

## Office Memorandum • UNITED STATES GOVERNMENT

TO : R. J. Smith, Jr., Chief, Operations Branch, Pro-DATE: December 27, 1950  
duction Division, New York Operations Office

FROM : E. M. Velten, Chief, Beryllium Operations,  
Production Division, Cleveland

SUBJECT: STUDY OF POSSIBLE RELOCATION OF CLEVELAND FACILITIES

REFER TO  
SYMBOL: ZB;EMV;Jmh

*Brush*

At the present time, the principle production operations of the beryllium program are conducted by The Brush Beryllium contractor under Contracts AT-(30-1)-541 and AT-(30-1)-510 for the operation of beryllium production and fabrication facilities at plants located in Luckey, Ohio, and Cleveland, Ohio, respectively. The Luckey, Ohio, operation consists of production of beryllium pebble metal and beryllium oxide from ore and subsequent vacuum casting of the metal. The beryllium facilities at Luckey are primarily Government-owned (Brush's equity at Luckey plant is about twenty-five (25) per cent of total investment for beryllium facilities) located entirely on land and in buildings either owned by the Commission or by the United States Government. The beryllium plant at Luckey is located on the site of magnesium reduction facilities formerly operated under the Defense Plant Corporation and presently maintained in standby by the Public Buildings Administration. The Commission obtained the use of this plant under a lease which contained a "security clause" agreement. The operations at Cleveland consist of the manufacture of beryllium powder from the solid ingot metal, subsequent vacuum sintering of the powder to massive metal, and machining or extrusion of the sintered block into forms required for various Commission uses both for Reactor and for Research and Development purposes. In addition, there is an operation at Cleveland, a small unit for the fabrication of beryllium crucibles, required for the beryllium production program. The plant at Cleveland consists primarily of Government-owned equipment in a building that is leased by the contractor. The contractor's general offices are also maintained at this same location as well as certain small production facilities for whatever commercial business he presently has.

The Health and Safety Division of the New York Operations Office has always taken the position that, from a health and safety standpoint, it is very undesirable to conduct beryllium operations at the present location of these facilities in Cleveland, Ohio. The operation as currently being conducted are unsatisfactory from an inplant health standpoint and will require an expenditure of an estimated \$60,000.00 within the next two (2) or three (3) months if they are to remain permanently in their present location. The potentially large public liability and unfavorable public relations angles, however, would not be solved by this expenditure. At the present time, there is every indication that the magnesium facilities presently in standby in the Luckey plant, as mentioned

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AT 30-1 510 Brush July 1950

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above, will be reactivated. This will mean that the "security clause" in our lease arrangement with the Public Buildings Administration will probably be invoked and will necessitate the construction of auxiliary facilities required for the operation of the beryllium plant presently at Luckey in order that the production of magnesium and beryllium at the Luckey plant site can be concurrent.

Since it will probably be necessary to construct additional facilities for Luckey operations in the near future and since it will be necessary to incur capital expenditures in the next two (2) to three (3) months at the Cleveland plant in order to make those operations safe from an inplant health standpoint, the problem is immediately raised as to whether or not the Cleveland production operations should be integrated with those at Luckey.

The following is a list of the advantages for consolidation of the Cleveland and Luckey beryllium operations with an explanation of each of the listed advantages:

1. Operating Cost Advantage

An operating cost savings of approximately \$30,000.00 per month can be realized from consolidation of the two operations versus continuance of the operations as they presently exist. The details of this calculation which lead to the \$30,000.00 estimated monthly cost savings are contained in Exhibit "A". The conditions that were assumed in reaching this figure are thoroughly stated in Exhibit "A". It is the opinion of the AEC beryllium group in Cleveland that at least this figure could be realized.

2. Health and Safety

The move of the production operations from Cleveland to Luckey will eliminate all the medical objections to the present Cleveland plant. In the move to Luckey, the facilities at Cleveland will be located in a building constructed to house such operations (as opposed to the converted stove factory which they now occupy) and the ventilation properly redesigned to control the inplant hazards. This will also result in a savings of the \$60,000.00 capital expenditures estimated by the Health and Safety Division to be required in order to contain the inplant health hazard that exists in the present Cleve-

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land facilities. (See Exhibit "B") The possible large public liability claim resulting from the operation of beryllium facilities in a densely populated area will be greatly reduced. All the health reasons for relocating the beryllium operations presently conducted at Luckey to the Luckey area are also applicable to the Cleveland plant. For the Health and Safety Division's position in this matter, see a memorandum of December 13, 1950, from Mr. Eisenbud to Mr. H. B. Fry, subject; "Memorandum of December 5, 1950, to F. M. Belmore" attached as Exhibit "B".

