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C-O-N-F-I-D-E-N-T-I-A-L *Israel Reactor* ~~TOP SECRET~~
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SUBJECT Nuclear Engineering Training/Large Nuclear and Electric Power Plant near Beersheba/
French Nuclear Assistance to Israel/Israeli Attitude Towards the Announcement of its Large-Scale Nuclear Effort/Opportunity for US Participation in Nuclear Powered Water Conversion

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THIS IS UNEVALUATED INFORMATION

SOURCE: A US citizen who is a nuclear engineer. He has been associated for several years with a training reactor. He is highly qualified in his field.

He has traveled extensively, visiting various parts of the world in connection with the setting up of programs for nuclear engineering training and to consult with government officials in regard to the problems of nuclear education. On a recent trip he was invited to consult with officials in Israel on this subject.

When I went to Israel in November 1960 it was my first trip. I was to advise in connection with nuclear engineering training. I was aware that there was a training reactor in Israel, and, at the Weizmann Institute and at other places, nuclear engineers were being trained. I was completely unprepared for the magnitude of the effort in Israel, or for the attitude of some of the Israelis in regard to it. What I learned about the large classified project near Beersheba all came indirectly. I spoke with a number of highly placed Israelis who were forced to acknowledge the existence of the classified effort in order that any use might be made of my consultative capabilities, but no one spoke to me of it in detail or gave any direct information about it. For this reason I prefer to keep the names of the Israeli officials with whom I spoke, and who were placed in the position of having to acknowledge some of the characteristics of the classified project, to myself.

2. One of the first places I was taken to consult was the laboratory of the Israeli Atomic Energy Commission. As soon as the conversation started it immediately became apparent that the Israelis had not anticipated that to discuss nuclear training with me they would have to reveal the objectives for which the training was being conducted. As a result, I had to ask pertinent questions, the responses to which immediately revealed the existence of very important project which the Israeli officials could not discuss with me. This impression was fortified with each of the conversations I had in Israel until it overshadowed everything else about my trip there. To name two items which immediately brought the classified project into evidence was the anomaly of the number of people being trained in nuclear engineering, the number desired to be trained in nuclear engineering, compared with the size of the present and planned unclassified atomic energy program. At the Weizmann Institute 20 or 30 people already have been graduated from a rather intensive course in nuclear engineering. Add to this the trainees at other Institutes and the reluctance to name exactly how many were expected to be trained in the near future, a

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clear disproportion immediately became evident. Another example was that when I entered the laboratory of the Israeli Atomic Energy Commission, I was asked to remove my camera and I learned that I was the first foreign visitor to this laboratory. Both of these circumstances impressed me as highly unusual. When I confronted the head of the laboratory, who is probably the principal administrator in the Israeli Atomic Energy program, and I told him it was quite obvious there was a good deal more to the Israeli program than he had indicated, this administrator was forced to acknowledge there was a good deal more, but said that for my purposes it would be necessary to pretend that nothing existed beyond the unclassified activities. But he added that I should bear in mind the Israelis would be dealing with curie quantities of polonium and gram quantities of plutonium. Of course this kind of response only increased my curiosity but I was never able to learn much about the large classified project which I concluded was a very large nuclear and electric power plant under construction near Beersheba. This I was able to conclude from vague references, hints regarding the railroad and transportation, but no specific instruction. No specifications were given to me for the reactor as to the total thermal power, or the gross electric power capacity. Neither was I given any specifications regarding reactor fuel, its amount, cladding, assembly or source. Almost all that I can say about the plant I have had to deduce and synthesize from chance remarks and vague references.

3. With regard to location, I believe the new construction which has been underway for at least three years, is located somewhere south of Beersheba. In this regard, I saw a report made by an engineer from a large US machine and foundry company and I think some of his information is wrong. He made the construction near Beersheba sound like a big research laboratory reactor. My reaction is that this plant will have a capacity well beyond research. Other information shown me in the US indicates the plant is being east of Beersheba. I think it is south. I spoke with an engineer associated with the railroad and he made reference to an extension of the railroad south of Beersheba and to the movement of heavy loads over this extension. He also mentioned the name "Kafir". I am not sure of this name and I have been unable to locate it on any map. I did not feel free to ask the engineer to repeat it.

