

A large blue fish with a yellow tail is swimming in a vibrant coral reef. The water is a deep blue-green, and the coral is a mix of bright green and yellow. The fish is the central focus, swimming towards the right. The coral is dense and varied in shape, with some branching and some more rounded. The overall scene is a healthy and colorful underwater ecosystem.

THE NAVY'S NEW
SHIPS to **REEF**
program

TEAMING UP TO MAKE REEFS
FROM DECOMMISSIONED SHIPS



THE U.S. NAVY has completed the cleanup and studies required by the U.S. Environmental Protection Agency (EPA) to donate the decommissioned aircraft carrier ex-ORISKANY to Florida for use as an artificial reef under the Navy's newest ship disposal program—the "Ships-to-Reef" program. On 15 February 2006, EPA issued to the Navy and the State of Florida a Risk Based Disposal Approval to dispose of polychlorinated biphenyls (PCB) contained in electrical cable and other non-liquid materials and equipment onboard the ex-ORISKANY. And on 17 May 2006, the Navy reefed the ship in the Gulf of Mexico, approximately 23 miles south of Pensacola, FL.



U.S. Navy photo by Gary Nichols



LEFT: The 888-foot decommissioned aircraft carrier ex-ORISKANY (CVA 34) is towed out to sea one final time. The ex-ORISKANY was the Navy's first ship sunk under the authority provided under the fiscal year 2004 National Defense Authorization Act (Public Law 108-136) and is the largest ship sunk as an artificial reef. The ex-ORISKANY artificial reef will benefit marine life, commercial and sport fishing and recreational diving off the coast of Florida.

ABOVE: The ex-ORISKANY arrives in Pensacola, FL from Corpus Christi, TX.

U.S. Navy photo by Photographer's Mate
2nd Jeffrey P. Kraus

This new "Ships-to-Reef" program allows the transfer of decommissioned vessels to coastal states for use as artificial reefs. In the past, the Navy had four main options for the disposition of decommissioned ships:

1. Scrapping the ship (dismantling it, using landfills for disposal, recycling materials where possible),
2. Using ships as targets for training exercises,
3. Donating ships to create museums, or
4. Selling ships to foreign militaries.

The new artificial reefing option emerged when the Navy was granted authority to transfer vessels stricken from the Naval Vessel Register to States, possessions of the United States, municipal corporations and municipalities under the fiscal year 2004 National Defense Authorization Act (Public Law 108-136). With the Navy's new artificial reefing program, states can propose areas where artificial reefs would be the most beneficial to enhance the marine ecosystem and potentially provide areas for recreational fishing and scuba diving.

The first ship reefed under the Navy's new "Ships-to-Reef" program is the aircraft carrier ex-ORISKANY.

The ex-ORISKANY.
U.S. Navy photo by Photographer's Mate
2nd Jeffrey P. Kraus

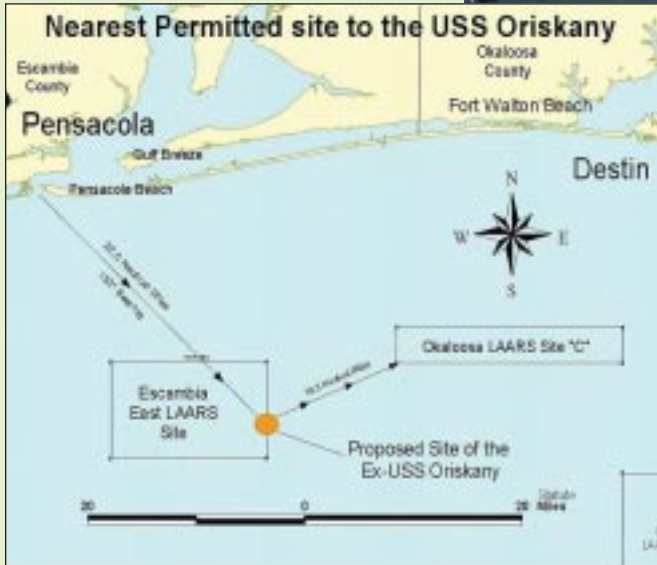


Photo by Dr. James P. McVey, NOAA Sea Grant Program

The ex-ORISKANY reef is unique because it is the first Navy warship that has been cleaned and prepared for sinking in accordance with the EPA's Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs.

