BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE 1745

TRANSCRIPT OF HEARING

AUGUST 19, 1959

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BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

IN THE MATTER OF:

CASE 1745 Application of Phillips Petroleum Company for an automatic custody transfer system. Applicant, in the above-styled cause, seeks an order authorizing it to install an automatic custody transfer system to trnasfer the custody of oil produced on the West Ranger Unit comprising certain acreage in Township 12 South, Range 34 East, Ranger Lake-Pennsylvanian Pool, Lea County, New Mexico.

BEFORE:

Daniel S. Nutter, Examiner.

T R A N S C R I P T O F P R O C E E D I N G S

MR. NUTTER: We will take next Case 1745.

MR. PAYNE: Case 1745. Application of Phillips Petroleum Company for an automatic custody transfer system.

MR. SPANN: Charles C. Spann of Grantham, Spann & Sanchez, Albuquerque, New Mexico, representing the applicant. I have one witness, Mr. Morgan.

(Witness sworn)

F. C. MORGAN,

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. SPANN:

Q Will you state your name, please?

A F. C. Morgan.

Q By whom are you employed, Mr. Morgan?

A Phillips Petroleum Company.

Q And in what position?

A I'm assistant superintendent in Hobbs, New Mexico production district.

Q How long have you been so employed?

A Eleven years, approximately.

Q And have you previously testified before this Commission as an expert petroleum engineer and had your qualifications accepted?

A Yes, sir, I have.

MR. SPANN: Any questions about the witness' qualifications?

MR. NUTTER: Please proceed. No, sir.

Q Are you familiar with this application, No. 1745?

A Yes, sir, I am.

Q Are you generally familiar with the type of installation that is proposed in this application?

A Yes, sir. We have twenty-two installations of the type proposed here now operating in our company. This will be our first in New Mexico.

(Thereupon, Applicant's Exhibit No. 1 was marked for identification.)

Q Now, I hand you Applicant's Exhibit 1. What does that show, Mr. Morgan?

A Exhibit 1 shows our West Ranger Unit which is made by Commission Order R-797. The unit contains about 5,120 acres and is described as all of Section 23, the W/2 of the NW/4 of Section 24, the NW/4 of Section 25, all of Section 26, Township 12 South, Range 34 East, Lea County, New Mexico.

Q Will you describe the lease ownership?

A Phillips Petroleum Company and Texas Pacific Coal & Oil jointly own the lease. The State of New Mexico, the common school fund is the royalty owner.

Q How many wells are presently producing within the area?

A At the present time, we have seven producing wells. Well No. 8 is currently on test. This map is in error. It is listed as a producing well. It is currently being tested. We have two rigs running continuously in the Unit.

Q How many wells do you anticipate will be drilled in the Unit?

A Probably sixteen, based on 80-acre spacing.

Q Now, would you describe the purpose of this application for a lease automatic custody transfer system?

A Well, the primary purpose is to effect and to improve

operations in the lease. To illustrate, we anticipate maximum production for about 2900 barrels of oil per day. This would require eleven 1,000 barrel stock tanks based on three and a half days' storage. With our proposed A.C.T. battery, only three tanks will be required. This difference of eight 1,000 barrel stock tanks has a dollar value of about $21,674. We estimate the cost of the A.C.T. installation to be 18,954, so we expect about $2,720 net savings from it. We expect other savings on gravity conservation and labor requirements, in addition to those.

(Thereupon, Applicant's Exhibit No. 2 was marked for identification.)

Q Directing your attention to Applicant's Exhibit 2, what does that show, Mr. Morgan?

A Exhibit No. 2 is the flow diagram of our dump type A.C.T. system. To explain this, starting with clean oil from your separation and treating facilities flows into 1,000 barrel surge tanks where level one (L1) is actuated, and this starts the monitor pump which is shown schematically there as P2. At this point, oil is pumped continuously from the surge tank through the monitor cell, where the percent water is measured and the oil returns back to the surge tank. If the percent water exceeds the pre-set valve, the circulating pump (P3) is started and the water-cut oil is recirculated through the treating facilities. When the monitor indicates clean oil again, the circulating pump (P3) is shut down.

