

HISTORY
OF SHELL OFFSHORE SEISMIC OPERATIONS
IN THE UNITED STATES

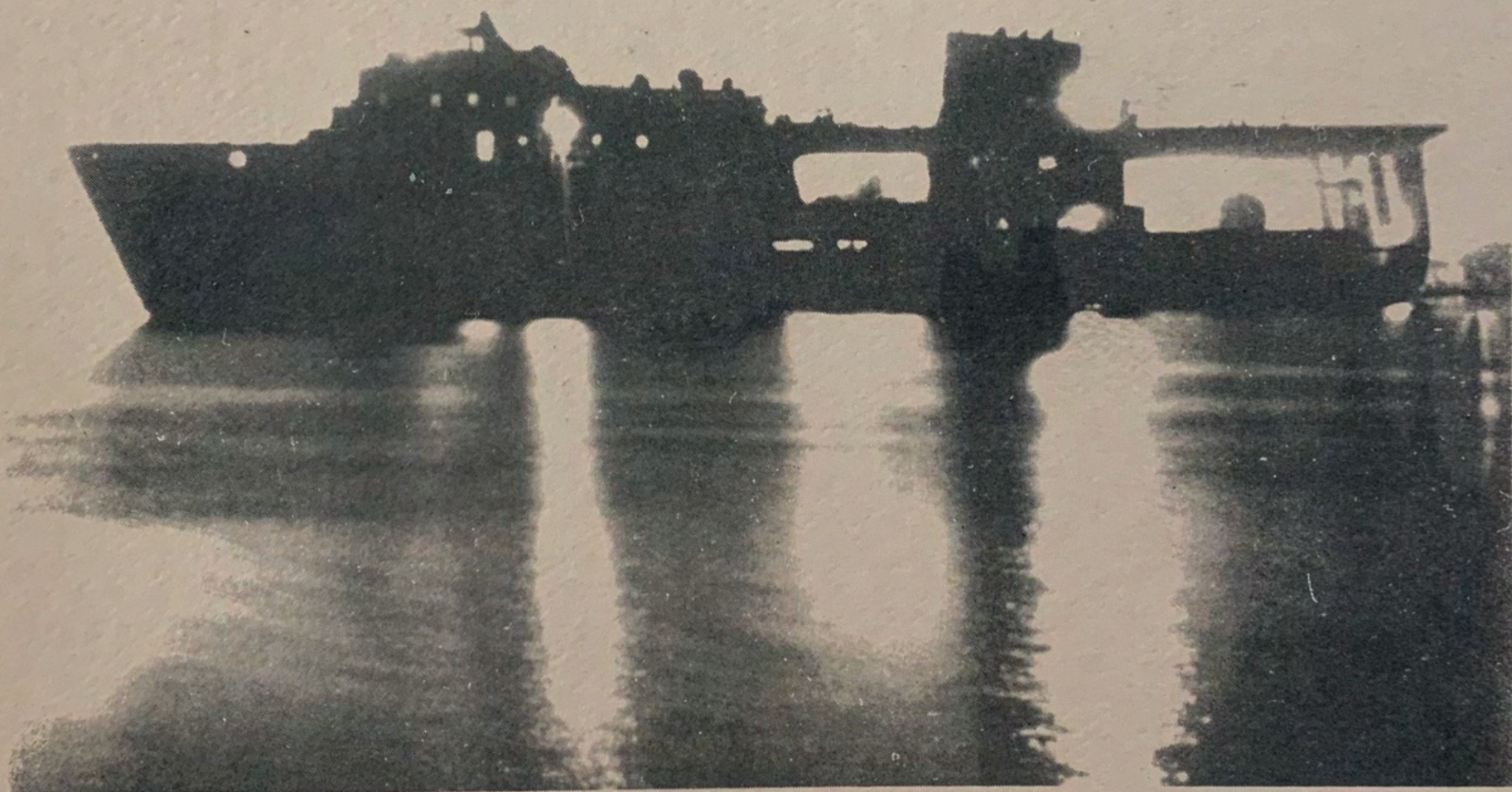


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Many of the people who started Shell's offshore seismic work have retired or are deceased, but a few who worked in the early days are still with Shell. Senior and younger personnel have supplied their recollections for the compiling of this history. They are acknowledged at the end of this introduction.

