S03E16 - Artemis II

The Multiverse Employee Handbook - Season 3

The Multiverse Employee Handbook has this to say about Going to the Moon:

Humanity did not go to the Moon because it was easy. It went because someone once declared in a speech, very confidently, that it would be hard, and everyone else nodded before fully considering the implications. Consensus was assumed.

The Moon itself was never the point. It was a convenient, visible objective—a large, nearby rock that could be pointed at while explaining ambition, progress, and national confidence to a room full of people who appreciated a good speech. The fact that it involved vacuum, radiation, and catastrophic failure modes was considered character-building.

Decades later, humans are returning with better technology, worse attention spans, and far more meetings. The rhetoric has softened—less destiny, more sustainability—but the impulse is unchanged: go somewhere difficult, do something impressive, and hope history remembers the intention rather than the invoices.

The Handbook notes that the Moon remains exactly where it was last time, patiently orbiting, unmoved by speeches, budgets, or resolve. It will still be there when humanity arrives again, ready to serve its traditional role as a mirror for human ambition and a reminder that difficulty has always been the point.

In summary, going to the Moon is not about rocks, flags, or footprints. It is about standing very far from home, looking back, and deciding that effort itself is a sufficient reason to begin.

——-

You're tuned into The Multiverse Employee Handbook.

Today, we're exploring Artemis II—humanity's first crewed return to lunar space in over half a century. Four astronauts. Ten days. A trajectory that goes around the Moon and comes straight back, which is precisely what the mission was designed to do, regardless of what your marketing department promised stakeholders.

This is the flight that proves we can actually do this again—that fifty years of institutional amnesia, retired engineers, and demolished launch facilities haven't permanently severed our ability to fling humans a quarter-million miles from home and retrieve them intact. It's a test flight. A dress rehearsal. A very expensive proof-of-concept conducted in the vicinity of a celestial body that has never once cared whether we show up.

We're talking about the Space Launch System—the most powerful rocket since the Saturn V, assembled with the urgency of a species that forgot how to do something important and is now slightly embarrassed about it. We're talking about Orion—a spacecraft built with 21st-century technology to accomplish what we last did with slide rules and rotary phones. And we're talking about a crew that includes the first woman, the first person of colour, and the first Canadian to venture beyond Earth orbit, which is either progress or very delayed credit, depending on how generous you're feeling about the previous fifty years.

Artemis II will not land. There is no lander. There are no spacesuits rated for moon walking. This mission's objective is to go very close to the Moon, loop around it using gravity, and return home having proven that all the extremely complicated systems required for "not dying" function as designed.

And if that sounds anticlimactic, consider that we're currently relearning how to do something we supposedly mastered in 1969—except now with modern safety standards, updated physics, and a distressing number of people who need the difference between "going to" and "landing on" explained in slide decks.

But first, gather 'round the trajectory-planning terminal, dear free-return colleagues, for a tale of mission parameters, marketing enthusiasm, and the critical distinction between orbital mechanics and wishful thinking—a distinction that, as we'll discover, becomes significantly more expensive when confused at the executive level.

In the fluorescent-lit realm of Quantum Improbability Solutions, specifically in the Department of Lunar Operations—which existed in a superposition of "adequately funded" and "wildly optimistic about gravitational physics"—the Square-Haired Boss was having what could charitably be called a mission architecture comprehension crisis.

It had started, as these things often do, with a memo that arrived with all the fanfare of a spacecraft achieving escape velocity:

SUBJECT: CONGRATULATIONS - QIS SELECTED FOR LUNAR MISSION CONTRACT

Mission parameters attached. Launch window: Q2 2026. Duration: 10 days. Objective: Lunar flyby with free-return trajectory to validate deep-space systems.

The Square-Haired Boss read the words “lunar mission” and immediately stopped reading.

He summoned the entire company to the atrium.

“Colleagues! We are going to the Moon! QIS will plant its flag on the lunar surface!”

In the back of the crowd, Senior Engineer Martinez felt her stomach perform an unscheduled orbital insertion burn.

“Sir,” she called out, “I should probably clarify the mission parameters—”

“No need for details, Martinez! This is about vision! About destiny! About the first corporate moonwalk in history!”

Martinez tried again. “But sir, the mission brief specifically states—”

“Details later! Right now, we celebrate!”

