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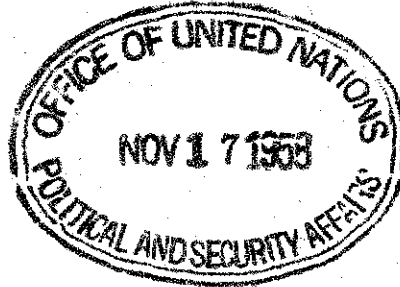
FROM : S/AE : J. Robert Schaezel

SUBJECT: Safeguards over the Export of Nuclear Materials

Attached for your information are copies of two memoranda reporting on a meeting held in Ottawa on November 5 concerning the safeguarding of export of nuclear materials. This meeting was attended by representatives from South Africa, Australia, the United Kingdom, the United States and chaired by the Assistant Under Secretary for External Affairs of Canada.

Attachments:

Copies of two memoranda.



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November 7, 1958

Meeting in Ottawa to Discuss Safeguards.
(November 5 and 6, 1958)

Canada - Mr. LePan, Chairman - External Affairs
 Mr. Langley, External Affairs
 Mr. Gray, ACL
 Mr. Watson, ACL
 Mr. Pollack
 Mr. Williamson, Canadian Embassy, Washington

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UK - Mr. Michels
 Australia - Dr. Baxter, Chairman Australian AEC
 Mr. Homer, Acting Australian High Commissioner
 South Africa - Mr. Fincham, Acting South African High
 Commissioner
 Dr. Shuttleworth, South African Embassy,
 Washington

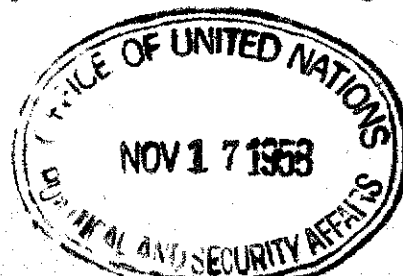
US - Mr. Wells, AEC
 Dr. Kratzer, AEC
 Mr. Armstrong, American Embassy, Ottawa
 Mr. Schaezel, S/AE, Department of State

(NOTE: The following notes are supplemental to a record of the meeting which will be prepared by Mr. Langley and circulated for the information of the participants.)

Mr. LePan proposed that the group consider three aspects of the safeguards problem: (1) the general prospects for effective control of atomic energy materials; (2) the kinds of safeguards which would be most suitable, in this connection the discussion might cover the UK and Canadian papers; and (3) consideration of questions apt to arise in carrying out a feasible program of control.

Mr. Fincham said that unfortunately the limitation of time and the problem of geography prevented the attendance at the meeting of a responsible South African representative and, furthermore, he and Dr. Shuttleworth were without instructions. It was therefore necessary that they participate in the meeting as observers.

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Dr. Baxter said at the outset he hoped the group would consider whether any system at all which will be effective can be devised.

With respect to the papers before the group, Mr. Michels cautioned that their document had not been sent to the Ministers and was therefore only the non-official views of the UK Government. He called special attention to the fact that the first three sections of their paper raised, he believed, all of the difficult problems needed to be solved before an effective system could be brought into being and acknowledged that the final section of their document, which laid out a possible safeguards system, did not flow logically from the earlier analysis of the problems. Mr. LeFan and Mr. Gray noted in contrast that the Canadian paper had received Ministerial approval.

With regard to the first section of the Agenda, Mr. Gray expressed the view that it would be possible to get international agreement of the safeguards system along the lines they had proposed if the interested countries wished to do so. He noted that Canada was fortunate in having a somewhat simpler problem than, say, the United States in that it was only concerned with the control of natural uranium at this juncture. The Canadian proposal was for an audit system. The Canadians were not prepared to argue that diversion could not take place under their scheme, although they felt that such diversion would subsequently be detected. Mr. Gray disagreed with earlier expressed US ideas that it would be possible to install resident inspectors abroad.

Dr. Baxter said that he was in somewhat the same position as the South African representatives; that he had been away from Australia for several months and that his Government had taken no position on this problem up to the present time. However, his Government was in favor of controls if a workable system could be devised. In his case his interest had been academic as far as Australia was concerned because of the CDA contracts for their available production. However, the CDA had recently suggested the termination of the contracts and the outlook, therefore, was for new production looking for markets. This situation would undoubtedly raise difficult political and economic problems for his country. A further complication is the fact that this production would be high cost uranium. The problem as he saw it was the difficulty of working out a plausible scheme. He had doubts that this

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could be done purely from a technical standpoint, that the nature of the problem was such that any system would be exceedingly complicated, that it would have difficult political overtones, and that it would have a high cost in money and manpower. He felt that a system would probably work for countries which had no intention of developing nuclear weapons; that those countries which wished to do so would either go ahead on their own or would find it easy to evade the system. It was his judgment that once a country made a decision to manufacture weapons the decision would be announced overtly and therefore an elaborate safeguards mechanism would be an anachronism. Almost any country that wants to develop weapons can find the uranium which, unfortunately, is a plentiful mineral and the technical problems of constructing bombs are not such as to deter countries with reasonable industrial competence. Dr. Baxter concluded by saying that these were the factors that made him most skeptical about the possibilities of developing an effective system.