### 3. Unscrambling of Government-Contractor Operations

An obvious advantage of the consolidation of the beryllium operations is that Government work with The Brush Beryllium Company is then placed at one location separate from any of the contractor's commercial business. At the present time, Government operations in Cleveland are conducted concurrent with Brush's commercial work in the same plant. In addition, the presence of the contractor's home office in the same building complicates this picture still further. Because of these scrambled activities, it has been impossible to put the Brush - Cleveland operations on the integrated accounting system and continual detailed audits of contractor costs are required. The move would resolve this matter. In addition, the Government-owned equipment would then be on Government-owned land and in Government-owned building so that in the event it became necessary, an operator other than Brush for beryllium work would be much more feasible. A second operator for the Government-owned facilities in Cleveland is not feasible under the present arrangement.

### 4. Flexibility of Operations and Scheduling

One of the problems which constantly plagues the Government work in the Cleveland operations, which are essentially on a job order basis, has been the proper scheduling of the work load for the Cleveland facilities. The requirements are such that it has been, and still is, impossible to predicate them with any degree of certainty more than two (2) or three (3) months in advance. This has led to a situation which is essentially feast or famine. Work at Cleveland is conducted either under forced draft with considerable overtime and heavy hiring to meet sudden large requirements or the work suddenly drops off to a low level with necessary outback in personnel and in

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all overhead departments. This procedure is costly and time-consuming. Consolidation of these operations at Luckey would tend to alleviate considerably the effects of the peaks and depressions in the level of operations of these facilities. The manpower pool necessary for the operation of the beryllium plant presently at Luckey is large enough that it can be called upon to cover most of the personnel expansion required by higher-level production of the beryllium fabrication facilities as well as usefully absorbing most of the surplus personnel at a lower level of operations. The whole problem of maintaining the beryllium fabrication facilities to a relatively even level to meet all the variations in the requirements for fabricated shapes is, therefore, considerably eased. The economies involved on this point are very difficult to evaluate and are not included in the operating cost savings in advantage 1 above.

#### 5. Utilization of Manpower

Consolidation of the Cleveland and Luckey beryllium production facilities results in an overall reduction in total number of personnel at the same time giving greater flexibility in the use of existing personnel. This point is rather obvious from advantage 4 above; however, it is mentioned to bring out the following two additional points:

- a. In the current manpower shortage facing the country, lesser total manpower is used to obtain equivalent beryllium production; and
- b. Much more effective use is obtained from the existing pool of technical manpower now maintained by The Brush Beryllium Company.

Under the present conditions, both Cleveland and Luckey each have their own technical staff and there is very little exchange of their technical ideas or manpower between these staffs. What exchange of technical ideas in staff that has been to date has indicated that the Commission could obtain considerable advantage from this point.

#### 6. Improved Management for Cleveland Operations

Due primarily to organizational quirks and personalities in The Brush Beryllium Company itself, the management setup for the Cleveland beryllium operations for the Commission leaves much to be desired.

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The primary fault lies in the fact that no one person in the Brush organization is given the total responsibility and authority for executive management of the Brush - Cleveland plant. This is not true at Luckey. This point has been the subject of considerable conversations between the AEC beryllium office in Cleveland and the Brush management. To date no satisfactory solution for this deficiency has been offered by Brush. Consolidation of the Cleveland production operations at Luckey would, by AEC assistance, require that the control of those production operations be fitted into the existing Luckey plant management structure.

#### 7. Short Write-off of Capital Investment

The cost study in Exhibit "a" shows that the write-off time on the capital investment necessary to consolidate the Cleveland and Luckey beryllium operations is approximately eleven (11) months. Even under AEC criteria, this is a very favorable write-off time and, even though the capital investment is high, the cost savings as presented in advantage 1 above will accrue to the Commission in a relatively short period of time.

#### 8. Easier Contractor and Government Supervision

Consolidation of the Cleveland and Luckey facilities will very obviously lead to easier contractor administration of the whole Government beryllium program as is evidenced indirectly in several of the advantages listed above. This will in addition, however, ease the Government problem of administrative control on this beryllium work. This is very apparent since there will be only one group of people to deal with for all beryllium problems rather than two or more as is true at present. The unscrambling of the commercial and Government operations at Cleveland made possible by the move as mentioned above, will greatly simplify the audit problem that presently exists with the Cleveland work. In addition, the advantage of the improved management that should be available by the move, directly effects the Commission work load with respect to the beryllium operations.