As many scuba divers and fishermen know, the ex-ORISKANY is not the first ship to create an artificial reef. There are many ships and other types of military equipment (Army tanks, for example) in U.S. coastal waters that have become thriving artificial reefs. (See our sidebar entitled, "The VERMILLION Artificial Reef" for one example of an artificial reef which has formed on a sunken Navy ship off the coast of Myrtle Beach, SC.) The ex-ORISKANY reef is unique because it is the first Navy warship that has been cleaned and prepared for sinking in accordance with the EPA's National Guidance—Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs.

The Navy has dedicated considerable time and resources to ensure the ex-ORISKANY reef will be safe.

The Basics About the **USS ORISKANY** (CVA 34)

- COMMISSIONED: 25 September 1950
- DECOMMISSIONED: 30 September 1975
- DISPLACEMENT: 27,100 tons
- LENGTH: 911 feet
- BEAM (maximum width): 147 1/2 feet
- DRAFT: 31 feet
- SPEED: 33 knots
- COMPLEMENT: 3,460 crew
- ARMAMENT: eight 5-inch guns, fourteen 3-inch guns
- AIRCRAFT: 80



The ex-ORISKANY arrives in Pensacola, FL.
U.S. Navy photo by Gary Nichols



Artificial reef.
Photo by Dr. James P. McVey,
NOAA Sea Grant Program

This team has been working together since 2003 to ensure the vessel was cleaned in an environmentally safe manner and that its use as a reef will not create a risk to human or ecological health.

The project team, led by the Inactive Ships Program Office of Program Executive Office (PEO) Ships included a unique blend of engineers, chemists, marine biologists, and public health professionals from Navy commands across the country including the Space and Naval Warfare Systems Command Systems Center San Diego/Marine Environmental Support Office, the Navy Environmental Health Center, Supervisor of Shipbuilding Bath, and the Naval Surface Warfare Center Carderock Division. This team has been working together since 2003 to ensure the vessel was cleaned in an environmentally safe manner and that its use as a reef will not create a risk to human or ecological health.

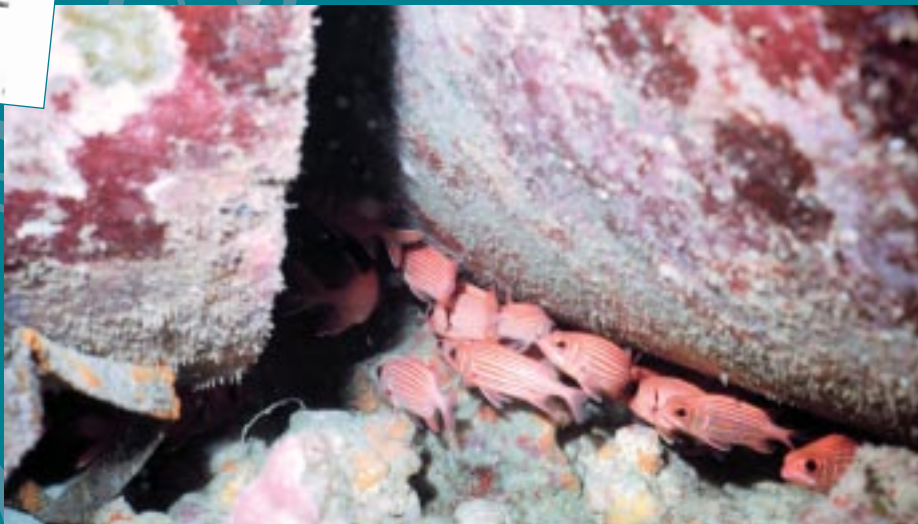
The Basics About EPA's National Guidance—Best Management Practices for PREPARING VESSELS INTENDED TO **CREATE ARTIFICIAL REEFS**

This guidance document was developed in response to the Maritime Administration's (MARAD) request for EPA to provide national environmentally-based best management practices for the preparation of vessels to be sunk with the intention of creating artificial reefs in permitted artificial reef construction areas. It also satisfies the mandate of Section 3516 of the National Defense Authorization Act for Fiscal Year 2004, which requires that MARAD and EPA jointly develop guidance recommending environmental best management practices to be used in the preparation of vessels for use as artificial reefs.

