

ENVIRONMENTAL HEALTH AND SAFETY REVIEW

R&E CURRENT/RETIREMENT EXECUTIVE TEAM MEETING

OCTOBER 12, 1988

MOBIL TECHNICAL CENTER, PRINCETON

J. P. McCULLOUGH

GOOD AFTERNOON, I WOULD LIKE TO BRING YOU UP TO DATE ON OUR RECENTLY RENAMED ENVIRONMENTAL HEALTH AND SAFETY DEPARTMENT; BRIEFLY COVER SOME RECENT ACCOMPLISHMENTS; AND THEN, GIVE YOU SOME OF MY VISION OF THE FUTURE. LET'S START WITH THE NEW ENVIRONMENTAL, HEALTH AND SAFETY ORGANIZATION. A LITTLE OVER A YEAR AGO, WE ASKED ARTHUR D. LITTLE TO REAPPRAISE, IN LIGHT OF TODAY'S COST CONTAINMENT ENVIRONMENT; THE ORGANIZATION, STAFFING, FUNCTIONS AND EFFECTIVENESS OF MOBIL'S ENVIRONMENTAL, HEALTH AND SAFETY ACTIVITIES AT THE CORPORATE AND PROFIT CENTER LEVELS. ADL CONDUCTED

SLIDE 1
A. D. LITTLE
STUDY

WORKING WITH OVER 50 MAJOR FACILITIES WE HELPED THEM DEVELOP INVENTORIES OF MATERIALS, WHERE THESE MATERIALS ARE USED, WHERE AND HOW MUCH EMISSIONS OCCUR AND PROVIDED THESE DATA IN FORMS USEFUL FOR EMPLOYEES AND PUBLIC OFFICIALS. THIS "EXPERT SYSTEM" ALLOWED OPERATING DIVISIONS WORLDWIDE TO COMPLY WITH NEW REPORTING REQUIREMENTS SIMILAR TO THE U.S. SUPERFUND AMENDMENTS REAUTHORIZATION ACT (SARA) RIGHT-TO-KNOW PROVISIONS AND OSHA'S HAZARD COMMUNICATIONS STANDARD.

SLIDE 9
TOXICOLOGY/
PRODUCT SAFETY
SUPPORT SUMMARY

OUR TOXICOLOGY/PRODUCT SAFETY SUPPORT IS ONLY POSSIBLE THROUGH THE PARTNERSHIP WITH THE MOBIL LABS AND OPERATING DIVISIONS ON A REGULAR BASIS. CENTRALIZING THIS ACTIVITY ELIMINATES COSTLY DUPLICATION OF EFFORT WHEN COMPLYING WITH NEW COMPLEX RULES, AND PROVIDES OVERALL SAVINGS TO MOBIL. I THINK THIS CENTER OF EXCELLENCE OFFERS ANOTHER STRONG MOBIL TECHNOLOGY EDGE THAT IS JUST BEGINNING TO BE EXPLOITED.

SLIDE 10
NEWSWEEK - THE
GREENHOUSE
EFFECT

NOW LET'S TALK ABOUT SOME ENVIRONMENTAL, HEALTH AND SAFETY ISSUES ON THE LEADING EDGE OF TECHNOLOGY. FOUR MONTHS AGO, WHO WOULD HAVE SAID THE "GREENHOUSE EFFECT" WOULD HAVE

GOTTEN SO MUCH COVERAGE BY THE MEDIA AND
BECOME A SUBJECT OF CONGRESSIONAL HEARINGS.
TODAY, IT IS GETTING A LOT OF ATTENTION PARTLY
BECAUSE OF THE DROUGHT AND THE HOT SUMMER.
HOWEVER, IT'S BEEN HIGH ON THE ENVIRON-
MENTALIST'S AGENDA OF EMERGING ISSUES FOR AT
LEAST TWO YEARS. HOW WILL THE GREENHOUSE
EFFECT INFLUENCE OUR INDUSTRY? AT THIS POINT,
THAT'S DIFFICULT TO SAY. FOR STARTERS, IT IS
NOT A PROVEN SCIENTIFIC FACT THAT WE ARE
EXPERIENCING A GREENHOUSE EFFECT. MAYBE WE
ARE IN THE MIDDLE OF ONE OF NATURE'S NORMAL
CYCLES.

