

24 July - Last Splash

Approximately 24 hours after they parted from the docking module, Stafford, Slayton, and Brand began their journey homeward. On the ground, the flight control team played Jerry Jeff Walker's "Redneck Mother" to wake the crew. [347] With a cheery "Good morning, gents. Party's over. Time to come home," CapCom Crippen told them to rise and shine. At half past seven, the crew started preparing for its mid-afternoon deorbit. As the men rubbed the sleep from their eyes, ate breakfast, and gathered data for the medical doctors on the ground, Crippen read them the news for the last time, news most of which the Apollo crew was making. The newspapers said that Slayton would fly again and that Stafford was still undecided about the future. Would it be NASA, the Air Force, industry, or politics? "That last option is sure out. I'll clue you, ol' buddy," was the General's response. Crippen gave a favorable weather forecast for the prime recovery area - visibility 16 kilometers, winds at 17 knots, scattered cloud cover at 600 meters, and wave height 1.1 meters. [50](#)

CSM deorbit came at 3:37:47, or about 13 seconds ahead of schedule. Six and a half minutes later, the command module was separated from the service module. As the reentry vehicle descended, Slayton and Brand commented on the buildup of gravity forces and the fireball that flared up as the heatshield pressed against the earth's atmosphere. At 4:18:24, Apollo splashed down about 7,300 meters from the recovery ship *New Orleans*. Houston control was filled with smiling faces and cigar smoke. Unknown at that time to the celebrants was the fact that the crew had inhaled nitrogen tetroxide fumes during the descent.

The descent phase had gone without incident until about 15,000 meters. In the days that followed the recovery, the story of the failure to actuate the Earth landing system (ELS) was told and retold several times by Glynn Lunney, John Young, and others. Vance Brand presented his version during the crew technical debriefing. When the CM reached an altitude of 9,144 meters, two earth landing switches that permitted the apex cover to be jettisoned at 7,310 meters were normally armed. The drogue parachutes would then be released, followed by the main chutes. Commenting on the descent, Brand said that as Stafford read steps from the Entry Checklist he threw the proper switches. There was quite a bit of noise in the cabin from the command module's thrusters and the passage of the craft through the atmosphere.

At 30K [9,144 meters], normally we arm the ELS AUTO, ELS LOGIC, that didn't get done. Probably due to a combination of circumstances. I didn't hear it called out, maybe it wasn't called out. Any case 30K to 24K [9,144-7,315 meters] we passed through that regime very quickly. I looked at the altimeter at 24K, and didn't see the expected apex cover come off. Didn't see the drogues come out. So, I think at about 23K, I hit the two manual switches. One for the apex cover and also, the one for drogues. They came out. That same instant the cabin seemed to flood with a noxious gas, very high concentration it seemed to us. Tom said he could see it. [348] I don't remember for sure now, if I was seeing it, but I certainly knew it was there. I was feeling it and smelling it. It irritated the skin a little bit, and the eyes a little bit, and, of course, you could smell it. We started coughing. About that time, we armed the automatic system, the ELS. . . [51](#)

The manual deployment of the drogue chutes caused the CM to sway, and the reaction control system thrusters worked vigorously to counteract that motion. When the crew finally armed the automatic ELS 30 seconds later, the thruster action terminated.

[Image here]

Diagram of air and propellant flow around the Apollo command module during descent through the atmosphere. Note propellant gases being drawn into the steam vent.

During that 30 seconds, the cabin was flooded with a mixture of unignited propellant and oxidizers from the thrusters. Prior to drogue deployment, the cabin pressure relief valve had opened automatically, and in addition to drawing in fresh air it also brought in unwanted gases being expelled from the roll thrusters located about 0.6 meter from the relief valve. Brand manually deployed the main parachutes at about 2,700 meters, and despite the gas fumes in the cabin, the

crewmembers continued to work through their checklist as best they could. Due to severe coughing and intercom noise, they had difficulty talking to one another and to the ground.

