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Chairman, Flag & Honors Committee
The Explorers Club
46 E. 70th Street
New York, New York 10021

Re: *Flag Report to The Explorers Club, Flag No. 132*
R.M.S. Titanic 2003 Scientific and Photographic Expedition

Dear Mr. Chairman:

It is my great pleasure to submit the following report to The Explorers Club on the *R.M.S. Titanic* 2003 Scientific and Photographic Expedition, for which I was awarded the privilege of carrying Explorers Club Flag No. 132.

I. Overview

The *R.M.S. Titanic* 2003 Scientific and Photographic Expedition consisted of 24 members from the United States, Canada, Britain and Russia, broken into three groups working in cooperation with each other. One group consisted of a seven member team working under the auspices of the U.S. National Oceanic and Atmospheric Administration's ("NOAA") Office of Ocean Exploration ("OE"). The second group consisted of a six member team participating at the invitation of Deep Ocean Expeditions ("DOE"). The third group consisted of eleven scientists conducting ongoing scientific research projects under the auspices of the P.P. Shirshov Institute of Oceanology of the Russian Academy of Sciences.

Explorers Club members included David G. Concannon, Esq., FN '96, participating at the invitation of DOE; Capt. Craig N. McLean, FN '01, leader of the NOAA team; Dr. George F. Bass, CO '74, participating at the invitation of NOAA; and Dr. Anatoly Sagalevitch, MED '98, leader of the Russian scientific team.

The expedition departed from St. Johns, Newfoundland, Canada on June 22, 2003, aboard the Russian Research Vessel *Akademik Mstislav Keldysh*. The *Keldysh* is the largest scientific research vessel in the world; she serves as the mother ship for two three-person deep-diving submersibles, *Mir I* and *Mir II*, which are capable of diving to depths of 6,000 meters.

The expedition arrived at the site of the wreck of the *R.M.S. Titanic* – 49° 56' 49" West Long., 41° 43' 57" North Lat. – on June 24, 2003. Three successful dive days followed, on June 25, 27 and 29, 2003. The expedition departed the site on June 30, 2003, and arrived in St. Pierre, France (off the coast of Newfoundland) on July 2, 2003.

II. Purpose

There were three main purposes of the expedition: (1) to conduct ongoing scientific research in the fields of marine archaeology, geophysics, marine biology, physical oceanography and microbiology; (2) to prepare the first digital photo mosaic of the *Titanic* wreck, which rests at a depth of 3,800 m., or 12,460 ft.; and (3) to assess the current condition of the *Titanic* and its surrounding wreck site to determine its rate of deterioration and assist in future exploration of the *Titanic* and its nearly identical twin, the *H.M.H.S. Britannic*. Each group on the expedition had specific tasks to accomplish. However, there was significant cooperation among the groups, and the expedition operated as one cohesive unit.

A. DOE Team

The DOE team consisted of six members:

- David G. Concannon, Esq., FN '96, principal in Explorer Consulting, LLC of Wayne, Pennsylvania. This was Concannon's second expedition to the *Titanic* and third expedition on the *Keldysh*. He helped organize R.M.S. Titanic, Inc.'s research and recovery expedition to the *Titanic* in 2000, where he made three dives to the wreck site. He was invited to participate in the *Titanic* 2003 expedition by DOE, which charters the *Keldysh* from the Shirshov Institute each year, to assist NOAA in achieving its objectives, act as a liaison between the various groups, and to assess the condition of the *Titanic* and surrounding wreck site.
- Kevin Gurr, of Delta P Technologies, Ltd., Dorset, England. Gurr is one of the leading technical divers in the world, and the past leader of technical diving expeditions to the *Britannic*, which rests at a depth of 130 m., 400 ft. Gurr was present to assess the condition of the *Titanic* and surrounding wreck site, compare the condition of the *Titanic* to the *Britannic*, and prepare for an expedition to the *Britannic* in the fall of 2003.
- Leigh Bishop, underwater photographer, technical diver and principal in Deep Image, Ltd. in England. Bishop was present to compare the condition of the *Titanic* to the *Britannic*, prepare for the *Britannic* expedition in the fall of 2003, and conduct research for a book he is writing on exploring lost liners.
- Carl Spencer, another Englishman, leading technical diver and the leader of the

2003 *Britannic* expedition. Spencer was present to assess the condition of the *Titanic* and surrounding wreck site, compare the condition of the *Titanic* to the *Britannic*, and prepare for the *Britannic* expedition.

- Larry Daley, operator of the *Titanic* museum in St. Johns, Newfoundland, Canada. Daley has provided logistical assistance to at least six *Titanic* expeditions, and he has an enormous collection of *Titanic* books, artifacts, historical documents and memorabilia. Daley was present to assess the condition of the *Titanic* and surrounding wreck site, and to provide historical information on the *Titanic* and past expeditions.
- Richard Robol of Los Angeles, California. This was Robol's second expedition to the *Titanic* and third expedition on the *Keldysh*. He was present to assess the condition of the *Titanic* and photograph the wreck.

