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Abstract

Scientific research in the deep ocean is a recent branch of wide-ranging marine research. The requirements of deep ocean scientific research have led to increasingly larger areas to be investigated while the mesh of investigations has become finer and finer, and deeper and deeper. In the deep seas the scientist ventures into an unlimited treasure house of knowledge; it is truly a voyage into the unknown. It has been almost twenty years since “Shinkai6500” was launched in 1989, and the vehicle providing the world’s greatest depth capability for a manned submersible, and also the vehicle has been providing for scientists a means to enable safely access and directly observe the deep ocean at a time when it was difficult for a man to venture to the deep seafloor. However, the time has come to consider a future deep submergence research vehicle as a succeeding vehicle for “Shinkai6500”. This paper covers the result of study on the conceptual designs of two types of manned deep submergence research vehicles; 11000m submergence vehicle (full depth) and 6500m submergence vehicle (two spheres). On the other hand, during this same time period of twenty years, remotely operated vehicles and autonomous unmanned vehicles were developed worldwide and became available with advanced controlling and sensing technologies. Today, a lot of investigations and operations in the deep sea are utilizing these unmanned systems. Nevertheless, it is still very important that humans work *in situ* to directly observe and act. This man’s capability generating innovative knowledge and hypotheses will be necessary at any time and in any period. Even if unmanned technologies are advanced in the field of natural science, the necessity of field work with man’s presence will not be diminished. Consequently, future capable manned submergence vehicles that are responsive to the needs of scientific research in the deep ocean must be used in collaboration with various kinds of unmanned vehicles.

This study was carried out by the “ad hoc Committee” organized in the Japan Deep Sea Technology Association with additional current status regarding “Shinkai6500”.