agreement made in the 1970s by both academies to use the NRC as a common operating organization, says one NAE source. NAE members say the council was also concerned about Liebowitz's attempts to fire experienced staff and his failure to provide them with a clear framework for his reforms. These concerns led the NAE council to pass a resolution in September restricting Liebowitz's control over personnel matters and the NAE's finances.

Relations between Liebowitz and the NAE council have continued to deteriorate since then, according to sources in both the NAS and NAE. The issue came to a head last month at the annual meeting of both groups in California. The NAS council unanimously agreed that it "has no confidence in Harold Liebowitz's capacity to provide leadership for the National Research Council," where he is second in command to NAS President Bruce Alberts. The resolution removes his authority to represent the NRC, instructs Alberts not to assign him any duties, and slashes NRC funds set aside for the vice chair. It also cites his "adverse impact on Research Council staff productivity and morale." In response, Liebowitz told *Science* this week that "the clear purpose of the NAS resolution was to thwart [my] efforts to correct management procedures in both the NRC and NAE" and to win federal grants aimed at increasing the number of minorities in engineering.

The same day that the NAS approved its resolution, the NAE council met with Liebowitz to discuss his performance. NAE Vice President Morris Tanenbaum told *Science* that the council did not "specifically" ask Liebowitz to resign. Other NAE sources, however, say council members informally requested that he step down by the end of the day on 21 February to avoid a public showdown with the council.

When Liebowitz took no action, the NAS released its resolution on 22 February, and the NAE council closed ranks behind its sister body. The NAE council "understands the reasons for the NAS Council's actions and its importance," the NAE said in a written statement. "It has been concerned about President Harold Liebowitz's leadership and operation of the NAE for some time."

Asked last week about the controversy, Alberts said that Liebowitz "is an innovative thinker, but he doesn't believe in following the rules." Given the NRC's complexity, Alberts said, "you can't just come in and try to do things your own way." While declining to provide specific examples, Alberts added that Liebowitz has also failed to understand the need to remain at arms' length from the studies NRC performs. "He has the idea that he is the PI [principal investigator] on every project he solicits." That may be fine for academia, Alberts said, "but that's not the way it works here. In fact, we have procedures to make sure that there is a separation between officials and those who will carry out the study. The review itself must be impartial."

Liebowitz dismissed Alberts's criticism as "so incorrect it's pathetic." He said that he wanted to be the contact person for studies done for the National Aeronautics and Space Administration because he felt that the NAE deserved a larger role within the NRC in space affairs.

The events of the past several months have led one of Liebowitz's most prominent backers to change his mind about the NAE president's leadership. "I apologize to everyone," said William Harris, an NAE member and engineering professor at Texas A&M University in College Station who campaigned on Liebowitz's behalf and worked closely with him as a paid senior consultant until the end of 1995. "It never occurred to me this could happen." Harris, whose contract was not renewed by Liebowitz when it expired in December, says Liebowitz has failed to involve members more fully. A frustrated Harris said that Liebowitz has "lost the capacity to concentrate ... and is unable to make decisions." Liebowitz denied those charges. "I have never had a problem with my management abilities," he said.

NAE member and Liebowitz supporter Kirk Bride said Liebowitz "has been prevented from executing his responsibilities by a small group of good old boys." However, Harris, who said he wants to see changes at the staid NAE, does not view the councils' actions as an attempt to preserve the status quo. "This is not an old boys' attempt to discredit him," Harris explained. "There is no vindictiveness on the part of anyone."

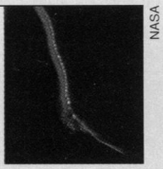
With the two sides at loggerheads, the council is contemplating its next step. NAE bylaws do not give the council the authority to remove the president from his $250,000-a-year position. "Our concerns have to be taken to the members," said Tanenbaum. "It is extremely important that they make a decision."

Tanenbaum wouldn't discuss the council's strategy, but he said the council is considering a range of options that includes asking members to recall Liebowitz or to amend the bylaws so that the council would have the authority to remove him. In any event, what has already become a very nasty fight seems certain to escalate before it is over.

–Andrew Lawler

SPACE SCIENCE

Fate of Tether Hangs by a Thread


NASA

The concept is simple: Reel out a line from the space shuttle like a kite on a windy day. But the second failure last weekend of a joint U.S.–Italian experiment that has already cost almost half a billion dollars shows that the use of tethers to boost satellites into higher orbits or to gather data is still far from a working reality. Although scientists are keen to try again, politicians in both countries appear reluctant to finance a third try.

The international crew aboard the space shuttle Columbia began deploying the 21-kilometer-long Tethered Satellite System on 25 February, unreeling the thin tether from a National Aeronautics and Space Administration (NASA)–built boom extending out from the shuttle's payload bay. At the end of the tether was a small satellite designed to send back a wide array of scientific and engineering data. In 1992 the tether reel mechanism jammed when the satellite was only 260 meters from the shuttle, and the crew was able to reel it back in. This time, however, the crew managed to unfurl most of the tether before it snapped and sped away from the shuttle. A defect in the system is the likely reason for the failure, said Ivan Bekey, senior executive for advanced concepts at NASA and one who helped develop the project.

Officials from both NASA and the Italian Space Agency (ASI) insist the mission was a success despite its unfortunate ending. Bekey said the fact that the crew was able to guide the satellite into a higher orbit and deposit it there "shows that you can raise the orbits of satellites using tethers." Giovanni Rum, head of ASI's space station and science missions departments, said "the data we did get are very encouraging" in demonstrating the promise of tethers. Leonardo Gagliardi, an ASI spokesperson in Rome, said, "We've done what we set out to achieve. It's a shame that the satellite is lost, because we can't put it in a museum." Lofting satellites into higher orbits without using heavy and expensive propellants is one of dozens of planned applications for the tethers, which some day might also generate and conduct power, emit low-frequency radio waves that penetrate the oceans, and gather data on magnetized atmospheric plasma that cannot be detected on the ground.

Replacing the lost satellite, however, would be expensive. With an annual budget of about $600 million and a host of other programs on its plate, ASI will be hard-pressed to afford a new mission. Earlier this week, Italian Science Minister Giorgio Salvini was put on the defensive as members of Parliament attacked his management of ASI. "The election campaign has already started," he responded. The satellite's future in the United States seems equally bleak. "My guess is that Congress won't want to put up the money for a third time," predicts one congressional staffer. Another aide is more blunt: "It's dead."

–Andrew Lawler

Additional reporting by Susan Biggin in Padova, Italy.