



**Western Electric**

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609 639-1234

**Engineering Research Center**

July 23, 1974

DR. H. TRACY HALL  
Post Office Box 7533  
University Station  
Provo, Utah 84601

Dear Dr. Hall:

I would like to thank you for spending the afternoon with me last Wednesday to show me some of your activities and equipment. It helped me to respond to the U.N.D.P. request and also provided me with some possible solutions to some of our Western Electric manufacturing problems. Your sintered diamond materials could be very useful, and I will pursue the possibilities further with Megadiamond Industries.

Attached for your information is a copy of my report to the U.N.D.P. regarding the project tender. I hope they will place an order so that you can move the press out of your shop and build a bigger, better one!

Again, thank you and your wife for your courtesy.

Very truly yours,

F. J. FUCHS  
Research Consultant  
Physical Processes

FJF:JA

Attachment

F. J. FUCHS, JR., P. E.

9 UNIVERSITY WAY

PRINCETON JCT., N. J.

REF: INDIA 72/041

JULY 22, 1974

MR. JOHN B. CELLA  
DIRECTOR  
PROJECTS EXECUTION DIVISION  
U.N.D.P.  
886 UNITED NATIONS PLAZA  
NEW YORK, N.Y. 10017

DEAR MR. CELLA,

IN RESPONSE TO YOUR REQUESTS OF JULY 8, 9, AND 18 I HAVE REVIEWED AND PREPARED AN ANALYSIS OF THE REVERE AND A.S.E.A. BIDS FOR THE HYDROSTATIC EXTRUSION PROJECT AND VISITED DR. HALL IN PROVO IN REGARD TO THE MATERIALS SYNTHESIS PROJECT.

THE BID ANALYSIS IS PRESENTED IN THE FORM OF CHARTS WHICH I HOPE SHOW CLEARLY THE CONTRASTS OF ONE BID WITH RESPECT TO THE OTHER, BUT DIGESTED DOWN TO ESSENTIALS. ALONG WITH THE ANALYSIS IS A BRIEF SUMMARY AND RECOMMENDATION. IF YOU WOULD LIKE MY HELP IN FURTHER STUDYING OF THE BIDS, I OFFER TO COME TO YOUR OFFICE, SPREAD ALL OF THE ACTUAL BID INFORMATION OUT ON THE TABLE AND SHOW HOW THE ANALYSIS RELATES BACK TO THE ACTUAL SUBMITTED DOCUMENTS.

I WAS PLEASED WITH THE CLARITY AND THOROUGHNESS OF THE BIDS. BOTH WERE CAREFULLY PREPARED AND LEAVE VERY LITTLE INFORMATION TO BE DESIRED. IT SEEMS THAT THE PROJECT WILL BE ASSURED OF SUCCESS.

I MANAGED TO ARRANGE A DAY AT PROVO BY RE-ROUTING MY FLIGHT BACK FROM SAN DIEGO ON THE 16TH TO STOP OVERNIGHT IN SALT LAKE CITY AND SPEND THE 17TH LOOKING INTO THE MATERIAL SYNTHESIS PROBLEM. DR. HALL VERY GRACIOUSLY GAVE ME A GOOD PART OF HIS DAY IN SEVERAL LOCATIONS AT THE UNIVERSITY AND AT HIS BUSINESS LOCATIONS. WE INSPECTED A NUMBER OF HIGH PRESSURE-HIGH TEMPERATURE PRESSES OF HIS MANUFACTURE. I OBSERVED THE ACTUAL RUNNING OF A BISMUTH AND MERCURY PHASE TRANSITION EXPERIMENT IN ONE OF HIS PRESSES, VISITED HIS MANUFACTURING LOCATION TO LOOK AT SAMPLES OF SINTERED DIAMOND, AND INSPECTED THE CUBIC PRESS OFFERED IN HIS QUOTATION OF MARCH 2, 1974.

THE PRESS IS A BEAUTIFULLY MADE EQUIPMENT OF THE CUBIC CONFIGURATION WITH SOME UNIQUE FEATURES. THE ALIGNMENT RODS IN THIS PRESS ARE HOLLOW AND PROVIDED WITH A FLOW OF HYDRAULIC FLUID WHICH ACTS AS A COOLANT FOR THE ANVIL MOUNTS AND ALSO RETRACTS THE ANVILS. THE PISTON-CYLINDER ARRANGEMENT IS REVERSED COMPARED TO THE USUAL WAY. THIS PROVIDES BETTER MOUNTING FOR THE ANVILS, SPACE SAVING AND LESS CHANCE OF ABRASIVE MATERIAL SCORING THE PISTON. THE PRESSES IN EXCELLENT CONDITION AND BY MY ESTIMATES WELL WORTH THE \$68,500 ASKED. I AGREE WITH HIM IF THE SAME EQUIPMENT WERE TO BE MADE TODAY, THE COST WOULD BE CONSIDERABLY HIGHER.

DR. HALL CONTENDS THAT THE TRAINING REQUIRMENTS AS SHOWN IN THE SPECIFICATION ARE OVERSTATED; AND I TEND TO AGREE WITH HIM. HE OFFERS TO DEMONSTRATE THE PRESS SYNTHESIZING DIAMOND TO OBTAIN ACCEPTANCE OF DELIVERY. THEN AFTER SHIPPING HE WILL SPEND TWO WEEKS IN INDIA TO COMMISSION THE EQUIPMENT AND TRAIN N.P.L. PERSONNEL IN MACHINE OPERATION AND MAINTENANCE. HE ESTIMATES THE COST OF THIS WILL BE ABOUT \$7000 CONSISTING OF HIS FEE PLUS EXPENSES.

MY OWN ESTIMATE OF THE MINIMAL PROJECT COST WOULD BE AS FOLLOWS: \$69,100 FOR THE PRESS, \$8,000 SHIPPING, \$7,000 FOR DR. HALL ASSISTANCE, AND ANOTHER \$10,000 FOR ADDITIONAL TECHNICAL ASSISTANCE, TOTALING \$94,000.

SINCE THIS EQUIPMENT IS AVAILABLE CURRENTLY IT APPEARS TO ME THAT IT COULD BE PUT TO GOOD USE AT N.P.L. TO START UP THE PROJECT ORGANIZATION THERE SOONER THAT WOULD BE POSSIBLE IF THEY WAIT FOR THE HYDROSTATIC EXTRUSION PROGRAM. REAL BENEFITS IN SCREENING, TRAINING, AND DEVELOPING PERSONNEL COULD RESULT IN BETTER HANDLING OF THE LARGER EXTRUSION PROGRAM.

MY RECOMMENDATION IS THAT THE U.N.D.P. PLACE AN ORDER FOR THIS EQUIPMENT AS SOON AS POSSIBLE.

VERY TRULY YOURS,

*F.J. Fuchs*  
F.J. FUCHS