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Atomic Energy Commission, 'German Participation in Pierrelatte Gaseous Diffusion Plant,' with Cover Memo from Myron B. Kratzer, Division of International Affairs, to Mr. Thomas and Mr. Kaufman, Department of State

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Summary:

This AEC report looked at the Pierrelatte plant’s prospective capabilities, possible West German motives for seeking an independent supply of enriched uranium (possibly in cooperation with the French), the “adverse” implications of a French-German project, and policy alternatives available to Washington. If the West Germans were determined to contribute to the French enrichment project, the AEC saw serious risks including the “the prospects of a Franco-German military alliance that could constitute a European third force capable of dominating Western Europe."

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TO (Name and unit)	INITIALS	REMARKS
Charles W. Thomas SCI State Department	DATE	Attached is a copy of an informal paper prepared in AEC concerning German participation in the Pierrelatte gaseous diffusion plant which may
TO (Name and unit)	INITIALS	REMARKS
Robert E. Kaufman EUR State Department	DATE	be of some interest to you in connection with your consideration of this problem.
TO (Name and unit)	INITIALS	REMARKS
	DATE	
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M.B.Kratzer DIA,USAEC		DOCUMENT TRANSMITTED HEREWITH CONTAINS CLASSIFIED DEFENSE INFORMATION
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GERMAN PARTICIPATION IN PIERRELATTE GASEOUS DIFFUSION PLANT

I. Introductions and Assumptions

There have been reports of French efforts to secure German and perhaps Italian financial and technical participation in completion of the French gaseous diffusion plant at Pierrelatte. The estimated cost of this plant, as announced by the French, is 1.2 billion dollars and its estimated output when in full production is to be ten kilograms per day of highly enriched U-235. It is now estimated that top product will not become available until 1967.

Based on current United States experience, the reported plant cost and its estimated operational cost and capacity, it is estimated that the cost of U-235 to the French would be two to three times that to the U.S. -- although it is difficult to determine, in light of French lack of technological background in this field, the actual cost of U-235 to the French. However, on the basis of U.S. experience it would appear that a plant of the cost estimated by the French could, through gradual improvement, achieve a substantially greater output. On the basis of its currently estimated modest capacity, the plant would not make a major contribution to projected French or German civil requirements for enriched uranium, even if its output were entirely available for these purposes. (Estimated German cumulative requirements alone for U-235, as estimated by a recent European Community study, are in the range of 50 to 85 thousand kilograms of U-235 by 1975 and annual consumption should rise rapidly thereafter. Cumulative production from the Pierrelatte plant by this time would have been less than 30,000 kilograms of U-235.)

It is reported that the German interest in participation is based on their desire to have a source of U-235 for civil purposes independent of the United States. It must be assumed, however, that any such participation would result in Germany having a source of U-235 which would be available to them for either civil or military purposes.

II. Possible Basis for German Interest in Alternate Source of Supply of U-235

The United States has recognized for some time the reluctance on the part of other nations to depend on a sole foreign source of supply for a vital energy resource such as U-235. As a consequence, U.S. U-235 distribution policies have been repeatedly modified to strengthen assurances as to the availability of U-235 from the United States. At the present time, AEC policies provide for entering into long-term contracts for the supply of U-235 corresponding to the economic life of the reactors to be supplied. Uniform prices, based on cost, apply domestically and abroad, and have been reduced significantly over the last two years. 65,000 kilograms of U-235 have been allocated by the

President for civil uses abroad, of which 30,000 has been made available to Euratom. The Commission has recently recommended an increase in the Presidential allocation for civil uses abroad to 150,000 kilograms of U-235 and, subject to approval of this recommendation and required Congressional approval, will increase the Euratom total to 70,000 kilograms of U-235.

Despite these actions and a number of other related liberalications in U.S. fuel distribution policies, there are unquestionably remaining areas where recipient nations such as Germany would prefer to see still more liberal policies. Some of these areas, as identified from specific comments made by German officials from time to time as well as generally known attitudes of recipient nations, are as follows:

1. U.S. U-235 is supplied under the condition that safeguards will be applied. (In the case of materials supplied to Euratom these are Euratom safeguards.)

2. Purchase of U.S. U-235 involves cost penalties, for example, for transportation. (These costs are minimal and there seems little likelihood, particularly in view of the reported cost of the Pierrelatte plant, that any competing plant abroad could offer U-235 at prices approaching those of the United States.)

