

U.S. Department  
of Transportation

**United States  
Coast Guard**



Commandant  
United States Coast Guard

Washington, D.C. **20593-0001**  
Staff Symbol:  
Phone:

DEPARTMENT OF TRANSPORTATION

U.S. COAST GUARD

STATEMENT OF REAR ADMIRAL JOEL D. SIPES

COMMITTEE ON SPACE, SCIENCE AND TECHNOLOGY

SUBCOMMITTEE ON NATURAL RESOURCES, AGRICULTURE RESEARCH,

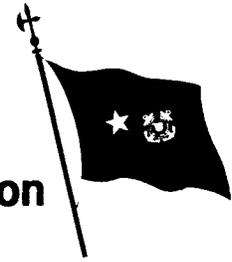
AND ENVIRONMENT

UNITED STATES HOUSE OF REPRESENTATIVES

7 SEPTEMBER 1989



**Rear Admiral Joel D. Sipes  
Chief, Office of Marine Safety,  
Security and Environmental Protection  
United States Coast Guard**



Rear Admiral Joel D. Sipes became Chief, Office of Marine Safety, Security and Environmental Protection in Washington, D.C., in May 1988. He directs a coordinated federal port safety and security program; an active marine environmental protection program; a program for the construction, inspection and certification of merchant vessels; the development of comprehensive marine safety standards; the licensing and certifying of U.S. merchant marine personnel; and represents the U.S. in various related international maritime forums.



Since graduating from the Coast Guard Academy in 1959, RADM Sipes has served in a variety of assignments including the All-Coast Guard Rifle and Pistol Detachment; Deck Watch Officer and Student Engineer on the icebreaker *Eastwind*; Assistant Engineer on the *USCGC Bibb*, and Tactics Officer at the Coast Guard Academy. He compiled and published the text on military leadership used for a number of years in Coast Guard officer training programs.

With more than 29 years of commissioned service, RADM Sipes assignments in the marine safety field included Engineering Inspector at Marine Inspection Office, Baltimore, Maryland; Commanding Officer, Marine Inspection Detachment, Lake Charles, Louisiana; Branch Chief in the Marine Environmental Protection Division at Coast Guard Headquarters, Washington, D.C.; Officer in Charge, Marine Inspection and Captain of the Port, Corpus Christi, Texas; and Captain of the Port, Houston, Texas. For the past three years, RADM Sipes served on the Eighth Coast Guard District staff as Chief of Operations and Chief of Staff.

RADM Sipes was Executive Assistant to the Commandant from 1981 to 1983. Prior to this, he was graduated from Industrial College of the Armed Forces (ICAF) and later served on the Commandant's staff as Special Assistant.

RADM Sipes earned a Masters of Public Administration degree from the University of Rhode Island and was elected to Pi Sigma Alpha, the National Political Science Honor Society. His decorations include two Meritorious Service Medals, five Coast Guard Commendation Medals, and the Distinguished Marksman Badge.

RADM Sipes was born in Pennsylvania, reared in Alexandria, Virginia. He is married to the former Ruth Ann Gilbert of Wahoo, Nebraska. She is a graduate of the University of Nebraska. They have two children: Stephanie and Jeffrey. In his spare time, RADM Sipes enjoys hunting, fishing, racquetball, jogging and furniture restoration.

DEPARTMENT OF TRANSPORTATION  
U.S. COAST GUARD  
STATEMENT OF REAR ADMIRAL JOEL D. SIPES  
COMMITTEE ON SPACE, SCIENCE AND TECHNOLOGY  
SUBCOMMITTEE ON NATURAL RESOURCES, AGRICULTURE RESEARCH,  
AND ENVIRONMENT  
UNITED STATES HOUSE OF REPRESENTATIVES  
7 SEPTEMBER 1989