By that afternoon, Marketing had produced logo concepts featuring the QIS flag on the lunar surface. HR scheduled “Lunar Surface Operations Training” including moonwalk choreography and flag-planting rehearsals. Procurement ordered 847 T-shirts reading “I LANDED ON THE MOON WITH QIS.”

Meanwhile, in the Engineering Department, the actual mission planning team was reading the NASA contract with increasing alarm.

“It’s a flyby,” Martinez said. “A flyby. We go to the Moon. We go around the Moon. We come back. There is no landing.”

“Has anyone told the Boss this?”

“I tried. He was mid-speech about destiny.”

“I’ll send an email.”

SUBJECT: URGENT - MISSION CLARIFICATION RE: LUNAR OPERATIONS

Sir,

• Trajectory: FREE-RETURN path
• Lunar operations: FLYBY ONLY - no landing

• Surface contact: ZERO
• Moonwalks: ZERO
• Flag planting: NOT APPLICABLE

There is no lunar lander on this mission. We will orbit the Moon and return directly to Earth.

The Square-Haired Boss read the subject line and immediately forwarded it to his assistant: “Handle this. Probably just standard engineering pessimism.”

The assistant filed it under “Technical Noise.”

Six weeks before launch, the QIS mission team gathered for the final readiness review.

Engineering presented the flight plan: an elegant free-return trajectory around the Moon.

Marketing presented their media strategy: a minute-by-minute breakdown of the historic lunar landing, complete with live-streamed flag-planting.

HR presented crew training status: all personnel had completed media coaching for lunar surface press conferences.

Procurement presented inventory: 847 T-shirts awaited distribution.

Martinez stood up.

“Sir, this mission does not include a lunar landing.”

The room went silent.

“I’m sorry?” said the Boss.

“We’re not landing on the Moon. We’re flying around it. Free-return trajectory. We approach the Moon, use its gravity to slingshot back to Earth, and return home. There is no landing. There are no moonwalks.”

The Boss’s hair briefly achieved a non-Euclidean geometry.

“But… the contract said lunar mission.”

“Yes. A lunar flyby mission. Around the Moon, not on it.”

“But Marketing has flags.”

“Marketing was not copied on the mission brief.”

“HR scheduled moonwalk training.”

“HR was working from Marketing’s interpretation of your announcement speech.”

“Procurement ordered T-shirts.”

“Based on HR’s training schedule, based on Marketing’s flags, based on your speech, based on reading only the first two words of the NASA contract.”

The Boss looked around the table. “Did anyone else know this?”

A forest of hands slowly rose.

“And no one thought to mention it?”

“We sent emails,” offered Engineering.

“We scheduled meetings,” added HR.

“We included diagrams,” said Martinez.

The Boss leaned back. His hair settled into a shape that resembled resignation.

“So we have 847 T-shirts for a mission where we don’t land?”

“Correct.”

The Boss was quiet for a moment.

“Can we change the T-shirts to say ‘I WENT NEAR THE MOON WITH QIS’?”

“There’s a reprint fee.”

“Do it. Cancel the boots. Tell Marketing we’re pivoting.”

He turned to Martinez.

“From now on, when Engineering sends a mission-critical clarification, I want you to also send it to Marketing, HR, and Procurement simultaneously. And schedule a meeting. With all department heads. Where we actually discuss the thing."

Launch day arrived. The spacecraft approached the Moon. Swung around its far side. Emerged on the return trajectory.

No landing. No flags. No moonwalks.

Just a beautiful, precise demonstration of orbital mechanics working exactly as Engineering had promised.

The Boss turned to Martinez. "This is actually quite elegant."

"Yes, sir."

"Going around something is just as impressive as landing on it."

"Exactly, sir."

Three days later, the crew splashed down safely. Mission success. The revised T-shirts—"QIS: WE WENT TO THE MOON (AROUND IT, SPECIFICALLY)"—sold moderately well.

And the following week, the Boss announced a new policy:

Mandatory Inter-Departmental Mission Brief Review Protocol

All mission-critical information would be shared across Engineering, Marketing, HR, Procurement, and Executive Leadership simultaneously. With diagrams. And a mandatory comprehension quiz.

Because as the QIS Lessons Learned report concluded: "The most sophisticated trajectory planning in the solar system means nothing if Marketing is designing flags for the wrong celestial body."

And Martinez added a footnote: "Also: read your emails. Especially the ones with 'URGENT' in the subject line."