Table 1 lists offshore seismic party chiefs who implemented the various technological advancements of the past fifty years. This list has been compiled from the memories of a number of people and therefore, like the rest of this history, may not be totally accurate or complete. We apologize for any errors or omissions. These party chiefs, their crews, R&D personnel, Head Office Field Engineering, management, and many other categories of personnel share credit for meeting the challenges of a new field in petroleum exploration.

CHAPTER 3

1945-1965: The Early Era Offshore the West Coast

Shell began marine seismic work along the coast of California in 1945, using contract equipment from United Geophysical and Western Geophysical. Bob Thornburg, a geophysicist in the Los Angeles office, was involved in those first efforts.

Several cable schemes were tried in the Santa Barbara Channel, but those with dragging sound detectors invariably got tangled in kelp. Then Western Geophysical invented a floating cable with seismometers molded into it. Although it was bulky and required very careful handling, it passed over or slipped through kelp.

Another problem was noise from wave action and the tailboats that pulled the cable on line. A further problem was getting the cable and boats into proper position. In areas of steep dips, the cable was hauled along broadside the line to record cross-dip components, and invariably the boats were out of position because it took several minutes after the instrument boat maneuvered into position for other boats to get the tail and side cables placed properly. Also, the crew had to use a transit on the top deck of the instrument boat to check positions of the cable boats. These procedures were so time-consuming that only 20-50 shots were recorded in a day.

At first, dynamite was used for the charges, but public concern about fish kill caused the State of California to ban it in 1949. During the 1950's black powder was substituted. It was expensive because 90 pounds of powder yielded records not quite equal in quality to those obtained with 10 pounds of dynamite. And it was even more dangerous. Any potential source of a spark had to be eliminated. If a powder can leaked, the crew immediately stopped work, dumped the can overboard, and watered down the area.

In 1958, Shell failed to win a single tract in an offshore lease sale held by the State of California. While holding a postmortem on this development, Shell management decided that the company was at a severe disadvantage on the entire Pacific Coast because it had no seismic data of its own. Party 138 was formed to work from Mexico to Alaska.

A utility vessel, the *Miss Janet*, was purchased. In 1959, in Los Angeles, she was outfitted with a high-resolution profiler with a gas exploder/sparker energy source. It was constructed in Houston by Shell Development. Bill Roevers and Tom Vining worked on this equipment. Tex Eckerle was the operator. (Operators at later dates were Myron L. Myrick, Fred Eilers, and H. B. Branting.)

Also in 1959, another utility vessel, the *Miss Helen*, was outfitted with full-scale seismic instruments built in Houston by Shell Development. Dr. E. Merten, John Tvedt, Bob Lawrence and Charlie Churchill worked on that project. Shooting started in early 1960 with Danny Long as operator, Duck Dean as shooter, and Bill McGehee as Party Manager. Etch Curry, who supplied technical supervision, was a sort of super party chief in charge of all the marine crews. Roy Farnsworth supplied valuable technical assistance.

Another boat involved during the period was the *Whirlaway*, pictured with *Miss Janet* and *Miss Helen* in Figure 35. Figure 36 shows people aboard *Miss Helen* in the early 1960's. (Figure 37 shows some of the same people nearly twenty five years later on the *Shell America*.) *Miss Betty*, shown in Figure 38, also worked with *Miss Helen* in the early 1960's off California, Oregon, Washington, and Alaska, as well as in the Gulf of Mexico; Duck Dean was the shooter.

Still another boat, the *Eureka*, worked on the West Coast and in the Gulf of Mexico in the 1960's. (See Figure 39.) She was a core-drilling vessel, which drilled cores in water depths greater than one mile, and a pioneer in dynamic positioning, which earned her an exhibit at the Smithsonian. She also carried a sparker system and two logging units. M. H. McNeely served aboard her as Party Supervisor and H. B. Branting was operator.

