

RS 6/30/89
Fr. Richard
Mhring

THE FUTURE OF DOMESTIC EXPLORATION

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SHELL OIL COMPANY, HOUSTON

TEXT OF REMARKS TO
THE HOUSTON GEOLOGIC SOCIETY
OCTOBER 26, 1988

"IT WAS THE BEST OF TIMES, IT WAS THE WORST OF TIMES, IT WAS THE AGE OF WISDOM, IT WAS THE AGE OF FOOLISHNESS, IT WAS THE EPOCH OF BELIEF, IT WAS THE EPOCH OF INCREDULITY, IT WAS THE SEASON OF LIGHT, IT WAS THE SEASON OF DARKNESS, IT WAS THE SPRING OF HOPE, IT WAS THE WINTER OF DESPAIR, WE HAD EVERYTHING BEFORE US, WE HAD NOTHING BEFORE US...." I THINK THESE WORDS OF CHARLES DICKENS ARE QUITE PERTINENT TO THE DOMESTIC EXPLORATION SITUATION TODAY. WE ARE AT A CROSS ROADS IN DOMESTIC EXPLORATION.

TECHNOLOGICAL IMPROVEMENTS HAVE REVOLUTIONIZED THE EXPLORATION BUSINESS OVER THE 3+ DECADES THAT I'VE BEEN A PART OF IT. UNFORTUNATELY, FOR THE LAST FEW YEARS, WE'VE ALL BEEN DISTRACTED FROM OUR BUSINESS. WE'VE BEEN SUFFERING AT THE HANDS OF THAT UNCONTROLLABLE OGRE CALLED "PRICE", AND LARGELY BECAUSE OF THAT, EXPLORATION ACTIVITY TODAY IS AT HISTORIC LOW LEVELS. ALL OF US HAVE PAID, AND MANY OF US ARE STILL PAYING, A PRICE FOR OUR HIGH SPENDING LEVELS DURING THE "BOOM" OF THE LATE 70'S AND EARLY 80'S. TODAY ABOUT THE ONLY INDUSTRY NEWS I READ OR HEAR IS THAT OF MERGERS, TAKEOVERS AND PROPERTY SALES.

ALL THIS, IN A BUSINESS WHICH EVEN IN TODAY'S PRICE CLIMATE CAN BE ENORMOUSLY PROFITABLE GIVEN SUCCESS. ALL THIS, HERE IN THE U.S., WHERE BY ALL REASONABLE ESTIMATES THERE ARE SIGNIFICANT UNDISCOVERED OIL AND GAS RESOURCES. ALL THIS, AT A TIME IN OUR EXPLORATION HISTORY WHEN WE ARE ARMED WITH THE VERY FINEST TOOLS WE HAVE EVER HAD TO WORK WITH.