When oil in the surge tank reaches level two (L2), the

transfer pump, which is P1, is started, which starts filling the metering tank with oil. Transfer is interrupted whenever the water percent recorded by the monitor exceeds the pre-set valve. The transfer pump fills the meter tank to the weir shown there on the top and spills over into the draindown line. This draindown line is sized to drain down at a rate less than the transfer rate to permit the oil level to rise outside the weir and trip level three (L3). When level three is reached, the transfer pump is shut down. Oil continues to drain down from outside the weir, and when the oil level drops down below level three (L3) valve, valve one (V1) opens to start the delivery cycle. The metered volume of oil is that volume of oil between valve one (V1) and the weir. When the oil in the meter tank reaches level four, a time delay occurs before valve one closes. This time delay insures that the oil is below valve one before this valve closes. The closing of valve one initiates another transfer cycle. The sump tank which I see located below the metering tank is provided so that the pipeline pump (P4) will not be stopped and started between dumps. The pipeline pump (P4) is controlled by level five (L5) and is powered by electric motors as are all pumps in this installation.

The delivery of oil to the pipeline will be a rate greater rather than the lease production; therefore, the level in the surge tank will drop until level one is reached. Delivery will then be interrupted, with the meter tank empty, until level two is again reached. Pressure and temperature in the metering tank

will be recorded on a thirty-day strip chart. This is shown to be on top of the tank.

Proportional samples will be stored in a vapor-tight vessel to provide composite gravity and percent water information. Dump counters will be used to count the number of tanks of oil sold, and will contain provisions to shut down the lease when the monthly allowable is produced. The monitor will be "fail safe," i.e. a burned out tube, etc., will signal bad oil, rather than clean oil. In the event a malfunction occurs and no oil is sold to the pipeline, the surge tank will fill and oil will overflow into the emergency overflow tank. When the oil level reaches level six, the lease shut-in valves at the header will close, thus shutting in the lease.

Q Now, is it anticipated that periodic calibrations will be required?

A No, sir, it is not. We will have the inside of the metering tank plastic coated with a baked on plastic, and on the twenty-two installations of the type A.C.T. system operated by Phillips, we have never had a case where encrustation of any type formed. This includes one installation in the Border Texas area where the crude had 4.50 degrees Fahrenheit. That metering tank has been periodically inspected during a two-year period, and no encrustation has formed. We feel confident the proposed installation will record the same success. I would like to add that present practice on conventional matters is to strap stock tanks

only when placed in service, and we consider these important situations. For these reasons we recommend strongly against any specific requirement for periodical calibrations. The pipeline company and Phillips will jointly inspect the metering tank from time to time and we consider this adequate precaution.

Q Why have you proposed a dump type A.C.T. system in preference to a PD system?

A We prefer the dump type system for several reasons. One, because we feel that its accuracy is equal to or superior to that of the PD meter. There is no inherent drive; therefore, no need to periodically calibrate the dump type. In addition, the dump type assures that the following conditions prevail before any other is transferred to the metering factor sale, and you might like to look at Exhibit 2 in following these points. The meter tank must be empty, valve one must be closed, the monitor must be registering good oil, the monthly allowable must not have been delivered to the pipe line, and the counter must have registered the previous dump. We feel that these provisions are worth the additional cost of a PD system in that they provide the pipe line company, the royalty owner, and ourselves, the producers, with the maximum assurance that no oil will be delivered to the pipe line that is not accounted for and that no oil is registered that is not delivered to the pipe line, and if I could, I would like to read into the record one quotation from Mr. Hiber, who is the Assistant Chief Engineer of our company and has pioneered the

development of this type A.C.T. system through the country. He says a PD meter cannot be as accurate as a dump meter. The basis of this statement is that the dump meter is a prover vessel and each dump is the proven volume and will have no variation as long as the operation sequence occurs. If the sequence does not occur, the system shuts down. Deposition could cause a variation but with plastic coatings there has been no deposition. PD meters are proved or calibrated with a prover tank which is the same type vessel used continuously in the dump system. For PD meters to have the same degree of accuracy, they must show exactly the same calibration factor each and every time the meter is proved. This, in fact, is not the case. Meter factors vary from proving to proving, and the factor change is always in one direction; increased slippage. The present custom of using the calibration factor at the beginning of each run period to write tickets, can only result in some quantity of oil going to the pipe line that the producer is not paid for.