In the early 1960's negotiations began with the State of California about permits for offshore seismic work. Bill Bates, a former production man who had been appointed manager of the new Shell Pacific Marine Division, arranged meetings with the California Land Commission, Fish and Game Commission, and even some members of the legislature. Everyone wanted to get away from the expense and danger of black powder. Eventually a compromise was worked out for the use of nitrate explosives. Also, a Simrad fish-detection sonic device was installed on the shooting boat, and a state representative came along to ensure that shots would be in positions and in amounts that would not destroy fish or other marine life. This major accomplishment by Shell benefitted the entire oil industry's seismic programs.

At this time, little was known about the geology off the Pacific Coast with respect to hydrocarbons, except for a few short miles outside San Pedro harbor and a strip of tracts around the edge of Santa Barbara Channel--areas that were extensions of trends which produced hydrocarbons onshore. Shell decided to obtain a regional grid of control from Mexico to Canada, extending offshore as far as any hydrocarbon potential seemed to exist.

A second seismic crew, Party 38, was added. The *Miss Juanita*, a wood-hull minesweeper retired from World War II, was outfitted with seismic instruments. (See Figure 40.) Myron Myrick and Fred Eilers were operators on this crew, and Ben Gillespie later became operator. Tex Eckerle became Party Manager. H. B. Branting was responsible for operating the sparker and gas-exploder boat, the *Miss Janet*. *Miss Ida*, a steel-hull utility boat, was the shooting boat. (See Figure 41.) Ben Gillespie was operator and Russ Miller was shooter.

From Mexico to the Canadian border, the crew ran a reconnaissance grid of lines ten miles apart and perpendicular to the shoreline. Mainly they made reflection recordings, but they also conducted refraction surveys in certain locations to check depths to basement.

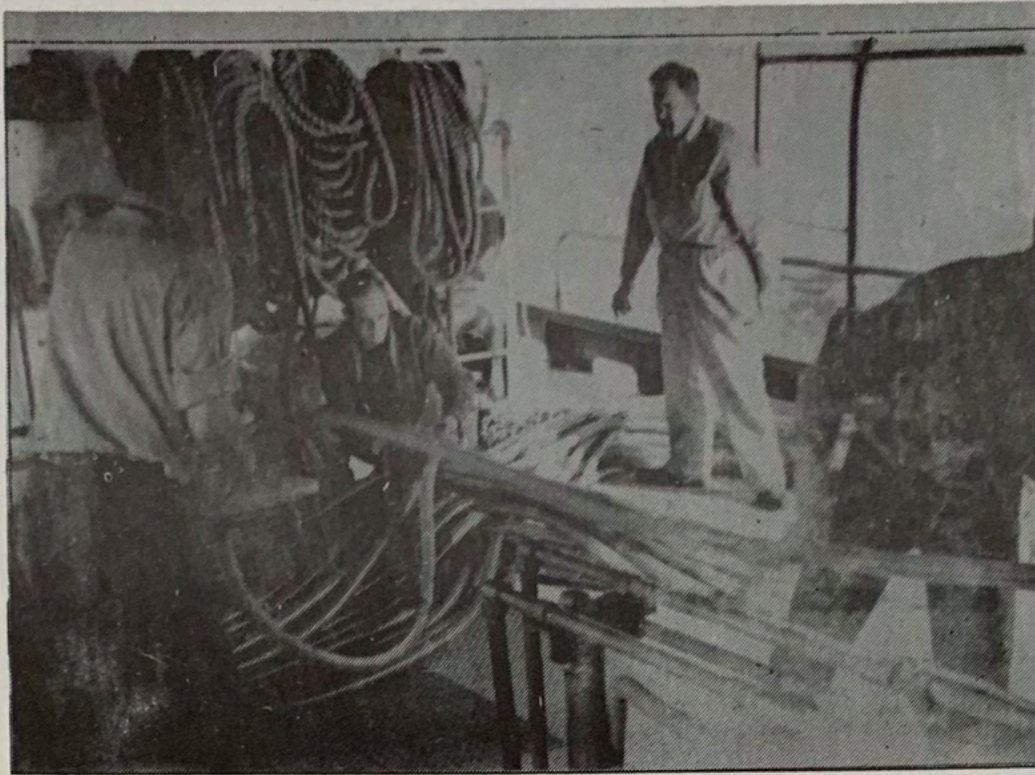


Figure 36 - early 1960s: Onboard *Miss Helen* were (left) Ted Johnson, assistant operator; Ben Gillespie, operator; and Charlie Churchill.



