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December 8, 2021

Hearing Transcript

LAMAR: When were you told about the hazard?

AYERS: I don't remember.

LAMAR: What did you do once you knew about it?

AYERS: I acted in accordance with procedure.

LAMAR: Which means?

AYERS: All the information on the subject is included in the stenographic record.

LAMAR: Mr. Ayers, do you realize the seriousness of the accusations made against you?

AYERS: Yes.

LAMAR: Then I suggest you change your approach.

■ **ISS—August 9, 2021, 13:50 GMT**

Lucy's day had started normally. Her alarm went off at seven in the morning—although the term *morning* was a matter of convention on the ISS as the sun rose (and set) every forty-five minutes, coloring the Earth with a gradient of red to yellow. She followed her tasks, as out-

lined in the schedule, keen to fulfill all her goals on time. The hours passed quickly, and soon it was time for lunch. Lucy went to the Unity module and prepared her meal: decaf coffee (instant and drunk through a straw; it would escape from a cup), frankfurters (vacuum-packed, reheated in a microwave), and tortillas (normal bread was a banned item, as it crumbled too easily). She ate with the rest of the American crew; the conversation was disjointed, as time was short: only twenty minutes for the meal, then a brief videoconference with Houston, and by then it was high time to get back to work—they had to make the best possible use of every minute, as each one cost tens of thousands of dollars.

Once the regulation twenty minutes were up, the astronauts tidied up after the meal: empty packaging made its way into plastic bags, and the bags into the BEAM module to await the cosmic garbage truck. The Cygnus cargo capsule was due to arrive in two weeks' time; it would be crammed with food, clothing, tools, and all the other paraphernalia required to keep the ISS working and the crew alive. After unloading it, the astronauts would fill Cygnus with trash—not just the food packaging, but also dirty, sweat-soaked clothing and

canisters of feces—and send the spacecraft off to be incinerated in the Earth’s atmosphere. If anyone on Earth looked up at the sky then, they would think the Cygnus was a falling star, silently make a wish, and delight in the beauty of the universe.

“OK. Ready?” asked Lucy, once they had finished tidying up.

“Ready,” replied Ezra. “You can connect.”

Lucy attached the tablet to the wall—it too was equipped with Velcro tabs—and tapped the appropriate button. She expected to see one of the flight directors: Michael, Judy, or Robert. She couldn’t remember who was supposed to be on duty. Instead, she saw the deputy director for crewed space flights, Steve Ayers. That didn’t bode well. Steve was a busy man. If he was joining them, it meant he had important news to convey. In Lucy’s experience, important news was rarely good news.

“Good morning,” said Ayers. “How are we feeling?”

“Great.” Lucy turned up the volume; the ceaseless hum of the air conditioning hindered conversation.

“Good to hear, although . . . well . . . I’m afraid I’m about to put a damper on your mood. I’ve just spoken to the NOAA. Their monitoring equipment has picked up an intense solar flare.”

“Classification?” asked Lucy.

“I’m afraid it’s an X.”

“Strength?”

“Not certain yet; they’re still analyzing the data. At least an eight, but possibly as high as ten.”

Lafayette whistled through his teeth. X10 was the highest possible classification. It meant that the Sun had just spewed out enough accelerated photons to disrupt the energy network and radio communications on Earth. The crew were not on Earth, so they would not be protected by the Earth’s atmosphere; where they were flying, it was so thin its effects were negligible. Luckily, they were still inside

the Earth's magnetic field, within the cloud of particles trapped by the Van Allen Belts. Had they been farther away—on the Moon, or on the way to Mars—there would have been no protection from the solar wind. The ionizing radiation would have shredded the cells in their bodies.

"Our assessment shows you are not at any risk. Each of you will probably absorb about one rem, well . . . maybe one-and-a-half," continued Ayers, "but we have to activate emergency procedures. Variant two."

Lucy ran through the steps of the procedure in her head: discontinue data transfer; switch off all electronic equipment not essential for the station to operate; put away all biological samples and close the laboratory cabinets; and take shelter in Harmony, the dormitory module whose cladding has the thickest layer of anti-radiation shielding. Her first crisis. She felt no fear, but rather a touch of excitement—so she would, after all, have an opportunity to step outside the spreadsheet cells and leave her humble mark on the ISS's history. If Lucy was scared of anything, it was of Nate's reaction. She knew that the news about emergency procedures being activated would be made public, and her husband would involuntarily start imagining the worst possible outcomes.

"NOAA says the solar wind will reach the station at fourteen forty-seven Spacecraft Event Time. So you have"—Ayers glanced at his watch—"just under an hour. At fifteen thirty-four you'll be safe. In the meantime, all channels of communication will be shut down."

"And the Russians?" Lucy involuntarily glanced toward the stern where Unity connected to Zarya.

"They've been informed, and are securing their segment of the ISS. Any other burning questions?"

Silence. They shook their heads. Negative.

"In that case, so long," said Ayers. "Take care!"

As soon as they disconnected, Lucy issued her commands to the

rest of the crew. She was securing Unity, Ezra was to take care of Destiny, Lafayette was responsible for Columbus, and Devaki—Tranquility. Lucy gave them half an hour for this task, and then they were to meet in Harmony, the dormitory module where they could safely wait for the solar wind to pass.