——-

And that brings us to the fascinating science behind Artemis II—and why "just" flying around the Moon is monumentally more complex than it sounds.

Unlike Hollywood's version where spacecraft zip to the Moon in an afternoon montage, Artemis II follows actual physics. This is NASA's test flight—validating every system before attempting a landing. Ten days. Four astronauts. A quarter-million-mile journey to prove we can do this safely.

Here's what makes this necessary: the Apollo programme ended in 1972. That's over fifty years ago. The engineers who built the Saturn V have retired or passed away. The manufacturing facilities were demolished. The institutional knowledge—how to actually do this—largely evaporated.

NASA had to rebuild everything from scratch. The Space Launch System is the most powerful rocket since the Saturn V, but it's entirely new engineering. Orion spacecraft? Completely modern design with 21st-century avionics. Even the launch facilities at Kennedy Space Center were reconstructed.

Artemis I flew in November 2022—an uncrewed test that travelled 270,000 miles from Earth and validated the basics. But it also revealed problems: the heat shield charred more than expected, delaying this crewed mission from 2024 to 2026.

Artemis II will test everything humans need to survive deep space: life support in the radiation environment beyond Earth's protective magnetosphere, navigation systems during the lunar far-side blackout when there's no communication with Earth, and that critical heat shield on return—because coming back from the Moon means hitting atmosphere at 40,000 kilometres per hour.

This validates everything required for Artemis III's landing attempt in 2027 or 2028. You can't land on the Moon if you can't safely get there and back first.

When we return from this brief trajectory adjustment, we'll meet the four astronauts making history, explore why free-return orbits are humanity's cosmic insurance policy, and discover what China's 2030 landing goal means for the new space race.

Welcome back, my gravitationally-challenged colleagues!

Before the break, we left the Square-Haired Boss learning that "to" and "on" are very different prepositions when discussing lunar missions. Now let's explore why returning to the Moon required NASA to essentially relearn everything from scratch.

The last humans to venture near the Moon were the crew of Apollo 17 in December 1972: Eugene Cernan and Harrison Schmitt, who walked on the surface, and Ronald Evans, who remained in lunar orbit. Twelve astronauts had walked on the lunar surface across six missions. Then—complete stop. For over fifty years, humanity simply didn't go back.

That gap wasn't just a scheduling issue. It was institutional amnesia on a civilizational scale. The engineers who designed the Saturn V retired. Many have since passed away. The technicians who knew how to weld fuel tanks for lunar missions found other work. The manufacturing facilities were demolished to make room for other projects. The companies that supplied specialised parts went out of business or pivoted to different markets entirely.

NASA didn't just lose the rockets. It lost the knowledge of how to build them.

The original Apollo blueprints still exist, but they're insufficient for modern safety standards. Apollo operated under 1960s-era risk tolerance—considerably more cavalier than today's approach to not killing astronauts. The computing power that guided Apollo 11 to the lunar surface had less processing capability than a modern smartphone. The heat shield technology used ablative materials that are no longer manufactured. The life support systems relied on components that haven't been produced in decades.

Everything had to be rebuilt. From scratch. To modern specifications.

The Space Launch System—SLS—is the most powerful rocket since the Saturn V, but it's entirely new engineering. Yes, it uses Space Shuttle-derived engines and boosters, but integrated into a configuration that's never flown before. Orion spacecraft shares nothing with Apollo beyond the basic concept of "capsule that keeps humans alive in space." Modern avionics, digital flight controls, advanced life support, updated heat shield materials—it's a 21st-century vehicle attempting a 20th-century mission profile.

Launch Complex 39B at Kennedy Space Center, the pad that will send Artemis II to the Moon, was completely reconstructed. New mobile launcher. New umbilical systems. New propellant handling. Even the recovery operations had to be redesigned for Orion's different splashdown profile compared to Apollo.

This is why Artemis I mattered so desperately.

In November 2022, an uncrewed Orion spacecraft launched atop SLS for a 25-day shakedown cruise. It travelled 270,000 miles from Earth—a record for any spacecraft designed to carry humans. The mission tested the heat shield, guidance systems, trajectory planning, and a thousand other critical details that determine whether astronauts come home alive or become permanent orbital debris.

The flight was largely successful. Which is why the problems it revealed were so significant.

The heat shield charred more than predicted. Not catastrophically—Orion returned intact—but more than models suggested it should. That's the sort of discrepancy that makes engineers very nervous when human lives will depend on the next iteration working correctly. Investigation and analysis pushed Artemis II from its original 2024 target to April 2025, then to September 2025, and now to no earlier than February 2026.