Mr. Wells said that the United States shared some of Dr. Baxter's worries about the technical aspects of the problem and had given a great deal of attention to the subject.

Mr. Gray said that they were thinking about an arrangement which would at least hold the situation together for twenty to thirty years and were not sanguine about the permanence of a control scheme. Mr. Schaezel said that the United States had consistently thought about safeguarding atomic energy materials in the context of ultimate agreements with the Soviet Union. In the absence of some such agreement he personally doubted whether any control of the peaceful uses of atomic energy would have substantial meaning, but, on the other hand, if the Western nations did not concert during the early development of atomic energy with the objective of setting up compatible accountability systems and preliminary arrangements for safeguarding atomic energy development, we might have lost a precious opportunity which could not be subsequently recovered and which would enable us in the event of an agreement with the Soviet Union to fit the production of fissionable material into an over-all international disarmament arrangement.

Mr. Gray felt that the Canadian system would work, but probably only for governments that can be trusted. He suggested that if a country has the intention of developing nuclear weapons, then nuclear materials should not be exported to them. He went on to say Canada could not afford to pay the cost of the more comprehensive US approach which he had debated with AEC officials over the years.

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Dr. Baxter felt that some of his reservations on the feasibility of a safeguards system would appear to be met by the approach set forth in the Canadian paper.

Mr. Michels said that the UK had consistently followed the US line on safeguards, although he admitted they had always been skeptical as to whether it could be negotiated and implemented. He felt, for instance, that any arrangement designed to detect a small percentage of diversion was impossible; furthermore, his Government felt that resident inspectors was not a politically feasible course of action. He went on to say that all the governments around the table had both domestic and international political considerations to take into account. In this connection the Labor opposition had consistently insisted that the Government maintain effective control over exports of nuclear materials. He did not feel that this attitude was necessarily a controlling factor but was merely one aspect of their internal political problem. Remarking on Mr. Gray's suggestion, Mr. Michels said he did not believe it would be possible to discriminate openly between customers. He thought that the potential "bad boys" were Japan and India. He suggested that one of the advantages of a control scheme was not so much to prevent such countries from developing weapons as it was to make it more difficult than would otherwise be the case. He added the thought that even a modest atomic energy control scheme, if accompanied by agreement on nuclear test suspension, would be effective in discouraging nations from embarking upon weapons programs, for testing is such an essential ingredient of a military program. He inquired as to whether a more modest scheme would be acceptable to the United States in the light of the political situation prevailing and with particular reference to the 1954 Act. Mr. Wells noted that the 1954 Act did not give the Executive Branch explicit orders on the nature of the control which should be effected over atomic energy materials other than the fact that there must be governmental guarantees from the receiving nation. He noted that the debate on the IAEA statute, however, had brought out the interest on the part of the Joint Committee in seeing that a thoroughgoing control system was developed by the Agency with respect to the materials supplied to it by the United States.

Mr. Schaezel said there was one further factor which was the fact that during the hearings on the US-Euroatom program, contrary to expectations, the Joint Committee had shown no interest in the proposed safeguards arrangements.

Mr. Michels said that he felt it necessary to repeat what he had said on previous occasions, which was that the US-Euroatom

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arrangement on safeguards, which undoubtedly was desirable for other reasons, had the effect of undermining the de jure principle of outside inspection. He went on to say that in his view the Euratom countries and the Community itself would undoubtedly develop a very effective system, but it was the principle that had been harmed. Mr. Schaezel reiterated points he had made earlier which were that Euratom had a truly international control system, that it had the unique role of governing all of the atomic energy activity in the Community, and he summarized the central elements of the US-Euratom arrangements on this subject. He also noted that as far as the de jure principle is concerned, this had been thrown in the face of the US negotiators repeatedly by Euratom who had said they were prepared to accept the same sort of arrangements which the US had with the UK and Canada.

Mr. LePan asked what we knew about the Soviet attitude on safeguards and what their position was likely to be. Mr. Michels replied that he had a number of conversations over the last two years with Emelyanov. From these discussions and other contacts with the Russians it was clear that they had reservations on technical grounds with respect to safeguards and they were also very skeptical about the possibility that many countries possessed the competence to make nuclear weapons. In this connection, Emelyanov had commented in the course of a private discussion at Vienna on the incredible incompetence of the Egyptians, who the Russians had been cooperating with for several years. Mr. Michels said the Russians were putting no safeguards conditions in their bilaterals as they were making available only small reactors; the Russians had argued that it made no difference. One interesting sideline of the Soviet attitude on this point was the sharp change in attitude shown by Mr. Emelyanov when he had first heard of the agreement between the UK and Japan for a power reactor. The Soviet attitude here was the great concern over the possible misuse of the material by the Japanese.