In addition, it takes elaborate and costly precautions on a PD system to detect when the meter is starting to fail and shut the system down before appreciable quantities of unaccounted for oil has been transferred. Add to this, that all PD meters are using temperature compensation which cannot be satisfactorily continuously policed. I quote Rudy Hamill of Service Pipe Line Company. He sayd, "I do not believe they are accurate." Phillips' experience also indicates that the commonly used PD meter tempera-

ture compensator is not reliable.

Frequency of PD meter calibration is again a conflict between pipe line and producer. The less often the calibration, the greater is the Pipe Line Company's advantage and the more the producer loses. It is customary to calibrate once a month. In spite of the claims to the contrary, getting ready to calibrate, and the calibration itself and the clean-up afterwards will take four and a half hours to half a day.

Q Now, you mentioned some twenty-two installations in other areas. Where are they located? I mean systems similar to this one?

A Yes, sir. We have fourteen of these in Oklahoma. Five of them are in Texas, and three in Utah.

Q Do you know how long they have been in operation?

A The oldest goes back in excess of four years.

Q Now, in your opinion, is this installation in the interest of conservation and prevention of waste?

A Yes, sir, it is.

Q Would you explain that?

A Yes, sir. I say that because gravity is usually increased from two-tenths to six-tenths of a degree API following an A.C.T. installation. This is because there is more rapid transfers of crude to the pipe line, and weathering is minimized. Also you don't have the flaring of vapor due to the opening of vessels as in the tank battery.

Q Have the offset operators been notified of the application?

A Yes, sir, they have.

Q How about the pipe line company?

A Yes, sir. Service Pipe Line Company is the purchaser. We have thoroughly reviewed this installation with them.

(Thereupon, Applicant's Exhibit No. 3 was marked for identification.)

Q Handing you Applicant's Exhibit 3, what is that, Mr. Morgan?

A Exhibit No. 3 is a photostatic copy of a letter from Service Pipe Line stating that this installation is acceptable to them.

Q Now, were Exhibits 1 and 2 prepared under your supervision and direction?

A Yes, sir, they were.

MR. SPANN: I would like to offer in evidence Exhibits 1 and 2 at this time, and also Exhibit 3.

MR. NUTTER: Phillips' Exhibits 1 through 3 will be entered.

(Thereupon, Applicant's Exhibits 1 through 3 were received in evidence.)

MR. SPANN: That's all we have.

MR. NUTTER: Anyone have any questions of Mr. Morgan?

MR. PAYNE: Yes, sir.

CROSS EXAMINATION

BY MR. PAYNE:

Q Mr. Morgan, if the oil in the tank is not pipe line quantity, do I understand that you recirculate it?

A Mr. Payne, this monitor pump I mentioned there, P2, is running continuously, and any time it sees a drop of water it automatically starts the circulating pump, and if you'll notice, this is a cone bottom tank, and the connection to that comes right out of the bottom, so it would be impossible for us to have a collection of bad oil.

Q Do you have any corrosion problem with the production from this pool?

A No, sir, there has been no evidence of corrosion at all. We have, as a matter of fact, routine plastic coating, plastic coated our --

Q So plastic coating would take care of it?

A Yes, sir, true, but our coating has only been for paraffin deposition.

Q I see. Now, I believe you testified as to how your high pressure shutoff switch works; shuts off the entire lease, is that right?

A That is correct, if level six is actuated.

Q Are they pumping or flowing wells?

A All flowing wells at the present time.

Q Do you have any provision, any low pressure shutoff --

A No, sir.

Q -- in case of a line break or malfunction?

A We have none at the present time with our convention battery, Mr. Payne.