BUT HERE'S A HEADLINE FROM THE NY TIMES IN
JUNE THAT SUGGESTS THAT A SHARP CUT IN THE
USE OF FOSSIL FUELS, INCLUDING PETROLEUM, IS
THE ANSWER TO THE PROBLEM. AND OZONE, WHICH
MAY BE AGGRAVATED BY THE GREENHOUSE EFFECT, IS
ANOTHER ISSUE THAT CONTAINS SIMILAR LONG TERM
OVERTONES.

THE POTENTIAL IMPLICATIONS OF THE PRESENT AND
NEWLY EMERGING ISSUES ARE SO IMPORTANT THAT
SENIOR MANAGEMENT HAS ASKED R&E FOR AN ASSESS-
MENT OF AN ENVIRONMENTAL WORST CASE SCENARIO

(E.G., HYDROGEN, FUEL CELLS OR NUCLEAR
POWER) FOR FLEETS, AND OTHER CONTROLS ON
BUSINESS FLIGHTS, AIRCRAFT, AND OTHER

SLIDE 11
NY TIMES
GLOBAL WARMING

FOR CALIFORNIA, A HIGHLY SENSITIVE BELL WEATHER STATE, TO HELP GAUGE THEIR IMPACT ON MOBIL'S OPERATIONS THERE. WE'RE JUST BEGINNING THIS STUDY AND WILL BE WORKING CLOSELY WITH THE OPERATING DIVISIONS TO DEVELOP THE SCENARIO.

SLIDE 12
CLEAN AIR BY
THE YEAR 2007

FOR THE PURPOSES OF OUR TALK, HOWEVER, LET ME PROPOSE A POSSIBLE WORST CASE SCENARIO FOR ACHIEVING CLEAN AIR BY THE YEAR 2007 IN THREE STAGES AS IT WOULD AFFECT OUR INDUSTRY.

SLIDE 13
STAGE I BY 1993

STAGE 1 - TO BE ACHIEVED BY 1993:

- 1) NEW CONTROL MEASURES TO REDUCE EMISSIONS FROM REFINERY HEATERS, BOILERS, OIL FIELD STEAM GENERATORS, VAPOR RECOVERY SYSTEMS, VALVES, PUMPS AND COMPRESSORS.
- 2) ESTABLISH NEW CONTROL MEASURES ON NITROGEN OXIDES FROM BOILERS AND FURNACES.
- 3) PHASE OUT THE USE OF FUEL OIL BY FIXED SOURCES.
- 4) IMPOSE NEW CONTROL MEASURES ON NEW VEHICLES. REQUIRE THE USE OF CLEAN FUELS (E.G., METHANOL, FUEL CELLS OR ELECTRIC POWER) FOR FLEETS, AND OTHER CONTROLS ON PLEASURE BOATS, AIRCRAFT, AND SHIPS.

SLIDE 14
STAGE II BY 1998

AND THAT'S ONLY STAGE I. NOW FOR STAGE II,
TO BE COMPLETED BY 1998:

1) CONVERT 40% OF THE PASSENGER VEHICLES AND
70% OF FREIGHT VEHICLES TO OPERATE ON CLEAN
FUELS. ALL DIESEL POWERED TRANSIT BUSES
SWITCHED TO CLEAN FUELS.

2) MAINTAIN THE NUMBER OF VEHICLE MILES
TRAVELED AND THE NUMBER OF TRIPS AT CURRENT
LEVELS. IF NECESSARY, CONSIDER RESTRICTING
DRIVING, LICENSING AND VEHICLE REGISTRATION.

3) MINIMIZE INCREASES IN EMISSIONS FROM
EXISTING STATIONARY SOURCES.

4) REDUCTION OF REFINING AND DISTRIBUTION
ACTIVITIES - MAINTAIN THE 1985 LEVEL.

SLIDE 15
STAGE III - 2000
AND BEYOND

AND FOR THE COUP DE GRACE - STAGE III - BY THE
YEAR 2007 AND BEYOND:

1) TOTAL PHASE OUT OF PETROLEUM REFINING,
PRODUCTION AND DISTRIBUTION.