Dr. Kratzer said that he disagreed somewhat regarding the degree of effectiveness which was possible of a control scheme from a technical standpoint. Certainly the US experts had never argued that any system was 100% accurate, but the assurance of effectiveness increased rapidly with the extensiveness of the system. He argued that once a substantial degree of effectiveness was achieved then the possibility of detection was sufficiently real that this added immeasurably to the overall effectiveness of control. He questioned the utility of an

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audit system as giving significant assurance of control against diversion. The AEC had examined this approach and had reached the conclusion that the effectiveness was in the range of a 4% probability of detecting 1% diversion. He said that it might be possible, of course, to have a 50% or 75% possibility of detecting a 5% diversion.

There was some discussion of the possibility of regional bodies carrying out the inspection function with IAEA audit. It was noted that aside from the OEEC and Euratom there was little likelihood of effective regional bodies being organized. There was general agreement that if regional inspection teams were to be accepted, with Agency audit, and should the Soviet Bloc be organized as one such regional body, that this would not necessarily be adverse to Western interests. This conclusion was reached by considering the alternatives that were realistically available and that, therefore, an Eastern control system subject to Agency audit and set up on compatible accounting procedures would be a net gain.

The Chairman asked that Mr. Watson summarize the Canadian paper. The latter noted that it was limited to natural uranium, leaving out the consideration of heavy water, special nuclear material and reactors. It rested on the premise that 100% effective control was impossible under any system and that audit and spot inspection would provide as effective control as could reasonably be expected. He noted that their approach would have the effect of re-enforcing the moral obligation of countries to honor their commitments which was analogous to having policemen available in sufficient number to deter the criminal but not to have one policeman assigned to each potential criminal. Canada did not envisage substantial uranium exports over the next few years nor did they see that appreciable quantities of fissionable material would be produced. The cost to them of their approach was somewhere in the range of \$10,000 to \$20,000 per year over the next five years which was largely to cover the travel of the Canadian experts who would stay no more than one or two days where Canadian uranium was being used.

Commenting on the technical problems of accurate detection, Mr. Gray said that the United States and Canadian experience was relevant. In connection with their 30, 40 and 50 MW experimental and test reactors, and bearing in mind that there was a complete exchange of information and access to the facilities, that when the completed fuel elements were processed by the US there was an average 75% error in the plutonium actually separated. He argued that if in this situation there were errors of such magnitude, it was impossible to devise a system which would be

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effective to the degree of precision hoped for by the American experts.

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In discussing the relationship of bilaterals to the Agency, and in answer to the question as to the problems of reaching a safeguard agreement within the Agency, Mr. Wells agreed with Dr. Baxter that it would certainly not be easy. He stressed, however, that the countries around the table should by all means maintain a common approach, that there should be no difference in the intensity each applied in the interim under their bilateral arrangements. Mr. Michels noted the importance of helping Marshal Smith but stressed that this must be done in such a way that neither he nor his staff were compromised. The UK had named an officer who would be assigned to Smith's staff and prior to his departure in December Mr. Michels felt that he should be fully briefed on the position the five countries wished to have established in the Agency. It was agreed that these men assigned to the Agency staff must not be influenced in their work once they have assumed their Agency responsibilities. It was also the consensus of the group that none of the nations participating in the meeting should publish any scheme before the Agency itself acts. A thorough briefing of the nationals assigned to the Agency will enable them to come forward with proposals acceptable to the five nations and then it is of the utmost importance that the five speak with a common voice. Mr. Pollack suggested that perhaps one of the best tactics would be for the Agency to announce a minimum system to deal with the immediate problems which would arise, clearly indicating that more extensive arrangements were required in the future.

Dr. Baxter observed that the East and the West appeared to be drifting farther apart as far as the Agency was concerned and he was inclined to feel that the end result might be agreement that each side would be responsible for inspection on its side of the curtain. He also noted the tendency to drift away from the earlier idea that materials should be supplied through the Agency. He felt that the division between the East and the West is such that neither side would be prepared to accept inspectors from the other.

Mr. Michels felt that there was a real problem concerning control of the 5,000 kilograms of material which the United States had committed to the Agency. In case Rumania came forward with a project and there were unsatisfactory safeguards arrangements devised by the Agency, what then would be the position of the United States on seeing this material going to the East.

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Mr. Michels summarized the UK paper, indicating that Annex B envisaged a system of controls generally similar to that outlined in the Canadian document. He noted that they would wish to have the Agency do the job for any bilateral system of controls which might subject the British to the accusation of being engaged in atomic colonialism. The Canadians agreed with this view and said they, too, could not envisage exercising bilateral rights on anything other than a limited interim basis. The Canadians and the British said that they had taken no action to implement the rights they had in their present agreements nor was there any immediate prospect of their doing so. Mr. LePan observed in passing that the UK paper reminded him of the title of a book by George Santayana, "Skepticism and the Animal Faith".

