

VENKAT KAPOOR returned to his office, dropped his briefcase on the floor, and collapsed into his leather chair. He took a moment to look out the windows. His office in Building 1 afforded him a commanding view of the large park in the center of the Johnson Space Center complex. Beyond that, dozens of scattered buildings dominated the view all the way to Mud Lake in the distance.

Glancing at his computer screen, he noted forty-seven unread e-mails urgently demanding his attention. They could wait. Today had been a sad day. Today was the memorial service for Mark Watney.

The President had given a speech, praising Watney's bravery and sacrifice, and the quick actions of Commander Lewis in getting everyone else to safety. Commander Lewis and the surviving crew, via long-range communication from *Hermes*, gave eulogies for their departed comrade from deep space. They had another ten months of travel yet to endure.

The administrator had given a speech as well, reminding everyone that space flight is incredibly dangerous, and that we will not back down in the face of adversity.

They'd asked Venkat if he was willing to make a speech. He'd declined. What was the point? Watney was dead. Nice words from the director of Mars operations wouldn't bring him back.

"You okay, Venk?" came a familiar voice from the doorway.

Venkat swiveled around. "Guess so," he said.

Teddy Sanders swept a rogue thread off his otherwise immaculate blazer. "You could have given a speech."

"I didn't want to. You know that."

“Yeah, I know. I didn’t want to, either. But I’m the administrator of NASA. It’s kind of expected. You sure you’re okay?”

“Yeah, I’ll be fine.”

“Good,” Teddy said, adjusting his cuff links. “Let’s get back to work, then.”

“Sure.” Venkat shrugged. “Let’s start with you authorizing my satellite time.”

Teddy leaned against the wall with a sigh. “This again.”

“Yes,” Venkat said. “This again. What is the problem?”

“Okay, run me through it. What, exactly, are you after?”

Venkat leaned forward. “Ares 3 was a failure, but we can salvage something from it. We’re funded for five Ares missions. I think we can get Congress to fund a sixth.”

“I don’t know, Venk...”

“It’s simple, Teddy.” Venkat pressed on. “They evac’d after six sols. There’s almost an entire mission’s worth of supplies up there. It would only cost a fraction of a normal mission. It normally takes fourteen presupply probes to prep a site. We might be able to send what’s missing in three. Maybe two.”

“Venk, the site got hit by a 175 kph sandstorm. It’ll be in really bad shape.”

“That’s why I want imagery,” Venkat said. “I just need a couple of shots of the site. We could learn a lot.”

“Like what? You think we’d send people to Mars without being sure everything was in perfect working order?”

“Everything doesn’t have to be perfect,” Venkat said quickly. “Whatever’s broken, we’d send replacements for.”

“How will we know from imagery what’s broken?”

“It’s just a first step. They evac’d because the wind was a threat to the MAV, but the Hab can withstand a lot more punishment. It might still be in one piece.

“And it’ll be really obvious. If it popped, it’d completely blow out and collapse. If it’s still standing, then everything inside will be fine. And the rovers are solid. They can take any sandstorm Mars has to offer. Just let me take a look, Teddy, that’s all I want.”

Teddy paced to the windows and stared out at the vast expanse of buildings. “You’re not the only guy who wants satellite time, you know. We have Ares 4 supply missions coming up. We need to concentrate on Schiaparelli crater.”

“I don’t get it, Teddy. What’s the problem here?” Venkat asked. “I’m talking about securing us another mission. We have twelve satellites in orbit around Mars; I’m sure you can spare one or two for a couple of hours. I can give you the windows for each one when they’ll be at the right angle for Ares 3 shots—”

“It’s not about satellite time, Venk,” Teddy interrupted.

Venkat froze. “Then...but...what...”

Teddy turned to face him. “We’re a public domain organization. There’s no such thing as secret or secure information here.”

“So?”

“Any imagery we take goes directly to the public.”

“Again, so?”

“Mark Watney’s body will be within twenty meters of the Hab. Maybe partially buried in sand, but still very visible, and with a comm antenna sticking out of his chest. Any images we take will show that.”

Venkat stared. Then glared. “*This* is why you denied my imagery requests for two months?”

“Venk, come on—”

“Really, Teddy?” he said. “You’re afraid of a PR problem?”

“The media’s obsession with Watney’s death is finally starting to taper off,” Teddy said evenly. “It’s been bad press

after bad press for two months. Today's memorial gives people closure, and the media can move on to some other story. The last thing we want is to dredge everything back up."

