

**National Aeronautics and
Space Administration**

**George C. Marshall Space Flight Center
Marshall Space night Center. Alabama
35812**

EP25 (79-23)

February 6, 1979

TO: Distribution

FROM: EP25/Mr. Ray

SUBJECT: Visit to Precision Rubber Products Corporation and Parker Seal Company

The purpose of this memorandum is to document the results of a visit to Precision Rubber Products Corporation, Lebanon, TN, by Mr. Eudy, EES1 and Mr. Ray. EP25. on February 1, 1979 and also to inform you of the visit made to Parker Seal Company, Lexington, KY on February 2, 1979 by Mr. Ray. The purpose of the visits was to present the O-ring seal manufacturers with data concerning the large O-ring extrusion gaps being experienced on the Space Shuttle Solid Rocket Motor clevis joints and to seek opinions regarding potential risks involved.

The visit on February 1, 1979, to Precision Rubber Products Corporation by Mr. Eudy and Mr. Ray was very well received. Company officials, Mr. Howard Gillette, Vice President for Technical Direction, Mr. John Hoover, Vice President for Engineering, and Mr. Gene Hale, Design Engineer attended the meeting and were presented with the SRM clevis joint seal test data by Mr. Eudy and Mr. Ray. After considerable discussion, company representatives declined to make immediate recommendations because of the need for more time to study the data. They did; however, voice concern for the design, stating that the SRM O-ring extrusion gap was larger than that covered by their experience. They also stated that more tests should be performed with the present design. Mr. Hoover promised to contact MSFC for further discussions within a few days. Mr. Gillette provided Mr. Eudy and Mr. Ray with the names of two consultants who may be able to help. We are indebted to the Precision Rubber Products Corporation for the time and effort being expended by their people in support of this problem, especially since they have no connection with the project.

The visit to the Parker Seal Company on February 2, 1979, by Mr. Ray, EP25. was also well received; Parker Seal Company supplies the O-rings used In the SRM clevis joint design. Parker representatives, Mr. Bill Collins, Vice President for Sales, Mr. W. B. Green, Manager for Technical Services, Mr. J. W. Kosty, Chief Development Engineer for R&O, Mr. O. P. Thalman, Territory Manager and Mr. Dutch Haddock, Technical Services, met with Mr. Ray, EP25, and were provided with the identical SRM clevis joint data as was presented to the Precision Rubber Products Company on February 1, 1979. Reaction to the data by Parker officials was essentially the same as that by Precision; the SRM O-ring extrusion gap is larger than they have previously experienced. They also expressed surprise that the seal had performed so well in the present application. Parker experts would make no official statements concerning reliability and potential risk factors associated with the present design; however, their first thought was that the O-ring was being

asked to perform beyond its intended design and that a different type of seal should be considered. The need for additional testing of the present design was also discussed and it was agreed that tests which more closely simulate actual conditions should be done. Parker officials will study the data in more detail with other Company experts and contact MSFC for further discussions In approximately one week. Parker Seal has shown a serious interest in assisting MSFC with this problem and their efforts are very much appreciated.

William L. Ray
Solid Motor Branch. EP25
Distribution:
SA41Messrs. Hardy/Rice
EE51/Mr. Eudy
EP01/Mr. McCool

*Source: Report of the Presidential Commission on the Space Shuttle Challenger Accident. June 6, 1986.
pp. 237-238*