Mr. Gray asked that in the event the Agency fails to reach agreement on the safeguards program would the UK be prepared to implement a safeguards system bilateral. Mr. Michels did not answer this question but remarked that there appeared to be a good chance of gaining agreement within the Agency. He and Mr. Gray agreed that there were several years yet before the problem of control became acute. Mr. Michels said that the British experts felt that if Japan were interested in developing a nuclear weapon, at the most two to five years would be added to the time required if the Japanese were inhibited by controls. There was further agreement that should the Japanese program move ahead more rapidly than now seemed to be the case, there would still be only small amounts of plutonium available before 1965 or 1966. The conclusion drawn from this time schedule was that it appeared we would have until about 1961 to reach agreement within the Agency, with the consensus being that we would know considerably before that time whether or not we would succeed in reaching agreement with the Soviet Union on such a system. which amount Japan?

Dr. Baxter suggested that countries using natural uranium as reactor fuel would almost inevitably disclose a program of diversion as they would have to fuel at about five times the normal rate, for short irradiation periods, if they were to produce significant amounts of plutonium for military purposes. He suggested that the pattern of uranium consumption would, therefore, disclose national intent.

Mr. Michels raised the question of how chemical processing would be handled. At this juncture only the US and the UK have plants which could handle the natural uranium which the Japanese have requested from the Agency. His question was that if this material is sent to the US or UK for processing, would these countries be prepared to accept IAEA inspectors to supervise this part of the process. He added that the UK would not.

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Mr. Wells said that the US had a problem similar to that of the British in that our plants are handling military material. Of course, in the future we anticipated that there would be chemical plants built to handle exclusively peaceful fuel. One answer would be to make a theoretical determination of the maximum amount of plutonium which could have been generated in a given assignment of depleted fuel and then transfer this quantity to an Agency storage plant.

Mr. Pollack asked whether a consensus had been reached on the desirability of the five countries obtaining safeguards rights in their sales arrangements. Mr. Fincham said that he could not commit his government on this point. He said that he knew nothing about a South African-Japanese uranium deal, despite various references to this in the press. As a clue to South African Governmental action, he said that the responsible minister had made the point that in South Africa other nations were involved in the export of uranium and that it was in the South African interest to cooperate with her allies in this endeavor. He said, however, that South African producers were worried about future markets.

In terms of future schedule it was generally agreed that it would be useful to have a further meeting of the same countries, perhaps in mid-January, to consider a draft paper outlining a safeguards system the five nations could support. Mr. Wells thought it would be possible for the United States to commit itself to provide a paper on its ideas, as the Canadians and the British had already done, by mid-December, which could be circulated to the other four countries. He also promised to provide within the next week or so a copy of the technical memorandum which had been prepared by the AEC staff setting forth the techniques of control and the numbers and types of personnel required. These requirements have been developed for different degrees of assurance of detectability and it was stressed that they were not intended to imply any particular policy conclusions.

There was some discussion of the dilemma of who pays for inspection, with the consensus being that this charge could not be handed on to the user and, in fact, the silence in the bilateral agreements on this point implied that it would be a cost on the supplier. It was emphasized that this could be a substantial problem as far as the Agency safeguard system was concerned in that the safeguard function would be performed by the Agency without charge to either party only in the case of Agency projects.

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The question was raised about the amount of uranium which might be shipped free of controls. Mr. Gray and Mr. Kratzer both said that the two ton maximum figure had been arrived at by the calculation that ten tons was a sufficient quantity to pose problems and with five potential supplier countries, each providing two tons, one would still be just short of the danger point.

Mr. LePan said that Mr. Robertson thought it might be useful to have a more informal exploration with the new Soviet Ambassador about the current ideas of the Russian Government on the problem of safeguards. Mr. Robertson had rather close working relationships with the Ambassador in the past and it was thought the conversation might produce some useful information. Both Mr. Michels and Mr. Schaetzel felt that an informal exchange on this subject would be useful.

Mr. Michels inquired as to the response either Canada or the United States would give to a request from India for special treatment. He was assured that neither country had any intention of modifying their present policies. Mr. Schaetzel called the attention of the meeting to the fact that the United States was prepared to lease heavy water to the Indians but that this arrangement had been arrived at only after lengthy negotiations and with the proviso that the Indians would accept inspection as long as the material was owned by the US--noting that it had been their suggestion that this was one way out of the impasse. He agreed, in answer to requests, to circulate a copy of the letter which was sent to the Indians to Mr. Michels and the others for their information.

