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INSURANCE AND INDEMNIFICATION IMPLICATIONS
OF FUTURE SPACE PROJECTS

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As we are all acutely aware, the international insurance industry has suffered substantial losses in the casualty insurance arena in the past several years. Some of those losses, but certainly not all, have been attributable to certain space activities undertaken by members of the international community. In addition, many of the insurance problems also involve the extraordinary number of aircraft accidents and other casualty losses associated with product liability and related liability payouts which have occurred within a relatively short period of time.

As a result, the allocation of risks between manufacturers of various technologies, the users and consumers of such technologies, and the insurers and re-insurers of such ventures, have resulted in a real or perceived imbalance of risk-taking to the apparent detriment of the insurers at this particular point in time. The reasons for this are, to be sure, complex. One thing is probably certain, however, and that is the global insurance community is exasperated at being the risk takers of last resort when it comes to what perhaps should by now be routine space activities. It is easy to be very sympathetic with this exasperation, but we must also keep in perspective that this is the nature of the insurance business. There are good times and bad. The pendulum of insurance underwriting history, which is never in complete equilibrium, appears to have swung in the direction of bad times for the space insurance industry. We all hope that the pendulum will swing back in favor of good times soon.

Although we amateurs in the insurance world may be prone to panic under current conditions, I venture to speculate that the professionals in the business know precisely the situation they face and, importantly, have innovative and productive ideas on how to recover from the current unfavorable circumstances. It may take a little time, I don't profess to know how long, for these ideas to surface and take recognizable form. However, it is my belief that they will emerge in time and I think it would behoove us all to allow this to germinate.

As we attempt to chart a course for the future we should resist the temptation to allow present problems to force us into near-term solutions which compromise or make more difficult long-term planning for successful space ventures. There is a very definite place for the international insurance community in space exploration. However, space science and technology move rapidly, and the insurance industry must learn to adjust rapidly as well. Bold vision and leadership are needed, and some risks the industry would prefer not to take might have to be taken in order to capitalize on the intense future commercial uses of outer space which are sure to come. Perhaps David Lloyd George said it best: "Don't be afraid to take a big step. You can't cross a chasm in two small jumps."

Let's keep in mind where we are in this point of recorded history. Only fifty years ago Charles Lindbergh ordered an airplane from the British firm Phillips and Powis, Ltd., to his own specifications. The plane was a Miles Mohawk reported by a magazine of the time to be "a well-equipped private machine for long-distance travel" and "powered by a Menasco Buccaneer, supercharged to 250 h.p., for fast high-level cruising." Also, only fifty years ago, Dr. Robert H. Goddard launched a four-chambered liquid propellant rocket to an altitude of 200 feet at Roswell, New Mexico. I wonder if these gentlemen and other pioneers like them ever considered the liability and insurance consequences of their work. Like it or not, there are profound social consequences which flow from technological advancement.

At the dawn of the Space Age three decades ago, who could have foreseen that in 1987 some 125 nations would be involved in space-related activities? Who could have foreseen the development of independent space launch capabilities in Europe as well as in Japan, China, and India in addition to the U.S. and the U.S.S.R.? The point is that the momentum toward more and more space ventures is crystal clear. Just how the worldwide insurance industry can harness this momentum to its advantage is a major challenge. I salute their courage in undertaking the difficult task of finding solutions which are workable and satisfying. At the same time, I would caution them once again to avoid near-term solutions to current ills which might compromise the promise of the future.

To provide an appropriate foundation for my discussion of options we at NASA have under consideration regarding our insurance and indemnification policies, as they relate to our customers and contractors, I would like to cover how NASA is planning to return the Space Shuttle fleet to safe flight as well as current U.S. policy regarding future uses of the Shuttle fleet.

As we are all aware, prior to the Challenger accident the Space Shuttle had provided a versatile, cost-effective, and relatively risk-free access to outer space. The demonstrated

ability of the Shuttle and its crews to accomplish on-orbit repairs and to retrieve and return payloads to earth was truly outstanding and had obvious insurance implications. At the time of the accident, we were well into demonstrating construction techniques in space using the Shuttle as the test platform. The promise for the future utilizing skills that only humans can bring with them to space was clearly there. It still is as we prepare to return to manned space flight.

We are engaged in a massive effort to get flying again. The recommendations of the Presidential Commission which investigated the accident together with the NASA response have resulted in a far-ranging review of many aspects of the Shuttle program. The obvious immediate technical effort surrounds the redesign of the solid rocket motor joints and testing the redesign. Not so obvious, perhaps, is the parallel effort engaged in reviewing all critical items in the overall system, the main engines, and operational procedures. The design of the entire system is being reviewed as well as the mission rules and even personnel training. There is a present emphasis on safety considerations which is very intense and permeates all aspects of our planning for return to flight.