"So what do we do, then? He's not going to decompose. He'll be there forever."

"Not forever," Teddy said. "Within a year, he'll be covered in sand from normal weather activity."

"A year?" Venkat said, rising to his feet. "That's ludicrous. We can't wait a year for this."

"Why not? Ares 4 won't even launch for another five years. Plenty of time."

Venkat took a deep breath and thought for a moment.

"Okay, consider this: Sympathy for Watney's family is really high. Ares 6 could bring the body back. We don't say that's the *purpose* of the mission, but we make it clear that would be part of it. If we framed it that way, we'd get more support in Congress. But not if we wait a year. In a year, people won't care anymore."

Teddy rubbed his chin. "Hmm..."

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MINDY PARK stared at the ceiling. She had little else to do. The three a.m. shift was pretty dull. Only a constant stream of coffee kept her awake.

Monitoring the status of satellites around Mars had sounded like an exciting proposition when she took the transfer. But the satellites tended to take care of themselves. Her job turned out to be sending e-mails as imagery became available.

"Master's degree in mechanical engineering," she muttered. "And I'm working in an all-night photo booth."

She sipped her coffee.

A flicker on her screen announced that another set of images was ready for dispatch. She checked the name on the work order. Venkat Kapoor.

She posted the data directly to internal servers and composed an e-mail to Dr. Kapoor. As she entered the latitude and longitude of the image, she recognized the numbers.

“31.2°N, 28.5°W...Acidalia Planitia...Ares 3?”

Out of curiosity, she brought up the first of the seventeen images.

As she'd suspected, it was the Ares 3 site. She'd heard they were going to image it. Slightly ashamed of herself, she scoured the image for any sign of Mark Watney's dead body. After a minute of fruitless searching, she was simultaneously relieved and disappointed.

She moved on to perusing the rest of the image. The Hab was intact; Dr. Kapoor would be happy to see that.

She brought the coffee mug to her lips, then froze.

“Um...,” she mumbled to herself. “Uhhh...”

She brought up the NASA intranet and navigated through the site to the specifics of the Ares missions. After some quick research, she picked up her phone.

“Hey, this is Mindy Park at SatCon. I need the mission logs for Ares 3, where can I get 'em?...Uh huh...uh-huh...Okay... Thanks.”

After some more time on the intranet, she leaned back in her seat. She no longer needed the coffee to keep awake.

Picking up the phone again, she said, “Hello, Security? This is Mindy Park in SatCon. I need the emergency contact number for Dr. Venkat Kapoor.... Yes it's an emergency.”

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MINDY FIDGETED in her seat as Venkat trudged in. To have the director of Mars operations visiting SatCon was unusual. Seeing him in jeans and a T-shirt was even more unusual.

“You Mindy Park?” he asked with the scowl of a man operating on two hours of sleep.

“Yes,” she quavered. “Sorry to drag you in.”

“I’m assuming you had a good reason. So?”

“Um,” she said, looking down. “Um, it’s. Well. The imagery you ordered. Um. Come here and look.”

He pulled another chair to her station and seated himself. “Is this about Watney’s body? Is that why you’re shook up?”

“Um, no,” she said. “Um. Well...uh.” She winced at her own awkwardness and pointed to the screen.

Venkat inspected the image. “Looks like the Hab’s in one piece. That’s good news. Solar array looks good. The rovers are okay, too. Main dish isn’t around. No surprise there. What’s the big emergency?”

“Um,” she said, touching her finger to the screen. “That.”

Venkat leaned in and looked closer. Just below the Hab, beside the rovers, two white circles sat in the sand. “Hmm. Looks like Hab canvas. Maybe the Hab didn’t do well after all? I guess pieces got torn off and—”

“Um,” she interrupted. “They look like rover pop-tents.”

Venkat looked again. “Hmm. Probably right.”

“How’d they get set up?” Mindy asked.

Venkat shrugged. “Commander Lewis probably ordered them deployed during the evac. Not a bad idea. Have the emergency shelters ready in case the MAV didn’t work and the Hab breached.”

“Yeah, um,” Mindy said, opening a document on her computer, “this is the entire mission log for Sols 1 through 6. From MDV touchdown to MAV emergency liftoff.”

“Okay, and?”

“I read through it. Several times. They never threw out the pop-tents.” Her voice cracked at the last word.