As far as the prospects of Indian cooperation in the safeguards field was concerned, Mr. Michels felt there were no grounds for Roger Marshal Smith's optimism about cooperation from Bhabha and the Indians. In reply to Mr. Gray's observation that the conversation he had had in Vienna seemed to show some new sympathy on the part of the Indians, Mr. Michels said that he had seen Bhabha subsequently in London and he was back on the same line again.

S/AE:JRobertSchaetzel:rvm

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Record prepared by the Canadian Delegation of a meeting held in the Conference Room of the East Block of the Parliament Buildings in Ottawa on November 5, 1958, to discuss "The Application of Safeguards to Nuclear Exports."

Present:

In the Chair:	Mr. D.V. LePan	Department of External Affairs, Canada
Australia	Professor J.P. Baxter, C.B.E.	Chairman, Atomic Energy Commission
	Mr. F.T. Homer	Acting High Commissioner
Union of South Africa	Dr. C.B.E. Fincham	Acting High Commissioner
	Dr. M.G. Shuttleworth	Scientific Attaché, South African Embassy, Washington
United Kingdom	Mr. M.I. Michaels	Under Secretary, Atomic Energy Office
United States of America	Mr. Algie Wells	Atomic Energy Commission
	Mr. J. Robert Schaetzel	State Department
	Mr. Willis C. Armstrong	Embassy of the United States
	Mr. Myron Kratzer	Atomic Energy Commission
Canada	Mr. J.L. Gray	President, Atomic Energy of Canada Limited
	Mr. D. Watson	Atomic Energy of Canada Limited
	Mr. S. Pollock	Department of Finance
	Mr. J.C. Langley	Department of External Affairs
	Mr. H. Williamson	Canadian Embassy, Washington

The Chairman welcomed the participants to Ottawa. He regretted the short notice at which the meeting had been called but hoped that all would agree that there was some urgency in seeking to reach a meeting of minds on the subject to be discussed. Not only were some countries faced with the problem of deciding what type of safeguards system they wish to apply in fulfilment of the obligations incurred under their bilateral agreements, but a number of developments, such as the establishment of precedents for uncontrolled exports of nuclear materials and increasing commercial pressures for the latter, were also occurring which would make it increasingly difficult as time passed to secure international agreement for a satisfactory safeguards system. In his view, the chances of doing so were greatest before atomic energy became commonplace in the public mind. He suggested that the meeting might discuss the subject in three phases:

- (a) what were the prospects for an agreement on safeguards?
- (b) what sort of safeguards system might be appropriate, workable and acceptable under present circumstances?
- (c) what further action would be required to promote such a system?

2. Several delegations expressed appreciation that the meeting had been called. The South African representative explained that the South African authorities were most interested in the subject and welcomed the opportunity to take part in the meeting; however, the time factor had not permitted them to make adequate arrangements for representation or for the preparation of instructions, and his participation would therefore be as an observer.

PROSPECTS FOR AGREEMENT

3. The Australian representative stated that, while he had no definite instructions, he knew that the Australian authorities were in favour of a safeguards system if one could be devised. The question had been academic for Australia until recently, since the Combined Development Agency had been purchasing the entire Australian uranium output. CDA had, however, recently indicated a wish to terminate its contract and this would create an Australian uranium surplus and consequent domestic problems. In his view, it would be difficult to devise a safeguards scheme which would work for a country which really wished to divert materials, particularly since the advance of technology and the wide availability of uranium meant that many countries could now put together a crude bomb. A safeguards system posed many technical problems (such as those outlined in the U.K. paper) which would require careful thought.

4. The U.S. representative said that his country had done a good deal of work on these technical problems, on which he might be able to circulate some information shortly. His attitude was one of cautious optimism and he considered that the issues at stake were so important that the United States and friendly countries had no alternative but to work towards an agreement on safeguards. Mr. Schaetzel added that this could be regarded as part of the effort to bring modern implements of war under some kind of control. The United States considered that this was the psychological moment for seeking agreement in respect of the peaceful uses of atomic energy.

5. The Canadian representative thought that it would not be too difficult, from a technical point of view, to devise a system which would enable one at least to detect the diversion of materials; the Canadian paper outlined one system which would meet this requirement.

6. The United Kingdom representative said that his country was publicly committed to the concept of safeguards but that he was frankly sceptical about the chances of devising a completely satisfactory system and of securing its adoption internationally. The first three papers circulated by the United Kingdom were designed to define the difficulties as the United Kingdom authorities saw them. Essentially, the view expressed was that it was technically impossible to devise a 100 percent

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watertight safeguards system and that even with a number of resident inspectors (which were politically out of the question) diversion could not be reduced below about 2 percent. Since it was considered impossible to discriminate between potential customers, the problem was to devise a system which would create a moral climate that would discourage a country from misconduct and would also be acceptable both domestically and in "recipient" countries. This might appear a modest objective but, as the U.S. representative had said, such a system might later fit into a more general scheme for disarmament. He wondered to what extent the United States Atomic Energy Act of 1954 laid down conditions on the type of safeguards system which the U.S. Government might adopt.