Options for managing obsolete and decommissioned military and commercial vessels include re-use of the vessel or parts of the vessel, recycling or scrapping, creating artificial reefs, and disposal on land or at sea. This guidance document discusses the preparation of vessels when employing the vessel management option of artificial reefing. Artificial reefs should be developed such that they enhance marine resources and benefit the marine environment. Strategically sited artificial reefs can not only enhance aquatic habitat, but also provide an additional option for conserving, managing, and/or developing fishery resources.

Although the best management practices presented in this document are intended for use when preparing vessels to serve as artificial reef habitat, the best manage-

ment practices may have applicability to other in-water uses of vessels, such as the creation of recreational diving opportunities and placement as breakwaters or other types of barriers. It is recommended that these best management practices be implemented for all in-water uses of vessels, with the caveat that further vessel preparation beyond that employed for artificial reef habitat may be needed. When preparing a vessel for other permitted in-water uses, consideration should be given to vessel stability and integrity prior to and after final placement.



Artificial reef squirrel fish habitat.
Photo by Dr. James P. McVey, NOAA Sea Grant Program

This guidance does not substitute for any statute or regulation, nor is it a regulation itself. It does not impose legally binding requirements on any Federal agency, States, other regulatory authorities or the regulated community, and may not apply to a particular situation based upon the circumstances. Regulatory decision makers, both Federal and State, retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate.

SOURCE: EPA web site (<http://www.epa.gov/owow/oceans/habitat/artificialreefs/finalguidance.html>)

THE VERMILLION ARTIFICIAL REEF

One example of an artificial reef which has formed on a sunken Navy ship is the VERMILLION Artificial Reef, 40 miles off the coast of Myrtle Beach, SC. The ex-VERMILLION is an amphibious cargo ship built in 1944 and decommissioned in 1971. The ship was sunk in 1987 in approximately 110 feet of water and immediately began forming into the thriving artificial reef that exists today. The Vermillion Artificial Reef became a popular recreational diving and fishing destination for local citizens and tourists in South Carolina within a matter of several months after sinking. The ex-VERMILLION is similar to the ex-ORISKANY project because it is a Navy vessel that was cleaned and sunk intentionally to form an artificial reef. The projects are different because the ex-VERMILLION was cleaned following acceptable standards at the time and reefed under the U.S. Maritime Administration's inactive reserve fleet program. The ex-ORISKANY project is the first time a U.S. Navy warship has been cleaned and prepared for reefing by the Navy following EPA's new guidance.



Tomtates fish (above right) and angelfish (right) at ex-VERMILLION artificial reef in South Carolina.

Photos by South Carolina Department of Natural Resources

Cleanup and preparation of ex-ORISKANY focused primarily on the removal of hazardous materials that were once operational components of the ship. Fuel and oil, asbestos, flaking paint, and other materials such as antifreeze, batteries, and fire extinguishing systems were removed from the ex-ORISKANY following the EPA guidance. This guidance also requires removing all liquid PCBs and solid materials containing PCBs at concentrations greater than 50 parts per million.

Because of the age of the ex-ORISKANY, PCBs were used in many types of equipment and materials throughout the ship

including bulkhead insulation, rubber products, paints, electrical cable insulation, ventilation gaskets, and lubricants. The Navy removed all liquid PCBs and much of the solid PCB materials from the ship, but there are approximately 700 pounds of PCBs in solid materials (mainly in cables) that could not practically be removed. The EPA has since granted a risk-based disposal approval that allows these solid PCB containing materials to remain on the ex-ORISKANY given that there are no unreasonable risks from potential exposure to the PCBs. (See our sidebar entitled, "EPA Issues Approval to Dispose of PCBs Onboard the ex-ORISKANY.")