Following a normal but hard splashdown, the command module flipped over, leaving the three men hanging upside down in their couches from harnesses. Brand, who was coughing the most because he was closest to the [349] steam duct opening, saw that Slayton was feeling nauseous and reminded Stafford to get their oxygen masks. The commander recalled:

For some reason, I was more tolerant to [the bad atmosphere], and I just thought get those damn masks. I said don't fall down into the tunnel. I came loose and . . . had to crawl . . . and bend over to get the masks. . . . I knew that I had a toxic hypoxia . . . and I started to grunt-breathe to make sure I got pressure in my lungs to keep my head clear. I looked over at Vance and he was just hanging in his straps. He was unconscious.⁵²

After Stafford secured the oxygen mask over Brand's face and held it there, he began to come around. Once the entire crew was breathing pure oxygen, Brand actuated the uprighting system. When the command module was upright in the water, Stafford opened the vent valve, and with the in-rush of air the remaining fumes disappeared.⁵³

Failure to throw the ELS switches led to an unanticipated two-week hospital stay for the crew in Honolulu. For Slayton, it also meant the discovery of a small lesion on his left lung and an exploratory operation that indicated it was a non-malignant tumor. After a short convalescence, Slayton joined the other four ASTP flyers for two tours, one of the Soviet Union and one of the United States. Despite a grueling month on the road, neither Slayton nor his team mates seemed any the worse for wear, and the warm public reception wherever they went seemed to indicate that the unfortunate accident at the end of the flight had not detracted from the basic success of the Apollo-Soyuz Test Project.⁵⁴ Rivalry had produced the first manned space flights in the early 1960s. But that sense of conflict had been overcome with the creation of an international test project. Ironically, this first joint flight also marked the end of an era. NASA's manned space program had seen its last splashdown. Apollo would fly no more.

50. Program Operations Office, "ASTP Technical Air-to-Ground Voice Transcription," p. 1037.

51. Crew Training and Procedures Division Training Office, "ASTP Technical Crew Debriefing," pp. 5-4 and 5-5; NASA News Release PC-56, "ASTP Crew Status Briefing," 25 July 1975; NASA News Release PC-57, "ASTP Crew Medical Status Briefing," 26 July 1975; NASA News Release PC-58, "ASTP Crew Medical Status Briefing," 26 July 1975; NASA News Release PC-59, "ASTP Crew Status Briefing," 27 July 1975; NASA News Release PC-60, "ASTP Post Flight Systems Review," 28 July 1975; NASA, JSC, "Apollo Soyuz Mission Evaluation Report," JSC-10607, Oct. 1975, pp. 14-4 through 14-13; and Richard Saltus, "Apollo Leak: Crew Failed to Trip Switches," *Washington Post*, 29 July 1975.

52. Crew Training and Procedures Division Training Office, "ASTP Technical Crew Debriefing," p. 5-5.

53. Interview, Stafford-Ezell, 6 Apr. 1976; and NASA, JSC, "Apollo Soyuz Mission Anomaly Report No. 1, Toxic Gas Entered Cabin during Earth Landing Sequence," JSC-10638, Dec. 1975.

54. NASA News Release, JSC, 75-69 "Astronaut Slayton to Undergo Surgery," 19 Aug. 1975; NASA News Release PC-63, "D. K. Slayton Medical Briefing," 20 Aug. 1975; press release, M. D. Anderson Hospital, Houston, Tex., "D. K. Slayton," 26 Aug. 1975; and R. Z. Sagdeyev and V. A. Olshevskiy, "Sovmestnymi usiliyami" [Through joint efforts], in *Soyuz i Apollon, rasskazivayut sovetskie uchenie inzheneri i kosmonavti-ychastniki sovmetstnikh rabot s amerikanskimi spetsialistami* [Soyuz and Apollo, related by Soviet scientists, engineers, and cosmonauts - participants of the joint work with American specialists], Konstantin D. Bushuyev, ed. (Moscow, 1976), pp. 180-198.



