

## SUBJECT: USING TRAFFIC CONES TO PREVENT AGV COLLISIONS

When working in or around the \AGV guide path, precautions must be taken to prevent injury or damage from vehicle collisions. Normally, collisions are prevented by the System Automation Manager (SAM) computer which tracks all vehicle movement. However, while a vehicle is under manual pendant control or has been disabled/faulted in the normal guide path, SAM tracking is disabled. During this time, the operator is in complete control of the vehicle and must take precautions to prevent collisions and accidental contact.

### 1. SAFELY INSERTING VEHICLE INTO AN ACTIVE SYSTEM.

- Caution must be exercised when inserting a vehicle into an active system. Failure to do so may result in injury, damage to vehicle components, and/or downtime. Refer to the system maintenance / instruction manual for complete insertion procedures.
- The use of traffic cones will reduce the possibility of collision during insertion. The laser bumpers on the front/rear of each vehicle detect object in a certain scan plane. The scan plane is set such that it may detect another vehicle or a traffic cone but may not detect raised lift forks or other object above the scan plane.
- The SAM computer does not begin tracking a vehicle until it is successfully inserted. By placing a traffic cone in the guide path, an approaching SAM controlled vehicle should detect the cone and stop.
- Cones should also be placed in the oncoming guide path, both in front of and behind the vehicle being inserted. (See Figure 1)



**Figure 1: Illustrating proper traffic cone placement.**



**Figure 2: The traffic cone placed to the rear of the vehicle under pendent control reduces the possibility of a collision by the approaching vehicle.**

## 2. SAFELY WORKING IN THE VEHICLE GUIDE PATH AREA

- Traffic cones must be placed on the vehicle guide path when work is being performed on or near the path.
- Traffic cones reduce the possibility of collision when placed between the vehicle and a maintenance stand, ladder or man-lift. See Figure 3.
- Maintenance personal should always work with a safety person on the ground. The traffic cones cannot replace the ground safety person.



**Figure 3: Illustrating proper traffic cone placement.**

### 3. SAFELY WORKING IN TRAILERS OR WAREHOUSE/STAGING/STORAGE AREAS

- Prior to entering a storage aisle or trailer that is being serviced by an vehicle, the operator must disable the aisle or trailer in the system.
- Traffic cones should also be used as a backup method to stop an AGV from entering the aisle or trailer. Placing a traffic cone on the guide path at the entrance to an aisle or trailer provides additional protection against an AGV entering the area.



**Figure 4: Illustrating proper traffic cone placement**

#### 4. SAFELY WORKING IN MULTIPLE GUIDE PATH AREAS

- When AGVS are in automatic mode, and enabled in SAM, SAM is able to help prevent accidental contact as it knows where each AGV is located. However, SAM is unable to prevent accidental contact when an AGV is off/ or in manual mode and not enabled in SAM.
- Figure 5 shows how vehicles may interfere or make accidental contact.

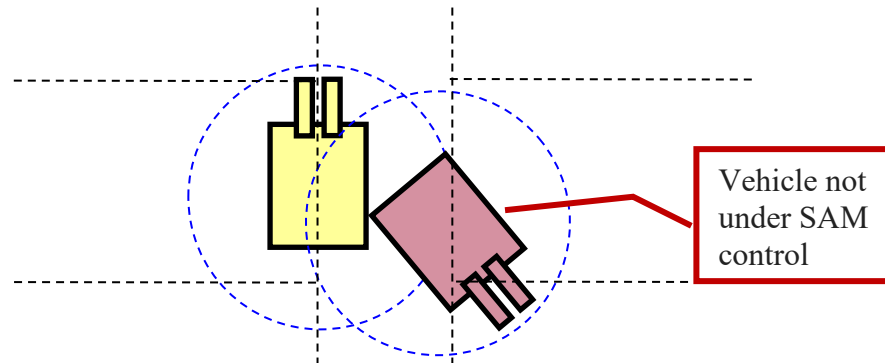


Figure 5: Accidental Contact

- When a vehicle is inoperable and/or not controlled by SAM, the user must take care to block travel paths around the repair area to assure the work area is safe from traveling vehicles. See Figure 6.

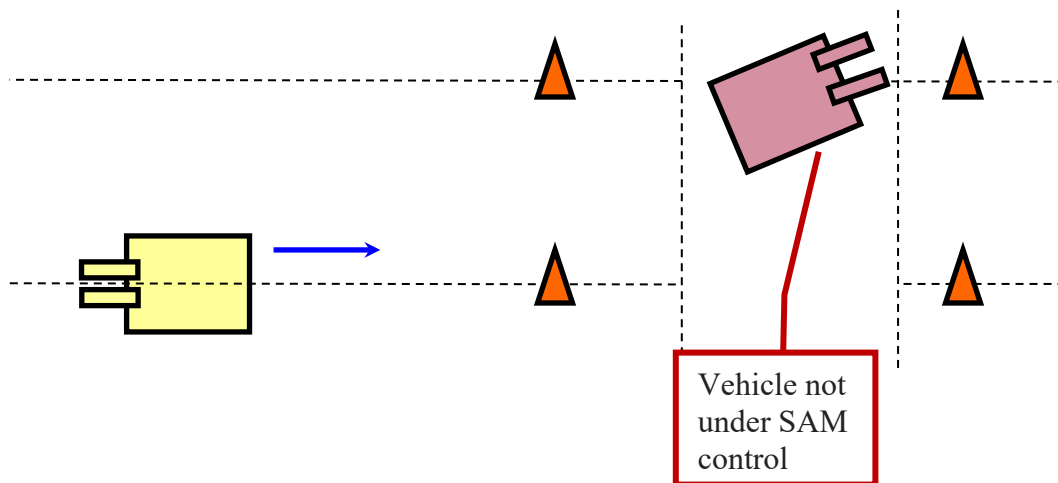


Figure 6: AGV Not Under SAM Control