

produce performance-reducing stress, increased possessiveness, defense of space and objects . . . and a greater tendency to personal isolation." Overall, these findings reveal that social isolation can be detrimental to human reliability both on and off the job. This conclusion has been confirmed by at least one former member of the nuclear military.

A final source of stress is the "familiarity syndrome." The more accustomed to operating a system humans become, the less attention they tend to pay to ensuring that no serious problems arise. The January 1986 Challenger space shuttle accident, the April 1986 Titan 34D rocket explosion, and the April 1986 Delta rocket failure seem to have "shattered" the complacency that years of "normal" missions had created. These accidents, however, do not rule out future missions in the way that nuclear war would almost certainly rule out future nuclear wars.

The final dimension of human reliability dealt with by Dumas is the effect of bureaucracy. He finds the most serious problem here to be the transmission of valid information from the bottom operational levels of the military hierarchy to the top. The reluctance of subordinates to point out their own or their superiors' mistakes, personal beliefs, rigid world views and concepts of loyalty have been shown to weaken the transmission of accurate information to the top. In this way dangerous problems may go unrecognized.

In business it has been recognized that the reluctance to impart bad news to the top is a widespread problem.

The consensus seems to be that there are basically two ways to handle this problem: create an organizational culture, an atmosphere of open communication and trust with informal channels of communication available; sharply reduce the degree of hierarchy in the organization.

Unfortunately, military organizational practices run counter to these sorts of reform. In addition to inhibiting upward communication, organizational barriers can also cause downward directives to be distorted, diverted or ignored:

One spectacular example of this command and control problem with obvious relevance to the nuclear arms situation, played a key role in the Cuban Missile Crisis of 1962, probably the closest the world has yet come to intentionally initiated full-scale nuclear war. At that time Soviet Premier Nikita S. Krushchev offered to withdraw the Russian missiles from Cuba if, among other things, the United States removed its nuclear-tipped missiles from Turkey. According to Attorney General Robert F. Kennedy, the President had asked the State Department to reach an agreement with Turkey "on several occasions" over the preceding 18 months, to withdraw the US Jupiter missiles from its territory. Apparently, on the last of these occasions (summer