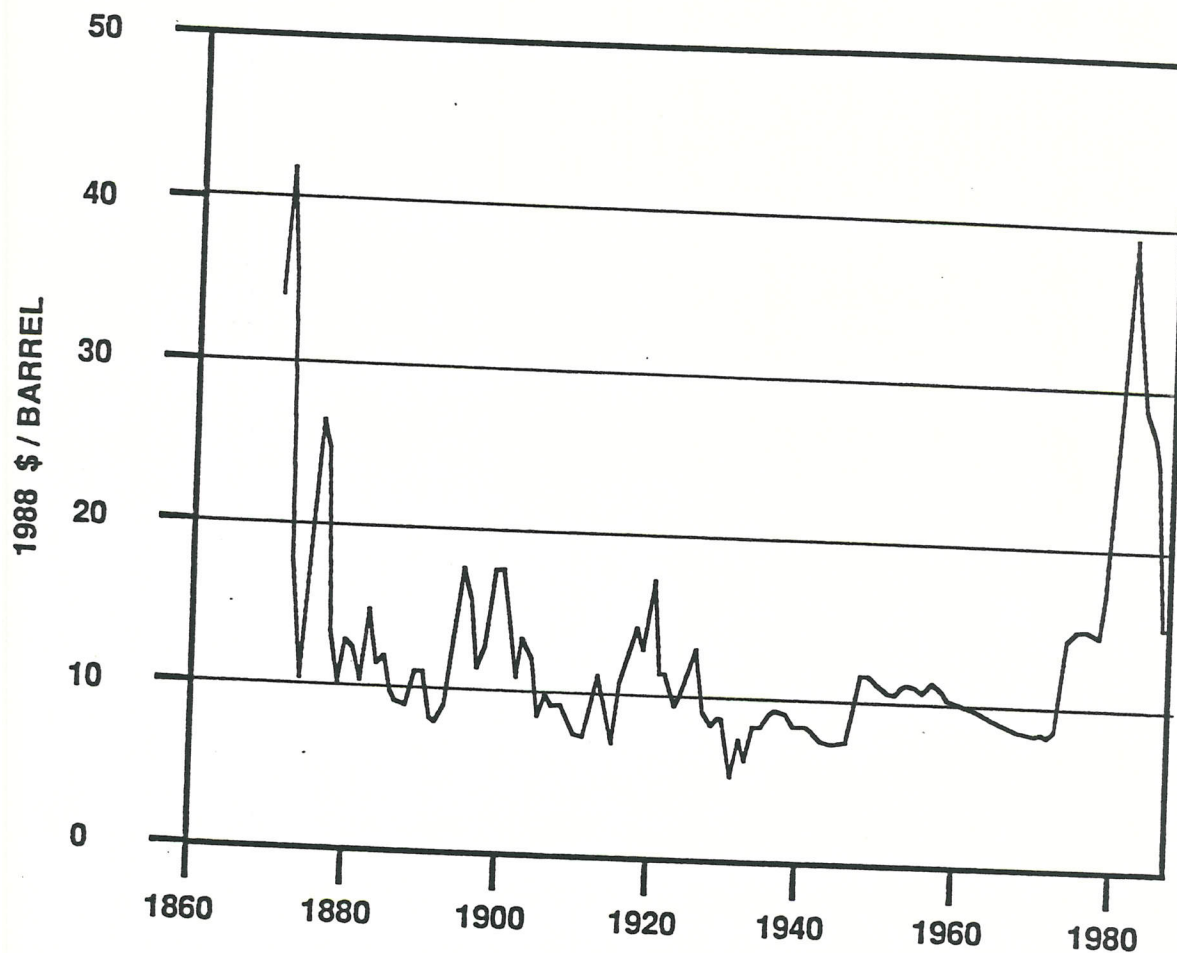
THESE ARE THE THINGS I'D LIKE TO TALK ABOUT TODAY. WE CAN LOOK TO OUR PAST AND SEE THE EVENTS THAT HAVE BROUGHT THE INDUSTRY TO ITS CURRENT STATE, AND I THINK, LEARN FROM THIS PAST. THERE ARE IMPORTANT LESSONS WHICH WE CAN USE AS EXPLORATIONISTS TO GUIDE US IN SHAPING OUR FUTURE. IN FACT, I BELIEVE THEY ARE LESSONS WE MUST LEARN IF WE ARE TO PROFITABLY EXPLOIT THE REMAINING RESOURCES.

NOW, LET ME TALK IN DETAIL ABOUT THE THINGS I HAVE MENTIONED. I BEGAN BY SAYING THAT THESE WERE THE WORST OF TIMES; LET ME ELABORATE ON THAT.