“Well, uh...,” Venkat said, furrowing his brow. “They obviously did, but it didn’t make it into the log.”

“They activated two emergency pop-tents and never told anyone?”

“Hmm. That doesn’t make a lot of sense, no. Maybe the storm messed with the rovers and the tents autodeployed.”

“So after autodeploying, they detached themselves from the rovers and lined up next to each other twenty meters away?”

Venkat looked back to the image. “Well obviously they activated somehow.”

“Why are the solar cells clean?” Mindy said, fighting back tears. “There was a huge sandstorm. Why isn’t there sand all over them?”

“A good wind could have done it?” Venkat said, unsure.

“Did I mention I never found Watney’s body?” she said, sniffing.

Venkat’s eyes widened as he stared at the picture. “Oh...,” he said quietly. “Oh God...”

Mindy put her hands over her face and sobbed quietly.

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“FUCK!” Annie Montrose said. “You have got to be fucking kidding me!”

Teddy glared across his immaculate mahogany desk at his director of media relations. “Not helping, Annie.”

He turned to his director of Mars operations. “How sure are we of this?”

“Nearly a hundred percent,” Venkat said.

“Fuck!” Annie said.

Teddy moved a folder on his desk slightly to the right so it would line up with his mouse pad. “It is what it is. We have to deal with it.”

“Do you have any idea the *magnitude* of shit storm this is gonna be?” she retorted. “You don’t have to face those damn reporters every day. I do!”

“One thing at a time,” Teddy said. “Venk, what makes you sure he’s alive?”

“For starters, no body,” Venkat explained. “Also, the pop-tents are set up. And the solar cells are clean. You can thank Mindy Park in SatCon for noticing all that, by the way.

“But,” Venkat continued, “his body could have been buried in the Sol 6 storm. The pop-tents might have autodeployed and wind could have blown them around. A 30 kph windstorm some time later would have been strong enough to clean the solar cells but not strong enough to carry sand. It’s not likely, but it’s possible.

“So I spent the last few hours checking everything I could. Commander Lewis had two outings in Rover 2. The second was on Sol 5. According to the logs, after returning, she plugged it into the Hab for recharging. It wasn’t used again, and thirteen hours later they evac’d.”

He slid a picture across the desk to Teddy.

“That’s one of the images from last night. As you can see, Rover 2 is facing *away* from the Hab. The charging port is in the nose, and the cable isn’t long enough to reach.”

Teddy absently rotated the picture to be parallel with the edges of his desk. “She must have parked it facing the Hab or she wouldn’t have been able to plug it in,” he said. “It’s been moved since Sol 5.”

“Yeah,” Venkat said, sliding another picture to Teddy. “But here’s the real evidence. In the lower right of the image you can see the MDV. It’s been taken apart. I’m pretty sure they wouldn’t have done that without telling us.

“And the clincher is on the right of the image,” Venkat pointed. “The landing struts of the MAV. Looks like the fuel plant has been completely removed, with considerable damage to the struts in the process. There’s just no way that could have happened before liftoff. It would have endangered the MAV way too much for Lewis to allow it.”

“Hey,” Annie said. “Why not talk to Lewis? Let’s go to CAPCOM and ask her directly.”

Rather than answer, Venkat looked to Teddy knowingly.

“Because,” Teddy said, “if Watney really is alive, we don’t want the Ares 3 crew to know.”

“What!?” Annie said. “How can you not tell them?”

“They have another ten months on their trip home,” Teddy explained. “Space travel is dangerous. They need to be alert and undistracted. They’re sad that they lost a crewmate, but they’d be devastated if they found out they’d abandoned him alive.”

Annie looked to Venkat. “You’re on board with this?”

“It’s a no-brainer,” Venkat said. “Let ’em deal with that emotional trauma when they’re not flying a spaceship around.”

“This’ll be the most talked-about event since Apollo 11,” Annie said. “How will you keep it from them?”

Teddy shrugged. “Easy. We control all communication with them.”

“Fuck,” Annie said, opening her laptop. “When do you want to go public?”

“What’s your take?” he asked.

“Mmm,” Annie said. “We can hold the pics for twenty-four hours before we’re required to release them. We’ll need to send out a statement along with them. We don’t want people working it out on their own. We’d look like assholes.”

“Okay,” Teddy agreed, “put together a statement.”

“That’ll be fun,” she grumbled.

“Where do we go from here?” Teddy asked Venkat.