GOOD MORNING MR. CHAIRMAN AND DISTINGUISHED MEMBERS OF THE SUBCOMMITTEE. I AM REAR ADMIRAL JOEL D. SIPES, CHIEF OF THE COAST GUARD'S OFFICE OF MARINE SAFETY, SECURITY AND ENVIRONMENTAL PROTECTION. THANK YOU FOR THE OPPORTUNITY TO APPEAR BEFORE YOU TODAY TO DISCUSS OIL SPILL CLEANUP TECHNOLOGY. WITH ME TODAY ARE CAPTAIN WAYNE BECKER, CHIEF OF THE RESEARCH AND DEVELOPMENT STAFF OF THE OFFICE OF ENGINEERING AND DEVELOPMENT AND MR. DANIEL SHEEHAN, CHIEF, TECHNICAL ADVISOR FOR MY OFFICE.

IN ACCORDANCE WITH VARIOUS PROVISIONS OF THE CLEAN WATER ACT, THE NATIONAL CONTINGENCY PLAN, AND MEMORANDUM OF UNDERSTANDING BETWEEN THE COAST GUARD AND THE ENVIRONMENTAL PROTECTION AGENCY, THE COAST GUARD PROVIDES THE PREDESIGNATED FEDERAL ON-SCENE COORDINATORS FOR POLLUTION INCIDENTS OCCURRING IN THE COASTAL ZONE. IN THE LAST TEN YEARS, THE COAST GUARD HAS RESPONDED TO APPROXIMATELY 8,800 OIL SPILLS ANNUALLY. THE SIZE OF THE SPILLS RANGED FROM ONE GALLON TO 2.8 MILLION GALLONS. WE CONSIDER THE EXXON VALDEZ SPILL TO BE UNIQUE BECAUSE OF ITS REMOTE LOCATION AND ENORMITY, FOUR TIMES LARGER THAN OUR PREVIOUS MOST SIGNIFICANT SPILL. THE VAST MAJORITY OF THE SPILLS INVOLVE LESS THAN 10,000 GALLONS; OCCUR IN SHELTERED WATERS; AND ARE ROUTINELY CLEANED UP USING CONVENTIONAL CLEANUP METHODS.

GENERALLY, MECHANICAL TECHNIQUES ARE USED TO CONTAIN OR DEFLECT OIL INTO AN AREA WHERE IT CAN BE REMOVED FROM THE SURFACE OF THE WATER USING SKIMMERS, PUMPS, ABSORBENT MATERIAL, MANUAL TECHNIQUES AND NON-SPECIALIZED EQUIPMENT, SUCH AS VACUUM TRUCKS. WHEN THE OIL IMPACTS THE SHORELINE, A LENGTHY, TEDIOUS AND LABOR INTENSIVE CLEANUP USUALLY IS NECESSARY. DURING A SHORELINE CLEANUP, GREAT EMPHASIS IS PLACED ON LIMITING ADDITIONAL ENVIRONMENTAL DAMAGE. TECHNOLOGY FOR THESE TYPES OF SPILLS IS GENERALLY CONSIDERED ADEQUATE.

MAJOR SPILLS IN RECENT YEARS HAVE CLEARLY IDENTIFIED SEVERAL FACTORS WHICH AFFECT THE EFFICIENCY AND EFFECTIVENESS OF RESPONSE ACTIONS. THESE FACTORS INCLUDE THE FOLLOWING: EACH OIL TYPE HAS SPECIFIC CHARACTERISTICS WHICH INFLUENCE ITS BEHAVIOR WHEN SPILLED, RESULTING IN DIFFERING BIOLOGICAL EFFECTS; CONTAINMENT BARRIERS LOSE EFFECTIVENESS WHEN THE CURRENT SPEED EXCEEDS ONE KNOT; WAVES OF THREE FEET AND HIGHER SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF CONTAINMENT BARRIERS AND MOST MECHANICAL RECOVERY SYSTEMS; DISPOSAL OF LARGE AMOUNTS OF RECOVERED OIL AND OILY DEBRIS IS ALWAYS A PROBLEM; AND THE USE OF DISPERSANTS IS CONTROVERSIAL AND POSES PROBLEMS WHEN THEY ARE CONSIDERED AS A RESPONSE ACTION.