Estimating the potential risks to people and the environment from the remaining PCBs was a great challenge for the Navy's ex-ORISKANY team. The team could not simply rely on sampling data to start the risk assessment process because the reef is not yet established. The Navy had to develop new, highly sophisticated computer models to predict the PCB concentrations in the water around the new reef, the amount of PCBs that will likely enter reef fish and the amount of PCBs that are expected to accumulate in the bodies of reef fish. The PCB concentrations predicted by the model were then used to complete two risk assessments.

EPA Issues Approval to **DISPOSE OF PCBs ONBOARD** THE EX-ORISKANY

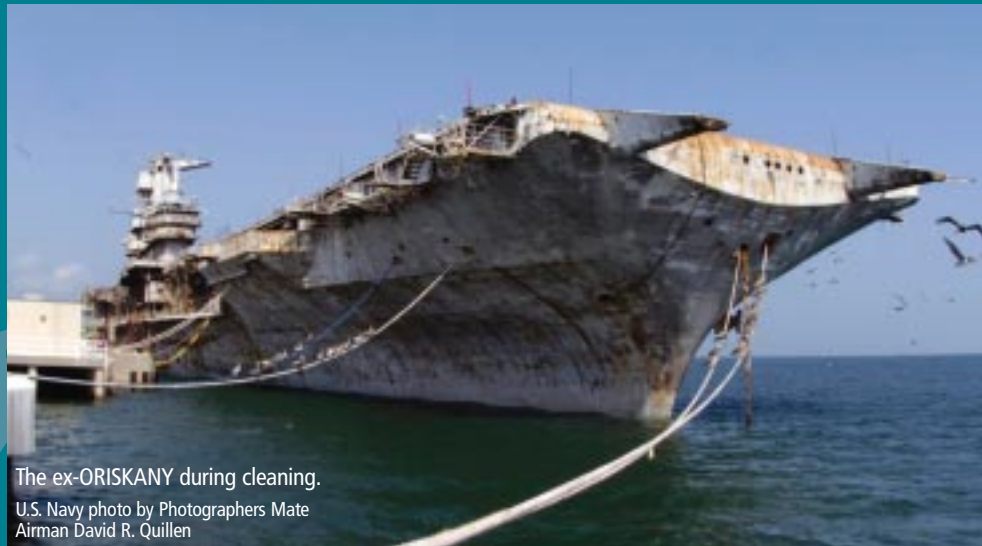
On 15 February 2006, EPA issued to the U.S. Navy and the State of Florida an Approval to Dispose of Polychlorinated Biphenyls contained in electrical cable and other non-liquid materials and equipment onboard the decommissioned USS ORISKANY. This approval allowed the Navy to deploy the ex-ORISKANY as an artificial reef in the East Escambia Large Area Artificial Reef Site, located in the Gulf of Mexico, approximately 23 miles south of Pensacola, FL.

"This is a significant milestone for EPA, the Navy and the State of Florida," said EPA Deputy Regional Administrator Stan Meiburg. "We are pleased to be able to work with the Navy and Florida in protecting our environment and moving this project forward."

Based on EPA's and the Science Advisory Board's review of the information provided by the Navy in the PCB disposal application, including leaching studies, fate and transport models, and human and ecological risk characterizations, EPA has determined that sinking the ex-ORISKANY will not pose an unreasonable risk to human health or the environment. This EPA PCB Disposal Approval for the Navy and Florida applies only to the ex-ORISKANY. EPA is currently developing a national approval process for disposal of ships containing non-liquid PCBs through reefing.

The Navy prepared the vessel for reefing off the coast of Pensacola, FL by removing or minimizing materials that may adversely impact the marine environment. An estimated 700 pounds of PCBs contained in felt and foam gaskets, electrical cable, insulation, and heat-

resistant paint remain aboard the vessel. In accordance with the Toxic Substances Control Act and its implementing Federal PCB regulations, the Navy applied for and obtained a risk-based PCB disposal approval to sink the vessel with the non-liquid PCBs onboard.