Figure 37 - 1985: Charlie Churchill onboard the *Shell America*.



Figure 38 - early 1960s: *Miss Betty*.

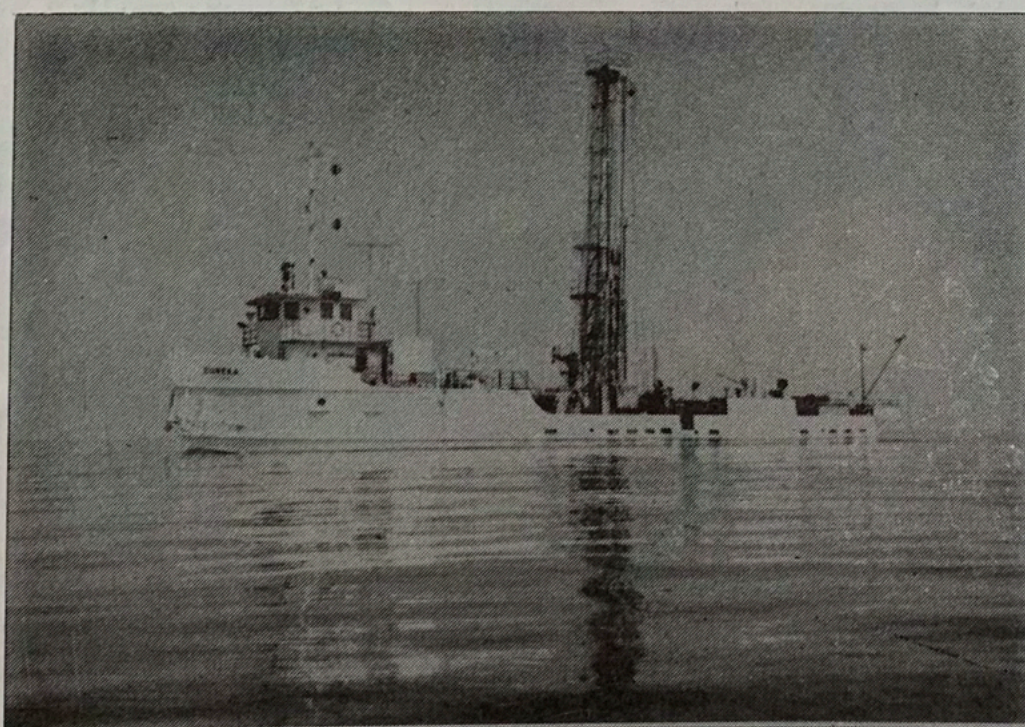


Figure 39 - early 1960s: The core-drilling vessel *Eureka*.