CONSIDER OIL PRICE. LET'S LOOK AT THE PRICE OF OIL IN REAL TERMS, THAT IS, REMOVING INFLATION, ALL THE WAY BACK TO THE 1860'S. FOR NEARLY 100 YEARS, FROM 1880 TO ALMOST 1980, THE REAL PRICE OF OIL FLUCTUATED ERRATICALLY IN A RANGE FROM ABOUT \$10/BBL TO \$15/BBL. (PRIOR TO 1880, PRICES WERE AS HIGH AS \$40/BBL WHEN PETROLEUM WAS STILL RELATIVELY SCARCE AND IT COMPETED WITH WHALE OIL, BUT THAT TIME PERIOD DOESN'T REALLY CONCERN US HERE.) IN THE EARLY 1980'S PRICES ROSE ABRUPTLY TO A HIGH OF ABOUT \$40/BBL,

See
graph.

AVERAGE ANNUAL U.S. WELLHEAD PRICE OF CRUDE OIL



Shell Western E&P
3/23/89

THIS TIME IN REPOSE TO THE ACTIONS OF OPEC. WHEN THIS HAPPENED, GOVERNMENTS (THOSE OF THE CONSUMING COUNTRIES) TOOK STEPS TO ENHANCE THE NATURAL RESPONSE OF SUPPLY AND DEMAND. THE 55 MPH SPEED LIMIT, BUILDINGS BEING KEPT WARMER IN THE SUMMER AND COOLER IN THE WINTER, AND THE ESTABLISHMENT OF THE STRATEGIC PETROLEUM RESERVE ALL WERE ATTEMPTS TO MODERATE THE PRICE INCREASES, AND PRICES DID COME DOWN. AS A MATTER OF FACT, PRICES CAME DOWN RATHER QUICKLY IN TERMS OF THE LIFE SPAN OF A PRODUCING FIELD.

WHEN OIL PRICE APPROACHED \$10/BBL, AS IT DID IN LATE 1986 AND AGAIN JUST A FEW WEEKS AGO, WE AGAIN SAW GOVERNMENTS INTERFERRING. THIS TIME THOUGH, IT'S THE PRODUCER GOVERNMENTS TAKING ACTION TO BOOST PRICES BY ENHANCING THE NATURAL RESPONSES OF SUPPLY AND DEMAND. SO WHAT OF FUTURE PRICES? MOST COMPANIES, MINE INCLUDED, ATTEMPT TO FORECAST THE FUTURE PRICE OF OIL. EVERYBODY WHO DOES THIS DRAWS A SMOOTH LINE, STARTING WITH WHATEVER THE PRICE IS TODAY, AND INCREASING (USUALLY) INTO THE FUTURE. WILL IT REALLY HAPPEN THAT WAY? WELL IF HISTORY IS ANY CLUE, PROBABLY NOT. MORE LIKELY IT WILL BE SOME ROLLER COASTER RIDE BETWEEN A PRICE THAT IS "TOO HIGH" AS I'VE JUST DESCRIBED, AND ANOTHER WHICH IS "TOO LOW." THE PROBLEM IS THAT NOBODY KNOWS HOW TO DRAW THAT SAWTOOTH CURVE, WHICH IS WHY THEY DRAW THE SMOOTH ONE. ALL SPECIFIC PRICE FORECASTS REALLY ARE IMPOSSIBLE. WITHOUT LABORING THE POINT - - BECAUSE THAT WOULD BE A TALK UNTO ITSELF - - THERE ARE TOO MANY UNKNOWNNS FOR THE SIMULTANEOUS EQUATIONS AVAILABLE TO SOLVE THEM.

AS AN EXAMPLE LET'S TALK ABOUT TODAY'S OIL PRICE, OCTOBER 1988. I'VE LOOKED AT WHAT PRICE SHELL OIL COMPANY FORECAST FOR OCTOBER 1988 EACH YEAR

WE MADE A FORECAST OVER THE LAST 15 YEARS. I CAN TELL YOU THAT THERE ARE 15 DIFFERENT NUMBERS, THE OLDEST NUMBER IS 15 YEARS OLD, THE NEWEST NUMBER WAS MADE LAST YEAR. THE LOWEST NUMBER IS A LITTLE ABOVE \$10/BBL, THE HIGHEST AROUND \$60, AND THE OTHER 13 ARE EVERYWHERE IN BETWEEN. WHAT AM I SUPPOSED TO DO WITH ALL THIS GOOD INFORMATION? IT IS ESSENTIAL TO ANY EXPLORATION OR DEVELOPMENT VENTURE THAT WE KNOW THE VALUE OF THE REWARD. WE KNOW THE PRICE ON THE DAY WE MAKE THE INVESTMENT, BUT THIS IS ALMOST VALUELESS. WE NEED THE PRICE 10 YEARS OUT, WHICH I USE HERE AS THE HALF LIFE OF OUR AVERAGE PROJECT.

