ASEN 5148 Midterm
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1.

a) Describe 5 activities that you, as the manager, would perform during the first hour of the day.

- Ensure no one was hurt
- Ensure the area is safe (chemical leaks, electrical)
- Have the clean room team carefully sweep for debris that has broken into small pieces and scattered throughout the room
- Inform stakeholders so they can expect delays
- Have teams start looking for information on how much impact force their hardware can take and be expected to work nominally.

b) Who is to blame?

The lead test conductor should not have allowed taking bolts from a test platform with hardware on it. Bolts and wasted test time are less costly than an entire satellite. Even if such a thing is allowable, he/she should have signed off on the bolts' removal and replacement, making the highest-level ensure the proper steps were followed.

c) What process changes would you implement to prevent this again?

I would not allow removal of hardware from the vehicle or test stand without notification and buy-in from the relevant stakeholders (test conductors of other shifts, hardware integrators). Additionally, I would not allow the removal of hardware securing a spacecraft to a platform for operations unrelated to that spacecraft.

2. Write a one page summary of your impressions of the Author's views.

Orbiting the Giant Hairball is an entertaining and informative narrative centered on a creative individual's experience in the corporate world. Gordon MacKenzie writes about how our culture stifles creativity, why large organizations become bloated bureaucracies, and how to overcome these forces to thrive. I will also frame my experiences and impressions from the American space program in this context.

The key theme throughout the book is that our culture seeks to suppress creativity, all the while loving the rewards that come with it. In one of the first anecdotes told, children are less inclined to identify as being creative. In another anecdote, a woman is shamed by her adult colleagues for sharing a drawing when asked. MacKenzie says conditioning happens because in the end, our society – and the corporate world – wants to minimize risk by clinging to past realities and successes. Creativity and innovation become stifled. In business settings, this leads to stagnation and death.

Aversion to risk is very well-known to the spacecraft community. Missions can cost millions or billions of dollars, and often there is only one chance for success. Human missions have additional profile in the public eye, while some debate their merit. All of this puts NASA in the hard spot of being inspiring and innovative with the looming shade of failure's consequences. So the organization sticks to tried-and-true methods and suppliers while incrementing technology at a slow pace.

The book's namesake is MacKenzie's term for the “tangled, impenetrable mass” organizations become as they grow. This transformation is inevitable, he argues, because such an organization had to be successful at one point, and they rely on those past successes for their bottom line. He does not offer a cure for the hairball, but does offer one for those in its grasp: orbit it. MacKenzie defines “orbiting” as being able to take advantage of everything the hairball can offer while avoiding getting sucked into the tedium.

As an engineer entering his eighth year of his career, this description really resonated with me. I have seen the hairball in various programs, in the government and at a large company. The hairs the make up the mass are many: design milestones, reviews, meetings upon meetings, layers of accountability. All of these hairs were implemented because they were attributed to success at some point (rightfully so in many cases). But as a staff member, it's easy to get sucked into the vortex and lose your passion and creativity when faced with these. Orbiting, if it works, sounds like a good way to utilize the resources of the hairball without getting lost and losing passion to the hairball

MacKenzie offers some advice to achieve orbit. Foremost is to have the courage to make mistakes. Know that it can take a lot of invisible work up front to produce a tangible result, and don't be afraid of failing (learn from your mistakes). The invisible work aspect applies to learning on the job, in my opinion. I have found that businesses tend to want you to be fully productive during the time they pay you. Unfortunately, that leaves little time for training on tangential subjects or outside thought that could lead to gains on the job. I have already taken steps to further my education for this reason.

The other advice focuses on your part in an environment that fosters creativity. First, to work with the bureaucrats in your path to find a “harmonious solution” to your mutual problems (after all, the bureaucrat is just doing their job). Many people see such bureaucrats as imposing unnecessary rules upon a victim who just wants to do the right thing. But focusing on a solution to both your problems is the best method, rather than blowing up or giving up. Finally, he challenges the reader to enable new ideas when the institution resists change. The idea is to enable your coworkers, which fosters a more creative work environment, which enables you to be more creative. It's no secret that happy people

make a happier workplace, so I'm inclined to agree with these points.

Overall, I thought MacKenzie was on-point. While his situation wasn't aligned with the aerospace industry, the main points rang true. After reading, I thought of ways to incorporate what I had learned into my professional life. I'm optimistic that this new-found wisdom will help me better channel my talents.