Mr. CONSTANDY. Mr. Chairman, I would like to ask that the script from the movie entitled "Guardrail Crash Tests—for Safety," dated July 1964, be made exhibit No. 14, and printed in the record at this point.

Mr. MCCARTHY. Without objection, so ordered.

(Script of film, "Guardrail Crash Tests—for Safety," follows as exhibit 14:

NARRATOR: "Guardrails . . . and bridgerails used throughout the country vary widely in appearance and design, and yet each has the same basic function—to demark areas of roadside hazards, and to deflect an out-of-control vehicle away from those areas, with minimum damage and the least possible injury to the occupants.

"But how safe are guardrails? Will they re-direct a straying vehicle or collapse under the impact? Are common design criteria needed for all installations, or are variations needed for different highway conditions?

"To answer these and a wealth of other questions, the General Motors Proving Ground has conducted an extensive program. In the interest of highway safety, this film presents 'Guardrail Crash Tests—*For Safety!*'

"The investigation of guardrail and bridgerail designs at the General Motors Proving Ground was initiated in 1958 for several reasons. First, several guardrail failures had been experienced during the preceding months, and it was mandatory that the causes for these failures be determined and corrected for driver safety. Second, the Proving Ground was being enlarged and existing roads improved. This construction and renovation would require miles of new guardrail, built to the safest possible specifications. And third, the 'W' section, beam-type rail had recently been introduced and was being suggested for national use. While laboratory tests had been made, no actual impact performance data were available regarding this new material.

"The guardrail situation was reviewed in detail, and proving ground management endorsed a study of current guardrail installations, with full-scale crash tests on those designs that appeared to provide the greatest safety potential. The results of this program would dictate the improvements to be made on the proving ground, and would provide valuable information to state and national highway planners.

"The following criteria were established for evaluating the various guardrail and bridgerail designs:

"(1) The rail must prevent the vehicle from leaving the roadway and going into a roadside hazard.

"(2) It must be flexible enough or of such design that it will deflect a vehicle at a rate of deceleration tolerable by its occupants.

"(3) It should deflect the vehicle parallel to the rail—*not* back onto the roadway so as to become a hazard to other traffic.

"(4) Finally, the guardrail should inflict a minimum amount of damage to the vehicle.

"It was further agreed that initial crash tests would be made at 35 mph at angles up to 20 degrees as this severity would reveal the better designs to be tested at higher speeds.

"With the parameters of the test program established, the work of gathering, evaluating, and testing began.

"Following physical tests four types of guardrail were selected for full-scale impacts and these would be tested with different mountings, on different post materials, spaced at various intervals.

"One of the earliest tests was made in June of 1958, on a section of convex ribbon guardrail, mounted to 6 by 8 inch wood posts spaced at 10-foot intervals. The car speed was 35 mph, and the impact angle was 18 degrees.

"A subsequent 35 mile-per-hour, 20-degree test with the same rail mounted on posts spaced at 5 feet produced almost the same results. The installation failed to turn the car properly, and both the rail and the car were damaged considerably. This and other tests indicated that the convex ribbon had insufficient beam strength even with five-foot post spacing.

"The 'W' section steel beam rail proved more satisfactory. Even with 12½-foot post intervals, the beam ribbon deflected this 37-mile-per-hour, 20-degree impact with only moderate lateral deceleration and some deflection back onto the pavement.