PAST RESEARCH AND DEVELOPMENT PROGRAMS HAVE STUDIED THE VARIOUS FACTORS AFFECTING RESPONSE ACTIONS. THE COAST GUARD WAS ACTIVE IN OIL SPILL TECHNOLOGY RESEARCH AND DEVELOPMENT FROM 1969 TO 1984. I HAVE INCLUDED A TABLE AT THE END OF MY WRITTEN STATEMENT THAT PROVIDES THE RESEARCH, DEVELOPMENT, TEST AND EVALUATION FUNDING OVER THAT PERIOD. THE DECREASE IN FUNDING

AFTER 1984 WAS DUE TO THE COMPLETION OF OUR ORIGINAL RESEARCH AND DEVELOPMENT PLAN AND THE LOGICAL PROGRESSION INTO HAZARDOUS SUBSTANCE TECHNOLOGY RESEARCH AND DEVELOPMENT WHEN OUR POLLUTION RESPONSE RESPONSIBILITIES WERE EXPANDED BY THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT AND THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT.

DURING OUR RESEARCH PROGRAM, APPROXIMATELY 240 REPORTS WERE PRODUCED BY, OR FOR, THE COAST GUARD ON OIL SPILL TECHNOLOGY. THESE EFFORTS ADDRESSED SUCH AREAS AS CONTAINMENT AND RECOVERY SYSTEMS; CLEANUP METHODS; DISPOSAL AND INTERIM STORAGE OF RECOVERED OIL; RESPONSE LOGISTICS, TRANSPORTATION, AND PLANNING; OIL SENSING, MONITORING, AND IDENTIFICATION; FATE AND EFFECTS OF SPILLED OIL; ARCTIC RESPONSE; AND FAST CURRENT RESPONSE.

IMPORTANT DEVELOPMENTS FROM COAST GUARD RESEARCH AND DEVELOPMENT INCLUDE A HIGH SEAS OIL RECOVERY SYSTEM; PUMPS FOR LIGHTERING TANK VESSELS; PUMPS FOR USE WITH VISCOUS OILS; FAST SURFACE DELIVERY SLEDS FOR FERRYING AND DEPLOYING EQUIPMENT TO OFFSHORE OR REMOTE SITES; POLLUTION RESPONSE VEHICLES, VESSELS, AND COMMAND POSTS; AN AIRBORNE IDENTIFICATION AND MAPPING SYSTEM CALLED AIREYE; THE CENTRAL OIL IDENTIFICATION LABORATORY; AND DEVELOPMENT OF RUBBER BLADDERS FOR STORAGE OF OIL REMOVED FROM A SPILL. THERE WERE MANY SUCCESSES MIXED WITH SOME FAILURES. HOWEVER, IT IS JUST AS IMPORTANT TO KNOW WHAT WILL NOT WORK AS IT IS TO KNOW WHAT WILL.

MANY OF OUR SUCCESSES RESULTED IN THE EQUIPMENT CURRENTLY OPERATED BY OUR STRIKE TEAMS. THESE INCLUDE THE HIGH SEAS OIL RECOVERY SYSTEM WHICH IS AN OPEN OCEAN CONTAINMENT BOOM WITH OIL SKIMMING AND RECOVERY CAPABILITY; THE AIR DELIVERABLE, ANTIPOLLUTION TRANSFER SYSTEM (ADAPTS) WHICH IS THE PUMP AND HOSE SYSTEM USED TO OFF-LOAD TANK VESSELS OUT OF THE TOPS OF THE TANKS; AND OUR VISCOUS OIL PUMPING SYSTEMS. THESE SYSTEMS ARE AIR DELIVERABLE BY COAST GUARD AIRCRAFT AND ARE RECOGNIZED TO BE STATE OF THE ART. THE AIREYE REMOTE SENSING PACKAGE WAS DEVELOPED FOR COAST GUARD HU-25 INTERCEPTORS. THIS SYSTEM WAS USED EXTENSIVELY IN VALDEZ. THE CENTRAL OIL IDENTIFICATION LABORATORY WAS DEVELOPED TO USE COMPLEMENTARY SAMPLE ANALYSIS TECHNIQUES TO IDENTIFY THE SOURCE OF DISCHARGED OIL. THIS SYSTEM HAS BEEN ACCEPTED IN THE JUDICIAL SYSTEM AND HAS BEEN USED SUCCESSFULLY IN HUNDREDS OF CASES.