Because unlike software, you can't patch a heat shield mid-flight.

The corporate analogy writes itself: imagine your company trying to recreate a product from fifty years ago. The original engineers have retired or died. The manufacturing facilities were demolished decades ago to save on property taxes. The suppliers who made the specialised components have long since pivoted to different industries or ceased to exist. Your institutional documentation consists of incomplete blueprints that don't meet current safety regulations and some microfilm that requires a machine you no longer own to read.

But Marketing has already promised clients the product will work exactly like the original. And unlike typical corporate promises, if this one fails, people don't just lose money—they die in the vacuum of space while the world watches on live television.

That's the challenge NASA faced. That's why returning to the Moon, despite having done it successfully six times in the early 1970s, required essentially starting over. The knowledge didn't transfer cleanly across generations. The industrial base moved on. The infrastructure was dismantled.

And now, after over a decade of development and tens of billions of dollars, we're finally ready to try again—starting with a mission that proves we can get there and back without landing, because apparently that's the responsible way to approach putting humans in deep space after a fifty-year gap in institutional memory.

Four astronauts will make history on Artemis II, launching in early 2026.

Commander Reid Wiseman brings 165 days of ISS experience from Expedition 41, two spacewalks, and a background as a naval aviator and test pilot with systems engineering expertise. Pilot Victor Glover will become the first person of colour to travel to the Moon—he flew on SpaceX Crew-1, spent 168 days on the ISS, and completed four spacewalks. Mission Specialist Christina Koch will be the first woman to travel to the Moon, holding the record for the longest single spaceflight by a woman at 328 days, and participated in the first all-female spacewalk. And Mission Specialist Jeremy Hansen will be the first non-American and first Canadian to travel beyond low Earth orbit—remarkably, this will be his first spaceflight ever. Most astronauts get a few Earth orbit missions before attempting lunar distance. Hansen gets the Moon first.

The ten-day mission follows a carefully choreographed profile. Days 1-2: high Earth orbit checkout, testing Orion systems with crew aboard. Days 3-4: trans-lunar injection—the burn that sends them toward the Moon on a free-return trajectory, meaning if everything fails, the Moon's gravity will automatically sling them back to Earth without requiring additional propulsion. Days 5-7: lunar flyby, swinging around the far side where there's no communication with Earth—the first humans to see it in person since 1972. Days 8-10: coast back and prepare for splashdown in the Pacific.

They're testing everything required for Artemis III: life support in deep space radiation, guidance and navigation systems, communications during the far-side blackout, crew habitability, that critical heat shield on return, and docking systems needed for future Gateway and Human Landing System rendezvous.

There is no lunar lander on this mission. That's Artemis III's job—currently targeting mid-2027, though 2028 or 2029 seems more realistic.

And here's where it gets complicated.

The Human Landing System is SpaceX's Starship HLS—a fifty-metre-tall vehicle that's essentially a fifteen-storey building designed to land on the Moon. It requires in-orbit refuelling: multiple tanker flights, possibly fourteen or more, filling a propellant depot in Earth orbit before the HLS itself refuels and heads to lunar orbit. There it will rendezvous with Orion in a Near-Rectilinear Halo Orbit, two astronauts transfer over, descend to the south pole region, spend roughly six-and-a-half days conducting four to five spacewalks, then ascend back to Orion for the trip home.

SpaceX is developing Starship HLS while simultaneously developing Starship for Mars missions, satellite deployment, and whatever Elon Musk tweets about on any given Tuesday. Their objectives don't always align with NASA's schedule or priorities, which creates a certain tension when your lunar landing system is being built by a company whose founder is more interested in colonising Mars than returning to the Moon. NASA's Safety Panel has warned Starship HLS "could be years late," and cryo-propellant transfer at the scale required has never been attempted.

Meanwhile, China is targeting a crewed lunar landing by 2030 using their Mengzhou crew vehicle, Lanyue lander, and Long March 10 heavy-lift rocket. Two astronauts for several days on the surface. They unveiled their lunar spacesuits in September 2024 and are sending robotic precursors—Chang'e 7 in 2026, Chang'e 8 in 2028—building on their successful Chang'e missions, including the first far-side sample return in 2024. They're planning an International Lunar Research Station with Russia by 2035.