3. The U.S. supplies enriched uranium domestically on a lease basis and gives credit, based on military value, for produced plutonium. U-235 is distributed abroad on a sale basis, with no commitment for purchase of plutonium, and with the understanding that only a fixed price will be paid if any plutonium is purchased. (These differences between foreign and domestic distribution policies would be eliminated by pending legislation providing for private ownership in the United States, and guaranteed purchase of plutonium at fuel value both here and abroad.)

4. Procurement of U-235 from the United States involves governmental approvals and administrative difficulties and delays. (This has been specifically identified as a problem by Germany particularly as it relates to subsequent transfers of supplied material from one project to another or from Germany to another country.)

5. There is a ceiling of 20 per cent enrichment on U-235 routinely supplied by the U.S. for power reactor use abroad. Although the U.S. has indicated that it will consider supplying more highly enriched material on a case-by-case basis, and is currently considering such a case involving a reactor in Germany, this makes the supply of highly enriched material for power reactors uncertain at a time when reactor concepts employing highly enriched uranium and thorium are the object of considerable technical interest abroad as well as in the United States.

In the final analysis, however, it seems clear that no action which could reasonably be taken by the United States or any other supplier of enriched uranium would overcome the strong desire of each major recipient nation for an alternate source of supply, preferably a domestic one. The closest approach that could perhaps be made to accommodating this desire would be the delivery in advance by the United States of a quantity of U-235 corresponding to the recipient country's anticipated requirements for a number of years. This course of action would clearly be infeasible. Partially in response to these considerations but also as a consequence of historical events which led to the presence in Germany of persons with a technical competence in the field, Germany has been working for a number of years on the gas centrifuge method of isotope separation. In 1960 as a result of U.S. initiative, the German Government agreed to classify its gas centrifuge program. This would have the effect, so long as the Germans honored this commitment, of limiting the opportunity of exporting gas centrifuge separation plants which German industry clearly had anticipated. As a consequence of the classification, there apparently has been some reduction in the German effort. The agreement to classify, however, does not reduce the German incentive to continue development of the gas centrifuge process for their own use as an alternate source of supply of U-235. As would their participation in the Pierrelatte plant, the construction of a gas centrifuge plant in Germany would provide the Germans with a source of U-235 which would be available for military as well as civil uses. From the German standpoint, it would seem to have the advantage over participation in the Pierrelatte plant of being an entirely domestic undertaking.

III. Adverse Aspects of Franco-German Cooperation

German cooperation in the French gaseous diffusion plant would appear to be contrary to a number of important U.S. interests and objectives. First, it would provide a source of U-235 for military purposes to a country whose entry into the atomic weapons field could possibly seriously impair U.S.-Soviet relations. The outcome, of course, could also result from German national effort on the gas centrifuge separations process. However, such a possibility, in any event, must be viewed in relation to the fact that Germany could unquestionably, at any time, successfully undertake a program for plutonium production independent of outside sources and consequent outside controls, as have the French. Second, Franco-German cooperation in this area could enhance the prospects of a Franco-German military alliance which could constitute a European third force capable of dominating Western Europe and wielding substantial military power. Third, a German financial and technical contribution would probably accelerate, and conceivably might even determine the difference

between success and failure of the French gaseous diffusion plant program. By bringing greater resources to bear, it also would probably lead to eventual enlargement of the plant to a size larger than it might be expected to reach if it remained solely a French undertaking. Fourth, the cooperation would undoubtedly have as one of its elements the communication of all French gaseous diffusion technology to Germany. This would make possible the construction in Germany of additional plants wholly German owned and operated and would further complicate the problem of controlling the dissemination of information in this area, particularly in view of the German predilection for export of industrial plants and technology.

As indicated above, some of the disadvantages of German cooperation in the gaseous diffusion plant program are not unique to such cooperation since other approaches are being actually undertaken or could be undertaken by Germany to acquire alternate sources of fissionable material. It can be concluded, however, some of the disadvantages outlined above would be unique to such German cooperation with France.

IV. Alternatives Available to the United States

In addition to the application of direct diplomatic pressure to dissuade Germany from participating in the French program, there are several possible courses of action which the United States could consider which might influence the decision of either of the parties with regard to the desirability of proceeding with the cooperation. One such alternative would be a further liberalization of U.S. U-235 distribution policy since there are obviously areas where this could be accomplished. Prices (which are already established at U.S. cost) could be reduced further to make less attractive and more costly the reliance by a recipient nation on any other source of supply. Safeguard provisions could be eliminated and reliance placed solely on the contractual guarantee of the other party that the material would be used only for specific purposes. Limitations on maximum enrichment normally made available to recipient countries could be relaxed or removed. With statutory changes, the requirements for governmental approvals could be reduced or eliminated and the transactions placed on virtually a commercial basis.