The DOE team made two dives to the *Titanic* on June 25, 2003. The team explored the wreck site, photographed the bow and stern sections, made comparisons to the *Britannic*, and removed debris left by several prior expeditions. During their dives, the team observed and documented significant damage to the bow section, particularly to the foremast, which was not present in 2001.

The foremast is now completely collapsed – like a pretzel stick that has been hit with a hammer. This damage may have been caused by a clandestine British salvage expedition that visited the wreck site between October and December, 2002, to recover artifacts with a remotely-operated vehicle (“ROV”). The damage to the mast could have been caused by the ROV pressing down on it while trying to gain access to the First Class cargo hold, or it could have been moved aside to gain access to the No. 2 cargo hatch. Alternatively, the mast could have simply collapsed due to natural microbial deterioration. There was no consensus among the members of the various groups on expedition as to the cause. In fact, there was sharp disagreement. In general, expedition members that had made previous dives to the wreck site were inclined to believe the damage was caused by man, while those that had not made previous dives believed the damage was caused naturally. Further study on this issue is required.

Finally, by exploring the *Titanic* wreckage, Gurr, Spencer and Bishop gained significant information about the structure of the ship and its nearly identical twin, the *Britannic*. This information allowed them to safely plan penetration dives into the interior of the *Britannic*, in ambient light, using rebreather technology developed by Gurr. Their subsequent *Britannic* expedition was a stunning success; it will be featured soon on the National Geographic Channel's “Mysteries of the Deep” series in the United States, and on Carlton TV in the United Kingdom.

For additional information about the DOE team members, please refer to <http://www.deepimage.co.uk> and <http://www.explorerconsulting.com>.

B. NOAA OE Team

The NOAA OE team consisted of seven members:

- Captain Craig McLean, FN '01, director of OE. Capt. McLean had significant input into the development of NOAA's "Guidelines for Research, Exploration and Salvage of RMS *Titanic*," issued under the authority of the RMS *Titanic* Maritime Act of 1986, and he provided guidance in this respect.
- Lieutenant Junior Grade Jeremy Weirich, OE's maritime archaeologist. Lt. J.G. Weirich organized and led the expedition for OE.
- Dr. George F. Bass, CO '74, from the Institute of Nautical Archaeology (INA), provided archaeological expertise. Dr. Bass's observations and opinions helped to characterize *Titanic*'s status within the perspective of the overall preservation of maritime sites.
- Larry Murphy, chief of the Submerged Resources Center, National Park Service, provided archaeology assistance and advice. His expertise on metallic shipwrecks and site formation processes from the USS *Arizona* Memorial directly complements NOAA's guidelines on *Titanic*.
- Dr. Roy Cullimore and Lori Johnston from Droycon Bioconcepts, Inc. ("DBI"), Regina, Saskatchewan, Canada, organized the microbiological and rusticle observations. They provided pre-dive support, guided the video coverage, and conducted microbe tests and degradation analyses. Both Dr. Cullimore and Ms. Johnston have had prior diving experience on the *Titanic*.
- Laura Rear, a Knauss Sea Grant Fellow in the NOAA OE office, provided data management support.

The NOAA team made four dives to the *Titanic* on June 27 and 29, 2003. More than 24 hours of annotated, on-site digital video data was acquired and catalogued on these two dive days. It will be used to construct a photo mosaic of the wreck site, provide a context for site characteristics, and form a better understanding of site formation processes. See <http://www.oceanexplorer.noaa.gov/explorations/03titanic/welcome.html>. The stern section of *Titanic* was specifically analyzed.

In addition, the NOAA team addressed microbial communities, called rusticles, that consume *Titanic*'s iron and cling to the wreck like rusty icicles. These features have been observed throughout the years. See <http://www.oceanexplorer.noaa.gov/explorations/03titanic/rusticles/rusticles.html>. Ongoing qualitative analyses contribute to the scientific research regarding the ship's degradation, as well as the future degradation rate of modern deep-

sea structures. Dr. Cullimore and Ms. Johnston continued microbial research they had previously conducted on expeditions to the *Titanic* in 1996, 1998 and 2001. See <http://www.dbi.ca/droycon/TITANIC.html>. Based on their observations in 2003, they have revised their estimates of the rate of deterioration of the wreck site. Dr. Cullimore opined that the rate of deterioration of the *Titanic* has significantly increased, the rate of deterioration of the stern section is some 40 years ahead of the bow section, and the bow section is likely to collapse within 20 to 25 years. See <http://www.oceanexplorer.noaa.gov/explorations/03titanic/rusticles/rusticles.html>. Dr. Cullimore and Ms. Johnston are expected to publish the results of their new research at the *Titanic* site later in 2004.

