



Preparing for Apollo: (left to right) NASA astronauts Roger Chaffee, Edward White and Virgil Grissom at work in the Apollo spacecraft simulator at Cape Kennedy. As reported on this page, the three men were killed when their spacecraft caught fire during a practice countdown on January 27

Spaceflight

THE APOLLO 1 DISASTER

Lt Col Virgil Grissom, Lt Col Edward White and Cdr Roger Chaffee, the crew chosen to make the first manned flight in NASA's Apollo programme, were killed in a launch-pad accident at Cape Kennedy on January 27. A practice countdown in preparation for the Apollo 1 flight (scheduled for February 21) had progressed to "T minus 10min and holding" when, in the words of Maj Gen Samuel Phillips, director of the Apollo programme, "A flash fire originated inside the capsule and surrounded it for a matter of split-seconds."

The hold in the countdown was reportedly caused by poor-quality communications between the spacecraft and the control centre. Gen Phillips said that one of the astronauts had reported "Fire in the spacecraft" by radio just before the accident. Technicians on the servicing tower attempted to extinguish the fire immediately, and succeeded in opening the hatch of the spacecraft 5min later. The astronauts were found still strapped in their seats.

The spacecraft was using its own electrical power at the time, Gen Phillips said, but the problem had not developed when the crew switched from ground power to the onboard power system. A board of inquiry was set up on January 28 to investigate the cause of the accident.

Even if no design fault in the spacecraft were found, the general indicated, the first manned Apollo flight could not now take place until May or June at the earliest. There was no spare flight spacecraft at the Cape; to prepare and transport

one there from the maker's plant, North American Aviation at Downey, would take about six weeks and to check it out after arrival would take another six weeks.

Whatever the source of the ignition, the speed with which the fire spread—the "flash" effect described by Gen Phillips—must be attributed to the 100 per cent oxygen atmosphere inside the spacecraft. The Apollo spacecraft is not equipped with ejection seats—in any case the Apollo 1 craft was within the servicing tower at the time of the accident—and it would have taken the astronauts several minutes to open the hatch from the inside and climb out.

(Biographies of the astronauts, page 183.)

WORLD SPACE ASSEMBLY : FIRST DETAILS

Almost one thousand delegates from 130 countries are expected to attend the United Nations conference on the exploration and peaceful uses of outer space, to be held in Vienna during September 11-23. Invitations to States and organisations have been issued by the UN Secretary-General, and planning for the conference is well under way.

The two main aims of the conference are (a) to examine the practical benefits to be derived from space research and exploration on the basis of technical and scientific achievements; and the extent to which non-space powers, especially the developing countries, may enjoy these benefits; and (b) to examine the opportunities available to non-space powers for international co-operation in space activities, taking into account the extent to which the UN may play a role.

These aims are to be achieved by the delivery and discussion of a number of papers, which will cover *inter alia* the following topics:—

(1) General appraisal of achieved and possible contributions by scientific and technical research in outer space and by international co-operation in providing practical benefits, especially for developing countries, in the field of biology, medicine, communications, meteorology and navigation and in other fields;

(2) Implications of space exploration for education, with special reference to possibilities of establishing programmes for the education and training of specialists to assist the developing countries in the peaceful uses of outer space; and

(3) Various other implications of expanding space exploration and research.

An introductory session at the conference will review the results of space research during the ten years of the space age. These will include basic scientific results in the physical exploration of the upper atmosphere and outer space, manned spaceflight, lunar and planetary research, with particular emphasis on their practical meaning.

This will be followed by nine thematic sessions devoted to communications; meteorology; navigation; other space techniques of practical benefit; biology and medicine; non-space applications of space technology; education and training; international co-operation and opportunities for participation in space research and application; and economic, legal and social problems of exploration and use of outer space relevant to international co-operation and practical benefits.

OAD DEFECTS TRACED

A detailed review of NASA's observatory-class spacecraft, and in particular of the failure of the first Orbiting Astronomical Observatory satellite in April 1966, was completed recently by the NASA review board set up by Dr Homer E. Newell, Associate Administrator for Space Science and chaired by Mr Robert F. Garbarini.

The in-flight failure of OAO-1 was described by the board as follows:

"At 1935:00.490 GMT on April 8, 1966 the OAO-1 was launched from the Eastern Test Range into a nominal 500-mile circular orbit inclined 35° to the equator. For seven minutes after separation from the Agena, available data indicated that the spacecraft performance was according to plan and satisfactory. At about eight minutes after separation, it is believed that an electrical transient produced an adverse effect on some of the equipment. For example, one of the star trackers experienced an unscheduled turn-on and roll search was terminated. Subsequent to this incident, data indicate that all