CLEARLY, OIL PRICING IS NOT ONE OF OUR GREAT TECHNOLOGIES. OIL IS A COMMODITY, AND THE WORLD IS AWASH IN IT. THE CURRENT WORLD R/P IS 43.5. PRODUCING GOVERNMENTS WILL IMPERFECTLY GUARANTEE THE PRICE FLOOR, AND CONSUMING GOVERNMENTS IMPERFECTLY GUARANTEE A PRICE CEILING. SHORT EXCURSIONS BELOW THE FLOOR OR ABOVE THE CEILING MUST BE TOLERATED BY INVESTORS, BUT DO NOT COUNT ON LASTING PAIN OR LASTING EUPHORIA, AS THE SHORT-TERM CASE MAY BE.

WITH THAT BACKGROUND ON PRICE, LET'S LOOK AT ANOTHER ASPECT OF OUR WORST OF TIMES.

DURING THE BOOM PERIOD, 1979 THROUGH 1982, WE SPENT AN EXTRA \$50 BILLION ¹ OF THE DAY ON LOWER 48 EXPLORATION, AS BEST I CAN CALCULATE IT. THIS TRANSLATES INTO ABOUT 600 SEISMIC CREWS AND 2,000 WILDCATS MORE THAN THE PROJECTED AMOUNT OF ACTIVITY USING OUR HISTORICAL BACKGROUND. FOR

THIS EXTRA EFFORT, WE FOUND MORE OIL AND GAS THAN OUR PREVIOUS 10-YEAR HISTORICAL AVERAGE, BUT NOT ENOUGH TO COME OUT AT TODAY'S PRICES. DURING THESE FOUR YEARS, WE SPENT AN EXTRA \$35 BILLION OF THE DAY OF DEVELOPMENT CAPITAL IN THE LOWER 48, AS BEST I CAN CALCULATE IT. OUR ADDITIONS TO RESERVES FOR THE PERIOD WERE HIGHER THAN OUR PREVIOUS 10-YEAR HISTORICAL AVERAGE, BUT AGAIN NOT HIGH ENOUGH TO COME OUT AT TODAY'S PRICES. **BASED ON A RECENT ANALYSIS BY MY COMPANY FOR THE 10 YEARS PREVIOUS TO THE BOOM, OUR DOMESTIC INDUSTRY RETURN ON INVESTMENT AVERAGED ABOUT 5 PERCENT REAL. FOR THE BOOM YEARS 1979-82, OUR ~~ANNUAL~~ RETURN FELL TO BELOW 0 PERCENT REAL. FOR THIS TO HAVE BEEN COMPARABLE TO THE PREVIOUS 10 YEARS, THE OIL AND GAS FOUND AND DEVELOPED DURING THE BOOM MUST BE PRODUCED OUT AT AN AVERAGE PRICE OF \$33 PER BARREL EQUIVALENT IN TODAY'S DOLLARS. IN 1987 THE AVERAGE PRICE OF WEST TEXAS SOUR WAS \$17.16 AND ITS LESS THAN THAT TODAY. WE SPENT TOO MUCH FOR WHAT WE ARE GOING TO GET BACK. OR, WE DIDN'T FIND ENOUGH FOR WHAT WE SPENT -- EITHER WAY YOU WANT TO LOOK AT IT.**