For additional information about the studies performed by the NOAA OE team, please refer to <http://www.oceanexplorer.noaa.gov/explorations/03titanic/welcome.html>. Additional information about Dr. Cullimore and Ms. Johnston may be obtained at <http://www.dbi.sk.ca/>. Dr. Bass' observations from the expedition were presented in the *INA Quarterly* (Vol. 30, No. 3), which is published by the Institute of Nautical Archaeology at Texas A&M University. See <http://ina.tamu.edu/>.

C. Shirshov Institute Team

The team of Russian scientists from the P.P. Shirshov Institute of Oceanology continued the scientific experiments they have been conducting at the *Titanic* site on seven expeditions since 1991. Due to the economic situation in Russia, their scientific research receives absolutely no financial support from the Russia government. Instead, research conducted by the Russian scientists is completely underwritten by funds acquired through the private charter of the *Keldysh* and *Mir* submersibles. The Explorers Club has played a significant role in assisting this scientific exploration through continued chartering of the *Keldysh* and *Mir* submersibles by The Explorers Club Travelers Program, and by successfully prosecuting litigation to restore public and scientific access to the *Titanic* for research and exploration in 1998 and 1999.

In 2002, the Shirshov Institute scientists published a monograph entitled "Oceanographic Investigations of the Gulf Stream Frontal Zone: The *Titanic* Site," Eds. A.M. Sagalevitch, Tu. A. Bogdanov, M.E. Vinogradov (Moscow: Nauka, 2002). This book contains a collection of the scientific studies conducted by the Russians at the *Titanic* site on expeditions in 1991, 1995, 1998, 1999, 2000 and 2001. These include hydrophysical studies; studies of the composition, biomass, temporal variability of planktonic communities, ichthyofauna and benthos communities; and studies of the features of the late Quaternary bottom sediments formed under intensive near-bottom currents and palaeo reconstructions of the sedimentation during the last 20,000 years.

The Shirshov Institute scientists continued this research in 2003, under the guidance of Academicians Anatoly Sagalevitch, MED '98 and Yuri Biogdanov, Chief Scientist on the *Keldysh*. Scientific experiments were conducted in the fields of geology, geophysics, biology and physical oceanography.

III. Findings

The *R.M.S. Titanic* 2003 Scientific and Photographic Expedition successfully achieved each of its three main objectives. The Shirshov Institute team conducted ongoing scientific research in the fields of geophysics, marine biology, physical oceanography and microbiology, thereby adding to the unique body of scientific knowledge that has been obtained by studying and exploring the *Titanic* site since 1991.

The NOAA OE team successfully prepared the first digital photo mosaic of the *Titanic* wreck, and assessed the current condition of the *Titanic* and its surrounding wreck site. This work will form a baseline for management of the *Titanic* site under the terms of an international agreement between the United States, United Kingdom, Canada and France, NOAA's "Guidelines for Research, Exploration and Salvage of RMS *Titanic*," and the RMS *Titanic* Maritime Act of 1986. This work will also assist in determining the rate of deterioration of the *Titanic* and in planning future exploration of the *Titanic*.

In fact, Dr. Robert Ballard, MED '78, has already announced plans to return to the *Titanic* in 2004 to assess the condition of the wreck since he last visited it in 1986 (on another Explorers Club Flag expedition). Dr. Ballard will undoubtedly be assisted by NOAA OE and the work performed by this team in 2003.

Finally, the DOE team successfully achieved its goals of assessing the condition of the *Titanic*, using its observations to prepare for ground-breaking exploration of the *Britannic*, and removing debris left by previous expeditions to the wreck site. DOE will use the knowledge it gained in 2003 to plan additional non-invasive expeditions to the *Titanic* for research and exploration.

IV. Conclusion

The *R.M.S. Titanic* 2003 Scientific and Photographic Expedition successfully achieved the objectives of an Explorers Club Flag expedition. The expedition contributed to the body of unique scientific knowledge that has been obtained by the *Titanic* site, it led to a new understanding of the deep-water microbiological processes that are eating away at the *Titanic*, and it assisted in the development of new techniques to safely explore other historically significant shipwrecks by a new generation of explorers. Flag No. 132 was carried with dignity to the *Titanic* wreck site, where it served as a symbol of exploration that is older than the *Titanic* itself, and a testament to what the human spirit can achieve.

Thank you for granting me the opportunity to carry Explorers Club Flag No. 132 on this historic expedition.

Respectfully submitted,

David G. Concannon, FN '96

Explorers Club Honorary Director
George F. Bass, CO '74

Holding Explorers Club Flag No. 132
Inside the *Mir* Submersible
At the Titanic Wreck Site

June 29, 2003

