



## #173 – Evacuation accountability procedures

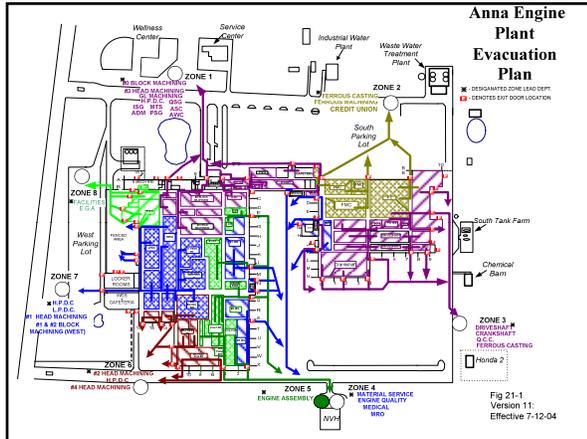
Rick Paulus

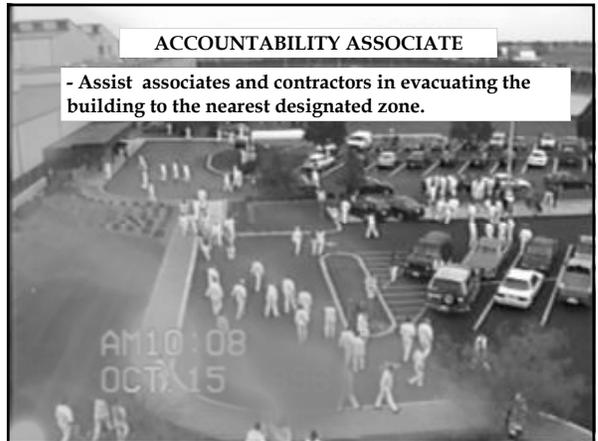
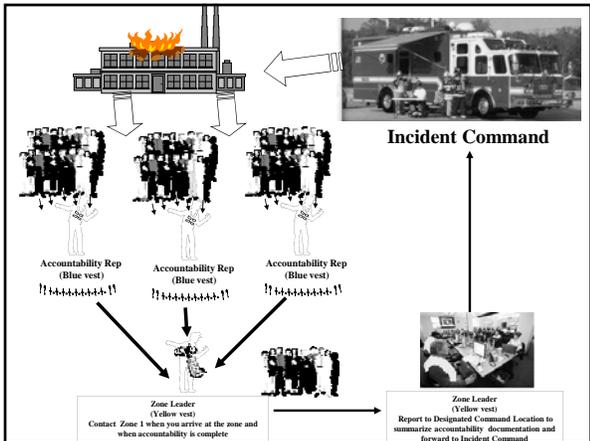
Thursday, March 31, 2011  
11:15 a.m. to 12:15 p.m.



# Evacuation Accountability Procedures

- Accountability Method- The Honda Way
- Evacuation Training Objectives
- Evacuation Roles and Responsibilities
- Evacuation Case Study







DATE: 7/15/2003

GUARD N

**EVACUATION DRILL ATTENDANCE SHEET**

ZONE 1 COMMUNICATION ASSOCIATE  
PRIMARY / ALT.

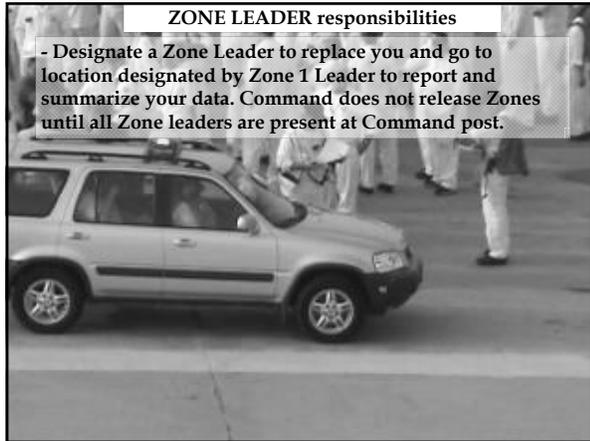
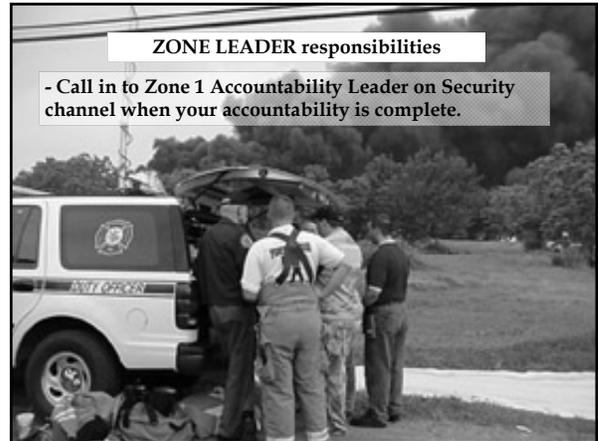
1ST SHIFT: Bob Zyle  
2ND SHIFT: \_\_\_\_\_  
3RD SHIFT: \_\_\_\_\_

H.P.D.C.