“Step one is communication,” Venkat said. “From the pics, it’s clear the comm array is ruined. We need another way to talk. Once we can talk, we can assess and make plans.”

“All right,” Teddy said. “Get on it. Take anyone you want from any department. Use as much overtime as you want. Find a way to talk to him. That’s your only job right now.”

“Got it.”

“Annie, make sure nobody gets wind of this till we announce.”

“Right,” Annie said. “Who else knows?”

“Just the three of us and Mindy Park in SatCon,” Venkat said.

“I’ll have a word with her,” Annie said.

Teddy stood and opened his cell phone. “I’m going to Chicago. I’ll be back tomorrow.”

“Why?” Annie asked.

“That’s where Watney’s parents live,” Teddy said. “I owe them a personal explanation before it breaks on the news.”

“They’ll be happy to hear their son’s alive,” Annie said.

“Yes, he’s alive,” Teddy said. “But if my math is right, he’s doomed to starve to death before we can possibly help him. I’m not looking forward to the conversation.”

“Fuck,” Annie said, thoughtfully.

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“NOTHING? Nothing at all?” Venkat groaned. “Are you kidding me? You had twenty experts working for twelve hours on this. We have a multibillion-dollar communications network. You can’t figure out *any* way to talk to him?”

The two men in Venkat’s office fidgeted in their chairs.

“He’s got no radio,” said Chuck.

“Actually,” said Morris, “he’s got a radio, but he doesn’t have a dish.”

“Thing is,” Chuck continued, “without the dish, a signal would have to be really strong—”

“Like, melting-the-pigeons strong,” Morris supplied.

“—for him to get it,” Chuck finished.

“We considered Martian satellites,” Morris said. “They’re way closer. But the math doesn’t work out. Even SuperSurveyor 3, which has the strongest transmitter, would need to be fourteen times more powerful—”

“Seventeen times,” Chuck said.

“Fourteen times,” Morris asserted.

“No, it’s seventeen. You forgot the amperage minimum for the heaters to keep the—”

“Guys,” Venkat interrupted, “I get the idea.”

“Sorry.”

“Sorry.”

“Sorry if I’m grumpy,” Venkat said. “I got like two hours sleep last night.”

“No problem,” Morris said.

“Totally understandable,” Chuck said.

“Okay,” Venkat said. “Explain to me how a single windstorm removed our ability to talk to Ares 3.”

“Failure of imagination,” Chuck said.

“Totally didn’t see it coming,” Morris agreed.

“How many backup communications systems does an Ares mission have?” Venkat asked.

“Four,” Chuck said.

“Three,” Morris said.

“No, it’s four,” Chuck corrected.

“He said *backup* systems,” Morris insisted. “That means not including the primary system.”

“Oh right. Three.”

“So four systems total, then,” Venkat said. “Explain how we lost all four.”

“Well,” Chuck said, “The primary ran through the big satellite dish. It blew away in the storm. The rest of the backups were in the MAV.”

“Yup,” Morris agreed. “The MAV is, like, a communicating *machine*. It can talk to Earth, *Hermes*, even satellites around Mars if it has to. And it has three independent systems to make sure nothing short of a meteor strike can stop communication.”

“Problem is,” Chuck said, “Commander Lewis and the rest of them took the MAV when they left.”

“So four independent communications systems became one. And that one broke,” Morris finished.

Venkat pinched the bridge of his nose. “How could we overlook this?”

Chuck shrugged. “Never occurred to us. We never thought someone would be on Mars *without* an MAV.”

“I mean, come on!” Morris said. “What are the odds?”

Chuck turned to him. “One in three, based on empirical data. That’s pretty bad if you think about it.”

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THIS WAS going to be rough and Annie knew it. Not only did she have to deliver the biggest mea culpa in NASA’s history, every second of it would be remembered forever. Every movement of her arms, intonation of her voice, and expression on her face would be seen by millions of people over and over again. Not just in the immediate press cycle, but for decades to come. Every documentary made about Watney’s situation would have this clip.

She was confident that none of that concern showed on her face as she took to the podium.

“Thank you all for coming on such short notice,” she said to the assembled reporters. “We have an important announcement

to make. If you could all take your seats.”

“What this about, Annie?” Bryan Hess from NBC asked. “Something happen with *Hermes*?”

“Please take your seats,” Annie repeated.

The reporters milled about and argued over seats for a brief time, then finally settled down.

