

5 September 1974

Mr. J. Paradis
United Nations Development Program
Projects Execution Division
866 United Nations Plaza
New York City, N.Y. 10017

Dear Mr. Paradis:

On 8 and 9 August 1974 I provided two days of consulting services to Dr. B. K. Agarwala of the Indian National Physical Laboratory on matters dealing with the projected Indian diamond synthesis program. As an extension of my consulting agreement, I spent 2 and 3 September 1974 with Dr. H. Tracy Hall at his manufacturing location in Provo, Utah inspecting and testing his 200 ton-capacity "cubic" high pressure-high temperature diamond making apparatus.

I have found the apparatus to be of good design, and overall well-constructed. Its operational characteristics will exceed the performance specifications desired by Dr. Agarwala. During operational tests, three materials defects and one design modification were determined. All can be corrected, and Dr. Hall agreed to do so. I recommend that the Hall apparatus be purchased for the preliminary phase of the Indian diamond-making program.

Details on the defects and design change mentioned above are as follows:

- 1) During tests, the head-plate of one of the hydraulic pistons showed some oil leakage. This slight leakage may be due to a defective oil seal, or it may be due to a pinhole leak in the head-plate steel casting. If it is just a matter of an oil seal, it is a simple quick repair. However, if it is a leak in the casting itself, it may have to be replaced. Dr. Hall will have the component disassembled to determine the cause of the leak and will proceed with its correction. If the casting must be replaced, Dr. Hall estimates that it will take about two months.
- 2) The electrical insulation around hold-down bolts on two of the four anvils was found to be defective. Dr. Hall will have new heavier insulators installed. This is a simple quick repair.
- 3) The manufacturer of the electrically driven and controlled hydraulic pumping system delivered a 60 cycle solenoid switch instead of the specified 50 cycle component. Dr. Hall pointed out this defect and stated that the manufacturer has agreed to deliver the proper 50 cycle unit. This should be no problem.

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