On October 3, 1986, the NASA Administrator announced that we would launch again on February 18, 1988. There is nothing magic about this date, but it does represent our assessment of where our conservative recovery program is taking us. Right now, of course, the pacing activity is the SRM redesign, test, manufacture, and qualification. If all goes as expected, February 18, 1988, may well be a good launch date. However, it should be very clear that safety of flight will dominate this and all launch decisions. This philosophy also has obvious insurance implications.

While the technical replanning has been proceeding, we also have concurrently reexamined the management structure of the Shuttle program. A new structure has been put in place which, we believe, will greatly strengthen the management control over the program. Whereas, previously the program had been largely managed at the Johnson Space Center in Houston, we now have a program director in Washington with direct authority over all aspects of the program. It will be a strong management structure not unlike the one we had in place during the Apollo program. Unfortunate as the Challenger accident was, the resulting long "down time" has provided us with the opportunity to perform an in-depth technical and management review of all aspects of the program. We have seized upon the opportunity, and we are firmly dedicated to returning the world's premier space vehicle to safe and reliable flight status in 1988.

As we return to flight status, there will be a different look insofar as the future use of the Shuttle fleet is concerned. Our manifest includes evidence of a significant U.S. policy redirection. This redirection in the near term is the result

of a four-orbiter fleet suddenly and unexpectedly becoming a three-orbiter fleet and of a reduced flight rate for each available orbiter. But in the far term, the redirection evidences a reinvigorated policy initiative to draw the U.S. private sector into the commercial launch business.

The change in direction was signalled by President Reagan on August 15, 1986. On that date, he made the all-important announcement that the U.S. would build a replacement orbiter for the Challenger. But he also began a fundamental redirection regarding the use of the Shuttle fleet when he announced that NASA would no longer be in the business of launching private satellites and that the U.S. private sector would play an increasingly important role in the American space effort. Henceforth, NASA and the Shuttle fleet would be dedicated to payloads important to national security and foreign policy as well as exploration, pioneering, and developing new technologies and uses of space.

With the overall policy direction established by the President last August, the focus of attention shifted to the Shuttle manifest to see which payloads would be flown and when. There were many complex issues involved. Because of the Challenger accident and other expendable launch vehicle failures, we have a large backlog of U.S. national security and scientific payloads which need early attention. Also, it is anticipated that the first Space Station launches will begin in 1993 and continue thereafter at a steady rate. In addition, because there will be a reduced flight rate for several years, space available on the Shuttle between 1988 and 1993 and beyond will be at a premium.

The chore of setting priorities on the manifest was extremely difficult and involved a number of Government agencies. What emerged was a policy that the only commercial and foreign payloads that the Shuttle would carry in the future would be those that are Shuttle-unique or have national security or foreign policy implications. This, in turn, meant that the Shuttle manifest had to meld U.S. national security missions, U.S. scientific missions, Shuttle-unique payloads, and commercial and foreign payloads that had national security or foreign policy implications. The manifest which finally emerged represents an equitable balance of the competing interests within the new policy constraints. One consequence, of course, is that commercial and foreign payloads which are not Shuttle-unique nor have national security or foreign policy implications are ineligible for future Shuttle launches. Also, those payloads that were covered by launch services agreements with NASA but which are not on the manifest cannot be accommodated prior to the expiration of their agreements due to the reduced flight rate and the priorities established as a consequence of the Challenger accident. The expectation is that the ineligible and unaccommodated payloads will gravitate to U.S. private expendable launch vehicles, thereby furthering

another Presidential policy goal. Whether and to what extent this goal will be realized remains to be seen.

When the Shuttle manifest was announced by the NASA Administrator on October 3, 1986, he pointed out that, through 1994, 41 percent of the Shuttle capability will fill the needs of the Department of Defense; 47 percent will fill NASA's needs; and 12 percent will be allocated to commercial, foreign government, and other U.S. Government civil space needs. So then, this is our "new look" for the foreseeable future. What are the implications for the insurance industry? As a result of the policy changes, will NASA now lose interest in insurance matters? Not at all. We not only have those customers who are on the current manifest to be concerned about, but we will also continue to fly Shuttle-unique payloads and those having national security or foreign policy implications. In addition, we will always have our NASA contractors and subcontractors involved in Shuttle launch and mission operations. Our normal concerns and involvement with insurance and indemnification issues will continue without abatement.

Let me share some of our current thinking on these matters. We continue to be very concerned about the continuity, capacity, and cost of space-related insurance. We are sympathetic toward the industry and its recent problems, and we appreciate the fact that risk management from the industry's viewpoint really turns out to be largely unmanageable due to forces beyond its control. We are also confident that they know their business better than anyone else and are best equipped to manage their way out of their problems. However, we at NASA are in the space exploration business, and we can't afford to let insurance problems frustrate the accomplishment of our important missions. NASA has the means to solve most of its insurance problems, but in so doing we may further exacerbate the insurance industry's problems.

