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Research Department, Mound Laboratory

July 19, 1963

Trip Report No. 81  
Visit to Sandia/Albuquerque,  
July 11, 1963, H. R. McGraw  
and R. E. Vallee

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The writer visited Sandia/Albuquerque on July 11, 1963, in conjunction with a visit to LASL, for discussions on explosives activities of mutual interest. The morning was spent with Dr. M. Taylor Abegg and the afternoon with Mr. J. J. Marron. Dr. R. E. Vallee was with the writer during the morning. A summary of the discussions follows.

Discussions with Dr. M. Taylor Abegg

Taylor is interested in the recent finding of oil in the PETN core of Mound pressurized MDF. Messrs. Joe Cassidy and Bill Frye of Pantex were with Taylor when the Mound visitors arrived. They stayed for discussions on MDF because of their interest in this subject. While these were in progress Loren Carlson and Bob Peterson of GMX-7 arrived to observe the status of the Mound-Sandia cooperative environmental tests on fine particle PETN, as representatives of Walt Meyers.

Tests establishing the presence of oil in the PETN core of Mound pressurized MDF were described by the writer. Pantex employs a 90 per cent water and 10 per cent oil mixture for pressurizing MDF. They observe penetration of water/oil into the ends of the MDF by a color test. Furfural is added to the pressurizing water. Subsequently, PETN from the MDF is treated with aniline acetate; a pink color shows the presence of water, the color being formed by the reaction of the aniline acetate with the furfural in the water. The Pantex visitors are working with a timing device with one-half grain PETN-MDF coiled around an Inconel spool; the MDF is pressurized in place on the spool with the assembly being sealed in surgical rubber. The pressurized MDF is failing, both in the coiled state and in straight lengths. During conversations at LASL

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Dr. G. Richard Grove

July 19, 1963

Walter Meyers advised that Herb Carrol of Pantex was separating various particle size PETN by wet screening through screens with microsize pores. Joe Cassidy will tell Mr. Carrol of the writer's interest in this activity. Apparently, areas of mutual interest exist for which visits between Explosives Research and Pantex would be of value. Taylor exhibited samples of microsize pore screens obtained from Buckby-Mears, Minneapolis.

Taylor showed two samples of MDF products for proposed cross-talk investigations. One consisted of three separate strands of MDF encased loosely in a lead sheath. The other consisted of four strands of MDF compacted tightly so that the sheaths lost their identity and the product resembled a lead wire with four PETN cores. MDF conversations were concluded and the Pantex visitors departed.

The Mound-Sandia cooperative environmental test program on fine particle PETN is described in MLM-CF-63-4-200. Explosives Research has processed and shipped products to Sandia for the test, fulfilling their commitment on this phase of activity. Taylor advised that Sandia processing was nearly completed. He will advise the writer when he will be ready to start environment tests so that testing can be conducted at both sites at the same time.

Loren Carlson, as instructed by Walt Meyers, advised Taylor that GMX-7 had taken the position that the use of the TRIPEON that Mound is obtaining should be controlled tightly and that none would be available for Sandia unless incorporated in explosive mixtures. The matter was brought up by Loren and nothing further was said on the subject. The writer had prior information that Taylor had requested some of the material.

Taylor will present a paper at the Atlantic City American Chemical Society Convention on the sensitivity of organo-metallic explosive compounds such as bis-ethylenediamine-dichlorocobalt (III) nitrates, iodates and chlorates. He is planning to attend an explosives meeting in England held by the Ministry of Aviation in October, which will be followed by a JOWOG meeting. The writer learned previously from Walt Meyers that the former meeting is a very exclusive affair,

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July 19, 1963

by invitation only. The writer suggested that Taylor recommend Mound Laboratory for participation in the group; Taylor thought it could be arranged by Mound contacting the secretary. However, greater prestige would be derived by being invited to attend and no action is planned.

#### Discussions with Mr. J. J. Marron

Jack Marron's interest is in fine particle PETN for use in multidetonator systems with low power supplies. Fine particle PETN surface area deterioration caused by heating is currently an obstacle to the program. Jack was shown, and he made copies of, data which will appear in the April and June monthly reports on the effect of heating certain fine particle PETN products (series with various amounts of TriPEON and series with Cab-O-Sil). He was enthused with results from a batch with two per cent added TriPEON (ER-2065) where the surface area decreased seven per cent during 24-hour heating at 88°C.

Jack introduced the writer to Dr. Eldred Harrington, physical chemist, who is a Sandia summer employee. Dr. Harrington is head of secondary education in the Albuquerque Public Schools, keenly interested in many things, and has worked at Sandia several summers. He is working on the separation of PETN into various particle sizes, with the view that the tendency for particle size to change during heating would be less if all particles were about the same size -- large particles would not grow at the expense of small ones because all would be about the same size. He exhibited two separating devices. One consisted of a series of four inverted glass cones of decreasing size. The material is charged to the largest cone and air pressure applied. The largest (heaviest) particles remain in the cone and the smaller (lighter) are blown to the next cone, where another separation takes place and so on. The other device consisted of an inverted glass cone surmounted with a glass tube about four feet long by four inches in diameter. The cone is mounted on a metal plate containing a cavity under the cone apex. The cavity is covered on top and bottom by thin sliding plates. The material is introduced slowly at the top of the tube. In falling through air it

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Dr. G. Richard Grove

July 19, 1963

classifies itself, with the heaviest on the bottom and the lightest on top. The plate covering the cavity is slid over, the cavity fills with the heaviest material, and the cavity is covered again. The plate at the bottom of the cavity is slid over and the content of the cavity is removed. The process is repeated as many times as desired. Fractions so obtained may be classified further.

Another concept, not constructed, is an inverted cone composed of segments. Each segment contains baffles to classify solid and a well around its lower periphery to collect material. The sample is placed in the bottom of the device and air is applied at the bottom. The various size baffles classify the material; material stopped by the baffles is collected in the wells. This method of separating sizes appeared least feasible. Dr. Harrington is cognizant of complexities with all methods. He will test the efficacies of his devices with clay particles prior to using PETN. This work will be followed with interest. Explosives Research attempts to classify large particle (1E26-type) PETN products by dry screening with mechanical agitation have been unsuccessful. Dr. Harrington is operating a Fisher Sub-Sieve Sizer. He was advised to contact the writer for any information he might need.



H. R. McGraw

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