International Partnerships

The Chunnel Project: Challenges and Lessons Learned

by John Noulton and John Neerhout

Day three, Thursday, April 20 began with an examination of the management of complexity. What better project to study than the "Chunnel," a newly opened tunnel under the English Channel from the white cliffs of Dover to the shores of Coquelles, France.

The French first proposed a Channel Tunnel 250 years ago, and in the 1870s work actually started and stopped. In 1975, the two nations agreed to resume the Channel, but "no public funds" were to be spent. A decade later, the private concession was awarded to a consortium of bankers and builders, known as TML. They created Eurotunnel International, and after the inevitable chaos of this triangular project management, Bechtel Corporation was called in for help.

John Noulton represented Eurotunnel and John Neerhout of Bechtel served as Project Chief Executive. Even with streamlined decision making and clearer lines of authority, the project team had to deal with 10 contractors (plus subs), two railway companies (with completely different standards), 220 syndicate banks and 600,000 shareholders, the newly formed European Commission (EC) and two governments that had been at war with each other more than with any other nations. A bureaucratic intergovernmental commission ruled, for example, that pass doors between vehicles had to be widened from 600mm to 700mm—the redesign and refabrication caused a nine-month delay and resulted in a $600 million claim by the supplier.

Nevertheless, the 31-mile tunnels were completed three days ahead of the original 1985 schedule but the cost came in high at $15 billion, and TML made "the claim of the century" against Eurotunnel project management of about $2 billion for cost overruns on mechanical and electrical equipment. With government intervention, the claims were settled in February 1994 and freight service began in the Chunnel in May, followed by gradual tourist service in the summer and autumn of 1994.

John Noulton noted that Eurotunnel had to divide costs and revenues equally between England and France so that the tax "take" or revenue would be equal. Also, French and British workers at opposite ends of the same tunnel worked under different work rules, norms, language, unions and standards. For example, the French could smoke and drink lunch wine, but the British workers wore a breathing apparatus and could not.

John Neerhout said: "When I reflect on the lessons learned from this colossal project, and try to formulate a message to project managers present and future, I think that proper organization, with the right people with clearly defined roles, and a proper contract, are the keys to success."

He added: "You will recall the numerous parties involved. It was essential to have Chunnel instructions and information at the proper level and with the proper detail. Micromanaging on the scale of this project would have resulted in complete chaos. You need experts at every level of responsibility." He concluded: "A lot of people don't know what they don't know."

Noulton agreed and added: "Just decide and be done with it."

Russian-American Cooperation in Space

by Jeffrey Manber
RSC Energia

Following are excerpts from the speech by Jeff Manber, managing director of American operations, Rocket Space Corp., Energia:

My topic this morning is the lessons we can learn from the cooperation and partnership with Russian organizations and cooperation—not just what we learn about space exploration, but equally important, what we learn about ourselves in the process. I want to also talk about a great secret: what makes the Russians continue their own space program at great costs and sacrifice.

...The Russians continue to adopt free-market principles for their space program. The organization that I worked with last time I was here, NPO Energia, is today RSC Energia, a privatized Russian corporation that controls many of the operations of the Russian manned space program. Russian workers own shares in the corporation; it is a commercial entity and soon we will be undertaking even more International, private-sector activities. This is space commercialization on a scale bigger than even the most ardent supporter of commercialization ever thought possible.

But I understand how strange all these changes are, in part because the turnaround in exploration is due to many factors, but of chief importance is our working together with the space program of the Russian Federation. That our space exploration future is so entwined with the Russians—whether as commercial competitors or partners—still befuddles some of the experts. It was crystal clear to many that the Russian space program would not, and could not continue to exist, compete with American or contribute to our own program. That it remains operational today, and indeed, that we are learning much from working with the Russians, shows that many did not understand the Russian program, how it works, and what it has to offer to the United States. Judged from an American perspective and American background, it was easy for some to dismiss the program of a former enemy. But history has shown—and I'll talk about this more—that those who oppose the opening of markets and the sharing of expertise and the resultant boom in new products at lower costs, lose in the marketplace...