DEPT.	SHIFT	BRA ASSOCIATE PRIMARY/ALT.	ATTENDANCE PLUS MINUS
#3 HEAD MACHINING	1ST	Mike Taylor	5 0
	2ND		
	3RD		
#6 BLOCK MACHINING	1ST	Todd Davis	7 12
	2ND		
	3RD		
#04/R/L MACHINING	1ST	Joe Beck	6 3
	2ND		
	3RD		
Office	1ST	Mike Taylor	0 5
	2ND		
	3RD		
ISG	1ST	Joe Smith	6 3
	2ND		
	3RD		
L.P.D.C.	1ST	Bill Lopez	7 4
	2ND		
	3RD		

- Put on Security designa

leader h your



**Evacuation Drill Concern**

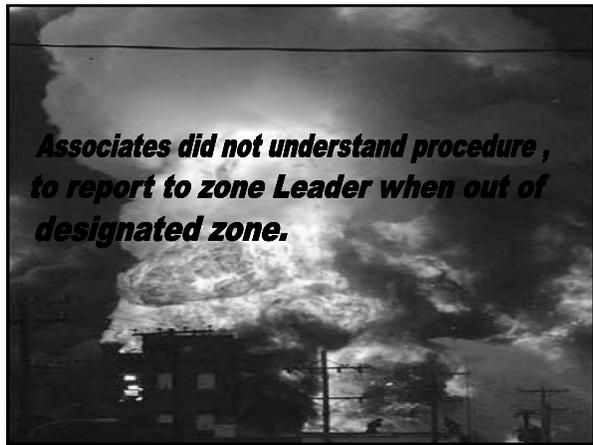
Zone and Accountability forms hard to read, filled out improperly

**EVACUATION DRILL**

NAME	ASSOC. NO.	STATUS
Joe Smith	1047	ALL
Jack	1082	ALL
Patricia	1082	ALL
Randy	2087	ALL
Joe	25290	ALL
Blaine	4377	ALL
Jack		ALL
Joe		ALL
Mike Smith		ALL
DS		ALL

1. PUT ON YOUR BLUE VEST.  
2. ASSIST WITH EVACUATING ASSOCIATES CONTRACTORS & VISITORS.  
3. ACCOUNT FOR MISSING & EXTRA ASSOCIATES, VISITORS AND/OR CONTRACTORS.  
4. LIST FULL NAME & ASSOC. NUMBER, IF POSSIBLE, ON THIS FORM.  
5. GIVE YOUR FORM TO THE ZONE COMMUNICATION ASSOCIATE IN THE YELLOW VEST.





•Evacuation Kit located at Zone Sites at bottom of poles that are posted with Zone Evacuation Signs.

- Exterior Evacuation Kit.
- Inside the Evacuation kit stocked with binders and necessary materials.
- Lock combination = 1000.

•Zone 4/5 have sub-department signs to improve organization.

•Example of sub zone signs posted along fence.

- Binder with documents and vest located in front inside pocket.
- Updated manpower lists are to be added to these binders monthly by accountability and/or department Safety reps.

- **Hand-held sub department signs for all Zones.**
- Hand held sign located in front pocket of binder.
- Accountability reps need to assign an associate to lift and hold sub department signs.