THE COAST GUARD'S OIL SPILL RESEARCH DID NOT COMPLETELY STOP DURING THESE PAST FEW YEARS. WE HAVE CONTINUED TO FUND THE MAPPING OF THE U.S. COASTLINE'S ENVIRONMENTALLY SENSITIVE AREAS IN ORDER TO PROVIDE DEFINITIVE MAPS FOR THE ON-SCENE COORDINATORS' DECISION MAKING. WE HAVE ALSO BEEN WORKING CLOSELY WITH NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION IN THE DEVELOPMENT OF A COMPUTERIZED SPILL RESPONSE INFORMATION SYSTEM THAT WILL ASSIST ON-SCENE COORDINATORS IN DECISION SUPPORT AND CONTINGENCY PLANNING FOR RESPONSES TO SPILLS OF BOTH OIL AND HAZARDOUS SUBSTANCES. THIS SYSTEM INCLUDES NOAA'S WELL RECOGNIZED CAMEO SYSTEM (COMPUTER AIDED MANAGEMENT OF EMERGENCY OPERATION) THAT IS WIDELY USED BY FIRE DEPARTMENTS AND EMERGENCY RESPONSE PERSONNEL THROUGHOUT THE UNITED STATES.

I SHOULD POINT OUT THAT OUR FORMAL R&D EFFORTS ARE AUGMENTED BY THE EXCHANGE OF INFORMATION ON THIS SUBJECT AT THE INTERNATIONAL OIL SPILL CONFERENCE, WHICH IS HELD EVERY TWO YEARS. THE CONFERENCE IS CO-HOSTED BY THE COAST GUARD, ENVIRONMENTAL PROTECTION AGENCY, AND THE AMERICAN PETROLEUM INSTITUTE. THE TWELFTH INTERNATIONAL CONFERENCE WILL BE HELD IN MARCH 1991 AND IT WILL INCLUDE REPRESENTATIVES OF OIL IMPORTING AND EXPORTING NATIONS, ENVIRONMENTALISTS, SHIPPERS, AND OIL INDUSTRY REPRESENTATIVES. WE WILL DISCUSS WHAT HAS BEEN LEARNED FROM RECENT INCIDENTS, ASSESS THE WORLD'S CAPABILITY FOR OIL SPILL RESPONSE, AND IDENTIFY WAYS TO ADVANCE THE TECHNOLOGY IN THIS FIELD.

EARLIER THIS YEAR, THE COAST GUARD RECOGNIZED THE NEED TO REEVALUATE ITS RESEARCH AND DEVELOPMENT PROGRAM RELATED ESPECIALLY TO DISCHARGES OF OIL INTO THE MARINE ENVIRONMENT. THE VALDEZ SPILL AND THE THREE RECENT MAJOR SPILLS BROUGHT THIS INTO THE NATIONAL SPOTLIGHT AND TIGHTENED THE TIME FRAME ON THE EVALUATION. WE HAVE COMPLETED THE FIRST PHASE OF THAT EFFORT. THE APPROACH TAKEN WAS TO LOOK AT THE OIL SPILL RESPONSE MECHANISM AS A SYSTEM AND TO EXAMINE OUR CAPABILITIES AND NEEDS ACROSS A VARIETY OF ENVIRONMENTAL CONDITIONS. WE THEN DIVIDED THE IDENTIFIED NEEDS INTO THOSE WHICH MIGHT BE ADDRESSED BY FUTURE RESEARCH AND DEVELOPMENT AND THOSE WHICH WERE MORE APPROPRIATELY ADMINISTRATIVE IN NATURE. THE NEXT STEP IN THE PROCESS WILL BE TO EVALUATE THE STATE OF THE ART AS IT EXISTS CONCERNING SPECIFIC PROJECT AREAS. AREAS WHICH APPEAR TO WARRANT CONSIDERATION FOR FUTURE RESEARCH INCLUDE BUT ARE NOT LIMITED TO:

