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From NMB-J

JO-307

May 28, 1957

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R. M. [unclear]

J. E. Reeves, Test Manager
Albuquerque Operations Office
U. S. Atomic Energy Commission
P. O. Box 5400
Albuquerque, New Mexico

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Dear Mr. Reeves:

One of the prime requirements for firing a large device at the EPG is that the radioactive material falls out in uninhabited areas close to the proving ground. In order to be sure that this condition will be satisfied, JTF 7 and the AEC have set-up a weather observation net and a weather central to allow proper prediction of the wind vectors at all altitudes and points of interest. In addition to this, the AEC through its laboratories, has established a Fallout Prediction Unit responsible for determining to the best of their ability where the fallout material will go under any wind condition.

There are two large uncertainties in the present prediction system. The first and most important of these is simply the fact that the analysis of observed weather information to produce a wind map is a long and tedious hand operation performed by as many as thirty people. It normally takes from four to five hours to accomplish this analysis after the observations are taken. Since weather observations over the whole Pacific weather system are taken every six hours, we quite often find ourselves in the situation of using weather information as much as twelve hours old to decide whether a shot should be fired.

In an attempt to improve this situation, Messrs. Stopinski and Israel of the LASL have developed a code to set weather information directly into an IBM 704 calculating machine which then, with the appropriate extra attachments, can produce a weather map in a few minutes. The presently developed system is not satisfactory; however, it is sufficiently promising that I believe by the time of Harlick an adequate code will be developed. The safety of the Pacific operations will be greatly increased if we can properly use the latest observed winds before firing a large shot.

DEPARTMENT OF ENERGY DIVISION OF APPLIED PHYSICS
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To: J. E. Narves

May 26, 1957

The second problem is the prediction of the fallout pattern taking into account the space and time variation of the wind pattern as the radioactive material is falling. Putting in this variation into the calculations by hand takes too much time to be of any practical value. However, I believe that the fallout prediction that can develop by the time of Hardtack, 704 code which will allow this calculation to be done by machine and hence increase materially the safety of firing. I should point out that it was exactly the lack of this type of calculation that led to our difficulties on the Tom shot of Operation Neptun.

While I cannot guarantee that either of the above calculational methods will be successful by the time of Hardtack, I believe that the probability of their success and the tremendous value to the safety of the operation is such that we should bend every effort to accomplish these gains. As you know, it is necessary to order the 704 now if we are to have it at Hardtack.

It is expected that the rental cost of the 704 will be \$35,000 - \$45,000 per month. I would expect the machine will be needed for approximately six months. I understand however, that the outright purchase price of a 704 is approximately three million dollars. The rental price includes engineers to operate and maintain the machine - the purchase price does not. We do not have a source of people to maintain the 704. It is not at all clear that a 704 will be desirable after Hardtack since other cheaper and simpler machines are now being built. Thus, it appears clear that we should not consider the outright purchase of the 704, but should only rent it for the duration of the Hardtack operation.

I trust the above is a sufficiently lengthy dissertation on the need of the IBM 704 machine. If there are other questions concerning this machine, I will be happy to attempt to obtain the answers you desire.

Sincerely,

Wm. Ogle
Alternate J Division Leader

WGO:al

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