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THIS DOCUMENT CONSIST OF 3 PAGES
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Mr. D. W. King, Patent Attorney
U. S. Atomic Energy Commission
Albuquerque Operations Office
Albuquerque, New Mexico

ATOMIC WEAPON DATA
CATEGORY SIGMA 1

Dear Mr. King:

Under separate cover we are sending you the "Mound Laboratory Explosives Components Report for April" (MLM-CF-65-4-536). The first thirty-six pages describe the results of our process development studies for the design agencies. However, pages 37 through 52 describe our development activities in support of explosives work at Mound Laboratory.

As you may recall, we sent you a Record of Invention form on July 17, 1964, by H. R. McGraw describing a technique of stabilizing the performance of PETN after exposure to elevated temperatures (Case S-30,558). You indicated that the discovery might be patentable, but because of the limited use picture within the Commission and in private industry, we decided not to pursue the idea.

I think that we should reconsider this case in the light of material presented on page 37 of the April Explosives Report. Here a technique is described for producing "free flowing" PETN which we are developing for use in automatic loading equipment. I believe that a "free flowing" product might be significant from a commercial standpoint because of the improved handling qualities. Thus, the work described in Case S-30,558 could be included in a patent covering the preparation of a "free flowing" PETN.

... AND DECLASSIFICATION REVIEW
DETERMINATION (CIRCLE ...)
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3. CONTAINS NO DOE CLASSIFIED INFO
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As indicated in the report, the optimum parameters have not been established. But we expect them to be completed in the near future. The "free flowing" material has been produced in the "Model 1" continuous precipitation unit, but the material cannot be produced in the "Model 2" precipitation unit. Thus, additional studies will be required.

The "Model 2" PETN precipitation unit is a laboratory scale assembly which we are using to establish the parameters for preparing PETN of predetermined physical properties. If the apparatus proves successful, I feel confident that a production scale unit will be built. At that time, it would seem advisable to prepare a Record of Invention form covering the process to protect the Commission's interests.

On page 42, additional information is presented on techniques of preparing "Pyrofuze" bridge-wires. The "Pyrofuze" bridge-wires, which are composed of palladium sheathed in aluminum, have superior explosive properties with detonators and are of significant interest for multipoint detonation systems. As yet I am not sure whether or not it would be advisable to pursue a patent application on the preparation of these "Pyrofuze" bridge-wires because of the limited use.

On page 44, additional studies on the preparation of dies by the decomposition of nickel carbonyl is presented. As shown in Figures 7, 8 and 9, the nickel can be decomposed on plastic samples, but some problems must be solved before the method is considered satisfactory. As I indicated in my letter of April 20, I do not know the originator of the idea of preparing dies by the decomposition of nickel carbonyl. However, we plan to send you a Record of Invention in the near future on a continuous method of decomposing nickel carbonyl to overcome stratification of the deposited nickel as shown in the photomicrographs in Figures 10 and 11.

I would appreciate your reviewing the report, particularly the areas that I have mentioned, and letting me have your comments. If additional information is required, please contact me at once.

Very truly yours,

Original Signed by Frank D. Shearin

Frank D. Shearin
Technical Editor

FDS/eb

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