I will try and explain what we are thinking by categories of activity. With regard to property damage or destruction, NASA has long had a policy whereby all Shuttle users, including the U.S. Government, must agree to an interparty, no subrogation, cross-waiver as a condition of flight. Under this policy, each party agrees not to bring an action against any other party on the same flight for loss of or damage to property on the flight no matter whose fault it is. We intend to continue this policy on future Shuttle flights. This will continue to minimize the risk for Shuttle users but doesn't help a user decide whether to self-insure. NASA can't solve that problem, but hopefully the insurance industry can. We have gone as far as we can with our cross-waiver policy.

On the other hand, insurance against liability to third parties presents an entirely different array of possible NASA options. Before listing them, let me state that NASA does not want to go into the insurance business. But, we will if we believe it is

necessary under the circumstances in order to further the exploration of outer space. Our current policy is to require our customers to carry up to \$500 million worth of third party liability insurance, naming the U.S. Government as an insured party, over and above which the U.S. indemnifies the customer against liability. One of our options is to retain this policy; however, this may be somewhat unrealistic given the current state of capacity and premium cost.

A realistic view of the current situation leads quickly to another option which is to reduce the scope of the risk to be insured. There are several aspects of this. The obvious reduction would be to reduce the \$500 million requirement to somewhere between \$100 and \$300 million and hope the accompanying premiums would be customer-palatable. Other associated reductions we have under consideration include the exclusion of the U.S. Government as a named insured while the payload is still in the Shuttle bay, as well as after deployment, and the elimination of the continuing insurance requirement for payloads in geostationary orbit.

Another option would be to eliminate the insurance requirement altogether. However, this probably would not be very practical. Not many enterprises would be willing to "bet the company" although large institutions might be willing to absorb the risk in lieu of insurance. An offshoot of this might involve some combination of customer self-insurance and NASA indemnification. In other words, the customer would agree to self-insure up to an agreed level of coverage and NASA would indemnify the customer against third party liability above that level. In such a case, NASA would require that customer assets be encumbered in some way for some period of time against the possibility of a liability payout.

Other options would put NASA in the insurance business. Under section 308 of the Space Act, NASA has the authority to provide liability insurance for Shuttle users and charge a premium. We have never done this and don't desire to, but we can. There are at least four interesting possibilities here. The first would be to allow a user to purchase a first layer of coverage from NASA, purchase a second layer commercially, and then NASA would indemnify the user above the second layer at no charge. This would be an "insurance sandwich." An alternate "sandwich" would be to reverse the first two layers; i.e., the user would purchase the first layer commercially, the second layer from NASA, and NASA would again indemnify over and above the second layer at no charge.

The third possibility might be a sharing arrangement whereby the user and NASA share each dollar of liability in the first layer, or perhaps any layer, and NASA would charge the user a premium based on the sharing arrangement. Finally, NASA could indemnify a user against all third party liability and charge the user an appropriate fee. The point here is that NASA has

options available to ease insurance-related impediments to access to space. We don't want to compete with the insurance industry nor deprive it of a business base, but we might have to should access to space become jeopardized due to an insurance crisis.

That brings me to the last topic for this paper--NASA contractors and subcontractors involved in Shuttle operations. The problem here is relatively simple and straightforward. It involves the pass-through of premiums charged our contractors for third party liability insurance to the U.S. Government. Under our contracts, these costs are reimbursable by NASA to our contractors. In other words, NASA has been paying large sums to the insurance industry for coverage related to Shuttle operations. This was not a problem for NASA until large premium increases began arriving without explanation and without any apparent connection to liability or increased risk. It became intolerable, and we concluded that we could better use our limited financial resources for program purposes. In 1984 we began to indemnify some our contractors totally or partially against third party liability which might arise during Shuttle operations.

For example, we indemnify Rockwell and Lockheed from the first dollar and others above specified amounts. We are now getting more and more pressure to extend indemnification to other contractors and subcontractors since the Challenger accident. The point is that NASA is saving millions of dollars in premium expenses we would otherwise be paying through our contractors to the insurance industry. That's good news for NASA; however, this removes hundreds of millions of dollars from the premium base of the insurance industry.

We would be happy to reexamine the way this is going if the industry would come up with some plan for getting Shuttle operations insurance under some reasonable control. There has been talk for years about establishing contractor pools to share the risk on a broad basis with some combination of insurance and NASA indemnification; but nothing ever materializes. We would be pleased to work with the insurance and contractor communities if appropriate representatives or groups of representatives could be identified to us. We have some time to work on this before the next Shuttle launch but time is rapidly running out. NASA can't pull this together on its own; we are not equipped to do so. We will help to the extent that we can, but if things don't start to get better we will resort to one of the most basic, time-honored principles of human behavior--self help. And don't forget--the Space Station is coming!