

New U.S. Drillship to Join IODP in 2007

by Kelly Kryc

After twenty years of service to the Ocean Drilling Program (1985–2003) and the Integrated Ocean Drilling Program (2003–present), the *JOIDES Resolution* is slated to receive an ‘extreme makeover’ transforming the ship into a state-of-the-art scientific ocean drilling vessel (SODV). The SODV is the U.S. contribution to the IODP and will be dedicated to advancing our understanding of the Earth by monitoring and sampling the ocean floor.

As IODP’s riserless platform, the U.S. SODV will provide a mobile, robust, and versatile ship that can operate in all the world’s oceans. During the coming year, the drillship will undergo a dramatic conversion that will make it virtually unrecognizable to drilling veterans. The U.S. SODV also will be renamed to reflect its new role in the IODP fleet.

The \$115 million ship conversion is funded by the U.S. National Science Foundation (NSF) over three years and is managed by the JOI Alliance (Joint Oceanographic Institutions, Texas A&M University, and Lamont-Doherty Earth Observatory of Columbia University). The JOI Alliance and NSF are committed to providing an enhanced drillship to exceed community expectations and to provide IODP with a platform capable of meeting 21st-century scientific drilling goals.

To exceed community expectations is the highest priority for the JOI Alliance. For the past six years, the community has provided guidance and advice through workshops, planning meetings, and committees to define the requirements of the riserless platform. In 1999, the Conference on Multiple Platform Exploration of the Ocean (COMPLEX) produced a report identifying requirements for riserless ocean drilling, sampling, downhole-logging, *in situ* measure-

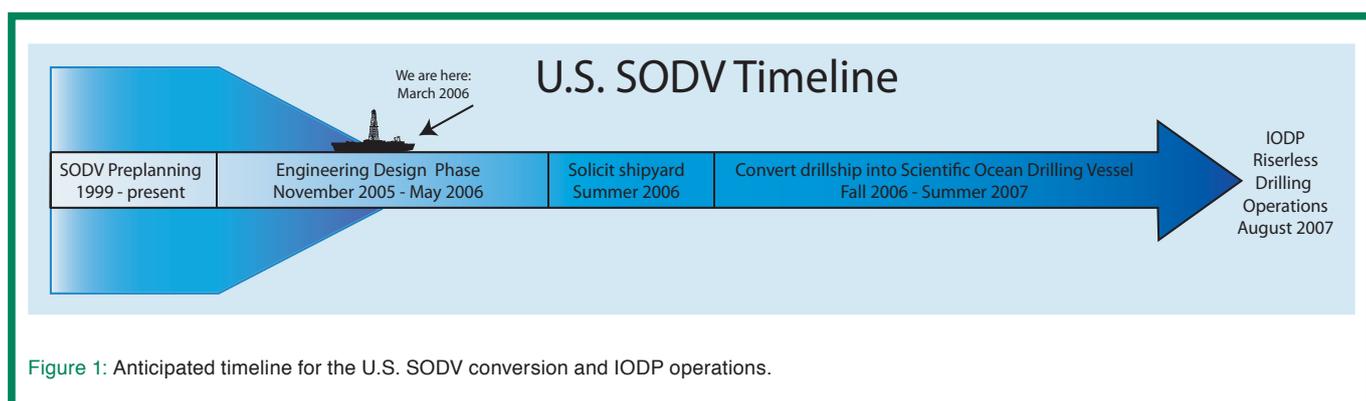
ments, and necessary laboratory facility improvements to achieve specific scientific results.

Building on the COMPLEX vision, the U.S. Science Advisory Committee created the Conceptual Design Committee (CDC) to formulate design characteristics of a single, riserless drillship configured to address the widest range of drilling objectives. The CDC report describes the performance specifications of a riserless ship targeted to nine scientific themes: observatories, rifting processes, convergent margins, large igneous provinces, oceanic crust, hydrothermal systems and massive sulfide deposits, deep ocean sediments, passive margin stratigraphy, and carbonate reefs, atolls, or banks (See Web link at the end of this article).

The CDC report also specified an idealized range of platform capabilities for the riserless drillship, including the ability to drill in a range of water depths (shallow and deep), a total drillstring length of 11,000 meters; continuous coring and sampling with high recovery in a wide range of lithologies, the ability to operate globally (including high latitudes) in a wide range of sea states with a sizeable scientific party, and a potentially larger diameter core barrel to allow for state-of-the-art downhole-logging tools.

At the NSF’s request, more than 100 scientists from ten countries responded to a questionnaire about the CDC report. Responses were compiled into a report that, together with the CDC report, has created the ‘gold standard’ reference used by the JOI Alliance.

The JOI Alliance continues to work to provide the IODP with a riserless drillship that will push the frontiers of scien-





tific ocean drilling. Efforts accelerated in 2004 when the JOI Alliance hired key personnel to lead the conversion. A contract was awarded in December 2005 to Ocean Drilling Limited to convert the *JOIDES Resolution*.

To prepare for the conversion, experts were mobilized to design and outfit the SODV. Their efforts resulted in the SODV Briefing Book, which presents a vision for the U.S. riserless platform (http://www.joialliance.org/MREFC/briefing_book). The briefing book synthesizes numerous recommendations received from the community into a comprehensive document that describes the capabilities and enhancements proposed for the drillship, including onboard scientific capabilities, drilling and coring technology, and habitability enhancements. The briefing book was released to the community in January 2005, with an online questionnaire to solicit feedback on the conceptual design characteristics of the ship.

In addition to the briefing book, the JOI Alliance developed a comprehensive SODV Advisory Structure of experts in science, drilling, information technology, lab design, and naval architecture. Twenty external advisors were selected to represent the community during the conversion (www.joialliance.org/MREFC/committees).

What exactly can science party members expect for \$115 million and several years of planning? The science capabilities proposed for the U.S. SODV will certainly turn heads. At a minimum, there will be a fifty percent increase in lab space compared with the *JOIDES Resolution*. The increased square footage will ensure better core flow through the laboratories and a greater variety of scientific instruments. Some enhancements may include x-ray fluorescence scanning, x-ray computed tomography scanning, a U-channel cryogenic magnetometer, an inductively coupled plasma mass spectrometer, a particle size analyzer, and multiple parallel sensor tracks to expedite core flow.

Improved core flow through the laboratories is important because the U.S. SODV will have the potential to collect more cores with better recovery than ever before due to a new and

enhanced drilling instrumentation system, a sub-sea camera system with improved handling, and a new drillstring with upgraded drilling tools. Proposed changes to the hull and machinery will produce faster transit speeds and a greater cruising range, which translate into more drilling time on station.

Gone are the days of cozy four-person staterooms and eight-person bathrooms that made the ODP experience so memorable. Instead, the converted drillship will have no more than two people to a stateroom and no more than four people sharing a bathroom. There also will be nine additional berths for scientists. Noise and vibration throughout the drillship will be significantly diminished compared to the ODP days. Better recreational facilities, a new mess area, and increased office and conference spaces will also improve the onboard habitability.

The timeline for the ship conversion is short. During summer 2006, a shipyard will be selected, and the conversion will take place between the third quarter of 2006 and the second quarter of 2007. Finally, in August 2007, the U.S. SODV will begin drilling operations for IODP.

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Related Web Link

<http://www.joialliance.org/MREFC/>

Figure Credit

Porthole photo by Robert Burger, JOI. Drillbit photograph courtesy of the Ocean Drilling Program.

