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A New Direction for Federal Oil Spill Research and Development

Written Statement of
Stephen L Edinger
Administrator
California Department of Fish and Game
Office of Spill Prevention and Response
1700 K Street, Suite 250
Sacramento, CA 95811
(916) 445-9326

Mr. Chairman and members of the Committee, thank you for this opportunity to testify before you today regarding California's experience and perspective on the status of oil spill response technologies.

I am Stephen Edinger, Administrator for the California Department of Fish and Game, Office of Spill Prevention and Response (OSPR). I was appointed as Administrator by Governor Arnold Schwarzenegger last November. Prior to taking this appointment, I spent 28 years in law enforcement, working for state and federal agencies, protecting the natural resources of California. I have investigated or served as the incident commander on hundreds of pollution events across California. Today, I oversee more than 200 employees dedicated to protecting California's habitats and wildlife from the devastating effects of pollution.

OSPR was established by the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 following the Exxon Valdez oil spill in 1989 and the American Trader spill in Southern California in 1990. OSPR is one of the few state-level entities in the nation that has both major pollution response authority and public trustee authority for wildlife and habitat.

OSPR has a legislated mandate to ensure that California's natural resources receive the best protection through oil spill prevention, preparedness, response and restoration. Specifically, I am required to provide for the "best achievable protection" which is defined as the highest level of protection that can be achieved through both the use of the best achievable technology and those manpower levels, training procedures and operational methods that provide the greatest degree of protection achievable. Additionally, I am mandated to consider using processes that are currently in use anywhere in the world to obtain the "best achievable technology."

I am proud of OSPR's close collaboration with federal partners. Our relationships with the U.S. Coast Guard, U.S. Environmental Protection Agency, U.S. Minerals Management Service (MMS) and other federal natural resource trustees have helped shape OSPR into the premier spill response program in the nation. We work closely with these agencies in a variety of efforts including planning, training, prevention, research and development, and spill response.

Today, I will share some of my observations from the November 2007 M/V Cosco Busan oil spill in the San Francisco Bay. I will also emphasize some of the gaps in oil spill response technologies that remain. I will highlight some of the effective oil spill technologies utilized by OSPR that were developed as a result of the enactment of state and federal oil spill legislation.

M/V Cosco Busan Oil Spill

On the morning of November 7, 2007, the M/V Cosco Busan was at berth 56, at the Port of Oakland located on the Oakland Estuary. The Cosco Busan, a 900-foot container ship, departed with visibility estimated at less than ¼ nautical mile. The Cosco Busan allided with one of the towers of the San Francisco Bay Bridge, resulting in the breach of three port wing tanks, spilling 53,000 gallons of bunker fuel into the San Francisco Bay. For almost three weeks, I served as California's incident commander. My role in this response gave me a unique perspective on the use and availability of oil spill technology.

The spill response by federal, state, local government and private contractors was immediate and aggressive. Within 90 minutes of the incident, the oil spill response organizations had the on-scene recovery capability of 1.5 million gallons. The total on-water recovery capability on scene within six hours was more than 2.4 million gallons. However, effective deployment of assets was hampered by the very fog that contributed to the accident. The first helicopter overflight was not conducted until more than five hours after the allision.

Oil recovery and cleanup operations in and around the San Francisco Bay continued for months following the accident. Recovery rates of oil well exceeded industry norms. Forty three percent of the oil spilled into the bay was recovered.

By comparison, on July 23, 2008, a collision between a barge and tanker resulted in 250,000 gallons of fuel oil discharged into the Mississippi River near downtown New Orleans. This spill resulted in the closure of river traffic and disruption of commerce for weeks. Less than 12 percent of the fuel oil was recovered.

While the response to the Cosco Busan oil spill was a success, improvements in current technologies could have increased recovery of oil and the protection of the environment.

Examples of Technology Needing Improvement

<u>Oil Detection During Reduced Visibility or Nighttime Conditions</u>
One of the highest priorities during an oil spill is to contain and remove the oil from the water as early as possible. However, oil recovery is hampered during times of reduced visibility. As demonstrated during the Cosco Busan response, fog hindered accurate trajectory analysis and on-water recovery. Skimming operations were shut down at night because there was no mechanism for detecting the oil. While thermal imaging is an effective oil detection tool, fog limits the use of this technology. We lack a critical tool to detect concentrations of oil during periods of restricted visibility.

Containment in High Velocity Environments
Conventional containment and exclusion booms begin to fail when currents exceed ¾ knots This limitation makes spill containment and protection of environmentally sensitive areas difficult if not impossible. We need a deployable boom that operates effectively in complex, high-velocity currents that are frequently encountered in coastal environments.

Chemical Dispersants
Chemical dispersants break oil into smaller particles that move into the water column. Currently, chemical dispersants are applied as a sprayed mix of water and dispersant onto freshly spilled oil. The type of oil, degree of weathering, sea state and other environmental conditions into which chemical dispersants can be applied safely and effectively, are limited. New delivery systems for dispersant applications including gels or other encapsulating forms show promise. However more research and testing are needed.