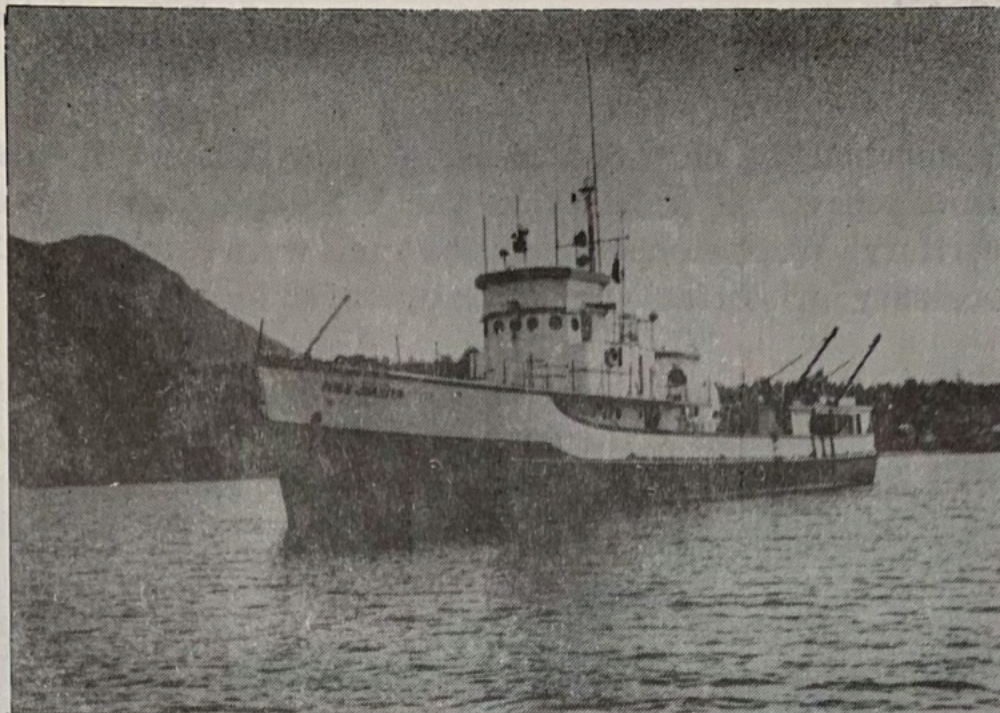


Figure 40 - early 1950s: *Miss Juanita*.

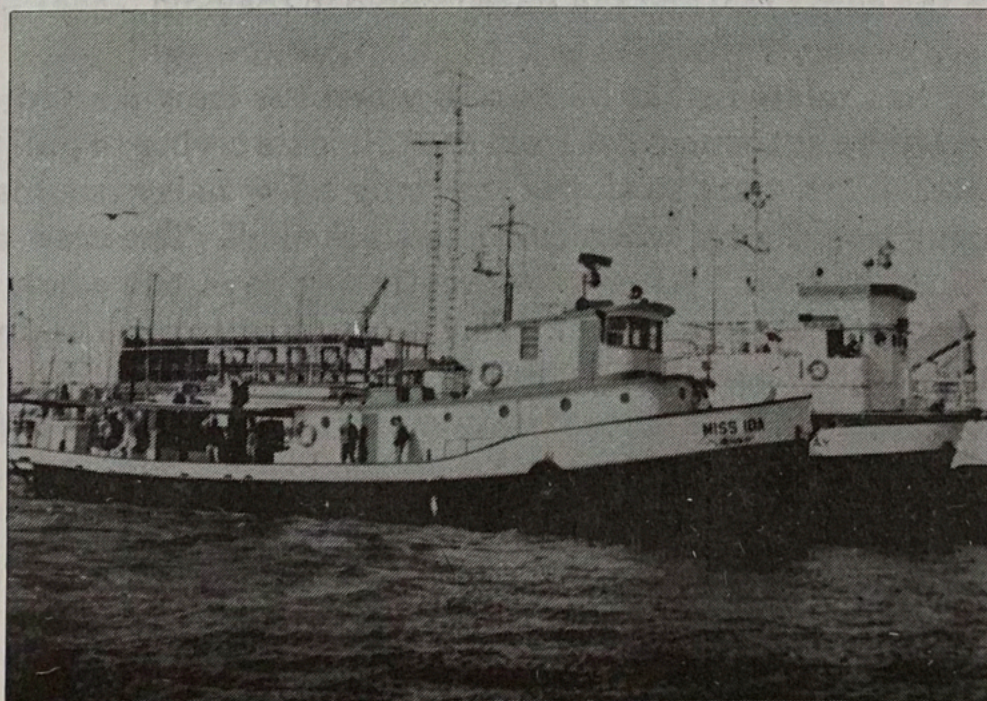


Figure 41 - early 1960s: *Miss Ida* with bow of *Miss Juanita* behind her.