Both nations are targeting the south pole region, where permanently shadowed craters contain water ice—a resource for future missions and the reason the terrain is scientifically interesting but operationally challenging.

This is the new space race. Not Cold War ideology, but geopolitical positioning. A former NASA administrator stated bluntly: "Countries that get there first write the rules." The stakes include scientific discovery, long-term infrastructure, technology development for Mars missions, international prestige, and establishing norms for space resource utilisation.

The corporate analogy is precise: two companies racing to dominate an emerging market. One has the legacy brand and historical credibility but aging infrastructure and bureaucratic inertia. The other has newer systems and centralised decision-making. Both are spending billions. The winner gets to set industry standards. The loser explains to shareholders why they're second.

Artemis II is the test drive—proving we can safely get there and back before committing to landing. It's the prerequisite nobody wants to do but everyone knows is necessary. Like test-driving your new company car around an empty car park before trusting it for a cross-country client meeting.

Except the car park is 240,000 miles away, the test drive takes ten days, and if anything fails, four astronauts die in vacuum while the world watches on live television.

So perhaps slightly higher stakes than typical product testing.

Well, my parabolically-inclined colleagues, we've reached the end of another quantum trajectory planning session.

Today we've learned that Artemis II isn't "just" a flyby—it's the critical validation before attempting a landing. Four astronauts—Wiseman, Glover, Koch, and Hansen—will make history in early 2026, becoming the first humans near the Moon in over fifty years. They'll test every system required to prove we can do this safely: life support in deep space radiation, navigation during the far-side blackout, and that heat shield on return travelling at 40,000 kilometres per hour.

We've discovered that returning to the Moon required rebuilding everything from scratch. Fifty years of institutional knowledge loss isn't just an inconvenience—it's a complete reset. The engineers retired. The facilities were demolished. The suppliers went out of business. NASA essentially had to relearn how to do something it supposedly mastered in 1969, except now with modern safety standards that frown upon the Apollo programme's rather cavalier approach to not killing astronauts.

And we've learned that success on this mission isn't measured by landing—it's measured by proving we can land safely on the next one. Artemis III in 2027 or 2028 will attempt the actual touchdown, assuming SpaceX's Starship HLS is ready, which is optimistic given that it's being developed by a company whose objectives occasionally diverge from NASA's timeline. Meanwhile, China is racing toward their own 2030 landing, making this less a scientific endeavour and more a geopolitical sprint to write the rules for lunar resource utilisation.

The philosophical observation remains: sometimes the greatest achievement is successfully completing the boring prerequisite. In the multiverse of space exploration, every orbit exists in a superposition of "expensive practice run" and "essential stepping stone" until you actually attempt the landing and discover whether your decades of preparation were sufficient.

Though I suspect somewhere in the quantum foam of reality, there's a universe where the Square-Haired Boss successfully landed on the Moon using PowerPoint slides and marketing enthusiasm alone, and a universe where QIS's mission patch featured the correct preposition from the beginning.

We don't inhabit those universes. We inhabit this one, where going TO the Moon and going ON the Moon are very different propositions separated by billions of dollars, years of development, and one extremely large Starship that may or may not be ready when needed.

Want to explore more quantum trajectory planning? Visit us at multiverseemployeehandbook.com where you'll find the latest space news, mission updates, and our new blog series: "A Manager's Guide to Orbital Mechanics."

And if you've enjoyed today's mission parameter clarification, why not share it with a fellow space enthusiast? Perhaps someone who's still confused about the difference between a flyby and a landing, or anyone who needs reminding that sometimes the most important missions are the ones that prove you can do the thing before actually doing the thing. Spread our signal like electromagnetic radiation through the vacuum—reliably, at the speed of light, and with absolutely no sound whatsoever.

This is your quantum-coherent correspondent, reminding you that in the multiverse of lunar missions, we're all just trying to understand the critical distinction between going TO the Moon and going ON the Moon—and apparently, billions of dollars in government contracts depend on getting that preposition exactly right.

And somewhere back at QIS headquarters, the Square-Haired Boss has just received a new memo: "Exciting news, team—we're landing on Mars!" The engineering department's collective groan has achieved escape velocity. Martinez is already updating her CV. And Procurement is frantically trying to cancel an order for 847 T-shirts that read "QIS: FIRST BOOTPRINTS ON MARS."

Because some lessons, apparently, require multiple orbits to fully sink in.