

UNITED NATIONS  
DEVELOPMENT PROGRAMME



PROGRAMME DES NATIONS UNIES  
POUR LE DEVELOPPEMENT

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19 September 1974

Dear Sirs,

..... We are pleased to attach a copy of the report made by Dr. Giardini as a result of his visit with you on 2 and 3 September 1974.

The purchase order for the 200 ton cubic press will be despatched to you during the course of next week. Mr. Paradis is presently in Europe due to unforeseen circumstances but will return on Monday 23 September 1974 at which time priority will be given to the above mentioned purchase order.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'A. Sutcliffe'.

A. Sutcliffe

For: J.H. Paradis  
Projects Execution Division

H. Tracy Hall  
P.O. Box 7533 University Station  
Provo, Utah 84602

DEPARTMENT OF GEOLOGY  
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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.

- 4) Operational tests indicated that a metering valve should be installed in the hydraulic line to the pistons, and that an upper pressure adjustment would be desirable. These modifications would minimize the possibility of over-rapid pressure release, or excessive pressure build-up, respectively. Dr. Hall has agreed to make these changes.

As stated above, the above defects and changes are not of a serious nature. They can be readily corrected, and Dr. Hall has stated that he will do so. Other units of similar design have shown good performance and long-term durability. Overall, I was very pleased with the apparatus. A statement for my consulting services to date is attached.

Respectfully submitted,



A. A. Giardini

cc: Dr. B. K. Agarwala, Head  
Mechanics Division  
National Physical Laboratory  
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New Delhi - 12  
India