Case Study Creation

Members :

1. Steve Waugh - NASA Astronaut
2. Bharath Williamson - NASA Administrator
3. Mitchell Starc - Flight Director
4. Evinia Sandra - Commander
5. Other Crew Members and Staff

Learning Objectives :

1. Why is integration important in any group work.
2. What are the decision making traps a team might fall into.
3. Why listening to every team member's idea is important.
4. How a leader should take a decision when they are unaware of the consequences
5. Why is rapport such a important factor in teamwork
6. The importance of proper planning, coordination, and meetings.

The Story :

NASA astronaut Steve Waugh is left stranded on Mars when the crew of the Ares 3 mission are forced to evacuate their landing site in Acidalia Planitia on sol 18 of their expedition due to an intense dust storm with high winds. During the evacuation. Waugh is impaled by an antenna and swept away. Also due to zero visibility, the crew presumes that Waugh is dead.

Turns out, he is injured but alive. With no way to contact Earth, Waugh must rely on his scientific and technical skills to survive, growing potatoes in the crew's Martian habitat (or Hab) and burning hydrazine to make water. He starts documenting his experiences.

Back on earth, NASA discovers that Waugh is alive when satellite images of the landing site show evidence of his activities. They contemplate on rescuing him, but withhold the news of his survival from the rest of the Ares 3 crew, on their way back to Earth aboard the Hermes spacecraft so as not to distract them.

Waugh plans to drive 3,200 kilometres to Schiaparelli crater when a subsequent mission, Ares 4, lands there in four years. He begins modifying one of Ares 3's rovers for the journey, adding solar cells and an additional battery. He makes a long test drive to recover the unmanned Pathfinder lander and Sojourner rover and brings them back with him to the Hab, allowing him to contact Earth.

Mitchell Starc, the Ares 3 flight director, convinces NASA Administrator Bharath Williamson to allow him to inform the Ares 3 crew of Waugh's survival; his crewmates are thrilled, except for Evinia Sandra, the commander, who is guilt-stricken for leaving him behind.

As Waugh's second potato harvest approaches, a tear in the canvas at one of the Hab airlocks breaches, collapsing the Hab and cannoning Waugh away from it, breaking his suit visor. Waugh survives and repairs the Hab, but his plants are dead, threatening him again with starvation. NASA hastily prepares an unmanned probe to send Waugh supplies, but the probe's rocket disintegrates on liftoff. A deal with the China National Space Administration provides a ready booster to try again, but with no time to build a probe with a soft-landing system, NASA is faced with the unlikely prospect of building one whose cargo will survive crashing into the Martian surface at 300 metres per second. Meanwhile, an astrodynamicist named Rich Purnell has discovered a slingshot trajectory that could get Hermes and the Ares 3 crew back to Mars on a much-extended mission to save Waugh, using the Chinese rocket to send a resupply probe to Hermes as it

passes Earth. Williamson vetoes the "Rich Purnell Maneuver" as involving too much risk for the other crew members, but Mitch secretly emails the maneuver to Hermes. All five of Waugh's crewmates agree to the plan, and once they begin the maneuver, NASA is compelled to send them the supply ship to save their lives.

Waugh resumes modifying the rover, since the new rescue plan requires him to drive to Ares 4's scheduled landing site and lift off from Mars in that mission's Mars Ascent Vehicle (MAV), which has already made an unmanned landing as part of the long preparations for that visit.

The resupply probe launches and docks with Hermes.

Waugh reaches the MAV and receives instructions on the radical modifications to the MAV that are necessary to reduce its weight and intercept Hermes during its flyby. The modifications leave a large hole in the front of the MAV, which Waugh covers with Hab canvas. During launch, the canvas patch tears, slowing the liftoff and leaving the MAV on a course too far from the Hermes for Waugh to be rescued. Sandra develops a plan to intercept the MAV by firing Hermes' attitude thrusters, then slowing down to match the MAV's velocity by blowing a hole in the Hermes front airlock with an improvised sugar-and-liquid-oxygen oxyliquit bomb. A crewman on a tether uses a Manned Maneuvering Unit to reach Waugh aboard the MAV and carry him back to Hermes.
Waugh and his crew return to earth safely.

Discussion Questions :

1.What decision-making traps did Waugh and others fall into?

2. What contributed to NASA's reluctance to inform other crew members that Waugh is still alive?

3. How did Sandra's bias towards her own action plan affect the rest of the crew members?

4. What communication strategies would have helped Waugh communicate more effectively?

5. What was the main problem in this story? How could it be avoided in the future?

6. If you were waugh and got stranded in mars, what would you do to return to earth?

Key Terms :

1. Professional group: A group that meets out of necessity with a common goal.
2. Ethics: Working through dilemmas to decide what is right.
3. Managing group conflict: Strategies for managing interpersonal conflict.
4. Self-regulation: controlling or redirecting disruptive impulses and moods
5. Decision Making Traps: Distortions and biases that can hinder people's abilities to make a clear and well thought out decision.
6. Meeting preparation: Creating a purpose, agenda, audience, and interaction design for a meeting.

7. Emotional intelligence: The ability to recognize/understand emotions in yourself and others.
8. Integration: Incorporating a new member into a group environment.
9. Agenda: The necessary material, topics, and time limits that are sent before the meeting starts.

Further Readings :

1. Boss, R. W. (1979). Essentials for successful organization development efforts. Group & Organization Management, 4(4), 496-504.
2. Herman, R., & Renz, D. (1999). Theses on nonprofit organizational effectiveness. Nonprofit and Voluntary Sector Quarterly, 28(2), 107-126.
3. Herman, R., & Renz, D. (2008). Advancing nonprofit organizational effectiveness research and theory: Nine theses. Nonprofit Management & Leadership, 18(4),399-415.
4. Interaction Design Basics. (n.d.). Retrieved December 07, 2016, from https://www.usability.gov/what-and-why/interaction-design.html