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In answer to your letter of August 2, 1964, requesting technical information on the handling of plutonium metal in various forms, we have the following comments and recommendations to make:

1. De-Chemistry and Reduction. Laboratory work has shown that the addition of water to the reduction bath causes the formation of a highly reactive coating (composition unknown) on the bottoms of test tubes used in the experiments. Precautionary measures should be taken to ensure complete drying of the reduction bath at all times. In conducting the results of laboratory work on the reduction of low temperature (300°C) plutonium powder, which has been hydrogen-atomized at a temperature of as low as 500°C, a small quantity of water should be used. After preliminary studies, and these latter studies may be found in higher hydrogen-atomization temperatures, the current best practice, temperature-time cycle duration should be of interest from this viewpoint.

2. Handling of Metal in Manipulatable Form. Metal should never be stored in contact with a chlorine solution. Storage vessel (except tanks for shipment) is to be removed from the line and/or stored for any length of time. It should be placed in a dry, weight-proof metal container (such as the container now recently in use in the 300 Area), vacuumed, and the air replaced with dried air of dewpoint less than -50°F. Any vessel used for such a

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purpose should contain as little oxygen as possible, to reduce to a
minimum the amount of oxygen which is present and free to react with the
metal.

3. Precautions. In general, garments should not be removed from the line and
should be handled as little as possible. They should be treated as
soon as possible after machining and should be washed or stored in bri-
quettes. Besides reducing any hazard associated with the handling of
garments, this procedure should give a reduction in the time of the stulls
resulting from casting briquettes.

4. Handling of briquettes. The present procedure for preparing briquettes for
shipment in probably satisfactory, provided the following precautions are taken:
only good, smooth briquettes with no evidence of unusual sensitivity should
be shipped; and the briquettes should be sealed in the can immediately after
sealing into the plastic bag. However, to give an added safety factor and
to comply with the recommendation that the metal never be left in contact
with a flammable material, it appears wise to wrap the briquettes in
aluminum foil before placing it in the plastic bag.

5. Summary. Present, approved Process Specification 5.09 reads as follows:
"Samples of platinum ore are cut from clean metal surfaces (polish and planar)
and packaged immediately in clean dry containers flushed with inert gas." This
is adequate.

We believe that compliance with the above suggestions will assure the safe
handling of platinum metal in the various forms in the operating line.

Original signed by
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