DURING THE BOOM, THE U.S. INDUSTRY GREW SO QUICKLY THAT WE REALLY OUTGREW OUR COLLECTIVE ABILITY TO GENERATE GOOD QUALITY PROSPECTS IN THE LOWER 48. THIS WAS A TIME CHARACTERIZED BY TOO MUCH MONEY CHASING TOO FEW DEALS. PRICE EXPECTATIONS OF THIS TIME PERIOD TURNED OUT TO BE UNREALISTIC IN HINDSIGHT. DOMESTIC EXPLORATION WAS THE PLACE TO INVEST MONEY, AND MANY IN THE INDUSTRY, IN AN ATTEMPT TO SPEND THAT MONEY, MAY HAVE ALLOWED TECHNICAL RISK ASSESSMENTS TO BE COMPROMISED. AS SUGGESTED BY JOHN BOOKOUT,

^{BOOKOUT}
 EX-PRESIDENT OF SHELL, "WE FORGOT THAT EVEN \$100 PER BARREL OIL OR \$10 PER
 THOUSAND GAS WILL NOT CLOSE A CONTOUR THAT IS NOT THERE," OR WILL NOT MAKE
 AN ACCEPTABLE RESERVOIR OUT OF A TIGHT SAND.

SINCE PRICES COLLAPSED IN EARLY 1986, EXPLORATION EFFORT HAS FALLEN
 SHARPLY. I BELIEVE THAT THE INDUSTRY, IN ITS CONTRACTION HAS DECREASED
 ACTIVITY LEVELS SO MUCH THAT WE HAVE GONE BELOW "CRITICAL MASS." IF WE
 CONTINUE ALONG THIS TRACK, WE WILL LOOK BACK ON THE LATE 1980'S AND FIND
 THAT, LIKE THE EARLY 1980'S, OUR FINANCIAL PERFORMANCE WILL HAVE BEEN
 UNACCEPTABLE.

CURRENT ACTIVITY LEVEL IS AT OR NEAR THE DANGER ZONE -- LACK OF CRITICAL
 MASS! WE ARE IN DANGER OF A SELF-FULFILLING PROPHECY. WE CAN'T FIND
 (ANYTHING BECAUSE WE DON'T DRILL. WE DON'T DRILL AND WE DON'T FIND
 ANYTHING!)

INVESTOR CONFIDENCE HAS DISAPPEARED. OUTSIDE FUNDS FOR DRILLING HAVE ALL
 BUT DRIED UP.

THE EXPLORATION/PRODUCTION BUSINESS HAS BEEN DISTRACTED -- WE HAVE TAKEN
 OUR EYE OFF THE BALL.

BANKRUPTCIES, MERGERS, LBO'S AND PRODUCING PROPERTY SALES ARE ALL YOU
 HEAR ABOUT. WE ARE DOWNSIZING AND SO IS OUR SUPPORT, SERVICE INDUSTRY,

OIL IS FOUND BY THE APPLICATION OF MULTIPLE WORKING HYPOTHESES, AND THERE ARE LESS AND LESS HYPOTHESES OUT THERE.

9 IT LOOKS LIKE WE WILL NOT BE CONTENT UNTIL WE HAVE BOUGHT, SOLD, OR TRADED OUR 36 BILLION BARRELS OF PROVED RESERVES ABOUT 3 OR 4 TIMES AROUND. WHERE IS THE PRODUCTIVITY IN THAT?!! RUSSIAN ROULETTE WITH PRICES!!! THE TRUE PRODUCTIVITY IN OUR VERTICALLY INTEGRATED BUSINESS IS TURNING A CORN FIELD INTO AN OIL FIELD. AND BY THE WAY, CAN STILL HAVE THE CORN TOO!

SOME PEOPLE SAY THEY ARE EMPHASIZING FOREIGN VENTURES NOW. WELL, I HAVE DRILLED MY SHARE OF DRY HOLES IN THAT ARENA. AND BESIDES THAT, YOU ARE REALLY TALKING ABOUT TOUGH LANDOWNERS.

