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January 19, 1960

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ELECTRON BEAM MELTING

H. Davis - Metallurgical Department Supervisor

H. M. Eikenberry and R. B. Steck

The following is a brief summary of the results from the initial inquiry concerning electron beam melting. The following companies are engaged in electron beam melting or electron beam welding. It is possible to adapt the welders to a drip melting operation. It is recommended, however, that the contract be given to a company who is engaged primarily in melting as the work would proceed under optimum conditions.

Each firm has been informed of NLGG's interest in electron beam melting. The tentative program was described as a two-phase operation:

Phase I - Drip melting of approximately 50 to 200 pounds of normal uranium metal. The product would be submitted for chemical (oxygen, carbon, nitrogen, hydrogen, etc.) and metallographic analyses at NLGG. As there would be no mechanical working (rolling, extrusion, etc.) to the product, the crucible size would be optional. An approximate ratio (height vs crucible size) of 6:1 would be maintained.

Phase II- Drip melting of approximately 1200 to 7200 pounds of normal uranium metal. Each ingot would be 7 in. OD, 44 to 46 in. long, and 1200 pounds in weight. The ingots would be fabricated into slugs through the standard rolling and machining processes. The decision to enter Phase II would be dependent upon available funds and Phase I results.

*H. M. Eikenberry*  
H. M. Eikenberry

*R. B. Steck*  
R. B. Steck

RBS:cs

cc: C. E. Folsen  
Central Files  
A. D. Cavett

<u>NAME</u>	<u>CONTACT</u>	<u>COMMENTS</u>
MEC Equipment Corp. 160 Charlemont Street Newton 61, Massachusetts	David Reece Manager - Standard Products Sales Department	Tentatively scheduled to do electron beam welding on centrifugally cast tubes for MICO. Crucible - 3-3/8" dia. Welding and Melting Single melt. Feed material - chips, scrap, slugs, etc. Approx. \$10-15/lb.
Air Reduction Co. Murray Hill, New Jersey	Gilbert Rothchild Central Research Dept.  cc: John H. Berryman Special Product Dept. Air Reduction Sales Co. Union, New Jersey	Primarily in welding. No U welding. Welded Nb, Ta, Mo, etc. Welding machine Crucible - 1" dia., 1-2" length
High Vacuum Equipment Corp.	Robert C. Gross Vice-President	Wholly-owned subsidiary of Robinson Technical Products, Inc. Definitely interested. Primarily welding, some refining. Electron-beam welding for Bettis. 100 KV power supply Chamber - 48" dia., 60" long.
Hamilton-Electrons, Inc. 40 Wall Street New York City	Irving Rossi* Chairman of the Board  *Personal friend of Mr. Joseph Martino	Electron beam welding, drilling, machining. No melting experience 2 kw welder. Welder on display at Hotel Statler in NYC on January 28, 1960

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Seisky Bros., Inc. 4915 W. 67th St. Chicago, Illinois (Several blocks from Midway Airport)	William H. Beecher Applications Engineering  cc: Bill Farrell Chief Application Engineer	Beam welding. No melting. 7-1/2 KVA welder. Chamber - 24" dia., 30" long. Beam welded Be, Nb, Mo, Ta. License with French AEC. Beam welded U for U. S. AEC.
Alloyd Research Corp. 35 Cambridge Parkway Cambridge, Massachusetts	Donald Hay Director of Technical Services	Primarily in welding. Currently setting up drip melting equipment. Will have 4" dia. crucible. Definitely interested. Sponsors of yearly Electron Beam Symposium.
Stauffer-Temescal Corp. 1201 So. 47th Street Richmond, California	Dr. Charles Hunt  cc: James Lowe Technical Sales Engineering	Primarily in beam melting. 60 kw unit. Small furnace - 3" dia. crucible \$40-\$45/hr. On stream 40% of time. Actual charge - \$100/hr. Melting rate - 2" to 6"/hr. Final pass - 1' to 2'/hr. Could adapt to 7" crucible. Definitely interested.
Wah Chang Corp. P. O. Box 366 Albany, Oregon	E. F. Baroch Metallurgical Processing	Contract work. Crucible - 5" dia. Could adapt to 7" dia. crucible. 2 beam melters, 3d unit in March. Electron beam - 1st pass. Arc melting - 2d pass (for grain refinement). \$12/lb for Columbium (Niobium). No U melting to date. Definitely interested.