The ex-ORISKANY during cleaning.
U.S. Navy photo by Photographers Mate
Airman David R. Quillen

The State of Florida and the Navy have signed an agreement that resulted in the transfer of the reefed vessel to the State. The PCB Disposal Approval requires the Florida Fish and Wildlife Conservation Commission, in cooperation with the Escambia County Marine Resources Division, to establish a post-reef monitoring program to ensure that fish caught at the ex-ORISKANY site remain safe for human consumption.

For more information on EPA's PCB Disposal Approval for the ex-ORISKANY, please visit <http://www.epa.gov/Region4/air/lead/PCBWebPage.htm>.

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Photo by Dr. James P. McVey,
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Photo by Jerry Reid, U.S. Fish and Wildlife Service

The results of risk assessments indicate that the ex-ORISKANY will form an environmentally safe artificial reef.

The Human Health Risk Assessment calculated risks to people from scuba diving at the reef and from eating fish caught at the reef. The Ecological Risk Assessment calculated risks to marine life from exposure to PCBs in the water and in the sediment and through their food chain. The results of both risk assessments indicate that the ex-ORISKANY will form an environmentally safe artificial reef.

In April 2004, the Navy requested a PCB Risk Based Disposal Approval to support the ex-ORISKANY reefing approximately 24 miles off the coast of Pensacola, FL at the Escambia East Large Area Artificial Reef. This request was the result of several years of work by the Navy, the EPA, Florida's Fish and Wildlife Conservation Commission, and the Escambia County Marine Resources Division. The EPA extensively reviewed the Navy's computer models and risk assessments. The information was examined by EPA scientists and outside experts

participating in the EPA's Science Advisory Board.

The EPA has determined that the science behind the computer models is sound and that there are no unreasonable risks. The Navy team's abilities to assess and communicate the predicted risks enabled the regulators and the public to see the benefit of reefing the ex-ORISKANY to both the marine eco-system and the Escambia County economy. The State of Florida, working with EPA, developed a post-sinking reef monitoring program for the ex-ORISKANY site to identify any differences from Navy model predictions so they can be assessed, communicated, and managed in a proactive manner.

In December 2005, the EPA announced their intent to issue a Risk Based Disposal Approval for reefing the ex-ORISKANY off the coast of Pensacola.

Some Frequently Asked Questions About **THE SINKING** OF THE EX-ORISKANY

Q. HOW WAS THE SHIP SUNK?

A. The sinking was conducted in accordance with an engineered sink plan which was developed specifically for the ship in order to conduct the sinking in a controlled manner. Main seachest piping within eight machinery spaces were breached by simultaneous detonations of small C4 explosive charges internal to the ship. Ship preparations in Pensacola involved removing selected external blanks on the underwater hull, allowing water into the seachest piping up to a closed gate valve or internal blank. Progressive flooding scuttled the ship. A safety zone was established around the perimeter of the ship during the sinking, and the public witnessed the sinking of the ship outside of this safety zone.

Q. WHAT OTHER THINGS NEEDED TO BE COMPLETED BEFORE THE VESSEL WAS SUNK?

A. The State of Florida accomplished additional work efforts in the island superstructure for diver safety. The Navy's authority for transferring vessels for artificial reefing required that the Navy ensure that the vessel was prepared in accordance with EPA document, National Guidance: Best Management Practices for Preparing Vessels Intended to Create Artificial Reefs. The Navy reviewed the vessel preparation documentation and determined that the vessel was prepared in accordance with the EPA guidance document.

Q. WILL THE NAVY MAKE OTHER SHIPS AVAILABLE TO BE SUNK?

A. Yes, the Navy has identified additional inactive ships that potentially can be donated for sinking and use as artificial reefs. These ships are designated for disposal and may be utilized for artificial reefing, Navy deep-water sink exercises or domestic dismantling based on the needs of the Navy to further reduce the size of its inactive ship inventory. Additional ships may be added to this list as active ships are decommissioned and designated for disposal, and as other inactive ships currently held in a retention status are redesignated for disposal.

