years ago that we began to apply these time-tested and time-proved principles to general industry, with almost immediate recognition that we had equipment that would work efficiently and reliably.

Included in this apparatus are highway and walkway crossing protection systems for industrial narrow and standard gauge railroads, area warning systems to protect vehicle and personnel at dangerous areas in industrial complexes, and even electrically locked derails, completely interlocked with door operating mechanism for door closures over tracks, to prevent damage by moving cars to personnel or the door itself.

Sometime ago when it was made public that the San Francisco Bay Area Rapid Transit organization had received approval from the voters to spend almost one billion dollars on a completely automatic rapid transit system, we immediately drew upon the specialized experience, skills and production facilities available to us to design and offer a communication and control system for this transportation complex.

Today, the system is ready and we are ready. This system for automatically operating rapid transit lines features the use of a general-purpose digital computer in an operations control center responsible for running the system.

An automatic wayside system is responsible for the safe operation of trains. It also executes commands from the operations control center and furnishes data needed by the central computer.

An automatic propulsion and braking system aboard each train controls acceleration and deceleration in accordance with commands received from the operation control center and the automatic wayside system. This system automatically performs the train running and stopping function.

High speed digital communication networks are used to transfer information throughout the system.

Each integral sub-system has fail-safe features and is self checking against failures. Use is made of redundance and self-repair techniques to promote reliability. Substantial capability is provided for manual supervisory control of the system when required.

The technologies involved in automating industrial processes by means of remotely controlled or automatically operated vehicles or machinery have been making steady progress for years in practically every area of industrial operation. As experts in your industries, I know you are keenly aware of the inroads made within your own particular operations. Automatic warehouses, production lines, strip mills, bottling processes, packaging lines, identification systems —if you can name it it's probably automated, or about to be! And I'm sure we all realize that the major problems existing today are not those pertaining to engineering, but are those that concern the political, social and personnel aspects of automatic control.

These are the problems which must be solved so that our engineering and communication talents can be focused on modifying and adapting existing equipment and on developing new apparatus for applications of remote control which, in many instances, will lead to automatic control.

Who would have thought 15 years ago that we could control and guide systems for blasting space vehicles into orbit around the earth or for hitting the moon or Venus? The idea of an atomic missile surging out of the ocean from a nuclear submarine would have been called science fiction. But many times in the past decade we have proved that the Jules Verne type of science fiction is now a reality.

In view of the almost awesome technological advances being made so swiftly in our world today, remote and automatic control of operations in industry actually take on more of a simple than a complex aspect.