The following is a list of the disadvantages for consolidation of the Cleveland and Luckey beryllium operations with an explanation of each of the listed disadvantages;

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## 1. Capital Investment Required

A study of Exhibit "A" will reveal that consolidation of the Luckey and Cleveland facilities will require a net capital investment on the part of the Commission of approximately \$320,000.00. This office has no information as to the possible availability of such funds for this purpose.

## 2. Burden on Luckey Labor Market

Transfer of Cleveland operations to Luckey will place an additional burden on an already tight labor market in the Luckey plant area. In addition, one special skill required, namely machinists, will present a very difficult procurement problem in the Luckey area due to the very small available pool for this type of skilled labor. In all fairness, it must be mentioned that the difficulty of procuring the required manpower already exists in the Cleveland area and will get worse although it is the opinion of the writer that this difficulty will be greater in the Luckey area. As a partial offset to this disadvantage it is anticipated that undoubtedly most of the older Brush personnel at Cleveland will be willing to relocate from the Cleveland area; however, under Brush's personnel policies, the Commission would have to bear the major expense of such relocation.

## 3. Loss of Key Personnel

This is definitely the risk that some of the key personnel presently employed in the Brush - Cleveland beryllium operation will, for personal reasons, decline to relocate in the Luckey plant area. This will aggravate the disadvantage outlined immediately above. It is impossible to make any estimate of the magnitude of this problem short of actual survey of the personnel involved.

## 4. Lack of Trained Operating Personnel

It must be assumed that the majority of the trained operating personnel will probably not be willing to relocate with the transfer of the beryllium operations. This being the case, the essential operations of the Cleveland production-type facilities will be on a shake-down basis until the new personnel are adequately trained. The principle effect of this and of disadvantage 3 immediately above will be

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to decrease the costs savings that could be realized from the consolidated operations of the beryllium program at Luckey over those that could be obtained by actual transfer of all key and trained personnel that are presently engaged in the operation until the new personnel can be trained.

#### 5. Future Schedule for Cleveland Operations

The present projected operating schedule for Cleveland keeps the plant at a reasonable level of operations through November, 1951. Commencing with March 1, 1951, there are at this time no firm requirements for production at Cleveland other than for approximately 250 pounds a month for Research and Development purposes. There are, however, two tentative requirements, namely the stockpile for the SIR program and the requirements for the ARE reactor, which when firmed up will require production at a reasonable level for the Cleveland-type facilities for a period of about eight (8) months. Even under ideal conditions, namely if these projected future requirements for eight (8) months' operation can be deferred until the Cleveland facilities have been moved to Luckey, this would enable us to realize only eight (8) months of the total eleven (11) months' write-off time required on the capital investment. It must be pointed out, however, that the approved schedule for beryllium operations involves the stockpiling of considerable quantities of beryllium metal in the form of pebbles and/or vacuum cast ingots, and it is only fair to assume that sooner or later some or all of this material will have to be processed into fabricated shapes which will necessitate the use of Cleveland-type facilities. The projected stockpiles of beryllium metal, if processed into shapes, are of such magnitude that it would require the use of Cleveland-type facilities over and above the eight (8) months projected for the SIR and the ARE by a bare minimum of an additional eighteen (18) months. Also the requirements for the SIR and the ARE are of such a nature (stockpile for SIR - definite requirements for ARE) that there is every reason to believe that they can be deferred for the period of time necessary to transfer and initiate operations of the Cleveland facilities at Luckey so that at least the eight (8) months' operating savings could be realized in these production operations.

#### 7. Increased Difficulty of Luckey Unit Price Operations

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The nature of the Cleveland operations is such that they are far more difficult to place on a unit-price basis than the beryllium operations presently in existence at Luckey. The question of unit price versus cost operations for the Brush - Luckey and Brush - Cleveland facilities is the subject of another study, but it should be pointed out that if the decision is made to place the beryllium operations presently at Luckey on a unit-price basis, the presence of the Cleveland facilities will considerably complicate this matter. This is due primarily to the fact that the work load for the Cleveland-type facilities is on an individual or job order basis which makes it very difficult to set any reasonable unit-price schedule.