NOW, SO MUCH FOR THE BAD NEWS. I ALSO TALKED AT THE BEGINNING ABOUT THE BEST OF TIMES. LET'S TALK ABOUT THAT.

1988
FIRST, CONSIDER THE RESOURCE BASE. THE USGS/MMS EARLIER THIS YEAR ESTIMATED THE REMAINING LOWER 48 RESOURCE BASE AS MORE THAN 30 BBO AND 300 TCF OF GAS. THESE ESTIMATES ARE SIMILAR TO SOME PUBLISHED BY MY COMPANY A FEW YEARS AGO. AS I THINK BACK TO THE CONTROVERSY WHEN THIS NEW USGS ESTIMATE WAS FIRST RELEASED TO THE PRESS, I DON'T REMEMBER ANYBODY ARGUING THAT THE NUMBERS WERE TOO HIGH. CLEARLY A SIGNIFICANT RESOURCE BASE EXISTS.

AND I ALSO DON'T BELIEVE THAT ALL OF IT IS IN FIELDS TOO SMALL TO BE SIGNIFICANT. JUST THIS YEAR, THERE HAVE BEEN TWO MAJOR DISCOVERIES ANNOUNCED IN OKLAHOMA, ONE A DEEP NEW ARBUCKLE PAY UNDER AN OLD FIELD, THE OTHER A NEW FIELD RIGHT ON THE EDGE OF THE CRINER HILLS. THERE'S NO QUESTION THAT WE ARE EXPLORING FOR A FINITE RESOURCE, AND THERE IS CERTAINLY SOME TRUTH TO THE IDEA THAT OUR GOAL IS BECOMING MORE FINELY DIVIDED. BUT THESE TWO DISCOVERIES ARE JUST A SAMPLE OF THE EVIDENCE THAT SIGNIFICANT FIELDS STILL REMAIN, EVEN IN THE MOST MATURE BASINS.

AND THERE'S EVEN MORE TO IT THAN THAT. IN 1981, THE USGS PUBLISHED AN ESTIMATE THAT 6.5 BBO AND 72 TCF OF GAS REMAINED TO BE DISCOVERED IN THE GULF OF MEXICO. SEVEN YEARS LATER IN 1988, THE GOVERNMENT ESTIMATE ROSE TO 9.6 BBO AND OVER 100 TCF. THIS HIGHER FORECAST COMES AFTER SOME 1 BBO AND 25 TCF HAS BEEN FOUND SINCE THE 1980 FORECAST. SO WHERE ARE THESE ADDITIONAL VOLUMES COMING FROM? I CAN ASSURE YOU THAT THE SOURCE ROCKS ARE NOT SO PROLIFIC THAT THEY HAVE GENERATED THIS MUCH MORE OIL AND GAS OVER THE LAST 7 YEARS. THEY CAME FROM OUR COLLECTIVE IMAGINATIONS, OUR NEW GEOLOGIC DATA, AND FROM OUR NEW TECHNOLOGY.

WHEN I STARTED IN THE BUSINESS IN THE 50'S OUR TOOLS WERE OUR WELL LOGS. SEISMIC WAS LIMITED TO RECORD SECTIONS PRINTED IN THE FIELD, AND WE WERE JUST STARTING TO THINK IN TERMS OF GENETIC STRATIGRAPHY. SINCE THEN, SEISMIC HAS PROGRESSED THROUGH STACKING AND DIGITAL RECORDING TO THE CURRENT APPLICATION OF ADVANCED PROCESSING SCHEMES USING SUPER-COMPUTERS.

WE'VE SEEN AN EXPLOSION IN OUR KNOWLEDGE OF SOURCE ROCK GEOCHEMISTRY AND THE APPLICATION OF PLATE TECTONIC CONCEPTS. DURING THE 70'S, WE SAW THE RECOGNITION OF BRIGHT SPOTS, FOLLOWED QUICKLY BY STRATIGRAPHIC GEOPHYSICS. ALL THESE TOOLS, COMBINED WITH THE WIDESPREAD USE OF 3-D SEISMIC HAS MADE IT POSSIBLE TO EXPLORE FOR VERY SUBTLE, AND VERY COMPLEX TRAPS. THIS IS A MAJOR REASON THAT THE OIL AND GAS RESOURCE BASE IN THE UNITED STATES REMAINS VIABLE FOR EXPLORATION.

