MONSANTO INDUSTRIAL CHEMICALS CO.
St. Louis, Missouri

February 11, 1972

cc: C. L. Bradford
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L. R. Stark - W4A
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T. Visit

CALL REPORT NO. 1972-11

TEXAS EASTERN TRANSMISSION CORP.
Shreveport, La.

Date of Call: February 4, 1972

Present for T. E.: Walter Woods
A. B. Jarnagin
Bill Hartman
Ben Means

Present for Monsanto: John Frederiksen
R. E. Hatton

SUMMARY:

Monsanto's all phosphate ester turbine lubricant MCS 1223 was discussed in considerable detail and compared with Turbinol 153 in a meeting held at the request of Texas Eastern. It was indicated basically that this product should perform in their turbines and that General Electric was aware of the product but that their approval would depend upon Texas Eastern's position.

Competitive fluids are also being considered by this group. They are also quite interested in looking at a fluid in the 150 SSU range. Texas Eastern has been in contact with concerning their experience with various fire resistant lubricants in gas turbines and is completely aware of the programs under development.

Texas Eastern has made no definite commitment as yet as to which fluids they will use to replace Turbinol 153. Continued attention to this account in terms of visits and additional data and coordination of efforts with their suppliers will be required.

DETAILS:

This meeting was called by Walter Woods to review the information provided on Monsanto's all phosphate ester turbine lubricant MCS 1223 compared to Turbinol 153. This information



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had been provided in bulletin form earlier in the week by John Frederiksen and resulted in this request for further discussion by the undersigned.

The meeting followed the format of a review of the properties of MCS 1223, particularly in terms of how they might relate to performance in General Electric gas turbines. It was quite apparent from the questions asked and from the information files that the attendees had with them that the competitive fluids are also being evaluated and that these are primarily the Fyrquel products.

The results of the undersigned's visit to the General Electric Gas Turbine group in Schenectady were reviewed. It was pointed out that this group will probably not give approval but will hopefully indicate no objections to running actual turbine tests on MCS 1223 or other synthetic phosphate esters. It was also indicated that the G.E. Medium Steam Turbine-Generator group at Lynn had given Turbinol 50 approval for use in their electrohydraulic control units and that the Gas Turbine Department generally considered such approvals sufficient for their purposes (control units only).

Each of the properties in the brochure were discussed in more detail and only the highlights will be reviewed here.

One particular area of concern seemed to be the rust inhibition characteristics. They indicated that they understood rust inhibitors had been added to MCS 153 sometime during its history. Since this was unable to be confirmed or denied by the undersigned, it was agreed that the past history would be reviewed on this subject. The rust seems to occur primarily on idle machines and Walter Woods and Bill Hartman both indicated that they had seen large amounts of rust on gears when Turbinol 153 was used. However, they do not really know that this has been a major or real problem and, as far as they know, has not affected operations in any way. Buck Jarnagin indicated that he had been discussing the experience with Paul Knight. Apparently these discussions have been quite extensive and frequent. He stated that Paul Knight says that Fullers Earth does not remove the rust inhibitors that are put in the competitive fluids. I indicated that this may be true if sufficient make-up fluid is added or if rust inhibitors of low acidity are used. Based upon these discussions it would appear that we need to be sure that coordination between the Texas Eastern and test programs be full and open and that we work closely with both

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groups. We must also examine the requirements and performance of rust inhibitors in our proposed turbine lubricants.

Walter Woods pointed out that there appear to be some differences in fire resistance between MCS 1223 and Turbinol 153. This opening was used to indicate why we had stayed so long with the chlorinated materials in spite of the opposition by certain units of General Electric. We indicated that the fire resistance of our MCS 1223 type fluids were equivalent in performance type tests to those of competitive products. Walter asked if we would be willing to run such comparisons in our laboratory for their observation. It was indicated that the laboratory would be made available together with personnel any time that they cared to come and watch or run such tests.

The area of stability and its meaning was reviewed with emphasis upon the Alcor test and the oxidation-corrosion data. This did not seem to raise any particular problems but neither did it seem overly important to them. However, it was pointed out that such type of testing is extremely important to and will undoubtedly become more important as higher powered machines such as the Frame 7000 G.E. units are put in operation. It was also indicated that the Westinghouse units were particularly critical in terms of such type stability as measured by coking in bearing housings.

In the area of lubrication it was pointed out that the LFW-1 test was considered to be of some importance by General Electric and that they might discover on discussing it with them that there was some difference as to test results. I indicated that our results show that metallurgy and surface finish were important in determining comparative ratings of the fluids. I also indicated that this was only one laboratory test and was not really indicative of field performance.

It was emphasized that we did not prepare "me too" fluids and did not expect our new phosphate esters to be equivalent in all respects to the competitive cresylic acid base products. The advantages of our approach in terms of total stability and availability were emphasized and these points seemed to be of considerable interest to some of the operations people present.

The question of price came up and this group was told that MCS 1223 would be no higher in price than Turbinol 153.

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They asked for written confirmation of this and it will be handled through John Frederiksen and Don Stegen with the group in Shreveport as well as the Purchasing group in Houston.

Toward the end of the discussion the question of viscosity requirements for the General Electric units was brought up. Texas Eastern was told that we were working on a 220 Saybolt second fluid (MCS 1223) at the direct instigation of General Electric since this was their recommended viscosity level. Walter Woods stated that most of the units operating in the field that he had heard about were running on a 150 Saybolt second fluid and indicated that this discrepancy would have to be cleared up with General Electric. He asked if we could provide a 150 Saybolt second fluid and was assured that we would be most happy to do so and that we had done preliminary work on such fluids. A short data sheet on MCS 1121 and MCS 1122 was left with them. These two products are the ones which are under consideration by Paul Knight for use in the fluid test and I had the distinct impression that they had been discussed between Jarnagin and Knight. It was pointed out that we do not have complete data on these products since is primarily concerned with the results of the National Research Council testing as compared to other information which we could provide. It would appear that we should be prepared to offer Texas Eastern this type of product together with additional data.

At the end of the discussion Walter Woods indicated that they plan to get together very shortly with General Electric to determine exactly what needed to be done in order to shift from Turbinol 153 to the phosphate ester fluids. There was considerable discussion among the Texas Eastern group concerning the necessity of changing impellers on the lubricant and hydraulic pumps. They do not feel that there will be any on the natural gas compressors on changing the lubricants. At the present time they are working out a program of how many and which units should be changed out and should be used as trial machines on phosphate ester fluids to cause minimum operational upset to their total system and also the timing involved.

It was quite obvious that competitors are working hard to obtain selection of their fluid by Texas Eastern. However, there was no indication that a positive commitment had been made to any fluid at this time.

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One particular area of concern is that of compatibility of the materials in the present Turbinol 153 turbines and the compatibility between MCS 1223 and Turbinol 153. Texas Eastern was told that they could top up the Turbinol 153 with MCS 1223 if this is the way they desired to proceed. It was reported that after standing, mixtures of the two products in 10:90, 50:50 and 90:10 ratios showed a trace of material rising tothe top which was identified as defoamer. This material separation was explained on the basis of the differing solubility of the silicone materials in the two base stocks. This related directly to experiences they had previously had and therefore created no problems. It was stated unequivocably that all the materials they have been using with Turbinol 153 can also be used with MCS 1223. During this compatibility discussion it was pointed out that Monsanto's basic position would be that they ought to drain the units as well as possible and then start operations on the new fluid. It was pointed out that this recommendation is based primarily on ecology considerations and not on performance.

R. E. Hatton

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