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7th January, 1944.

J. T. Beal, Esq.,
Ministry of War Transport,
Berkeley Square House,
W. 1.

Dear Mr. Beal,

Thank you for sending me copy of the notes of the meeting held in Room 3016, Berkeley Square House, on Wednesday, 15th December last.

Dr. Kehoe has now returned to the United States, but I will forward to him his copy of the notes and have no doubt he will let us have his comments in due course.

There is one point in particular on which I would like to comment, namely, the top of page 3, the sentence beginning :-
"Dr. Kehoe added that". I believe this sentence should read :-

" Dr. Kehoe added that if he could be certain that spirit tankers contained no sludge he would be prepared to withdraw that part of his tentative regulations which dealt with the removal of sludge, but lacking information on this point suitable precautions should be taken."

You will appreciate that the tentative regulations in question deal with two separate problems : 1) the removal of sludge (if any) from the bottom of tanker compartments, and 2) the removal of scale (when necessary) from the inside surfaces of the compartments.

Sincerely yours,

T. R. A. Bevan.

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Cleaning of Tanker Compartments
which have contained Leaded
Spirit.

Amendments to notes of meeting held
in Room 3016, Berkeley Square House, 15th
December, 1943:-

Page 3:-

Line 5 - the words "that part of" to
be inserted after "withdraw"

Line 6 - the words "which dealt with
the removal of sludge" to be
inserted after "regulations".

Ministry of War Transport.

15th January, 1944.

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on to say as regards shore storage tanks that, as the result of experience and

NOTES OF MEETING HELD IN ROOM 3016
BIRCHLEY SQUARE HOUSE, ON WEDNESDAY 15TH DECEMBER, 1943.

Mr. W.F. Wackrill (Chairman)	Ministry of War Transport.
" W.T. Williams	" " " "
" R. Gillespie	" " " "
Dr. H.E. Watts	Home Office (Explosives Department)
" E.R.A. Herewether	Ministry of Labour & National Service (Factory Department)
Mr. E. Topham	" " " " " "
" W.R. Hockaday	" " " " " "
" S.H. Wilkes	" " " " " "
" H.W.L. Legg	Ministry of Fuel & Power.
" H.E. Heath Ives	Tanker Tonnage Committee.
" K.J. Balsillie	" " " "
" J.R. Robertson	" " " "
" R.J.E. Dodds	" " " "
" H.C.T. Bryant	" " " "
" W.F. Pascoe	" " " "
Dr. R.A. Kehoe	Associated Ethyl Co. Ltd.
Mr. T.R.A. Boyan	" " " "
" H. Fossett	" " " "
Capt. S.F. Golds	Anglo Saxon Petroleum Co. Ltd.
Dr. H.B. Footner	Asiatic Petroleum Co. Ltd.
Mr. R.I. Lewis	" " " "
Mr. W.L. Nelson	Eagle Oil & Shipping Co. Ltd.
" S. Hann	" " " " " "
" H.A. Wilson	Anglo-American Oil Co. Ltd.
" H.S. Humphreys	British Tanker Co. Ltd.
Capt. W.M. Hutchison	" " " "
Mr. W. Cary	" " " "
" Malcom Brown	Trinidad Leaseholds Ltd.
" J.T. Beal (Secretary)	Ministry of War Transport.

THE CHAIRMAN in opening the proceedings observed that, although since the beginning of the war aviation spirit, and during the past year all spirit brought into this country was leaded, no question had arisen of dangers attendant on the carriage of leaded products until a few weeks ago when a doubt was raised as to the loading of edible oil in a tanker which immediately previously had carried leaded spirit. The Associated Ethyl Co. Ltd., had since submitted to the Tanker Owners through the Tanker Tonnage Committee of the Petroleum Board draft regulations for the cleaning of tanker compartments which have contained leaded spirit. The purpose of this meeting was to invite Dr. Kehoe and his associates to explain why and on what evidence it was thought necessary to have these regulations. The Ministry were most anxious that tanker crews or any persons working on tankers should not be exposed to unnecessary risks but before agreeing to regulations of an onerous nature which might involve delay to tankers it must be satisfied that the regulations were necessary.

MR. HEATH IVES said that Tanker Owners were vitally interested in the welfare of their men and could not allow any avoidable conditions to obtain which would involve them in any risk. At the same time, one had to give thought to what the avoidance of hazard might mean, and, when that is known, in what way it could be accomplished in practice. He drew attention to the fact that aviation spirit was such a volatile nowadays and pointed out that although this spirit had been carried for four or five years with no apparent ill effects, we are not sure that it is not with what has happened.

" H.R.A. Hierowether
 Mr. E. Topham
 " W.R. Hockaday
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 " J.T. Beal (Secretary)

Ministry of Labour
 (Factory Department)

Ministry of Fuel & Power.
 Tanker Tonnage Committee.

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Anglo Saxon Petroleum Co. Ltd.

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MR. HEATH IVES said that Tanker Owners were vitally interested in the welfare of their men and could not allow any avoidable conditions to obtain which would involve them in any risk. At the same time, one had to give thought to what the avoidance of hazard might mean, and, when that is known, in what way it could be accomplished in wartime. He drew attention to the fact that aviation spirit was much more volatile nowadays and pointed out that although this spirit had been carried for four or five years with no apparent ill effects, we are concerned with what might happen and not with what has happened.