7. The United States representative replied that the Act laid down no explicit requirements with regard to a safeguards system, apart from calling for certain guarantees which are embodied in U.S. bilateral agreements. Congress would, however, certainly expect the Administration to develop a suitably careful system. Similar considerations would apply in connection with the safeguards called for in IAEA's statute.

8. The United Kingdom representative suggested that this raised a point of major significance. He thought that all the participants in the meeting would agree that they should work towards a common safeguards system, since it would be impracticable for each of several countries, supplying a "recipient" country with different materials "triggering" safeguards, to apply its own system. It appeared to him that the simplest and most workable common system would be one applied by IAEA, and that this would also avoid the odium which would fall on individual countries if they were to apply their own safeguards. Since the U.S. had offered 5,000 kg. of U235 to IAEA and Congress would have to be satisfied that the Agency's safeguards system was satisfactory before this offer was fulfilled, the United States view on what type of Agency system was acceptable would be decisive.

9. The Chairman wondered whether the safeguards embodied in the U.S.A.-Euratom agreement would throw any light on this.

10. Mr. Schaetzel replied that the safeguards problem had given rise to some difficulty during the negotiations with Euratom. The European Atomic Community had all-encompassing rights under the Euratom treaty and, as a sovereign authority, had refused to accept an externally administered safeguards system as this would have been more restrictive than the arrangements which the U.S. had with the U.K. and Canada. It had seemed to the United States that, by making a concession to Euratom, they would be able to contain a large part of the French atomic energy programme within the larger Euratom scheme and that this would be a net gain. The United States had therefore agreed with Euratom on a system (the details of which were subject to U.S. approval) involving the continuing right of mutual audit and embodying the ultimate sanction that the U.S. could terminate the co-operative programme if it were not satisfied that the system was being properly executed. Both parties had also agreed to consider transferring responsibility to an international system at an appropriate time if one should be put into effect.

11. The United Kingdom representative had no difficulty in accepting the objectives of the United States in reaching agreement with Euratom on the safeguards system in question. He asserted, however, that by choosing to foster European supra-national institutions, the United States had lost something

in respect of another objective, the development of an international safeguards system. He was not worried about the effectiveness of the Euratom safeguards system in practical terms. Nevertheless the de jure position was serious since the right of self-inspection had been granted to Euratom and, by thus contracting a Western European group of nations out of a larger international scheme, the chances of achieving the latter had been reduced; countries which proposed the adoption of an international scheme through IAEA were also open to attack on the grounds that they were using the Agency only to retain a measure of control over under-developed countries.

12. Mr. Pollock suggested that if groups of member countries of IAEA were to organize themselves on a basis similar to Euratom, it would be difficult to discriminate against them by denying them the rights now accorded to Euratom. He wondered what the reaction of the United States would be if it were suggested that IAEA introduce a system of regional self-inspection.

13. The United States representative thought that this would depend on the type of regional group involved. Some might be acceptable, others not. In any case it was difficult to foresee any genuine regional group similar to Euratom apart, perhaps, from OAS. The idea, however, should not be dismissed out of hand.

14. The United Kingdom representative agreed that inspection by regional bodies within an IAEA system might offer possibilities. He cautioned, however, that the image of Euratom as a quasi-military group was a political reality and that this was liable to cause trouble and must be reckoned with.

ELEMENTS OF A SAFEGUARDS SYSTEM

15. At the request of the United States representative, Mr. Kratzer gave an indication of United States thinking on this aspect of the problem. He agreed that a 100 percent effective system was not possible. A good deal of work, however, had been done on estimating the degree of effectiveness of safeguards systems in various circumstances and it had been found that the effectiveness of safeguards was closely correlated with the cost of the system. This relationship could be represented graphically by a curve approaching 100 percent effectiveness at the high rates of expenditure which a full-time residential inspection system would involve. The advantage of an inspection system falling on this part of the curve was that its effectiveness could be accurately predicted. At lower levels of expenditure where effectiveness fall off, so did the accuracy of predicting effectiveness. Audit systems of safeguards suffered particularly from this disadvantage and, on the basis of U.S. studies, it was thought that the probability of detecting a one percent diversion of material under a simple audit system was only 4 percent.

16. The United Kingdom representative agreed that an audit system by itself was not adequate since there was nothing to prevent a dishonest management from maintaining two sets of books. Audit must therefore be supplemented by sampling and inspection. The essential choice was between a 24-hour resident inspection system and an audit/spot check system. He believed that the effectiveness of the former was largely illusory as compared with the type of system proposed in the Canadian paper, and that it was politically out of the question as well as being impossibly expensive in terms of scientific manpower. He illustrated

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the sort of difficulties which would be encountered in securing international agreement for any type of safeguards system by citing the United Kingdom's negotiations for an Atomic Energy agreement with Brazil which were being held up on this very issue: the Brazilians had taken the line that theirs was a friendly nation and that it would be difficult to secure parliamentary approval for an agreement containing safeguards. He concluded that something along the lines of the Canadian proposal, perhaps somewhat elaborated and graduated in the rigour of its application according to the technical nature of the situation to which it was being applied, would meet the requirements we had in mind.