It can be seen from a study of the advantages and disadvantages listed and commented on above that the principle driving motive for the move of the facilities would be the operating cost savings that can be obtained by the consolidation of operations. If there were in hand firm operating requirements for the Cleveland-type facilities for a period of greater than eleven (11) months, there would be no problem to discuss since the cost picture alone would dictate that the consolidation should be made as quickly as possible. However, the lack of firm requirements for finished shapes has always been a continual one in the Commission's beryllium program; in other words, at any time in the past, it was always projected that beyond a certain time (generally one (1) to four (4) months removed) there would be no more requirements for beryllium metal and consequently, the planning would be to shut down operations. However, in every case, before the projected shutdown was to occur, additional requirements arose which necessitated continuation of the Cleveland-type operation. This has been the history of the program for the last two years and there is no reason to believe that this will change. In fact, there is evidence that there will be additional requirements for beryllium over and above those predicated since the level of requirements of beryllium for Research and Development purposes is higher now than it ever has been in the past and experience has shown that the more the material that is used in developmental programs, the more the likelihood that additional firm requirements will subsequently arise.

Although the writer has no information as to the possible availability of \$320,000.00 of capital funds estimated to be required to effect the consolidation of beryllium operations, it would appear that present national conditions would greatly increase the likelihood that this money for this purpose could be obtained. Also it is very probable that an expenditure

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of funds will be necessary to separate the present beryllium operations from the standby magnesium facilities now at Luckey and this being the case, the Cleveland move can be effected more economically along with this work at Luckey than any time previously or in the future. It is the opinion of the writer that in addition, the balance of the advantages listed for the consolidation by far offset the balance of the disadvantages.

From a preliminary analysis of the situation, the timing and manner of the consolidation of the Cleveland and Luckey facilities, if made, depends upon the most up-to-date information on the beryllium requirements that must be produced from the Cleveland-type facilities after February, 1951. The possible variations are as follows:

1. Assuming the requirements picture is as we know it today, namely that after February, 1951, only the SIR stockpile and the ARE reactor core are definitely to be produced and further that the urgency of both of these requirements is such that a delay of eight (8) months will in no way effect these programs, then the best course to follow is:
  - a. Immediately curtail operations in Cleveland at the conclusion of the ANPPA work and reduce the staff to that nucleus of key personnel which we would want to transfer to the operations at Luckey. This nucleus could be utilized to produce the small orders for Research and Development and to assist in the development of the design of the building to house the Cleveland operations at Luckey. In the event we become involved with another crash program, we would have a staff which could be expanded to meet the requirements although admittedly this expansion would be costly.
  - b. Make the new facilities at Luckey which will have to be built if the magnesium plant is reactivated large enough for both the Cleveland and Luckey operations.
  - c. Immediately begin the design of the building to house the Cleveland operations and construct this building when the facilitating units have been completed.
  - d. Begin and complete the move to Luckey at the earliest possible date thereafter.

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2. Assuming that the production of the SIR and ARE requirements cannot be delayed because there will be firm requirements immediately following their completion, then the best course is to proceed as outlined in 1 above except that the Cleveland operations would have to be maintained at a production level large enough to meet the production requirements.
3. Assuming that the requirements are as outlined in 2 above, except that they can be delayed for eight (8) months, then we should proceed as in 1 above. In this case the move from Cleveland to Luckey would be even more desirable since we would be assured of realizing more of the cost savings predicted for combined Cleveland-Luckey operations.
4. Assuming that the only requirements are the SIR and ARE programs with no known requirements to follow and that these cannot be delayed then the best course is:
  - a. Produce the SIR and ARE requirements in the Cleveland plant.
  - b. Make the necessary alterations to the Cleveland plant to meet in-plant requirements for health and safety (estimated cost \$60,000).
  - c. Make the new facilities at Luckey large enough to accommodate the Cleveland operations in the event that it is decided in the future to make the move.

Since all the possible alternatives depend on requirement information from the Reactor Development Division in Washington and further since any decision on consolidation of Cleveland-Luckey facilities also rests with them, it is recommended that:

1. A meeting be set up between the proper personnel in Washington Reactor Development Division and New York Operations Office and the whole matter of the possible consolidation of beryllium operations at Luckey be discussed in detail to obtain a policy decision on the course of action to be followed.
2. That prior to the meeting recommended above, the pertinent facts of this study be presented to the Reactor Development Division for advance information.