



NASA

M E M O R A N D U M

To: Sean O’keefe, the Administrator of NASA
From: Calvin Schomburg (Krisada Tawee)
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Subject: **Recommendations to Prevent Disasters in the Future**

NASA is an outstanding organization. We have achieved success in creating amazing things that never happened before in the world. Our people are committed in pursuing our incredible and unique goals. Nevertheless, the Columbia disaster is an unexpected incident conveying the sense of loss to our organization. The reasons that “the foam did it, the institution allowed it” reflect our deep-seated problems. Under our traditional system, NASA has conflicting goals of cost, schedule and safety management leading a terrible catastrophe. In this memo, I will provide recommendations to solve the issue of improper management through the use of the structural framework.

Underlying the structural perspective or framework are some core assumptions, five of which apply to this situation.

- ✓ “Organizations exist to achieve established goals and objectives.
- ✓ Appropriate forms of coordination and control ensure that diverse efforts of individuals and units mesh.
- ✓ Organizations work best when rationality prevails over personal preferences and extraneous pressures.

- ✓ Structures must be designed to fit an organization's circumstances (including its goals, technology, workforce and environment).
- ✓ Problems and performance gaps arise from structural deficiencies and can be remedied through analysis and restructuring" (Bolman & Deal, 2003, p.45).

Analysis of the Situation

A piece of foam shed from the shuttle's fuel tank during the ascent made a hole in the leading edge of Columbia's left wing. Sixteen days later, during the re-entry, hot gases getting in through the hole destroyed the spacecraft and ended the life of seven crewmembers on board. The CAIB members point the finger of blame to the technical and organizational failures.

Even though the CAIB concludes that there is no individual to take responsibility, still the evidence shows that NASA management failed to realize the relevance of engineering concerns for safety. However, I myself agree with the board that the organizational structure and processes are significantly flawed that allow safety to be compromised no matter who is in the decision-making positions. It is the influence from the organization that shapes people into such directions. Therefore, this is the organization accountability to answer what went wrong in the place.

The question remained to our organization is what can we do to prevent such a catastrophe? We have tolerated lost tiles and shedding foam. We have downplayed the threat of foam as something that normally exists with no negative effects. We have viewed the flaw as normal and accepted it as an understood risk. Why did we expand the boundary of acceptable risk? In addition, our communication in the crisis situation is significantly inefficient. The important information cannot flow fluently but get stuck at one point. While the engineering team was concerned about the life-or-death situation of the crews, why was the management

team still required too much quantitative data to ensure the decision-making? These are the results from the deficient structure, which can be described from the structural framework as the following.

1. *Conflicting Goals*-- Our goals and objectives were set inappropriately. NASA operated with a constrained budget but had ambitious launch schedules. The White House, Congress, and NASA Headquarters created the unrealistic goals and objectives, which forced us to compromise any factor for goal attainments. The measure of NASA's success became the same as a transportation company: We had to do too much work with too little money. However, we are the American technological leader, and we are a research organization, so we cannot be on a fixed budget. As a result, the shedding foam issue was hidden behind since it can affect another operation and time schedule.

2. *Organizational Barriers*-- Our organization has a strong hierarchical structure. There are so many levels of both formal and informal chains of command. They are barriers that block our communication. "Hierarchy provides an effective means for controlling situations that are fairly certain but in uncertain situations can encounter information and decision overload" (Morgan, 2006). In the crisis of Columbia's case, while engineers put forward the concern of negative effects from the hole on the orbiter, the information didn't get through to the one who can take actions or NASA Headquarters but got stuck at the management team who misunderstood its importance.

3. *The Process of Proofs*-- From an engineer's viewpoint, our recommendation cannot be practical if someone in power does not agree with it. Particularly, our organizational structures are divided into many sections, in which there are their own standpoints. "Units tend to focus on their priorities and strike out on their own" (Morgan, p.50). The management team wants to keep

going on its operations and schedules while the engineering team is concerned more about safety. The different perspectives create the process of proofs, which insists on the quantitative information. In such a crisis, while the engineering team provided tentative information about severe effects from the hole on the orbiter, the management teams still required too many proofs to convince them because they were concerned about their achievement.

Recommendations

In order to respond to ambiguous threats in the future, NASA must restructure the organization to facilitate better decision-making and communication. To encourage officers to speak up and leaders to listen, NASA's employees must be given the opportunity to participate in the planning of the vision's implementation. This will allow them to make their values clear to the executives and result in reasonable plans and goals. Also the engineering team should be able to communicate directly to the people in power, rather than through the management team, so that they can feel heard and included.

I suggest the following:

✓ *Create realistic and practical goals with the appropriate budget and timetable.* Given that NASA was established under political issues, our goals and objective have deviated from a normal research organization. By setting down-to-earth goals and allowing employees to participate in goal setting processes, NASA will have realistic and practical goals with more understanding and commitment from employees. Also with sound budgeting and time schedules, we will create phenomena for the world again.

✓ *Shorten hierarchy.* Our organizational structure does not allow effective coordination and communication. With hierarchical barriers and long chains of command, each unit tends to focus on its own priority. As a result, the information cannot go through but get stuck at one point. In

the organization that handles high-risk situations, the dynamic flexibility is important. With flatter hierarchy, our organization will have more flexibility and more channels of communication.

✓ *Create an independent engineering team.* This will make the information more effective and communication more direct. By allowing engineers to communicate directly to the people in power or NASA Headquarters, the information will be practical. The independent engineering team will inform technical data to the headquarters, especially about safety issues before launching orbiters and maintain total authority to postpone schedules. Also while in the spaceflight operation, the engineering team will have opportunity in presenting their idea to both the management team and the executives.

Strengths and Limitations

The strength of the recommendations is long-term benefit. “Restructuring is a challenge process that consumes time and resources” (Bolman & Deal, 2003, p.83). Realistic goals, flatter hierarchy and the independent engineering team will create additional value for the organization. With the restructuring of NASA, I also believe an increase in collaborations will result.

However, “restructuring is a powerful but high-risk tool” (Bolman & Deal, 2003, p.92). It will be hard for executives to avoid political pressure from the White House and Congress in setting realistic goals since our success also means some politicians or political parties’ victories. Also some people in power of NASA might feel uncomfortable and not agree with flatter hierarchy. When redesigning the organization it may produce confusion and tension or even resistance among the organization.

Conclusion

From the structural frame, I highlight the specific issues in NASA due to the improper management. By setting reasonable goals and providing a better opportunity for members to be involved in the planning as well as fostering communication across the organization, NASA would be able to bring back confidence in doing amazing things for mankind. I specially recommend restructuring the organization to get more coordination in preventing such disasters in the future.

References

Bolman, L., Deal, T. (2003). *Reframing organizations: artistry, choice, and leadership, third edition*. San Francisco: Jossey-Bass.

Morgan. G. (2006). *Images of organization, updated edition*. Thousand Oaks, California: Sage Publications.