Monsanto

FROM (NAME & LOCATION): J. H. Davidson - G. O., St. Louis

DATE: January 23, 1973

SUBJECT: TURBINOL 1122, 1223

REFERENCE:

TO: All Domestic Field Salesmen
Regional Managers

(See distribution list attached)

cc: T. L. Gossage - B2SL
C. Paton
N. T. Johnson
R. E. Hatton
W. R. Richard - T3A
J. F. Herber - T3G
L. R. Stark - W4A
P. D. Fowlkes - W4A

Over the past several years we have discussed our fire resistant turbine lubricant program as a development project which we hoped would come to commercial fruition. Until several months ago, commercial use of fire resistant turbine lubricants was uncertain and the market seemed to be very slow in developing. However, General Electric is actively promoting fire resistant lubricants for their large industrial gas turbines to be delivered in 1974. While large gas turbines are only part of the industrial turbine market (which includes small and medium size gas turbines as well as all sizes of steam turbines), the potential for our Turbinol (phosphate ester) products is significant. Use of fire resistant lubricant in all GE large gas turbines will mean potential of approximately $500,000 in 1974 for initial fill alone. If GE would also recommend FR lubricant for all their small and medium size gas turbines, which should follow on the heels of large gas turbine standardization, potential will double to $1M/year for initial fill and total potential will increase yearly due to make-up requirements in addition to the initial fill "base".

Before we can solicit business for Turbinol use in GE large gas turbines, we must get some "running time" in turbines to gain GE approval. This we are doing at Trans Canada Pipelines (natural gas pipeline) and will soon be doing at Texas Eastern Transmission. The Texas Eastern trial, which we have now definitely obtained, is particularly important since it will be in a GE turbine. A successful trial will put us in excellent position against Stauffer, particularly if we can show greater thermal stability, a property of critical importance in turbines.

PLAINTIFF'S EXHIBIT 67
1-10-92 989

TRAN 003014

I have attached a summary of a recent presentation given by Roger Hatton at Texas Eastern as well as a booklet on Turbinol 1122 and 1223 (comparing to our former PCB product, Turbinol 153). This presentation is particularly appropriate to send to you since it is a summary of the salient points from a product and customer standpoint. The trial commitment from Texas Eastern is the culmination of a year's work by Roger and John Frederiksen. Potential Turbinol business is $100,000.

You will be receiving our "plan of attack" on the Turbinol program as soon as the '73 Marketing Plan is published. We will be asking for your help soon in contacting those customers (primarily utilities) who have a GE large (Series 7000) gas turbine on order for late 1973 or 1974 delivery. Jim Bryant has now assumed sales responsibility for General Electric in the turbine area and we will be trying to gain preference for our Turbinols over Stauffer's Fyrquel R & O turbine lubricants at both GE and the customer in order to "lock in" as many turbines as possible.

We will be sending out additional Turbinol information, a marketing strategy and a GE purchaser list, in the near future. We will ask for and will appreciate your continuing help to make the Turbinol program a success.

If you have questions or comments concerning our plans or the attached information, please feel free to contact us.

J. H. Davidson

/pep
Attachments

TRAN 003015

HARTOLDMON0040894

Distribution

J. Armentor	1460
R. S. Bevacqua	1550
C. Boutin	1800
J. G. Bryant	1650
R. J. Christman	1460
C. L. Clay	1070
P. D. Craska	1010
H. R. Ford	1070
J. G. Frederiksen	1460
D. R. Hansen	1800
L. T. Johnson	1650
J. A. Kriss	1800
D. H. Lewis	1180
M. L. Marcum	1070
D. L. Mellon	1010
B. G. Moore	1940
W. C. Moore	1210
R. K. Puckett	1070
J. S. Pullman	1650
G. O. Reed	1410
H. J. Richardson	1410
J. J. Roder	G4NN
C. F. Seger	1010
P. L. Slayton	1650
W. H. Slowikowski	1010
R. V. Weyland	1180

TRAN 003016

HARTOLDMON0040895

INDUSTRIAL FLUIDS

A REVIEW OF MONSANTO'S

FIRE RESISTANT TURBINE LUBRICANTS PROGRAM

FOR

TEXAS EASTERN TRANSMISSION CORP.

January 11, 1973

TRAN 003017

REH/pep

Monsanto

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Program Goals

To provide fire resistant turbine lubricants which offer

- maximum cost/performance
- long term supply
- environmental acceptability

To verify above in full scale operations

HARTOLDMON0040897

Program Status

Two basic lubricants developed

- Turbinol 1122

  150 SUS at 100°F.

  -20°F. pour point

  1.17 specific gravity

- Turbinol 1223

  220 SUS at 100°F.

  -5°F. pour point

  1.14 specific gravity

Stability

- Oxidation-Corrosion Tests

  Show lower acid number rise and less solids formation in severe tests (347°F./168 hr.)

  Confirmed in NRC (National Research Council of Canada) and GE tests

- Alcor Deposition Test

  Form less tube deposits at 450-550°F.

  Confirmed in NRC tests

- Fullers Earth filtration

  Additives not completely removed, acidity can be reduced

HARTOLDMON0040898

Lubricating Ability

- Bench tests

  Equivalent or better than turbine lube oil and other phosphate esters

- Slow Speed tests

  GE work shows these equal to competitive phosphate esters, better than petroleum oil

- Ryder Gear tests

  Equal to or better than other phosphate esters

Rust Prevention

- Pass ASTM standard rust tests with distilled water

- Turbinol 1122 passes sea water test (24 hr.)

- Turbinol 1122 passes "film tenacity test"

Foaming Characteristics

- Low foaming results in ASTM tests

Materials Compatibility

- Metals

  No problem with ordinary metals of construction

HARTOLDMON0040899

- Non metallics

  No problems with organic materials normally used for phosphate ester fluids

- Other fluids

  Compatible with competitive phosphate esters

  Compatible with Turbinol 153

  Limited solubility in petroleum oil and vice versa

HARTOLDMON0040900

Program Status

Trans Canada Pipe Lines Field Test

Turbinol 1122

Canadian Westinghouse turbine - DeLaval booster

Test started November 25, 1972

24 Hour/Day operation

Test goal - 8,000 hours

Results to date

- Excellent performance A slight foaming problem held under control by defoamer addition
- Fluid analyses show no change in fluid properties

HARTOLDMON0040901

Program Status

General Electric

No objection to use in their gas turbines

Cooperative programs

- stability tests
- slow speed tests
- Ryder Gear tests
- specification preparation

Approval of Monsanto products for use in EHC systems of steam turbines

HARTOLDMON0040902

Advantages to Texas Eastern in use of Monsanto Turbinol lubricants

- Supply
  - Raw materials (synthetic organics)
  - Phosphate esters
  - Control raw material supply back to phosphorus
- Stability
  - Longer fluid life
  - Less maintenance due to cleaner operation (less deposit formation)
- Safety
  - Fire resistance
  - Very low toxicity levels
- Support
  - Sample analysis program
  - Technical experience

TRAN 003024

HARTOLDMON0040903