2) PROMOTION OF FUEL CELL TECHNOLOGY.

3) INCREASED PENETRATION OF ZERO-EMISSION
VEHICLES.

NOW, THOSE OF YOU, LIKE ME, WHO SAID THEY
WOULD NEVER BAN THE USE OF LEAD, WILL SAY --
PREPOSTEROUS! A TWILIGHT ZONE SCENARIO! IT
WILL NEVER HAPPEN!

SLIDE 16
PATH TO CLEAN
AIR

WELL, WHAT I'VE JUST READ IS A VERBATIM
EXTRACT FROM THE 500 PAGE DRAFT SOUTHERN
CALIFORNIA AIR QUALITY REPORT ENTITLED: PATH
TO CLEAN AIR: POLICY PROPOSALS. I'M SURE
SOME OF YOU ARE FAMILIAR WITH THE REPORT.
USM&R IS LEADING MOBIL'S RESPONSE TO THESE
PROPOSALS, ALONG WITH THE REST OF INDUSTRY.
WE HOPE, AND REALLY EXPECT, THAT A MORE
RATIONAL PLAN WILL EMERGE FROM THE UPCOMING
HEARINGS, WHICH WILL BE HELD THIS FALL.

SLIDE 17
BENZENE RISK
MANAGEMENT
ISSUES

ANOTHER LEADING EDGE ISSUE THAT RELIES ON THE
MOBIL TECHNICAL CENTER OF EXCELLENCE, INVOLVES
RISK ASSESSMENT. HERE WE HAVE USED THE
EXPERTISE OF OUR TOXICOLOGISTS, AUTOMOTIVE
SPECIALISTS, AND CHEMISTS COORDINATED BY OUR
PRODUCT SAFETY MANAGER TO ADDRESS THE BENZENE
RISK MANAGEMENT ISSUES. CALIFORNIA NOT ONLY

HAS THE PATH TO CLEAN AIR, BUT IS CONSIDERING REDUCING THE ALLOWABLE MAXIMUM BENZENE CONTENT OF GASOLINE TO 0.6 PERCENT BY VOLUME. MANY STATES AND THE FEDERAL GOVERNMENT ARE CONSIDERING GROUNDWATER CLEAN UP STANDARDS FOR BENZENE CONTAMINATION TO 1 PART PER BILLION. WE BELIEVE THIS IS WELL BELOW A THRESHOLD FOR ANY HARM TO HUMAN HEALTH. WE ALSO ARE ALERT EPA'S DESIRE TO FURTHER CONTROL REFINERY EMISSIONS IN ATTEMPTS TO REDUCE THE POTENTIAL FOR BENZENE TO HARM HUMANS.

SLIDE 18
API BENZENE RISK
ASSESSMENT
PROJECT

WE ARE CONTINUING TO WORK WITH THE REGULATORS
MOBIL LED THE API BENZENE RISK ASSESSMENT PROJECT IN COOPERATION WITH THE CHEMICAL MANUFACTURERS ASSOCIATION AND THE WESTERN OIL AND GAS ASSOCIATION. A MAJOR PART OF THIS PROJECT WAS ASSIGNMENT TO CLEMENT'S ASSOCIATES TO DEVELOP A NEW LINEAR RISK MODEL BASED ON AVAILABLE BIOLOGICAL SCIENCE FROM HUMAN AND ANIMAL STUDIES ON BENZENE INDUCED LEUKEMIA.

SLIDE 19
BENZENE CONCEN-
TRATION IN
AIR FOR
 1×10^6 RISK

THE NEXT SLIDE SHOWS THE BENZENE CONCENTRATION IN AIR FOR AN ESTIMATED 1 IN A MILLION RISK OF DEATH FROM LEUKEMIA. CALIFORNIA'S RISK ESTIMATE BASED ON ANIMAL STUDIES INDICATES THE ALLOWABLE LEVEL WOULD BE 0.0006 PARTS PER BILLION BENZENE. EPA'S 1984 RISK ASSESSMENT,

USING A LINEAR MODEL DOWN TO ZERO, ESTIMATES THE SAME VALUE AT 0.04 PARTS PER BILLION. BY USING MORE REASONABLE ASSUMPTIONS AND RECOGNIZING MORE STATISTICAL VARIATION, CLEMENT'S UPDATE OF THE EPA ESTIMATE (USING EPA METHODS) IN 1985 SHOWS 0.5 PART PER BILLION BENZENE. THE NON-LINEAR MODEL, BASED ON BIOCHEMICAL PHENOMENA, DEMONSTRATES THAT THE BENZENE CONCENTRATION IS 80 PARTS PER BILLION.

