AEC
F. de Vathaire, Saclay, France
L. Vinarnick, French Standards Organization
S. W. Joslin, U.K. Ministry of Power
F. R. Farmer, U.K. (AEA)
R. Kenneth Thomas, U.K. - British Standards Institute.

The general plan of the meeting was for each person or group represented to discuss his approach to the problem of reactor siting.

Canadian Approach - Dr. Laurence:

Canada has not developed a systematic procedure for location of reactors but considers each one by committee evaluation on a case by case basis. Some of Dr. Laurence's observations follow:

a. There is an unbalance of emphasis on protection of the public versus a lack of interest on protection of workers.

b. He believes reactor siting should be based largely on the "risk", i.e., the likely number of fatalities per year.

c. He would put greater emphasis on evaluating effectiveness and reliability of safety devices. He believes too much emphasis is put on safety of normal operation and not enough on abnormal situations. He thinks reactors will move closer to population centers but at this time Canada will not put large reactors in centers of population. He would very much disapprove a rule to prevent this, however. Canada now puts reactors in thinly populated areas and he believes experience will afford a sufficient degree of safety as population increases.

A/235

d. Dr. Lawrence believes, with the British, that people close in to a reactor site should count disproportionately higher in relation to the dose they might likely receive than people further out.

IAEA Activities - Mr. Gorodkar:

It was explained that IAEA's present major interest in the site question relates to suitability of harbors for nuclear ships. They are heavily involved in harbor evaluation problems. Mr. Gorodkar explained that they consider that the first step must be to establish some upper limit of hazard, not the maximum credible accident which is "purely speculation", but a realistic appraisal based on experiment and other evidences of what might be actually released to the atmosphere from a ship. The second step is to consider environment and the impact this upper limit of hazard might have. Time factors are important. Isobaric maps should be prepared in which actions to avoid hazard or doses which would be received must be considered in evaluating each particular location. As a separate item there should be a continual emphasis on prevention of all accidents. Probabilities are important here, and safety would be achieved in lowering probabilities of accidents, but the crucial question in site or harbor evaluation is not probability of accidents but what is the largest accident one must reckon with.

The German Approach --- Dr. Stauber:

Dr. Stauber stated that his present paper has been prepared largely in response to a paper given at the Geneva ISO meeting (1960) on Procedures for Site Evaluation (ISO 5686) with which he does not agree. "Risk", as proposed in the U. S. paper, "is not" a measure of safety to be considered in site evaluation, rather severity or "efficiency" of likely accidents is the important question. Stauber arrives at a maximum credible accident, assumes 25 rems to the body or 25 rems to each organ as permissibly acceptable, then makes detailed calculations of what might be released from a reactor giving full consideration to all safeguards and safety devices and concludes that "if one can stay on the edge of an exclusion area for 24 hours after the maximum credible accident without exceeding the permissible dose, then the site is acceptable."

Dr. Stauber's comments on a paper by Dr. Wirtz (Karlsruhe - unpublished)

Dr. Stauber said that Dr. Wirtz's paper is more from an academic viewpoint and does not lead to practical conclusions or recommendations though it has many interesting ideas. It gives a good method of considering wind distribution over a period and contains some other excellent calculational techniques. It is an over-all excellent theoretical study but does not employ practical considerations in deciding or which would lead to a method for site selection or evaluation.

Dr. Stauber's comments on German Government Attitude:

He states that the German government approach to reactor location is "at this time a great trouble". There are many German scientists who are influential in this problem but who have not come to a practical standing. He feels there is great need for education of the authorities and understanding of the problems of reactor location. Apparently, however, the German government now appears to be inclined to accept 25 rems to the body or 25 rems to organs as an accidental emergency dose.

The French Approach - Mr. Manoux:

France has not developed a systematic policy for location of reactor sites. A report has been written (CEA #1724) in which consequences are calculated for the releases of 1 MW of fission products into an environment.

The British viewpoint - Dr. Pärmer:

This has been discussed in other sections of this report and at this place only some brief miscellaneous notes will be added:

a. The British have not adopted a permissible exposure dose which may be used in site evaluation. They have adopted an "action dose" for use in post-accident decisions. If there is danger that thyroid dose of children after an accident will exceed 25 r., then remedial action will be promptly taken to prevent it, if possible.

b. Dr. Pärmer stated that their basic approach revolved around such questions as these: how do you decide about a city of 50,000 removed a distance from a reactor site as compared to a small village of a few thousand very close by? This led to their procedure for evaluation of sites by weighting population importance according to the square of the exposure doses which they might receive.

The American viewpoint - Dr. Beck:

The recently published proposed guides to the selection of sites were described and explained. There was considerable discussion. The other members present generally felt that the distance requirements were too much for application in other countries.

Actions Taken by the Working Party at the End of the Meeting:

a. It was agreed that the ISO Working Party should encourage persons now known to be working on site criteria and selection procedures to publish their papers or at least to prepare drafts which would be available to the Committee.

b. It was agreed that meteorological applications and fallout depositions are important to site selection and people having capability in this subject should be invited to the next meeting of the Committee.

c. It was agreed that there appear to be a number of common elements in the various approaches now being developed on the site problem and there appears to be basis for hope that some eventual general agreement on at least some basic principles can be agreed upon, which is the goal of the ISO group. It was further agreed, however, that considerably more exchange of information, papers and perhaps conference discussions, such as took place with a very small number of people at this particular meeting, would be necessary before the ISO effort on consolidation of ideas could effectively proceed.

d. The representative of IAEA stated that his organization had tentative plans for a small conference, for informational exchange purposes only, tentatively planned for the fall of 1961. He suggested that this conference might coincide with the needs recognized by the ISO group in their present meeting and that perhaps the conference should be planned jointly by the two groups.

There was favorable response to the suggestion of Mr. Gerecker, and the Chairman agreed to explore the possibilities of a small meeting on reactor siting in the fall of 1961 to be sponsored by IAEA or jointly sponsored by IAEA and the ISO committee.

e. It was agreed that perhaps in 1962 more definite work toward the ISO objective for the working party on reactor siting might be effectively scheduled.

f. The group decided that it did not seem appropriate to schedule a meeting in June at Helsinki as had been suggested.

g. Dr. Stamber expressed in behalf of West Germany an interest in becoming a formal member of the working party on reactor siting. The Chairman agreed to explore the possibilities with the parent organization.