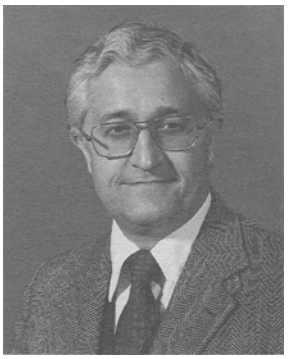
Guest Commentary



American bridges falling down, falling down.... It is widely known that the infrastructure of the United States is decaying. In fact, it is generally recognized that the legislated funds allocated to maintain the transportation system barely keep pace with the rate of deterioration. In particular, our highways are showing the visible and sometimes dramatic effects of this decline. Bridges are rusting badly and in some cases collapsing. The Connecticut Mianus Bridge tragedy was only a hint of possible future disasters. The infrastructural problems of the cities, particularly New York City, are legion.

The American public expects that road tolls and gasoline tax dollars, combined with substantial bond issues, will buy the best and most effective solutions to the problems of corroding bridge steel and reinforced concrete. This is simply not the case. Bridges continue to be painted, using more advanced paint systems, at ever-increasing costs. In some cases, painting appears to be an ongoing task. These paints work, but obviously not very well. However, there is a far better solution that is cost effective and proven—thermal spray metallization.

Metallization is a well-established process of spraying molten zinc or aluminum onto properly prepared steel. The process is simple and straightforward: The coating system protects the steel by galvanic action; that is, the sprayed metal coat corrodes sacrificially, rendering the steel effectively noble. Europeans have used thermal spray metallization technology since World War II, with dramatic results. Numerous examples attest to the effectiveness of the process and its long-term cost benefits. Many documented cases show that bridge steel has been protected by metallizing for 30 or more years, without significant maintenance. The kilometer-long Pierre Laport Bridge in Quebec has been thermal sprayed with zinc metal. When conventional painting costs were projected to be unreasonably high, the Government of Quebec elected to thermally spray the bridge, which has proven to be a satisfactory alternative. Perhaps the largest aluminum thermal spray metallization job was undertaken by Connoco, which used the process to protect the steel of a $1,000,000,000 offshore rig in the North Sea. Subsequent examination of the rig has proven that metallization is suitable in marine environments as well.

So why doesn't the United States spray its bridges and associated transportation components? Ignorance, laziness, lobbying by paint manufacturers—all contribute to limiting the use of the best available technology. Local and federal governments create additional problems with mandated low-bid procedures of awarding government contracts.

Perhaps our federal and state transportation authorities will learn from the Europeans. One cannot be too encouraged, however, when well-attended bridge maintenance symposia are filled with reviews of the ever-increasing corrosion problems that are "solved" using newer and better (and more expensive) paints. When metal spraying is suggested, the bureaucrats look puzzled and the painters become irritated—"You can't spray molten metal on steel. It's too dangerous! It's too expensive!"

There is, however, some hope. The U.S. Navy has ships that rust, requiring a maintenance regime not unlike the chip-paint cycle of bridges. Driven by economic considerations and the need to use personnel more efficiently, the Navy has found a better way. Due to the dedication of a few determined military and civilian Naval personnel, the problem of ship maintenance is being solved by thermal spray metallization. This concept of corrosion protection is now written into military specifications. The Navy has discovered that many man-hours are being saved for more valuable duties. And finally, a number of state transportation departments are undertaking programs to spray zinc on structural steel and on reinforced concrete for rebar protection during bridge and highway repair. Additionally, various highly effective plastics are being thermal sprayed for corrosion protection. Progress is fi-

nally being made. A special session on thermal spraying and the infrastructure will be presented at the 1993 National Thermal Spray Conference.

Meanwhile, the painters paint and the bridges rust and sometimes collapse. When will it be realized that the problem is greater than the current solutions? And more importantly, an effective solution is actually at hand.

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