Lucy moved hastily, which only increased her disorientation. She wasn't yet accustomed to every wall being both a floor and a ceiling and all the surfaces being dotted with electronic equipment. It made it seem as if the modules, which were by no means spacious, were expanding into a fourth dimension—it would have been easy to miss or forget something amidst cables protruding from everywhere and screens gleaming from every wall. Fortunately, Lucy had memorized the technical diagrams of every part of the station in full. She could have drawn the location of every wire and every pipe from memory; this helped her to orient herself in the apparent chaos. So, she spun around, first left-right, then up-down, and with a brisk *click! click! click!* on the buttons, panel after panel faded to black.

She glanced at her watch: it was time to go. Lucy grabbed a handrail, yanked it, and went flying through the module. Too fast: her shoulder hit a wall and she went into a spin. The station whirled around her; the blood hummed in her ears. She grabbed another handrail, stabilized herself, and pushed off once again—this time more carefully. She floated through Destiny, and moments later she reached Harmony; all she had to do now was a 270-degree turn and she found herself in her sleep station. She had just enough time to send a brief email to Nate—*All ok don't worry*—and then she switched off her computer. Only then did she lean out of her cubicle. Lafayette's sleep station was directly above hers, and he was already inside it; to the left, she saw Ezra. To the right, where Devaki slept, it was empty.

"Where is she?" asked Lucy.

"I don't know," replied Lafayette.

"Devaki?" called Lucy, although she couldn't be sure whether her voice could be heard above the noise of the fans. Tranquility was relatively far away, off to one side of Unity.

No reply. She glanced at her watch: two thirty-nine. Devaki still had eight minutes before a wave of accelerated particles swept across the station.

"We need to go and get her," said Ezra. Lucy would've preferred he frame it as a question: *Should I . . . ?*

"She can't have gotten lost!"

"No, but something may have happened to her." The pilot wasn't letting it go.

"Let's give her a few more minutes," answered Lucy—though, as she said it, she heard the hesitation in her own voice. She didn't want Devaki to feel she had been reduced to the role of a damsel in distress, but as the commander, she was responsible for Devaki's safety. Of course, even if Devaki didn't reach Harmony by the time the solar wind hit the station, she wouldn't be facing death. At least, not a sudden death.

Ezra was about to say something else, but then seemed to change his mind. Lucy had suspected he might be difficult and might struggle to take orders from a civilian, particularly from a female civilian. Ezra was over fifty years old and belonged to the previous, now-waning generation of astronauts: the cowboys, swashbucklers, and aces of the heavens. He had no real interest in the scientific goals of the mission, or "all that nerd crap," as he called it when his superiors were out of earshot. For Ezra, the flight into space was a final combat challenge, another badge to pin onto his uniform alongside his medals from Iraq. In the twenty-first century, the average mission lasted months, rather than the week or two common in the Apollo era, and plans were evolving for expeditions to Mars

that would last years. Hence, NASA was now counting on a different type of astronaut: measured, conciliatory, and able to discuss their emotions openly. The generational changeover was almost complete; Ezra was one of the last of the old-style astronauts.

"How about checking the cameras?" asked Lafayette. "Or are they already off?"

"They're off."

"Two forty-one!" butted in Ezra, urging her to act.

"I know," replied Lucy. "OK, go and check what has happened to Devaki."

Ezra nodded, and pushed off to the stern, toward Tranquility. A minute passed. Two minutes. Long enough to get between the modules many times over. *What's happening with Devaki?* thought Lucy. A snag with the equipment? Had she absentmindedly lost track of time? Unlikely. They weren't dealing with the start time of a movie show or a bus departure—this was lethal radiation. You don't forget about that kind of thing, or trifle with it.

"Quite some start to the expedition, eh?" said Lafayette, winking at her. The smile had never left his face; he could have featured in an encyclopedia under the heading *Optimism*. They needed people like him here, people with boundless and infectious enthusiasm. She wondered whether he really was like pure condensed sunshine, or if it was just for show: *Look, I'm not threatening. No need to get nervous.*

"At least something's happening," she answered.

"Oh, there's always stuff going on here, alright."

She caught a heavy note in his answer, some kind of hurt or grievance.

"Is Earth pushing you hard?" she asked, probing.

"Sure is . . . and this will put me back another half day." He took off his glasses and wiped them with a chamois cloth. When he finished, he lifted the glasses up to the light to check whether the lenses were

clean. "Listen, d'you know what criteria Faizan uses to pick the astronauts to form a crew?"

"No, I don't think anyone knows."

"Uh-huh."

"Why are you asking?"

"No specific reason," answered Lafayette. Then he added more loudly, "Just out of interest."

Really? she thought. *No reason at all?* But before she could ask another question, Lucy heard noises coming from the direction of the hatch, a knock, perhaps, and maybe panting; the sounds were barely audible above the thrum of the air conditioning. Devaki burst into the module, followed by Ezra a moment later. It was two forty-six. The solar wind would hit in one minute.

"Sorry!" gasped Devaki.

"What happened?"

"I had to . . ." She stopped herself. "I needed a moment."

Lucy examined her carefully. Pallid complexion, tousled hair, and saliva in the corner of her mouth. Should she say something, or not? Should she play the leader's card, or keep it in reserve? She could feel the others watching her; they were curious to see how she would play it.

"I would rather you vomited here than put other crew members at risk," Lucy said, mixing reproach and compassion in her tone in carefully measured proportions.

"I understand. I didn't want to—"

"End of subject," said Lucy.

"Well, let's hope this doesn't happen again," said Lafayette. "This type of solar flare usually only occurs once every dozen years or so. And we're at a solar minimum."

Beep! Beep! Beep! It was the alarm on Lucy's watch. Two forty-seven. It had begun.