WE ARE CONTINUING TO WORK WITH THE REGULATORS TO GAIN ACCEPTANCE OF BETTER RISK ASSESSMENTS BASED ON SOUND SCIENCE AND NOT ARBITRARY EXTRAPOLATION INTO UNKNOWN REGIONS. THESE TYPE OF ACTIVITIES CAN HELP LEAD TO MORE REASONABLE REGULATIONS OF IMPORTANT TRACE ELEMENTS AND PETROLEUM PRODUCTS THAT ARE FOUND IN AIR THROUGHOUT THE WORLD.

THESE CUTTING EDGED ISSUES ALSO DEMONSTRATE MY PHILOSOPHY AND THAT OF THE WHOLE ENVIRONMENTAL, HEALTH AND SAFETY DEPARTMENT THAT MOBIL IS DIFFERENT, HAS BEEN, AND SHOULD CONTINUE TO BE DIFFERENT, FROM OUR COMPETITORS. WE USE OUR TECHNOLOGY IN ENVIRONMENTAL,

HEALTH AND SAFETY AREAS TO DEVELOP PRODUCTS THAT ARE SAFER AND CAN BE MARKETED WITH A COMPETITIVE EDGE. WE ALSO ARE NOT SATISFIED WITH JUST TESTING FOR TESTING SAKE. MOBIL'S RESEARCH PHILOSOPHY FLOWS INTO OUR TOXICOLOGY, PRODUCT SAFETY AND ENVIRONMENTAL SCIENCE EFFORTS TO UNDERSTAND WHY AND HOW THINGS WORK SO THAT WE CAN DEVELOP NEW PRODUCTS TO ADDRESS GROWING PUBLIC CONCERNS WITH EHS ISSUES

SLIDE 20
KEY ENVIRON-
MENTAL TRENDS

THE KEY FORWARD ENVIRONMENTAL TRENDS THAT WE SEE ARE PRESSURES TOWARD ZERO RISK-ZERO EMISSIONS INTO THE AIR, WATER AND NO WASTES. WE ALSO SEE INCREASED PUBLIC INVOLVEMENT IN EVERY ASPECT OF OUR BUSINESS THROUGH EXPANDING RIGHT TO KNOW LEGISLATION AT THE STATE, NATIONAL AND INTERNATIONAL LEVELS. FINALLY, WE BELIEVE THERE IS A POTENTIAL FOR EHS ISSUES TO MAKE FUNDAMENTAL CHANGES IN THE OIL AND CHEMICAL BUSINESS OPERATIONS.

SLIDE 21
NEW PRESSURES -
NEXT 5-10 YEARS

I TOLD YOU OF SOME OF THE PRESSURES, SUCH AS THE CALIFORNIA WORST CASE PATH TO CLEAN AIR. BUT, EVEN IF BANNING OF REFINING AND OIL PRODUCTION, DOES NOT HAPPEN, WE CAN CERTAINLY EXPECT NEW PRESSURES OVER THE NEXT FIVE (5) TO

TEN (10) YEARS. SOME OF THEM WILL BE REDUCTION IN AROMATIC AND BENZENE CONTENT OF GASOLINE; FURTHER REDUCTION IN STATIONARY AND MOBILE SOURCE EMISSIONS; MORE STUDIES ON THE ALLEGED HEALTH RISKS OF PETROLEUM PRODUCTS; NEW REFERENDUM ISSUES LIKE CALIFORNIA'S PROPOSITION 65; AND NEW CLEAN FUEL PROPOSALS FOR METHANOL FUELED VEHICLES, FUEL CELLS, ELECTRIC CARS, AND MAYBE EVEN SOLAR POWER.

NOW, I WILL BE GLAD TO ANSWER ANY QUESTIONS THAT YOU MAY HAVE.