17. The Canadian representative agreed with much of the foregoing. He suggested that the cost of a safeguards system on the basis proposed in the Canadian paper would be minimal in terms of both money and manpower. He also maintained that it was futile to aim at a completely watertight safeguards system since extensive United States-Canadian experience in accounting for plutonium in fuel rods irradiated in Canada indicated that it was impossible to predict plutonium formation within a margin of error of less than 5%.

18. The Australian representative suggested that it might be fruitful to consider a different approach. Why not classify countries according to the likelihood of their diverting materials? Many countries were not interested in large scale nuclear development, while others had ample nuclear technology and resources of their own. This left a few countries, such as Japan and India, which would be acquiring large research or power reactors within the next few years and which would only then have the technological resources to fabricate nuclear weapons. Instead therefore of trying to devise a rigorous universal system, one might aim at a minimal universal system and make special, more comprehensive, arrangements for the real problem countries. One might also overcome their objections to safeguards by including some of their nationals as inspectors.

19. Mr. Kratzer suggested that there were three objections to this approach. First, that Canada, the United Kingdom and the United States had sought uniform rights regarding safeguards in all their bilaterals; second, that this approach would involve discrimination in the implementation of safeguards; third, that it would make it much more difficult for IAEA to apply safeguards.

20. The United Kingdom representative agreed that discrimination as between countries was not possible since it would be regarded as an Anglo-Saxon conspiracy. In his opinion, the most practicable way to go forward was through IAEA, with perhaps some arrangement for inspection on a regional or group basis, as had been suggested earlier in the meeting. The Japanese request that the Agency apply the safeguards embodied in the Japan/U.S.A. agreement, and U.S. acceptance of this expressed at the last General Conference of the Agency, meant that IAEA must quickly develop a safeguards system. It would be little short of catastrophic if the Agency were to present a system unacceptable to the United States, in particular, since this would mean that the latter would be unable to fulfill its pledge of fissile material. The Soviet bloc already maintained that the United States offer was a propaganda gesture devoid of content and the United States would be open to sharper criticism of this kind if it should even appear unwilling to fulfill its pledge, however justifiable the reasons. It therefore appeared to him that there was urgent need to clarify the ideas of those

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present on what would constitute an acceptable Agency system and then to pass this information in a discreet way to Roger Smith, Head of the Safeguards Division. The United Kingdom was assigning a man to the Division in December and would like to brief him in advance if a decision could now be reached on what constituted an acceptable system. In view of the Japanese request to the Agency, it would be difficult for the U.S.S.R. or other countries to oppose a reasonable Agency system and there was therefore a real chance of securing the Board's approval. If this was to be done, however, it was essential that Western countries should not announce their own intentions and ideas on safeguards, and should not give cause for suspicion that they were seeking to influence the Agency, until after it had produced its own scheme.

21. The United States representative agreed that the essential point was to determine what type of Agency system would be acceptable to the countries represented at this meeting. The United States authorities were aware of the urgency in reaching decisions on this matter and this sense of urgency had been reinforced by some of the new arguments which had been advanced. Mr. Kratzer added that the U.K. paper presented a fine analysis of the problem. He nevertheless thought that safeguards offered a real hope of buying time during which an agreement on disarmament or test cessation might be negotiated; he also thought that, having regard to the limited nuclear power likely to be produced over the next few years, the degree of efficiency and rigour of the safeguards system would have a significant effect upon the length of this interim period.

22. The United Kingdom representative could not agree. Quoting the case of Japan, he said that if the Japanese now purchased a power reactor, it could not be in operation before 1963; allowing one year for the irradiation of fuel elements and another year for cooling off, they would have little plutonium before 1965. There was therefore ample time to develop a nuclear disarmament scheme and the extra time which the most rigorous safeguards system would add to the interim period was almost insignificant from this point of view.

23. The Australian representative added that by exercising control over the fuel available to the Japanese, it would be possible to detect if they were misusing their nuclear resources since, to obtain plutonium quickly, they would have to use short irradiation periods and would require fuel at up to five times the normal rate.

24. The United Kingdom representative stated that this raised another problem, namely whether U.S. and U.K. chemical processing plants should be open for inspection under a safeguards system. For the time being spent rods from Japan and other countries would probably be returned to the U.S. or the U.K. for processing and it might be difficult to deny access for inspectors to verify the treatment and disposal of plutonium. This problem had been previously discussed and the United Kingdom had at one time offered to permit inspection. This offer had, however, since been withdrawn.