FINALLY, LET'S CONSIDER THE MOST IMPORTANT ASPECT OF OUR BUSINESS, THAT OF OUR FUTURE PROFITABILITY. THE PROFITABILITY OF DEVELOPING EXISTING OIL FIELDS IS EXCEPTIONALLY HIGH RELATIVE TO ANY OTHER USE OF A DOLLAR THAT I CAN CONCEIVE. THE PRICE PREMISE ON WHICH I BASE THIS STATEMENT IS OF COURSE PRIVATE, BUT I CAN ASSURE YOU THAT OLD CONSERVATIVE SHELL IS STILL OLD CONSERVATIVE SHELL. REMEMBER THOUGH, THAT DEVELOPMENT INVESTMENTS ARE INCREMENTAL INVESTMENTS - IGNORING SUNK COSTS, WHICH ARE THE EXPLORATION COSTS, THE FINDING COSTS.

Devel (incremental)
vs
Expln (sunk costs)

THE TRICK IS TO CONTROL SUNK COSTS -- WE AS AN INDUSTRY HAD NOT BEEN DOING THIS FOR THE PAST 10 OR SO YEARS. AND NOW FOR THE LAST 2+ YEARS WE HAVE GREATLY OVER-REACTED. CONTROLLING EXPLORATION COSTS, TO MOST PEOPLE, IMPLIES REDUCING THEM. THIS IS NOT WHAT I MEAN. I MEAN THAT WE MUST GET OUR EXPLORATION EXPENDITURES -- OUR WILDCATS AND ALL THE HIDDEN COSTS BEHIND THEM -- BACK IN SYNC WITH OUR ASSESSMENT OF TECHNICAL RISK!!! WE MUST DO A BETTER JOB OF BEING GEOLOGISTS AND PAYING ATTENTION TO OUR TECHNICAL RISK ASSESSMENTS.

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IF SHELL OIL DOES ONE THING WELL -- IT IS THAT WE KEEP GOOD RECORDS. *See tabulation from this paragraph.*
 IN THE LAST 16 YEARS -- LARGELY DURING THE BOOM PERIOD -- WE DRILLED
 ALMOST 1200 WILDCATS. BY A STANDARD, THE DETAILS OF WHICH I WILL NOT
 GO INTO, WE PRE-DETERMINED ABOUT A QUARTER OF THEM TO BE HIGH RISK.
 ALL ~~OF THE~~ WILDCATS PRE-DETERMINED TO BE HIGH-RISK FAILED. OF THE
 REMAINING 900 MODERATE TO LOW RISK WILDCATS, 500 WERE DRILLED IN ONSHORE
 LOWER 48, 140 WERE DRILLED IN THE GULF OF MEXICO, AND THERE WERE 260
 FOREIGN WILDCATS. IN EACH OF THESE THREE ARENAS, 35-40% OF THESE
 MODERATE RISK WILDCATS FOUND HYDROCARBONS.