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Budget and Objectives
Assumptions

Product Safety
Information
Safety and Industrial
Hygiene
Risk Management
Technology
Coordination
Oil Spill, Crisis and
Disaster Preparedness

Legislative and
Regulatory
Coordination
EHS Compliance
Superfund
Management

Toxicology
Technical Service
and Research

Newsweek

The Greenhouse Effect

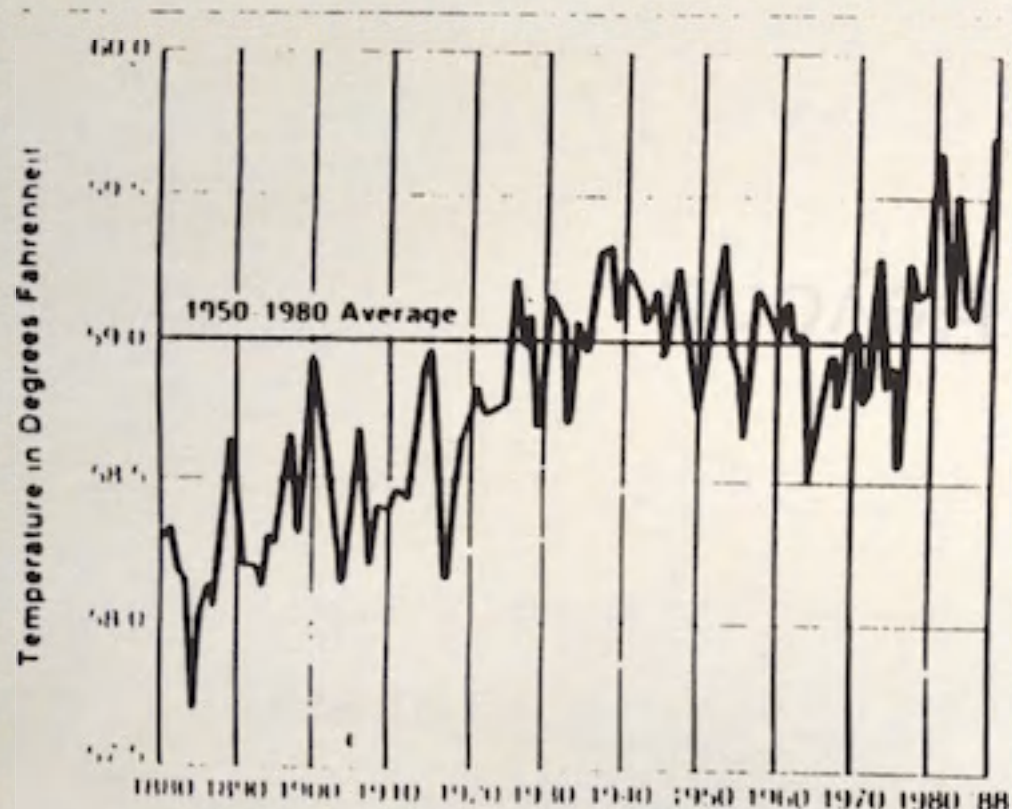
Danger: More Hot Summers Ahead



The New York Times

NEW YORK, FRIDAY, JUNE 24, 1988

Global Warming Has Begun, Expert Tells Senate



Global Warming: Greenhouse Effect?

Average global temperatures through the first five months of 1988. As a baseline, scientists use the global average from 1950 to 1980.

Source: James E. Hansen and Sergej Lebedeff

Sharp Cut in Burning of Fossil Fuels Is Urged to Battle Shift in Climate

By PHILIP SHABLOFF
Special to The New York Times

WASHINGTON, June 23 — The earth has been warmer in the first five months of this year than in any comparable period since measurements began 130 years ago, and the higher temperatures can now be attributed to a long expected global warming trend linked to pollution, a space agency scientist reported today.

Until now, scientists have been cautious about attributing rising global temperatures of recent years to the predicted global warming caused by pollutants in the atmosphere, known as the "greenhouse effect." But today Dr. James E. Hansen of the National Aeronautics and Space Administration told a Congressional committee that it was 99 percent certain that the warming trend was not a natural variation but was caused by a buildup of carbon dioxide and other artificial gases in the atmosphere.

Continued