“This is a short but very important announcement,” Annie said. “I won’t be taking any questions at this time, but we will have a full press conference with Q&A in about an hour. We have recently reviewed satellite imagery from Mars and have confirmed that astronaut Mark Watney is, currently, still alive.”

After one full second of utter silence, the room exploded with noise.

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A WEEK after the stunning announcement, it was still the top story on every news network in the world.

“I’m getting sick of daily press conferences,” Venkat whispered to Annie.

“I’m getting sick of hourly press conferences,” Annie whispered back.

The two stood with countless other NASA managers and executives bunched up on the small stage in the press room. They faced a pit of hungry reporters, all desperate for any scrap of new information.

“Sorry I’m late,” Teddy said, entering from the side door. He pulled some flash cards from his pocket, squared them in his hands, then cleared his throat.

“In the nine days since announcing Mark Watney’s survival, we’ve received a massive show of support from all sectors. We’re using this shamelessly every way we can.”

A small chuckle cascaded through the room.

“Yesterday, at our request, the entire SETI network focused on Mars. Just in case Watney was sending a weak radio signal. Turns out he wasn’t, but it shows the level of commitment everyone has toward helping us.

“The public is engaged, and we will do our best to keep everyone informed. I’ve recently learned CNN will be dedicating a half-hour segment every weekday to reporting on just this issue. We will assign several members of our media relations team to that program, so the public can get the latest information as fast as possible.

“We have adjusted the orbits of three satellites to get more view time on the Ares 3 site and hope to catch an image of Mark outside soon. If we can see him outside, we will be able to draw conclusions on his physical health based on stance and activities.

“The questions are many: How long can he last? How much food does he have? Can Ares 4 rescue him? How will we talk to him? The answers to these questions are not what we want to hear.

“I can’t promise we’ll succeed in rescuing him, but I can promise this: The entire focus of NASA will be to bring Mark Watney home. This will be our overriding and singular obsession until he is either back on Earth or confirmed dead on Mars.”

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“NICE SPEECH,” Venkat said as he entered Teddy’s office.

“Meant every word of it,” Teddy said.

“Oh, I know.”

“What can I do for you, Venk?”

“I’ve got an idea. Well, JPL has an idea. I’m the messenger.”

“I like ideas,” Teddy said, gesturing to a seat.

Venkat sat down.

“We can rescue him with Ares 4. It’s very risky. We ran the idea by the Ares 4 crew. Not only are they willing to do it, but now they’re really pushing hard for it.”

“Naturally,” Teddy said. “Astronauts are inherently insane. And really noble. What’s the idea?”

“Well,” Venkat began, “it’s in the rough stages, but JPL thinks the MDV can be misused to save him.”

“Ares 4 hasn’t even launched yet. Why misuse an MDV? Why not make something better?”

“We don’t have time to make a custom craft. Actually, he can’t even survive till Ares 4 gets there, but that’s a different problem.”

“So tell me about the MDV.”

“JPL strips it down, loses some weight, and adds some fuel tanks. Ares 4’s crew lands at the Ares 3 site, very efficiently. Then, with a full burn, and I mean a *full* burn, they can lift off again. It can’t get back to orbit, but it can go to the Ares 4 site on a lateral trajectory that’s, well, really scary. Then they have an MAV.”

“How are they losing weight?” Teddy asked. “Don’t they already have it as light as it can be?”

“By removing safety and emergency equipment.”

“Wonderful,” Teddy said. “So we’d be risking the lives of six more people.”

“Yup,” Venkat said. “It would be safer to leave the Ares 4 crew in *Hermes* and only send the pilot down with the MDV. But that would mean giving up the mission, and they’d rather risk death.”

“They’re astronauts,” Teddy said.

“They’re astronauts,” Venkat confirmed.

“Well. That’s a ludicrous idea and I’ll never okay it.”

“We’ll work on it some more,” Venkat said. “Try to make it safer.”

“Do that. Any idea how to keep him alive for four years?”

“Nope.”

“Work on that, too.”

“Will do,” Venkat said.

Teddy swiveled his chair and looked out the window to the sky beyond. Night was edging in. “What must it be like?” he pondered. “He’s stuck out there. He thinks he’s totally alone and that we all gave up on him. What kind of effect does that have on a man’s psychology?”

He turned back to Venkat. “I wonder what he’s thinking right now.”

LOG ENTRY: SOL 61

How come Aquaman can control whales? They’re mammals!
Makes no sense.