

▶▶ Examples of the 3D Model Search

There are high expectations being placed on the 3D Model Search system for Kibo's operations across the next ten years. One application of the 3D Model Search, for instance, will be in detecting any system or equipment malfunctions, which are inevitable in the harsh environment experienced by the International Space Station. Any such problems need to be dealt with swiftly, and for this, ground operation staff need to be familiar with all the mechanisms of the space station - which itself is composed of an enormous number of parts. Once any problems are identified, the ground team has to be able to rapidly work out how to repair them, and then send the appropriate instructions to the astronauts. Since it is impossible for the ground operations staff to go on site, they will be using virtual 3D models. (Figure 12.8 shows the specific example described below.)

There are four lighting devices in the experiment logistics module. If one of them should not light up, the ground staff would find the faulty location in the storage room in the 3D virtual model. As the model is exactly the same as the real room, they are able to quickly find the affected device visually. On clicking the specific device in 3D, the related information and 3D data can be rapidly reviewed, and will also include any prior defects as well as solutions. The ground staff can then swiftly transmit the repair instructions while referring to the data available. In this virtual XVL world, the information is as precise as if the ground staff were actually looking at the real thing.

The potential of this system is vast. For example, in space it is enormously complex and dangerous to inspect the exterior of the station. However, with 3D models, it is easy to see the exterior of the model and find the defects. To search for the location of an interior part is also easy in 3D: simply walk inside the virtual vessel! This feature is unique

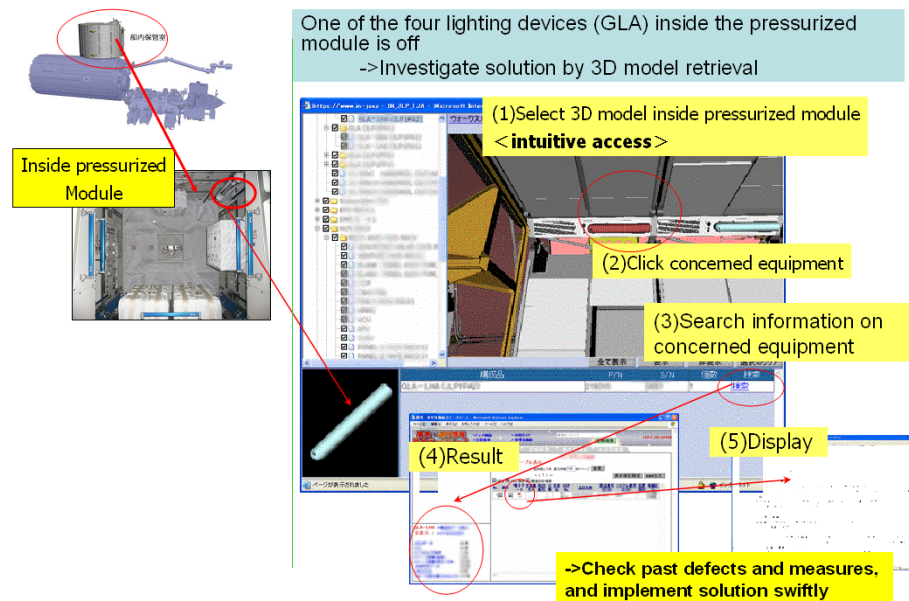


Figure 12.8 Example of 3D Model Search