## Evacuation Drill Objectives

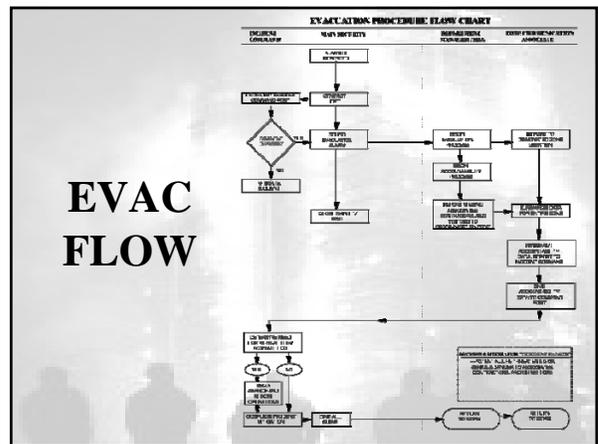
<p><b>Objective</b></p> <ul style="list-style-type: none"> <li>➤ All associates shall exited the building within 5 min. after the start of the drill.</li> <li>➤ Zone leaders shall complete accountability documentation at all of the zone within 15 min of the drill start time.</li> <li>➤ Zone leaders shall summarize the accountability data and develop a list of missing associates within 1 hour of the drill start time.</li> <li>➤ Verify the accuracy of the departments accountability methods. 10 associates shall be identified as missing from their dept.</li> </ul>	<p><b>Measurement Criteria</b></p> <ul style="list-style-type: none"> <li>➤ "EKT" associate will sweep the plant and give all clear when all associates are out of the building</li> <li>➤ Zone leaders will call Zone 1 when accountability is complete. Zone 1 will direct the other Zone leaders to the location where the accountability will be summarized.</li> <li>➤ Accountability data will be summarized by the Zone accountability leaders. A time will be identified when the task is complete</li> <li>➤ Without the departments knowledge, randomly select 10 associates to go to a different location than their normal evacuation zone.</li> </ul>
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## Roles and Responsibilities

WHO	PRIOR TO EXERCISE/EVACUATION	DURING EXERCISE/EVACUATION
EMERG. SERVICE STAFF (INCIDENT COMMANDER)	<ul style="list-style-type: none"> <li>• UPDATE EVACUATION MAPS</li> <li>• DEVELOP PROCEDURES FOR EVACUATION</li> <li>• SET OBJECTIVES AND PLAN FOR DRILLS</li> <li>• TRAIN EXIT MEMBERS &amp; MGT.</li> <li>• AUDIT DEPT. SHUTDOWN PROCEDURES</li> </ul>	<ul style="list-style-type: none"> <li>• ESTABLISH INCIDENT COMMANDER STRUCTURE</li> <li>• DECIDE IF SEARCH TEAM NEEDS TO BE ACTIVATED, BASED ON RESULTS OF ACCOUNTABILITY DATA.</li> </ul>
SAFETY REPS	<ul style="list-style-type: none"> <li>• POST EVACUATION ROUTE MAPS WITHIN YOUR DEPT.</li> <li>• TRAIN DEPT ASSOC. ON EVACUATION ROUTES AND ZONE LOCATIONS</li> <li>• CONFIRM EQUIPMENT SHUTDOWN PROCEDURES ARE IN PLACE, UP TO DATE &amp; ASSOCIATES ARE TRAINED.</li> <li>• CONFIRM ACCOUNTABILITY DOCUMENTATION IS CURRENT AND AVAILABLE</li> <li>• INSURE ZONE AND ACCOUNTABILITY ASSOCIATES ARE TRAINED</li> </ul>	<ul style="list-style-type: none"> <li>• ASSIST ASSOCIATE, CONTRACTORS &amp; VISITORS IN EVACUATION</li> <li>• ASSIST IN SUMMARIZING ACCOUNTABILITY WITHIN YOUR DEPARTMENT</li> <li>• EVALUATE &amp; MONITOR EFFECTIVENESS OF DRILLS</li> </ul>
SECURITY	<ul style="list-style-type: none"> <li>• BECOME FAMILIAR WITH SECURITY EVACUATION PROCEDURES</li> <li>• KEEP UPDATED CALL LIST AVAILABLE AT ALL</li> </ul>	<ul style="list-style-type: none"> <li>• UPON DIRECTION OF INCIDENT COMMANDER SOUND EVACUATION ALARM</li> </ul>
ADMINISTRATION	<ul style="list-style-type: none"> <li>• INSURE SECURITY IS PROPERLY TRAINED IN EVACUATION PROCEDURES</li> <li>• INSURE SECURITY HAS UPDATED CALL LIST</li> <li>• ESTABLISHED ACCOUNTABILITY METHOD AND TRAIN DEPARTMENTS IN THE PROCEDURES.</li> </ul>	<ul style="list-style-type: none"> <li>• ASSIST ASSOCIATE, CONTRACTORS &amp; VISITORS IN EVACUATION</li> <li>• IMPLEMENT ACCOUNTABILITY PROCEDURES AND SUPPORT EMERGENCY OPERATIONS GROUP.</li> </ul>
PLANT MANAGEMENT.	<ul style="list-style-type: none"> <li>• INSURE ADEQUATE RESOURCES ARE IN PLACE TO RESPOND TO EMERGENCY.</li> <li>• SUPPORT EMERGENCY PREPAREDNESS BY INSURING ANNUAL DRILLS ARE CONDUCTED</li> </ul>	<ul style="list-style-type: none"> <li>• BE PREPARED TO SUPPORT EMERGENCY OPERATIONS GROUP</li> <li>• ASSIST ASSOCIATE, CONTRACTORS &amp; VISITORS IN EVACUATION</li> <li>• IF YOUR AREA IS EVACUATED, REPORT YOUR LOCATION TO THE ZONE COMMUNICATION ASSOCIATE.</li> </ul>