MANY, MANY OF THOSE HIGH RISK WELLS -- PRE-DETERMINED, REMEMBER --
SHOULD NOT HAVE BEEN DRILLED, AND THEY COST US DEARLY. THE MODERATE
 TO LOW RISK WELLS ENJOYED AN EXCELLENT SUCCESS RATIO - ABOUT THE SAME
 IN ALL ARENAS: ONSHORE, GULF OF MEXICO, AND FOREIGN. THIS DOES NOT
 MEAN THAT THEY WERE ALL BIG SUCCESSES BY ANY MEANS! JUST THAT THEY
 BOOKED SOME RESERVES. BUT THIS IS WHERE YOU START. THAT UNCONTROLL-
 ABLE OGRE CALLED PRICE, THEN, AT LEAST HAS SOMETHING TO WORK ON FOR
 THE FOLLOWING 10 TO 20 YEARS. AND LET ME TELL YOU SOMETHING ELSE,
 THOUGH I ALWAYS GET IN TROUBLE OVER THIS. AFTER BEING INVOLVED IN
 VARYING DETAIL WITH 1000± WILDCATS OVER 30 ODD YEARS, I FEEL REASON-
ABLY CONFIDENT ABOUT ONLY TWO THINGS BEFORE A WILDCAT SPUDS:

- ① I CAN, AS A GEOLOGIST, DETERMINE IF THE WELL WILL BE HIGH, MODERATE, OR LOW RISK WITH RESPECT TO FINDING HYDROCARBONS, AND
- ② I AM NO GOOD AT ALL FORECASTING WHAT THE SIZE OF THE ACCUMULATION WILL BE IN THE ABSENCE OF NEGATIVE CONTROL. AND, YES, I AM FAMILIAR WITH LOG NORMAL DISTRIBUTIONS, ETC. MY PROBLEM IS THAT I KNOW TOO MUCH ABOUT VARIATIONS IN RESERVOIR STRATIGRAPHY AND THE VAGARIES OF MIGRATION PATHS.

SO, THE EXPLORATION INDUSTRY MISSED ITS HIGH RISK PIE IN THE SKY DURING THE BOOM, AND BY ALL ODDS -- SHOULD HAVE. WE MUST RETURN TO OUR TECHNOLOGY AND BELIEVE OUR TECHNOLOGY. IT WILL BE RIGHT. I THINK WE WILL COME TO OUR SENSES AGAIN. THE RESOURCE BASE IS OUT THERE, AND THE TOOLS WE HAVE TO WORK ON IT WERE HARDLY EVEN IMAGINED 30 YEARS AGO. THE BUSINESS IS POTENTIALLY TOO GOOD TO BE IGNORED, AS HAS BEEN DONE FOR THE PAST 2½ YEARS.

YEARS AGO, WHEN OIL WAS \$3 A BARREL AND WE THOUGHT WE COULD SEE THE END, WE SPECULATED ON WHO WOULD BE THE LAST EXPLORATION AND PRODUCTION

EMPLOYEE. THE GENERAL CONSENSUS WAS THAT HE WOULD BE A TANK GAUGER WITH A PICKUP TRUCK, PROBABLY SOMEWHERE OUT IN WEST TEXAS. HE WOULD MEASURE OUT THE FINAL DRIP AND TURN OUT THE LIGHTS. THIS IS PROBABLY WRONG. I BET THE LAST EXPLORATION/PRODUCTION EMPLOYEE WILL BE AN EXPLORATION GEOLOGIST WITH A PICKUP TRUCK, SOMEWHERE OUT IN OKLAHOMA. HE WILL CHIP OFF A PIECE OF ARBUCKLE OUTCROP, DRIVE TO THE NEAREST PHONE, AND TELL THEM TO DRILL DEEPER.

Amoco Production Company

SHEET NO. OF

OIL

ENGINEERING CHART

FILE

APPN

SUBJECT SHELL/NEW FIELD WILDCATS
WORLD WIDE : 1972 - 1988 *

DATE 7/1/89

BY RS

	<u>NUMBER</u>	<u>% SUCCESS</u> ***
HIGH RISK **	300	0
MODERATE TO LOW RISK **	900	
ONSHORE LOWER 48	500	35-40
GULF OF MEXICO	140	35-40
FOREIGN	260	35-40
WORLDWIDE TOTAL	<u>1200</u>	<u>26-30</u> % overall

- * T.F. HART REMARKS TO HOUSTON GEOL SOC 10/26/88.
 ** RISK PRE-DETERMINED
 *** BOOKED SOME RESERVES