As work approached the northern border, one day a Canadian destroyer put a shot across *Miss Juanita's* bow. It seems that the U.S. and Canada were disputing who controlled that territory. Work stopped until channels were established for getting permits and informing necessary jurisdictions about the operations.

In 1962, the grid was extended into Canadian waters. Grant Murphy, Lorne Kingwell, Pat Fuller, and other Canadians worked on that phase. About 1963, Shell Canada bought *Miss Juanita* and continued the operation in the summers of 1963 and 1964, with Ben Gillespie assisting and instructing in 1963.

Also during the summers of 1963 and 1964, Shell Canada operated the *Cedarwood*, a wood-hull Canadian ship, off British Columbia. (See Figure 42.) Al Thomas of Shell Canada was operator, and H. B. Branting of Shell Oil went along to get the systems started. The seismic gear was designed by Tom Vining of Bellaire Research Center.

During early phases of Pacific operations, choosing cables stirred up much controversy. Some felt that Western Geophysical's floating cable was better for maneuvering close to the rocky shoreline and for the unique geology. Others thought the Paslay cable, developed in the Gulf of Mexico and first used by Shell there in 1960, should work anywhere. From the beginning, the *Miss Helen* was equipped with the Paslay cable, which yielded good results except in parts of Santa Barbara Channel where closer spacing of channels was needed to reveal steeper dips. Dennis Longley conducted studies to demonstrate that the Western Geophysical data recorded with 60-foot channel spacing showed steeper dips more effectively than the 200-foot spacing being used on the *Miss Helen*.

The cable controversy continued on into 1962 when Party 138 was sent aboard the *Miss Helen* from Oakland to record some lines in Cook Inlet, Alaska. There was much debate about which kind of cable to take. Some contended that the floating-type cable was needed because tailboats would be required to keep the cable on line in the swift tidal currents (6+ knots) of the inlet. Everyone agreed to compromise by taking both kinds--the floating cable on the ship's reel and the Paslay cable in the hold.

Etch Curry has related what happened: when the crew started work in Cook Inlet, they were frustrated by extreme noise from the tailboats trying to pull the floating cable in the swift currents. Work went so slowly that only a few noisy records were obtained in a day, usually during tide change when currents slacked off. The crew mumbled about that "good cable down in the hold." After a few frustrating days, the whole crew pitched in and took only a few hours to change to the Paslay cable. They got as many records in an hour with the new cable as they had been getting in a day. Also, the records had less noise. With the Paslay cable, they shot lines across the inlet during slack tide and parallel to the shore at other times. They returned to California with the Paslay cable on the reel, the winner in this acid field test. Shell never again used the floating-type cable.



Figure 42 - early 1960s: Cedarwood, used off western Canada, with Miss Juanita behind her.

Late in 1963, the Pacific Marine Division converted *Miss Helen* to 48 channels (two FM tape transports with 24 channels each) and added a 4800-foot cable with larger reel. Many predicted a cable that long would break during tow, but the pessimists lost again--the cable worked.

Roy Farnsworth and Bob Lawrence worked on this equipment conversion. Tex Norcross was the operator during the transition.

In this early era, data was processed with analog systems, which required constant adjustment. In the late 1960's more dependable digital systems were introduced.

The next era in Shell offshore seismic history began in 1965 with the launching of a modern vessel, the *Phaedra*. In 1966, the *Artemis* was launched and made her first appearance on the California Coast. In 1967, the *Niobe* was added to the fleet. Thereafter, Shell no longer maintained separate ships and operations for the Gulf of Mexico and the Pacific Coast. *Miss Janet* was decommissioned and sold. *Miss Helen* was rigged with sniffer-sparker gear by Harold Wise and his group from BRC and finished her Shell career working in the South China Sea off northern Borneo in 1969 with Leif Olstad as captain, F. R. (Rob) Hoesley as party supervisor, and H. B. Branting as operator.

On each of the three new ships, recording and shooting took place on the same ship for the first time. Before, there had always been both a recording boat and a shooting boat. The three new ships went where needed, depending on seasons and lease sale schedules. From that time on, this history merges into a single narrative describing all coasts of the United States.