Helicopter Expendable Countermeasures

The HH-53 helicopter carries the AN/ALE-39 Expendable Countermeasures Dispensing System. This system has a capacity of 60 decoys. The operator pre-programs the system to dispense a fixed number (up to 20) of the loaded decoys on demand. As long as decoys are available, the pilot can dispense them to help counter surface-to-air (SAM) missiles fired at the helicopter. In recent operational tests, a single flare decoy was successful in decoying an infrared (IR) guided SAM away from the HH-53 in 10 of 12 tests.

Suppose that a HH-53 helicopter has been assigned rescue missions inside enemy territory. There is expected to be a large (unknown) number of IR guided missiles that will be shot at the HH-53 before it has a chance to reload its AN/ALE-39 system. How many flares should the operator program the AN/ALE-39 to dispense each time in order to maximize the number of IR guided SAMs that the HH-53 is expected to survive?