## Roles and Responsibilities

WHO	PRIOR TO EXERCISE/EVACUATION	DURING EXERCISE/EVACUATION
CHIEF, EKT'S	<ul style="list-style-type: none"> <li>• INSURE ASSOCIATES ARE AWARE OF EVACUATION ROUTES AND ZONE LOCATIONS</li> <li>• INSURE SHUTDOWN PROCEDURES ARE IN PLACE AND ASSOCIATES ARE TRAINED.</li> <li>• INSURE ASSOCIATES CAN RECOGNIZE EVACUATION ALARM</li> <li>• INSURE EVACUATION MAPS ARE POSTED</li> <li>• DESIGNATE A PRIMARY AND ALTERNATE ASSOCIATE RESPONSIBLE FOR PERFORM DEPARTMENT ACCOUNTABILITY ON EACH WORKING SHIFT</li> </ul>	<ul style="list-style-type: none"> <li>• ASSIST ASSOCIATES, CONTRACTORS &amp; VISITORS IN EVACUATION</li> <li>• ENSURE ALL ASSOCIATES, VISITOR AND CONTRACTORS WORKING WITHIN YOUR DEPARTMENT ARE ADEQUATELY EVACUATED AND ACCOUNTED FOR</li> <li>• EVALUATE &amp; MONITOR EFFECTIVENESS OF DRILLS - FEEDBACK TO SAFETY REPS</li> </ul>
COORDINATORS	<ul style="list-style-type: none"> <li>• ASSESS YOUR WORK AREA FOR HAZARDOUS OPERATIONS AND DEVELOP SHUTDOWN PROCEDURES.</li> <li>• INSURE ASSOCIATES ARE TRAINED IN SHUTDOWN PROCEDURES AND TRAINING IS DOCUMENTED.</li> <li>• INSURE ASSOCIATES, CONTRACTORS AND VISITORS ARE AWARE OF EVAC ROUTES AND ZONE ASSEMBLY LOCATIONS.</li> <li>• CONFIRM ASSOCIATES CAN RECOGNIZE A EVAC ALARM</li> <li>• CONFIRM EVACUATION MAPS ARE POSTED</li> <li>• INSURE THAT ALL ASSOCIATES, CONTRACTORS AND VISITORS UNDERSTAND THAT IF THEY ARE OUT OF THEIR ASSIGNED DEPT., DURING AN EVACUATION, THEY SHOULD REPORT IN TO THE NEAREST ZONE COMMUNICATION PERSON AS AN EXTRA PERSON.</li> </ul>	<ul style="list-style-type: none"> <li>• PREPARE TO EVACUATE ASSOCIATES IF ALARM IS SOUNDED</li> <li>• ASSIST ASSOCIATES, CONTRACTORS &amp; VISITORS IN EVACUATION</li> <li>• ENSURE SHUTDOWN PROCEDURES ARE CARRIED OUT OR SIMULATED DURING INCIDENT/DRILL</li> <li>• ACCOUNT FOR AND FEEDBACK ANY MISSING ASSOCIATES, VISITORS AND/OR CONTRACTORS TO YOUR DEPARTMENT ACCOUNTABILITY ASSOCIATE</li> <li>• EVALUATE &amp; MONITOR EFFECTIVENESS OF DRILLS - FEEDBACK TO SAFETY REPS.</li> </ul>
CONTRACTORS	<ul style="list-style-type: none"> <li>• BECOME FAMILIAR WITH YOUR PROCEDURES DURING A PLANT EVACUATION.</li> <li>• BECOME FAMILIAR WITH YOUR ASSIGNED ZONE LOCATION AND ALTERNATE LOCATIONS.</li> </ul>	<ul style="list-style-type: none"> <li>• EVACUATE THE PLANT THROUGH THE NEAREST EXIT.</li> <li>• REPORT YOUR FULL NAME AND COMPANY TO THE ZONE COMMUNICATION ASSOCIATE IN THE YELLOW VEST.</li> <li>• REMAIN IN THE ACCOUNTABILITY ZONE UNTIL THE ALL CLEAR IS GIVEN BY THE ZONE COMMUNICATION ASSOCIATE.</li> </ul>
ASSOCIATES RESPONSIBLE FOR ACCOUNTABILITY	<ul style="list-style-type: none"> <li>• BECOME FAMILIAR WITH YOUR PROCEDURES DURING A PLANT EVACUATION</li> <li>• BECOME FAMILIAR WITH YOUR ASSIGNED ZONE LOCATION AND ALTERNATE LOCATIONS.</li> </ul>	<ul style="list-style-type: none"> <li>• PUT ON BLUE VEST AND GET ACCOUNTABILITY FORMS</li> <li>• ASSIST ASSOCIATES, CONTRACTORS &amp; VISITORS IN EVACUATION</li> <li>• ACCOUNT FOR YOUR DEPARTMENTS MISSING ASSOCIATES, VISITORS AND/OR CONTRACTORS AND REPORT THEIR NAME TO YOUR ZONE COMMUNICATION ASSOCIATE.</li> </ul>
ZONE COMMUNICATION ASSOCIATE	<ul style="list-style-type: none"> <li>• BECOME FAMILIAR WITH YOUR PROCEDURES DURING A PLANT EVACUATION.</li> <li>• BECOME FAMILIAR WITH YOUR ASSIGNED ZONE LOCATION AND ALTERNATE LOCATIONS.</li> </ul>	<ul style="list-style-type: none"> <li>• EVACUATE THE PLANT, PUT ON A YELLOW VEST, PUT ON A RADIO</li> <li>• TURN TO CHANNEL 1 AND PROCEED TO YOUR ASSIGNED EVACUATION ZONE.</li> <li>• SUMMARIZE ACCOUNTABILITY DATA FROM EACH DEPT ASSIGNED TO THE ZONE, FEEDBACK RESULTS TO INCIDENT COMMAND.</li> </ul>