Q Do you feel that any such installation is necessary here?

A No, sir, I do not.

Q Do you have a man on this lease?

A Yes, sir, seven-day pumper.

Q What is the gravity of the oil?

A It has averaged exactly forty degrees over the past year.

MR. PAYNE: That's all. Thank you.

QUESTIONS BY MR. NUTTER:

Q Is this installation as you have laid it out here on Exhibit 2, adequate to handle the expected production from the entire lease?

A Yes, sir. Mr. Nutter, it has been sized to handle up to 3500 barrels of oil a day, and we don't anticipate much over twenty-eight, twenty-nine hundred.

Q Now, the only critical part of this thing, as far as measurement of oil is concerned, is the interval from the weir down to valve V1, is that correct?

A Yes, sir, that is correct.

Q And that entire interval is plastic coated?

A Yes, sir, plastic coated.

Q Now, with Phillips' experience with twenty-two of these

similar installations, have they ever had a failure of valve V1?

A No, sir. I might add one other thing along that line, Mr. Nutter. We have a six-months routine check where we check up all the component parts that are subject to failure. We pull the plate off V1 and if there is leakage, it will be corrected. This is a joint inspection by the pipe line company and the producer.

Q This inspection is made only every six months?

A Yes, sir, and we have never had occasion to find any one leaking yet.

Q Is there any way of looking into the sump tank to see if oil is accumulating in there between runs?

A I think the best way -- there is a real simple method, just pull the back plate in the valves, and any leakage can be detected there.

Q Is there any possibility of any impurity getting in there?

A In my judgment, Mr. Nutter, no, sir, because of, as I mentioned earlier, our monitor pump system. We interrupt or will not transfer oil any time that there is bad oil in that sump tank, it is interlocked and it is impossible to transfer oil as long as it can see a drop of water.

Q What is the volume of the tank from the weir to V1?

A Twenty-five barrels.

Q What do you do, calibrate that upon the initial installation, then?

A Yes, sir, that is correct. The pipe line company, they are a little more qualified than we are, but it is a joint thing and it does, according to point 1101, which calls for two calibrations and certain degrees of accuracy, and that will be done before it is placed in service.

Q You feel there is no drift in the accuracy of this thing thereafter?

A Mr. Nutter, I don't see how there could be.

Q Except deposition of paraffin inside the meter tank or failure of V1?

A Yes, sir, the deposition would definitely cause a change, but as I testified, on twenty-two installations we have, we have never had any evidence of encrustation, and this will be inspected by the pipe line company and ourselves periodically. I feel confident with our experience with plastic there will be no encrustation.

Q Now, you say that it is inspected periodically. Is that part of the six months' check-up that this system undergoes?

A This will be done more frequently than that. The pipe line company wants to look at it too. It is a real simple thing to do. We have a thief hatch on top of our metering tank, and we have a hatchway on the lower portion of the metering tank, so it will be real easy to look at. You can lower a flashlight, for that matter, into it and determine the condition of the tank.

Q Has Phillips in its other twenty-two installations made

it a practice to inspect them for accuracy every six months?

A Not precisely for accuracy. In the places where there had been a previous tendency in their conventional stock tank for encrustation, they have inspected them to satisfy themselves that they have a good plastic job.

Q How about the pipe line companies, have they had any particular frequency that they look to check and see that they are running accurately?

A No, sir. The only thing that the pipe line company has ever brought up is a matter of draindown and that is something that, in our past experience, they want to do at least twice, you know, to make sure that the draindown is a fixed value and doesn't vary significantly with temperature.

Q Pipe Line wouldn't care if V1 failed?

A They would love it.

MR. NUTTER: Anyone have any further questions of Mr. Morgan? He may be excused.

(Witness excused)

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, J. A. Trujillo, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in Stenotype and reduced to typewritten transcript by me, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this, the 5th day of September 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

J. A. Trujillo
NOTARY PUBLIC

My Commission Expires:

October 5, 1960

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1745, heard by me on 8-19, 1959.

New Mexico Oil Conservation Commission, Examiner