Another step which is currently under consideration would make significantly more attractive the use of U.S.-supplied U-235 abroad. This is the proposed adoption of a policy of toll enriching, in U.S. diffusion plant facilities, natural uranium supplied by other nations. Adoption of this policy could somewhat reduce over-all U-235 costs and would reduce the foreign exchange component of these costs considerably. This would enable countries possessing substantial amounts of natural uranium to utilize domestic natural resources, thereby

relieving domestic political pressures and increasing domestic economic activity. However, the policy would not affect in any substantive way the fact that the using country would continue to be reliant upon U.S. gaseous diffusion plants for a supply of enriched uranium. It would not, therefore, have a major effect in reducing German incentives for alternate sources of supply.

Any or all of these steps could be taken either with regard to all recipient nations or specifically in favor of Germany. It seems apparent, however, that a preferential arrangement in favor of Germany would not, for any reasonable period of time, be justifiable, since pressures for uniform treatment for all friendly countries in this area have always been great and throughout the history of the program our policy in this area has been to accord uniform treatment to all cooperating nations. Further, it seems equally apparent that each of these steps have major disadvantages and would defeat other important U.S. policy objectives. This is particularly true in the case of safeguards. Finally, and most importantly, we believe it would continue to be true that no economic or administrative liberalizations or incentives would remove the desire of Germany to have a source of supply which was wholly independent of the United States.

An additional method by which the United States might affect the outcome of the proposed cooperation would involve arrangements with the French Government which would reduce their incentive to seek outside financial and technical assistance, conceivably through an offer to supply highly enriched U-235 to France for both civil and military purposes. The French determination to have an independent nuclear weapons capability is such that no U.S. offer of assistance of this nature is likely to dissuade them from proceeding with completion of the plant. Nevertheless, if the offer involved were not merely a commitment to make future deliveries, but the actual early delivery of a quantity of U-235 corresponding to a number of years of output of the Pierrelatte plant, it is conceivable that France might abandon the project or drastically curtail the present rate of expenditures for its construction. Alternatively, a U.S. offer of assistance in resolving the problems which have been encountered by the French in construction of the plant might be employed to dissuade the French from seeking and accepting any outside assistance. The supply of any technical assistance, of course, would involve the communication of Restricted Data which is regarded as highly sensitive.

An analogous approach would be the offer of some type of assistance to Germany which would satisfy Germany's desire for an independent U-235 production capability and thereby remove the German incentive for cooperation with France. The most obvious method for achieving this would take the form of technical cooperation with the Germans leading to the construction by them of a gas centrifuge separations

plant. As indicated earlier in this memorandum, a German effort in this area has long been underway and this effort may lead to their construction of a plant with or without U.S. cooperation. The possibilities of U.S. cooperation with Germany in the gas centrifuge area have been considered in the past purely for reasons of maximizing our own technical progress in this field in view of the significance and high quality of the German program. This consideration indicated that there were difficult political problems involved in undertaking such cooperation in view, on the one hand, of U.S. restrictions on communication of Restricted Data and, on the other hand, of the restrictions of the Euratom Treaty on any new bilateral cooperation by members of the Community with third parties.

A third avenue of approach would be to attempt to channel the German (and presumably other European Community members') desires for an independent source of supply of U-235 into a Community project for the construction and operation of a U-235 separations plant which would be subject to Euratom's controls and whose product would be devoted exclusively to civil uses. The Europeanization of the Pierrelatte Plant would clearly be totally unacceptable to France. This approach could be built around an expansion of the German and Dutch gas centrifuge programs possibly supplemented by U.S. technical assistance in this area. If the real German objective is to obtain an alternate source of U-235 for its civil program, this approach might have attraction for them.

As a further possibility, the United States might take measures to encourage the U.K. and France to develop a joint cooperative program in the production of U-235 employing the facilities at Pierrelatte or Capenhurst or perhaps both of those facilities. This would to a large measure obviate the problems associated with the communication of U.S. Restricted Data which would arise under a U.S. program of technical assistance to the French in this field, since the U.K. effort has been undertaken independently and without the communication of any U.S. Restricted Data. Of course, U.K. gaseous diffusion plant data is classified by the U.K. in accordance with the common classification guide and the matter of the adequacy of French security procedures for the protection of the information received from the British would have to be considered.