DR. KEHOE stated that there was no evidence of serious illness or fatalities to the personnel of tankers, but urged that he was dealing with potential and not actual risks. It was not his policy to impose unwarrantable precautions on the Petroleum industry. The tanks of ships carrying leaded gasoline have points of striking similarity with shore tanks and the similarity is all the more striking in the case of ships which persistently carry this commodity. DR. KEHOE went on to say as regards shore storage tanks that, as the result of experience and investigation, the view is accepted that precautions must be taken against exposure to lead compounds frequently but not always found in sludge. It was not

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possible always to predict conditions and circumstances bringing about risks, but there had been 100 cases of ethyl lead poisoning, including 20 fatalities from cleaning storage tanks. Insofar as the tank compartments of ships resemble shore storage tanks, so should there be comparable precautions. His strong feeling was that regulations should be introduced before rather than after the incidence of cases. He thought that the precautions recommended against lead exposure were not unreasonable and made the additional point of the liability to exposure to dust containing lead compounds of workmen engaged in preparing tanks for repair or in repairing them. DR. KEHOE concluded by saying that men ought not to be exposed to danger and that it was both wise and necessary to take reasonable precautions.

THE CHAIRMAN then asked Mr. Wilson to give the meeting a short description of the process of cleaning tanks.

MR. WILSON briefly described the Butterworth method and also the method by which after the cargo had been pumped out and while tank lids were still closed, steam is injected for three or four hours when a windsail is rigged and the tanks washed down with hoses.

There followed an interchange of views between Dr. Watts and Dr. Kehoe during which it emerged that the tetra ethyl lead content of modern spirit is at present about $5\frac{1}{2}$ c.c. per gallon whereas it was about 3 c.c. in the 1928 product, (at which time a Departmental Committee of the Ministry of Health investigated the possible danger of lead poisoning). It was also ascertained that shore storage tanks are cleaned out much less often than tankers - in some cases a period of years passed without cleaning. There was also agreement that the process of gas-freeing a tanker gets rid, by volatilisation in the steam, of a certain quantity of tetra ethyl lead. The danger is however constituted by what is left in the sludge which has to be manhandled.

MR. TOTHAM stated that the Factory Department were concerned only with tankers in drydock and then mainly with explosive risks. The Government regulations required thorough cleaning including the removal of sludge and there were also other precautions. He reiterated that so far as he was aware there was no information to suggest any injury to health from any mysterious cause.

In reply to questions by Mr. Williams, MR. WILSON said that in his experience sludge as such was not evident in spirit tankers, that the tank compartments were cleaned out once a voyage - say, about every six weeks - and that during each cleaning men were inside the compartments for about twelve hours altogether. He said that there was little or no deposit and certainly nothing resembling the sludge described in storage tanks which seemed to consist of an emulsion of products from the leaded spirit.

questioned by Mr. Williams DR. KEHOE explained the rapidity with which inhalation of lead compounds from storage tanks has resulted in fatal poisoning. It was acute, not chronic poisoning.

DR. MERRIMAN agreed that the nature of the symptoms was as Dr. Kehoe says, rapidity of poisoning, and pointed out that opportunities for exposure were tending to increase. He added that if we take precautions now we would be prepared for eventualities.

At this point, the Chairman enquired if the Home Office would be prepared to undertake tests of any deposit which might be found in the compartments of tankers and of seals taken from tankers and assumed to

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At this point, the Chairman enquired if the Home Office would be prepared to undertake tests of any deposit which might be found in the compartments of tankers and of scale taken from tankers, and assured the Home Office Representative present that the Ministry of War Transport and others concerned would be happy to co-operate in affording the necessary opportunities.

DR. KEHOE did not think it feasible to test in advance of cleaning or repairs whether, due to lead content, a toxic condition existed in tanker compartments. He explained that the draft regulations drawn up by him were prepared

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of the same nature as that found in storage tanks. It now appeared that this information was incorrect and he would welcome an investigation to ascertain the nature of any deposit found in tanker compartments. DR. KEHOE added that if he could be certain that spirit tankers contained no sludge he would be prepared to withdraw his tentative regulations, but lacking information on this point suitable precautions should be taken. It was also necessary to examine the scale from tankers which when dry might be inhaled. The problem of shore tanks was investigated for over two years and many containers examined before the conclusions he had described earlier were reached.

THE CHAIRMAN then asked if it would fit in with the views of the tanker owners if the Home Office were to undertake the investigation in consultation with the Associated Ethyl Co.

In reply MR. HEATH EVES said that he appreciated the way in which Dr. Kehoe had put the case. He emphasized that the first care is the safety of the men, but that it would be necessary to explore the proposed regulations from the point of view of practicability. There was the difficulty of getting equipment in present days. If we query the precautions it is because we want to be sure that the need for them exists. MR. HEATH EVES concluded by saying that he agreed that the first thing to be done is to have the investigation and analyses carried out and hoped that the matter would be put in hand as soon as possible.

THE CHAIRMAN thanked the meeting and said that the matter might now be left to the Ministry of War Transport, Home Office, and Ministry of Labour. It was suggested, however, that the Associated Ethyl might be invited to co-operate in the investigation. Dr. Watts welcomed this suggestion and it was arranged that a suitable questionnaire for the projected investigation would be compiled by Associated Ethyl and submitted to the Home Office.

The meeting then closed.