As to the size of the plant I was, of course, given no details but I feel sure its design is far beyond any kind of a training reactor and that it will be capable of producing weapon-grade plutonium. There is no question in my mind but that the Israelis have the technical capability to construct and operate a nuclear plant up to the power level of 200 MW thermal. What they do not know already, they have the ability to learn. It seems clear the French are assisting in this program and that their G-2 was in operation when the Israelis started the Beersheba project, or soon after. I estimate that the power level of the Beersheba project will be approximately 250 MW thermal.

5. In regard to fuel for the reactor, it seem probable that this will be supplied by the French. The French have had a continuing interest in Israel and wish to preserve a foothold in the Middle-East. The Israelis gave no indication of any plans for a large scale uranium concentration or for metal and fuel fabrication plant which would be required to support a reactor of this size. Further, there is no reason to go into that side of production because it seems the French are prepared to be of assistance. I heard that the specifications for the plant had legends in both French and Hebrew.
6. I have been shown in the US a photograph of the classified Israeli construction near Beersheba which was said to have been taken from a road. This photograph represented exactly what I would expect to see in the construction of the plant I had pictured in my mind from what I had heard about. I was not at all surprised that it looked the way it did, especially since it so closely resembled the French G-1 reactor building. There is little chance that this installation is a research reactor because there is too much auxiliary construction for that.
7. An Israeli government official close to the Prime Minister told me there would be an announcement concerning a joint French-Israeli power reactor in approximately three weeks which would bring it to around the middle of December 1960.

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This was not in agreement with a statement made by an Israeli official in the Atomic Energy Commission who said it would be at least a year before any announcement was made. I took this to mean that the announcement would be made at the time the reactor was completed and in operation and I estimated from other remarks this might be during the summer of Fall of 1961.

8. As far as I know, the Israelis have no specific plans to build another research reactor. They talked about the possibility in general when the Rehovoth reactor becomes overloaded. Originally, they had planned to build a heavy-water moderated research reactor and, in fact, they have the fuel for it. I don't know where they obtained the fuel, but it is now going to be wed in 2 subcritical neutron multiplier assembled on the Thermal column of the reactor at Rehovoth. Rothenstein of Technion will be in charge. A hole will be made in the top shield of the Horizontal thermal column and the fuel and heavy water will simply be set on top of it. They have all the heavy water they need for this purpose obtained from the small plant at the Weizmann Institute.

9. I feel quite sure the Israelis are aware of what I know about their classified reactor project. This became obvious in several ways. Among others, the Israelis discussed quite frankly the impact of the announcement and the probable results. They are very much aware that the announcement will produce a strong reaction throughout the Arab World, particularly from Nassir. There will probably be an appeal by the Arab States to the United Nations, claiming potential nuclear aggression on the part of Israel and also probably some appeals to the USSR for assistance in developing a similar potential. The Israelis are considering all the angles carefully but realize they have to go their own way alone and do the best they think they can with what is available to them. They regard the US as a sort of rich but stupid uncle who will provide all kinds of moral support but actually do nothing whatever in a practical sense to provide the Israelis with any military security or at the very most provide too little too late. The Israelis have the view that this large nuclear development is something which they must do and take full responsibility for on their own, both for their own protection and for their economic development. In my discussions with Israeli officials it seemed clear there was an area in which the US could participate on a non-military basis which could assure Israeli respect and recognition for US interest in the Middle East without antagonizing the Arab States. Uppermost in the Israeli official minds, next to military security, is the problem of water. If the US wishes to take a positive step and participate in nuclear development in Israel, it could offer technical assistance in regard to the use of nuclear power for the conversion of sea water. Such a proposed cooperation would be enthusiastically received, partly because of the lack of success currently attending Israeli efforts in this direction. I found the Israelis to be a desperately realistic group. They are aware of their limitations, but are determined to do as much as they can while they can.

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