The Navy is currently working with the Atlantic States and Gulf States Marine Fisheries Commissions on an improved process for transfer of ships to states now that the ex-ORISKANY has been sunk and lessons learned are incorpo-

rated in the transfer process. It is the Navy's intent to start making some of these ships available for application.

States, Commonwealths, and Territories and possessions of the United States, municipal corporations or political subdivisions thereof, may submit applications for obsolete MARAD and Navy vessels. Details regarding the current artificial reefing application are available at MARAD's web site.

Q. WAS A MEMORIAL HELD? IF SO, WHEN AND WHERE?

A. Local authorities conducted a memorial service at the National Museum of Naval Aviation on 13 May 2006.

Q. WHY IS REEFING IMPORTANT TO THE NAVY/STATES?

A. Benefits of sinking these vessels include building reefs favorable to marine life, commercial and sport fishing and recreational diving; removing environmental risks caused by aging ships berthed in sensitive waterways; and cost benefits allow MARAD, the Navy and the recipient to share costs of ships transfers and preparations for sinking.

Q. WHAT DOCUMENTATION DID NAVY HAVE AVAILABLE TO SUPPORT THE ENVIRONMENTAL CLEANING ASSOCIATED WITH THE REEFING PREPARATION OF THE EX-ORISKANY IN ACCORDANCE WITH THE DRAFT NATIONAL GUIDANCE?

A. The Navy, as a part of its inactivation process for every vessel, performs many types of surveys. For the ex-ORISKANY, these surveys included documentation on the liquids (oils, fuels, water), asbestos, PCBs, Freon, mercury, and radiological materials that had been onboard and removed from the vessel. These documents provided a valuable baseline for the Navy as the statement of work was developed and for the Navy contractor performing the work. Navy personnel worked closely with the contractor to inspect for any materials not on the inventories, which required management. When there was a question about proper management for a material, appropriate sampling and analysis was completed. The results of that analytical work were coordinated with the appropriate regulatory authority.

SOURCE: The Inactive Ships Program Office of Program Executive Office Ships web site (www.peoships.crane.navy.mil/reefing/oriskany.htm)




The ex-Oriskany makes its way along the Intracoastal Waterway from Naval Air Station Pensacola to the Gulf of Mexico.
U.S. Navy photo by Mike O'Connor



The Inactive Ships Program Office of Program Executive Office Ships has constructed a web site (at www.peoships.crane.navy.mil/reefing/oriskany.htm) to provide the latest, specific information about the status of the ex-ORISKANY as well as general information about the process of creating artificial reefs. The site also includes a variety of fact sheets and answers to frequently asked questions about the Navy's "Ships-to-Reef" program.

More than one hundred residents of the city of Pensacola turned out in support of this proposal at a public meeting on 10 January 2006. The meeting was a very visible example of the partnering that occurred on this project both within the Navy team and with, EPA, and the State of Florida. Project managers, computer-modeling experts, risk assessment experts, chemists and marine biologists from the Navy, EPA, and Florida participated in the meeting. It was the culmination of almost two years of working together to refine the Navy's model and ensure the risk assessments met EPA requirements.

On 15 February 2006, EPA issued to the U.S. Navy and the State of Florida an Approval to Dispose of PCBs contained in electrical cable and other non-liquid materials and equipment onboard the ex-ORISKANY.

The ex-ORISKANY was prepared for sinking at NAS Pensacola and the Navy reefed the ship on 17 May 2006. For more information on this project and the Navy's "Ships-to-Reef" program, visit the U.S. EPA Region 4 website at www.epa.gov/region4/air/lead/PCBWebPage.htm; the EPA headquarters PCB home page at www.epa.gov/pcb/; or the Navy's website at www.peoships.crane.navy.mil/reefing/oriskany.htm. 

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