## CASE STUDY

**Heat exchanger rupture and ammonia release in Houston, Texas**  
(One Killed, Six Injured)



**The Goodyear Tire and Rubber Company**

Houston, TX  
June 11, 2008

**Key Issues:**

- Emergency Response and Accountability
- Maintenance Completion
- Pressure Vessel Over-pressure Protection



2008-06-1 TX  
January 2011

**Introduction**

This case study examines a heat exchanger rupture and ammonia release at The Goodyear Tire and Rubber Company plant in Houston, Texas. The rupture and release injured six employees. Hours after plant responders declared the emergency over, the body of an employee was discovered in the debris next to the heat exchanger.

**INSIDE . . .**

Incident Description  
Background  
Analysis  
Lessons Learned

*Goodyear Houston Case Study* January 2011

### 3.0 Analysis

#### 3.1 Emergency Procedures

##### 3.1.1 Onsite Emergency Response Training

Goodyear maintained a trained emergency response team, which attended off-site industrial firefighter training, conducted response drills based on localized emergency scenarios, and practiced implementing an emergency operations center. Other employees received emergency preparedness training primarily as part of their annual computer-based health and safety training.

Although Goodyear procedures required that a plant-wide evacuation and shelter-in-place drill be conducted at least four times a year, workers told the Chemical Safety Board (CSB) that such drills had not been conducted in the four years prior to the June 11<sup>th</sup> 2008 incident. Operating procedures discussed plant-wide, alarm operations and emergency muster points for partial and plant-wide evacuations; however, some employees had not been fully trained on these procedures.

##### 3.1.2 Plant Alarm System

Although Goodyear had installed a plant-wide alarm system, some workers reported that the system was unreliable, as in this case, when workers were not immediately made aware of the nature of the incident. Emergency alarm pull-boxes located throughout the production unit areas sound a location-specific alarm. However, ammonia vapor released from the ruptured heat

##### 3.1.3 Accounting for Workers in an Emergency

Facility operating procedures also outlined Goodyear's worker emergency accountability scheme. Supervisors were to account for their employees using a master list generated from the computerized electronic badge-in/badge-out system.

During the incident however, a malfunction in the badge tracking system delayed supervisors from immediately reviewing the list of personnel in their area. Handwritten employee and contractor lists were generated, listing the workers only as they congregated at the muster points or sheltered in place. Later, EOC personnel compared the handwritten lists against the computer record of personnel who remained badge'd in to the production areas.

Additionally, although emergency response team members were familiar with the employee accountability procedures, not all supervisory and security employees, who were to conduct the accounting, had been trained on them. In fact, some of the employees responsible for accountability were unaware prior to the incident that their jobs could include this task in an emergency.

*Since the fatally injured employee was a member of the emergency response team, area supervisors did not consider her absence from the muster point unusual.*

5

## Evacuation and Accountability Procedures

Q & A



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