Many of you in this room are the troops in the trenches for working with the Russians. I know it is challenge enough to learn and understand how things are done on an engineering level. But I challenge and urge you to do more, and to study how the Russians are restructuring their own industry. Because the irony is that what the Japanese taught Detroit was how to go back to Detroit's own roots in manufacturing and corporate structure. What was *new* was how Detroit was making cars in the 1960s and 1970s. What was tried and true was how they did it in the 1930s and 1940s, and the Japanese in the sixties and seventies

So too, I believe, in the Russian Federation. Their space industry reflects our own commercial marketplace, not in space but in manufacturing. Let me cite some examples:

1) Consider the Russian Space Agency headed by Mr. Kptev: it is a small government space agency of no more than three hundred people. It has limited powers, behaving more as a central coordinating office. Of course, they are also incorporating their scientific organizations into a civilian space agency, but the counterpart to NASA in Washington is "lean and mean."

2) Mr. Yuri Semenov is now president of RSC Energia, a commercial corporation that handles operational space programs. We are a corporation that will raise capital, solicit business and work overseas, when appropriate. Energia has negotiated commercial contracts with ESA, with

NASDA, with the Chinese, with European industry and also a *commercial* contract with NASA.

3) There is strong and legitimate competition. We at Energia have competition from Krunichev, to name one example. We also work together with them. They too are moving into the international marketplace. Krunichev, along with Energia, is working with Lockheed to market the Proton. It is not a Russian project, it is not an American project.

4) Russian space industry has a limited use for contractors. The strange and often blurred lines between the public and private sector that exists in our space industry, do not exist in Russia.

5) Clean lines of authority. Everyone knows who is in charge of remote sensing, of materials processing, of manned launches, of the space station, for the Russians. On the American side the lines of authority are unclear and changing every few months . . .

I'll tell you right now what the secret is: it's their determination to continue to explore and the humility of pushing into space. They have a commitment on a society-wide basis, one that survived the breakup of their empire, the collapse of their lives and they will hold it all together and push forward into space.

They are not into space because we are. Space is not a symbol of any one government or federation or nation-state. It is a pride that digs deep into their own history. They can speak of where they will be in space in a hundred years at the same time they smile in embarrassment when questioned about a train schedule for next week.

Working with the Russians, you at NASA will pick up ideas on how to run a space station or launch people in sub-zero weather to spend a year in space. But all that will be for naught if everyone in this room and in our society does not regain our willingness to explore. Otherwise, we are rushing in new programs and new technologies and grafting them onto a system that does not work.

Friends of mine at NASA and in industry tell me that "things will be better with this new program, or with this new budget." I think it takes more than that.

We need to again take risks, to understand and accept that some do die so that others can live in a new frontier. That is what I think it takes to do the business of space exploration. That's what makes our business different than cars of computer chips. It takes courage on a personal and society level to send men and women to orbiting stations and then on to planets.

We in this country cannot have senior administration officials telling us that virtual reality is the same as exploration. "That we can put our minds where our feet can never go." That's not bad news for NASA. That's bad news for us as people, a nation of immigrants and explorers.

So what I've learned from the Russians is that the issue may not be the size of the next launch vehicle program or what percentage of it is reusable, if it isn't going to launch on time. And let's not worry about the size of our space industry; if we continue to graft new technology on old management structures, our programs will fail the test of the marketplace. And I've learned that all of this is secondary to whether we even wish to explore as a nation.

As both the administration and Congress explore how to restructure NASA, you in this room should not sit still. Alfred Sloan, the auto industrial leader, warned in 1963: "For unrivaled leaders, success itself breeds the roots of complacency, myopia and ultimately, decline." It is our fate that from time to time in our commercial history we must re-learn from others—from the Japanese how to build cars like Henry Ford, and perhaps from the Russians how to create a commercial market—for space services.