25. The United States representative stated that his country only had joint military/civil plants. Plants designed exclusively for civil purposes might later be established and this might make it easier to permit inspection. In the meantime, one might consider the possibility of hypothecating the appropriate quantities of plutonium to the custody of IAEA whenever fuel rods were returned from countries abroad for processing.

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26. The Australian representative had understood the United Kingdom representative to suggest that no safeguards be applied until the Agency had produced its scheme. He wondered whether Canada intended to put its proposed system into effect before this and whether the meeting should not try and decide whether its collective goal was an acceptable and compatible IAEA system or one which producing countries could put into effect before IAEA announced its system or if it failed to do so.

27. The Canadian representative said that it was unlikely that Canada would apply safeguards within the next year or so. Canada had nevertheless been disturbed by reports of a South African sale of uranium to Japan without provision for the application of safeguards, and considered that it was important that all producing countries continued to establish their rights in this matter in agreements and sales contracts with other countries.

28. Mr. Schaetzel thought that this touched on a real problem: if the countries present at the meeting did not present a common front in insisting upon establishing their right to apply safeguards, efforts to develop a safeguards system would collapse. It was clearly also necessary to reach agreement on the substance of a safeguards system among countries participating in the meeting and other friendly countries if an international system was to be sold in the international forum.

FUTURE COURSE OF ACTION

29. The United Kingdom representative suggested that, if progress was to be made, the countries represented at the meeting must agree among themselves on a safeguards system and then try and secure international approval for it through IAEA, in the meantime maintaining a discreet silence on their plans.

30. The Australian representative agreed and wondered whether IAEA's Board might not ask the Director-General to put forward an Agency system by a given deadline. He also thought that it might be useful if specific proposals for a safeguards system acceptable to the five participating countries were drafted on the basis of the present meeting.

31. The Chairman thought that it might be somewhat precipitate to undertake drafting at this stage. It was his impression that another meeting might be required in order to reach definite agreement prior to drafting.

32. The United States representative agreed, saying that his country still had to present its analysis. In response to a query, he added that it might be possible to do so by early December.

33. The Chairman proposed that a meeting of officials (perhaps drawn from the Embassies concerned) should be held in Washington about December 15, 1958, to receive the U.S. paper and to exchange any additional information which might be available.

34. The United Kingdom representative suggested that, if possible, the United States paper should include a list of items of equipment which would be covered by a safeguards system. He also suggested that a later meeting, which should aim at reaching definite agreement on a safeguards system should

be held in Vienna following the meeting of the Agency's Board of Governors in January, 1959, pointing out that many of the persons concerned would already be in Vienna at that time and that this location would permit an informal and unobtrusive briefing of Roger Smith on the type of Agency safeguards which would be acceptable to the five countries present.

35. It was agreed that:

- (a) the United States representatives would circulate certain technical papers to other participating countries as soon as possible;
- (b) that a meeting would be held in Washington about December 15, 1958, to receive the U.S. analytical paper;
- (c) that a meeting would be held in Vienna about January 20, 1958, with the object of reaching agreement on a safeguards system;
- (d) that, in the meantime, no publicity should be given to the intentions or plans of participating countries with regard to safeguards.

36. During the concluding exchanges at the meeting, the following additional points were mentioned:

- (a) when the question of safeguards arises in IAEA the best tactics might be for the United States and United Kingdom to favour a rather rigorous system while the other three countries advocate a system which would in fact be acceptable to all five countries. The U.S. and U.K. could then appear to compromise and thus increase the chances of gaining general acceptance for a reasonable system;
- (b) the United States is considering the possibility of permitting the export of sample quantities of natural uranium, greater than the present limit of 1,000 kg. for uncontrolled exports to any one country, subject to limited safeguards of the kind provided in its research bilaterals (periodic reports, periodic inspection and the return of spent fuel to the U.S.A. for reprocessing);
- (c) the United Kingdom representative reminded the meeting that his country had always taken the position that it would not seek to apply safeguards to materials exported to Australia and South Africa. He wondered whether others had considered the possibility of extending similar special treatment to members of the new Commonwealth, such as India. The U.S. and Canadian representatives replied that neither of their countries was considering any form of special treatment for India. The United States has recently agreed to lease some heavy water to India, and the lease agreement provides for safeguards. Canada has consistently refused to supply uranium to India without safeguards;
- (d) it was generally agreed that it would be useful if the Under-Secretary of State for External Affairs were to explore the Russian attitude towards safeguards with the new U.S.S.R. Ambassador to Canada should the opportunity arise. The U.S.

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authorities had discussed this question with the Russians on several occasions at the time of the first Geneva Conference, without any useful result. The U.K. representative had more recently spoken to the Russian member of the Agency's Board of Governors and had formed the opinion that the U.S.S.R. would be inclined to agree privately with the application of safeguards to countries such as Japan, but would continue to take the position in public that safeguards were a Western device to keep control over under-developed countries.



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