National Aeronautics and
Space Administration

ORION'S SERVICE MODULE

Orion's service module is the powerhouse of the spacecraft, supplying it with the electricity, propulsion, thermal control, air and water it needs in space. After the Space Launch System rocket gives Orion the push it needs to venture toward deep space and detaches from it ,the service module will propel the uncrewed spacecraft on its mission 40,000 miles beyond the moon and help it return to Earth, detaching before the crew module reenters Earth's atmosphere. For the first time, NASA will use a European-built system as a critical element to power an American spacecraft. Provided by ESA (European Space Agency) and its partner Airbus Defense and Space, the service module extends NASA's international cooperation from the International Space Station into deep space exploration.

20,000

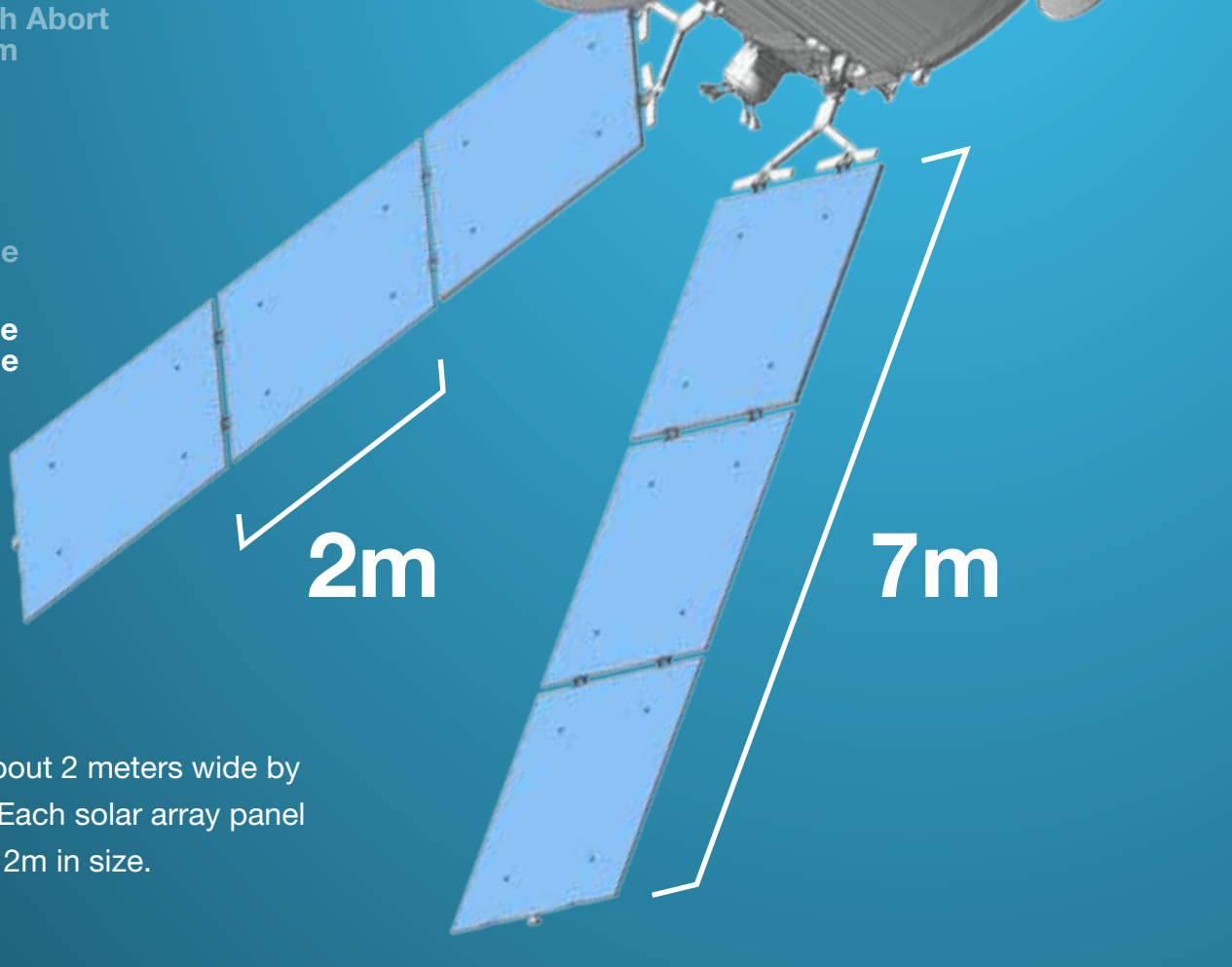
The Orion spacecraft is made of three primary elements - the launch abort system, the crew module, and the service module.

The European-built service module is comprised of 20,000 parts and components that must fit together perfectly and perform reliably. The service module has four solar array wings to provide power.

Launch Abort System

Crew Module

Service Module



Each wing is about 2 meters wide by 7 meters long. Each solar array panel is about 2m by 2m in size.

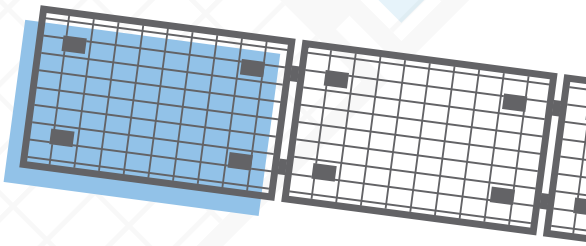
11

The European service module is being built by 11 European countries as part of an international agreement between NASA and ESA (European Space Agency). The countries include Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Spaid, Sweden, Switzerland, and the United Kingdom.

100

Just one of the 2 meter by 2 meter panels of the four solar array wings has more than 100 solar cells. All four wings combined have a total of 15,000 solar cells to convert light into electricity!

Many of the ESA countries are participants in the production of the solar arrays.



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Orion's four solar array wings are made of three panels that provide enough electricity to power two three-bedroom homes.

1000 sensors collected data on Orion's service module as it was shaken on a vibration table at NASA Glenn Research Center's Plum Brook Station in Sandusky, Ohio. This testing simulated how Orion's structure flexed and stood up to 35 tons of spacecraft weight during a launch.

1000

19

This Orbital Maneuvering System engine was used on the space shuttle to provide the thrust for orbital insertion, orbit circularization, orbit transfer, rendezvous, deorbit and abort situations and flew on 31 shuttle flights.

The engine flying on Exploration Mission-1 flew on 19 space shuttle flights, beginning with STS-41G in October 1984 and ending with STS-112 in October 2002.

The Orion service module main engine provides nearly 5778 pounds of force! The engine is also equipped to swivel from side to side as well as up and down.

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