BNL-104462-2014-TECH

AGS/AD/Tech Note No. 21;BNL-104462-2014-IR

TRIP REPORT - CALIFORNIA June 6-11, 1966

J. C. Schuchman

June 1966

Collider Accelerator Department

Brookhaven National Laboratory

U.S. Department of Energy

USDOE Office of Science (SC)

DISCLAIMER

Accelerator Department
BROOKHAVEN NATIONAL LABORATORY
Associated Universities, Inc.
Upton, L.I., N.Y.

AGS DIVISION TECHNICAL NOTE

No. 21

J.G. Schuchman

June 14, 1966

TRIP REPORT - CALIFORNIA June 6-11, 1966

V.J. Buchanan, D. Hoober and J. Schuchman visited the following manufacturers and laboratories to gain detailed information on certain vacuum seals and couplings which could be used on the converted AGS. Listed below are the companies visited, people involved, and brief discussion of meetings.

1. Marman Division of Aero-Quip Corp.
11214 Exposition Blvd.
Los Angeles, Calif.
(213) GRanite 8-0921

Mr. R. Forrester,
Nuclear Products Mgr.

Mr. C. Ohoshi, Engineer

Marman will quote on a double con-o-seal joint with pump-out, OFHC copper gaskets, flange material S/S 304L, gasket retention, inner seal 8" I.D., 3/8" axial flange movement available to remove and install gaskets. Two style couplings will be proposed, one typically per their drawing MJC-63517, and another style for the 3/8" axial movement probably an over center toggle with two take-up bolts ninety degrees to either side of the toggle.

Marman's facilities and capabilities are impressive and they could handle any coupling work we could give them. Detailed machining information on flanges is available.

2. Parker Seal Company
10567 Jefferson Blvd.
Culver City, Calif.
(213) 837-5101

Mr. R. Soloff, Mgr.
Mr. A. Kutas, Engineering
Mr. B. Woods, Testing

Two "Vee seals" are now available 1/8" and 3/8". In time a complete line is planned. The seal is made from inconel-718. It is rolled into rings, electron-

bem welded, aged, sealing surfaces lapped and finally the seal is plated. Indium-plated seals will seal at about 100 lb/in.

A tour through their facilities show that they are well equipped to manufacture gask-o-seals, but very little for metal "Vee-seal" production. Parker will be quoting on a double "Vee-seal" assembly for a flat flange assembly.

3. Del Mfg. Co.
5711 East Sheila Street
Los Angeles, Calif.
(213) RAymond 3-9244

Mr. M. Delgado, President
Mr. G. Rommel, Sales Mgr.
Mr. L. Arranaga

Del has redesigned their "Oval" seal so that it now is made by rolling flat stock to a generally oval cross section rather than reshaping round tubing. Reason - the supplier of the round clad tubing discontinued the tubing line.

Del is a very small company. They seem to have the necessary equipment and talent, but will they survive the next five years is questionable. The new style oval seal looks good and is worthwhile persuing. They too are quoting on a double seal for flat flanges.

4. LRL, Berkeley, Calif.

Mr. F. Reinath - 200 Bev Linac Vacuum System
Mr. R. Eaton - 200 " " " "
Mr. J. Susta - Seals, Couplings and Vacuum Chamber for 200 Bev

J. Susta is working on designs for the vacuum chamber, seals and couplings. A large fixture is now being made which will compress a gasket between a pair of flanges until "keepers" are inserted to hold the flanges together and the fixture then removed. The drawings showed copper con-flat type gaskets although aluminum and indium plated aluminum may also be tested. The hardware should be complete in a few months.

They propose roughing the vacuum chamber and sputter-ion pumps with turbo-molecular pumps. No valve is being used between the pump and chamber. The isolation valves used to separate superperiods are manufactured by Whittaker Corp. They are all metal bellows sealed and use the Batzer style seals. A word of caution was issued regarding the turbo-molecular pump. First, a mass spectra at low pressure (10^{-9}) showed a sizeable hydrocarbon peak in the 60 a mu range. More important is the fact that if the pump becomes contaminated with oil, say from the backing pump, it is very difficult to remove and the pump must be disassembled, cleaned and baked to do a good cleaning job. N. Milleron did the backstreaming tests.

Another point was brought up which should be considered and it is venting the system to dry air rather than to normal ring atmosphere.

5. LRL Livermore, Calif.
Mr. T. Bayzer - Mech. Engr.

T. Batzer designed the Whittaker valve. It is all metal and claims approximately 2000 cycles with little noticeable leakage. A 12" valve cycled 1200 times had a closed conductance of 10^{-9} std cc/sec. A detailed drawing of this valve was obtained. The aluminum foil Batzer seal is used throughout the areas we visited. It is useful from cryogenic to bakeout temperatures.

6. SLAC, Palo Alto, Calif.
Mr. R. Conviser - Vacuum Engr.

R. Conviser stated that the Ultek pumps seemed to pump helium quite well. A leak in a piece of counting equipment permitted argon to directly enter the vacuum system. The 600 ℓ/sec Ultek pump would automatically trip off due to high currents caused by the high pump pressure. The system was re-evacuated and the pumps started. Again the argon leak caused the pumps to trip off (the time interval was about 3 hours). When helium was substituted for the argon, without fixing the leak, the pumps maintained the design vacuum, hence they must pump helium very well.

Conclusion

It is doubtful if one metal seal can be developed which can be used throughout the AGS. Rather a few types should be used, each type being the best for a particular application.

The Marman coupling design seems to be the one to follow. A program should be set-up to test the double Con-o-seal and a double Oval seal. The Oval seals should be made in flat flanges.