

Subj: Cassini Briefing Points
Date: 97-09-11 21:03:55 EDT
From: KRUG4SPACE
To: WSpaceport, B Walden, wnwhite@worldnet.att.net
To: bharris@netpass.com, LA47th
To: michelle_baker@ccgate.ueci.com, cew@acm.org
To: augiokdi@ibmmail.com, RUTLEDGES@delphi.com
To: Shirls3971, PancratzCM, kikin@gio.com.au
To: macdust@flinet.com, JGLJGL, bam@draper.com
To: hal5@advicom.net, csdc-list@netcom.com
CC: mgilbroo@hdrinc.com, 71055.2110@compuserve.com
CC: lauri@his.com, OrdMars, awasser@mcimail.com

TO: Activists
FR: Karen Rugg

The following are detailed talking points for activists and members. Another message will follow tomorrow with a set of brief points to be used as a media handout.

** ACTIVIST TALKING AND BRIEFING POINTS **

NOTE: NATIONAL SPACE SOCIETY STATEMENT ISSUED SEPT. 8, 1997:

Statement from Charlie Walker, NSS President, and Pat Dasch, NSS Acting Executive Director:

"Saying 'no' to Cassini would be saying 'no' to knowledge. Cassini, planned for years to reveal the secrets of Saturn, its rings and mysterious system of satellites, will provide invaluable data and another unforgettable rendezvous with images we've never seen before.

Saying 'no' to Cassini would jeopardize years of international preparation and investment. Misinformation and exaggerated claims of risk should not be allowed to slam the door on deep space discovery. Cassini's Radioisotope Thermoelectric Generators (RTGs), which occupy the center of current debate, have proven their safety and capability in 23 prior missions, including human missions. RTGs are the only realistic option for sending probes great distances from the Sun and will certainly play a part in future human missions. The National Space Society fully supports the launch of Cassini."

AT ALL TIMES: "We're here to demonstrate our support for Cassini because it is safe and this nation cannot afford to have deep space exploration jeopardized by misrepresentation. Opponent's claims of deaths, cancers and other risks are untrue. They have been asked repeatedly to submit numbers to support their claims, and nothing has ever been submitted.

1. Cassini is safe. Cassini is the most scrutinized and reviewed planetary mission in history. Every phase of spacecraft design/operations/reliability has been reviewed and validated in a peer review, multi-agency and independent process requested by NASA.

2. Cassini will conduct outstanding, unique science. After reaching Saturn in July, 2004, Cassini will orbit the planet for four years, carrying out a series of detailed studies of Saturn's atmosphere, its numerous moons, its magnetosphere and its fabled ring system. Saturn's complex ring system is a model for the dust disk that produced the Solar System, giving scientists

insight into how planets are formed. Cassini will also deploy a probe called Huygens [Hoy-gens], which will explore Titan, a moon with a dense, organically-rich atmosphere. For scientists, Titan represents a model for the chemical evolution that preceded the origin of life on Earth.

3. The Radioisotope Thermoelectric Generators (RTGs), which will provide power for Cassini, enable deep space exploration. There are 22 space systems still in space or on Mars or the Moon powered by nuclear power sources, including the Pioneers, Voyagers, Vikings, Ulysses (1990) and Galileo (1989) missions, as well as the Apollo lunar landing missions. It is the heat caused by the decaying Pu 238 that is converted to electricity to power the spacecraft and its instruments.

4. RTGs are proven safe. They have no moving parts and cannot meltdown or explode. They are NOT "nuclear reactors." The plutonium dioxide (Pu 238) is contained in 72 marshmallow-sized ceramic pellets which are then encased in layers of iridium, then a graphite impact shell and finally an aeroshell. The aeroshell is constructed of material much like a solid cloth with a third dimension of threads going in and out. If one "thread" breaks, the cloth doesn't break; stresses are redistributed and the aeroshell remains intact. .

5. Solar cells cannot be used to power Cassini. The Saturnian system only receives 1/100th the sunlight we receive here at Earth; arrays required to power Cassini would be too heavy to launch with any rocket available today or in the near future. Individuals opposing the launch are using the same argument they used in 1989 -- that NASA ignored information that Galileo's Jupiter orbiting mission could have been performed with a concentrated photovoltaic solar array (CSA). This was not true then, and is not true now. In 1989, NASA learned that CSAs could not be ready at least until 2010. Opponents also suggest that NASA can take its time to develop a solar alternative, that Saturn "will still be there." But it won't. The planetary alignment that provides the necessary gravity assists for Cassini occurs only every 175 years and will be lost in just a few years, long before we can expect improved solar technology or larger booster rockets. Delaying Cassini by years or decades also unnecessarily wastes the work of the many scientists who have dedicated their careers to this mission.

6. The opposition insists that solar cells developed by the European Space Agency's (ESA) to power the comet-explorer, Rosetta, can be used for Cassini. This is not true. ESA recently confirmed with NASA again that similar cells could not be used to power Cassini.

7. Opponents omit information that would provide valuable context. In noting a 1964 spacecraft which burned up on re-entry and released its plutonium source, they do not mention that the craft was designed to do just that. Since then, nuclear generators have been dramatically redesigned. No plutonium was released in two accidents involving missions carrying RTGs since the units were redesigned in 1965 to contain their plutonium fuel source. The details on the two accidents are: Nimbus satellite launch from Vandenberg failed, RTG recovered from the Santa Barbara channel and plutonium re-used in another satellite; Apollo 13 RTG in lunar module survived re-entry at 25,000 mph.

8. There is less than one in a million chance that an accident could occur when Cassini "flies by" the Earth in 1999. We are in greater danger of Earth suffering a catastrophic impact from a comet or asteroid next year. The expected radiation dosage a person might receive is only one millirem (unit of radioactivity). To put this in perspective, we receive an average of 360

millirems each year just by living on Earth. Luminous dial wristwatches give about 2 millirems (mrem) per year; television from 1 to 10 mrems per year; dental x-rays, 1000 mrem per series; a chest x-ray, 500 to 5000 mrem per exposure.

9. Developing Cassini has resulted in other benefits, including new technologies that will have commercial applications. Engineers developed a solid-state data recorder that has no moving parts, a new-generation gyro (also with no moving parts), a new solid-state power switch, and a new-generation radio receiver.

10. Opponents continue to state that "NASA has been contaminated by a militaristic purpose," that "NASA is advancing the nuclearization of space" and that "Cassini is about nuclearization and space weaponry." This is not true and is an argument again recycled from the late '80s which is not relevant to today. Deep space exploration programs such as Cassini are run by NASA, not by or for the military. NASA employs RTGs because they are the best tool for the job; they have used them for over 37 years.

For more information, visit <http://www.nss.org/> or <http://www.jpl.nasa.gov/cassini/>.