Ship Simulators
Ship simulators show tremendous potential in preventing maritime accidents. Just as airline pilots use simulators, they can be used by ship pilots and vessel masters to practice entering and navigating different California harbors and responding to different shipboard emergencies, such as loss of power or loss of steering. However, development of future simulators requires funding and programmatic support to improve and strengthen maritime navigational safety.

Examples of Emerging Technology Utilized by OSPR

Multi-spectral and Thermal Imaging
One of the most important initial steps in response to an oil spill at sea is the assessment of the extent of the oil slick and the quantity (i.e. thickness) and distribution of oil within it. Since most oils rapidly spread to very thin layers when released at sea, accurate determination of which areas contain the most amount of oil is vital for efficiently guiding oil spill response efforts. This emerging technology uses a combination of sensors to capture imagery from wavelengths outside of the human visible light range.

Platform A, located in federal waters six miles off of the Santa Barbara coast developed a leak in an oil tank in December 2007. We successfully utilized multi-spectral and thermal imaging technology developed by OSPR, MMS and a Southern California company to locate and characterize the slick. The Platform A oil spill response was OSPR's first operational use of remote sensing technology to confirm the presence of oil on the ocean's surface, accurately map the extent of the oil slick, classify the remote sensing images into oil thickness categories and present these data on a mapping Web site for use by the incident command in close to real time.

This imaging system has enabled rapid oil spill mapping with far greater quantitative and geographical accuracy than is possible using only visual observations. Current planned refinements include improving the speed with which data can be captured, processed and disseminated.

High Frequency Radar Surface Current Monitoring

Along the California coastline, high frequency radar stations record ocean currents. OSPR funded research with San Francisco State University and the Naval Postgraduate School that allows the dissemination of the data via the Internet in Geographic Information Systems (GIS) format. These data, collected as part of a national framework called the Integrated Ocean Observing System, are used to create oil trajectories, implement strategies to protect sensitive habitats and position oil recovery assets where they would be most effective. Surface current data were used extensively during the Cosco Busan response to create trajectories using real-time conditions. These trajectories aided in the identification and protection of environmentally sensitive sites at risk.

Physical Oceanographic Real Time System (PORTS)

PORTS consists of a complex array of measuring instruments, cable, radio and telephone telemetry that compiles real time water levels, tide, current, salinity, and meteorological data for the channels, harbors and bays. It is an asset to safe navigation, spill response, search and rescue operations, and in the collection of historical data for determining long-term trends. The PORTS information is used on a daily basis by vessel operators, harbor pilots, educational institutions and recreational boaters.

In the years since its inception in California in 1995, the system has enhanced navigational safety for the full range of commercial, passenger and recreational vessels, improved pollution response and supported both environmental protection and commerce in California. PORTS is a cooperative effort by the State of California, harbor authorities and NOAA. Under Gov. Schwarzenegger's leadership, OSPR has been able to fully fund PORTS in the San Francisco Bay.

However, the use of PORTS in California has not reached its full potential. Due to limited funding,some harbors and commercial ports on the west coast lack access to the PORTS system. In addition, there is no mechanism to incorporate data from other systems, like the high frequency radar, into PORTS. Without a consistent funding effort for maintenance and upgrade improvements, PORTS will remain an effective but inconsistent tool for mariners. Currently, I am not aware of any new or upcoming technology that may be available to replace the PORTS system.

Geographic Information Systems

Geographic Information Systems (GIS) are fully integrated into oil spill prevention and response in California. GIS has proven to be an excellent data management

and organizational tool for drills, exercises, contingency planning, natural resource damage assessment, response and recovery. We generate large amounts of data during an oil spill, much with a geospatial component. The inherent ability to import and display convergent data layers provides the incident commanders with powerful decision-making tools. GIS products are routinely used to track the progress of the response, guide daily activities and support the incident investigation.

California's Role in Federal Research and Development

OSPR's in-house research program has successfully partnered with federal agencies on several projects, as described earlier. For example, a proposal evaluated in OSPR's Scientific Study and Evaluation Program led to real world testing of multi-spectral and thermal imaging sytems by the MMS at their Ohmsett facility in New Jersey.

In addition, OSPR co-sponsors a highly successful biannual technology workshop that focuses on federal, state, academic and private research efforts.

California has had limited but productive collaborations with the federal research program. My staff has served on National Academy of Science's panels evaluating chemical dispersants, the development of national research priorities in conjunction with the National Oceanographic and Atmospheric Administration's collaboration with the University of New Hampshire and the initial federal efforts for standardization of dispersant testing protocols. We would support a continued and increased role with respect to identification of research priorities and the practical application of new methods and technologies.

Conclusion

OSPR and the State of California recognize the need for continued improvement in the prevention of and response to oil spills. OSPR is committed to utilizing the best achievable technologies as required by statute to provide for the best achievable protection of the marine environment. We support federal research efforts to improve and develop technologies that address these issues.

Again, I would like to thank you for the opportunity to address this sub-committee. I would be happy to respond to any questions you may have.