- 1) IN-SITU BURNING,
- 2) DEVELOPMENT OF AN AIRBORNE OIL SLICK THICKNESS SENSOR,
- 3) DEVELOPMENT OF INNOVATIVE CONTAINMENT BARRIERS FOR HIGH CURRENT/ICE AREAS,
- 4) DEVELOPMENT AND EVALUATION OF NONDAMAGING SHORELINE CLEANUP TECHNIQUES,
- 5) CHEMICAL TREATING AGENTS OTHER THAN DISPERSANTS,
- 6) EVALUATE THE TECHNOLOGIES USED IN VALDEZ,
- 7) FATE OF DISPERSED OIL,
- 8) DISPERSANT EFFECTIVENESS,
- 9) DISPERSING THICK OILS,
- 10) BIOREMEDIATION,
- 11) SPILL RESPONSE INFORMATION AND DECISION SUPPORT SYSTEMS.

AFTER THE RESEARCH AND DEVELOPMENT NEEDS ARE IDENTIFIED, A COMPREHENSIVE PLAN CAN BE DEVELOPED.

THE COAST GUARD RECOGNIZES THAT THE OIL INDUSTRY AND OTHER FEDERAL DEPARTMENTS AND AGENCIES, SUCH AS THE ENVIRONMENTAL PROTECTION AGENCY, DEPARTMENT OF THE INTERIOR, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND DEPARTMENT OF ENERGY, HAVE THEIR OWN OIL SPILL TECHNOLOGY RESEARCH AND DEVELOPMENT NEEDS AND PLANS. BECAUSE OF THIS WIDE AND VARIED INTEREST, FEDERAL RESEARCH AND DEVELOPMENT IN THE FUTURE MUST BE COORDINATED TO PREVENT DUPLICATION OF EFFORT. THE COAST GUARD, AS THE AGENCY RESPONSIBLE AND ACCOUNTABLE FOR RESPONSE IN THE COASTAL ZONE, IS PREPARED TO TAKE THE LEAD, UNDER SECRETARY SKINNER'S DIRECTION, IN COORDINATING RESEARCH AND DEVELOPMENT EFFORTS IN OIL SPILL RESPONSE.

TOWARD THAT END, SECRETARY SKINNER HAS ASKED THE COAST GUARD TO HOST A TWO-DAY R&D PLANNING SESSION, SEPTEMBER 26 AND 27, AT OUR R&D CENTER IN GROTON, CONNECTICUT. THE PURPOSE OF THE MEETING WILL BE TO REVIEW ADMINISTRATION NEEDS CONCERNING OIL SPILL RESPONSE DETERMINE WHICH MIGHT APPROPRIATELY BE DEALT WITH BY RESEARCH AND DEVELOPMENT. THERE IS HIGH INTEREST IN A VARIETY OF AGENCIES IN THE R&D AREA AND WE FEEL THAT A COORDINATED APPROACH EARLY ON WILL MINIMIZE REDUNDANT EFFORTS AND MAXIMIZE THE UTILITY OF OUR EFFORTS.

IN CLOSING, I WANT TO EMPHASIZE THAT A COORDINATED ADMINISTRATION RESEARCH AND DEVELOPMENT PLAN UNDOUBTEDLY WILL CONSIST OF NEW INITIATIVES WHICH ARE NOT NOW INCLUDED IN RECENT BUDGET CONSIDERATIONS. ADDITIONAL RESOURCES WILL BE NECESSARY TO DEVELOP AND IMPLEMENT A SUCCESSFUL PROGRAM.

THANK YOU, MR. CHAIRMAN, I WILL BE HAPPY TO ANSWER ANY QUESTIONS THAT YOU OR THE OTHER MEMBERS OF THE SUBCOMMITTEE MAY HAVE.