

Unclassified/FOUO



***Mine Resistant Ambush Protected
(MRAP) Safety***

DOD Safety Forum, 23 Sep 08

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Deployment & Operations Task Force***

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- **The concern: Theater tactical vehicle mishaps**
 - **CENTCOM vehicle accident data Jan 2003 – Aug 2008**
 - 246 fatalities
 - 900 serious injuries
 - **MNC-I data for CY05**
 - 384 rollovers
 - 71 fatalities
 - **Army Combat Readiness Center data for OIF/OEF**
 - 538 HMMWV rollovers through Jan 07
- **The challenge: Apply lessons learned from Up Armored HMMWVs to get ahead of the “bow wave” when MRAP is fielded**

MRAP Mishaps – 1 Nov 07 – 20 Sep 08

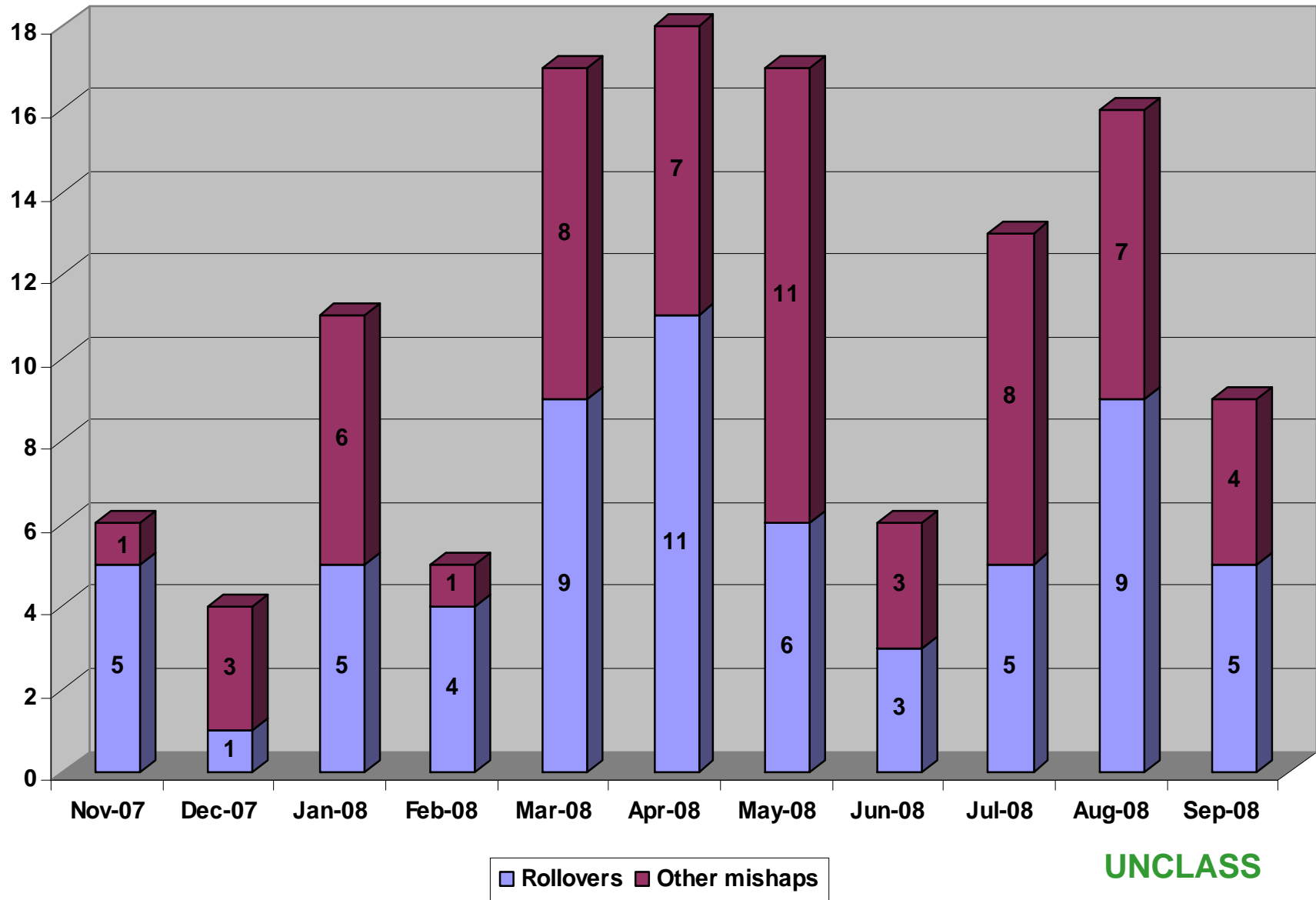
- **122 mishaps (recorded from multiple sources*)**
- **63 (51%) rollovers/tip-overs**
 - 39 - Fall initiated : ledge, slope, ground surface collapsed
 - 14 - Maneuver initiated: swerving maneuver on flat ground or terrain
 - 3 - Impact Initiated: hitting object
 - 7 - Unknown cause
- **7 fatalities from rollovers**
- **66 injuries from rollovers**
- **59 other mishap events include:**

Event	Number
Traffic Accident with other vehicles	12
Personal Injury – Falling off/tripping	6
Personal Injury – Crushing (doors, hatches, Rhino, turret)	16
Power Line Related	10
Fire	4
Other, i.e. hit objects, failed to set parking brake, etc.	11

* CENTCOM SIGACTS, Unit Safety Gram/Red-Hash, Safety Centers. Data includes both OIF and OEF.

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MRAP Mishap Trend - 1 Nov 07 – 20 Sep 08



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Some of the Challenges – Vehicle Rollover



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Some of the Challenges – Power line Entanglement



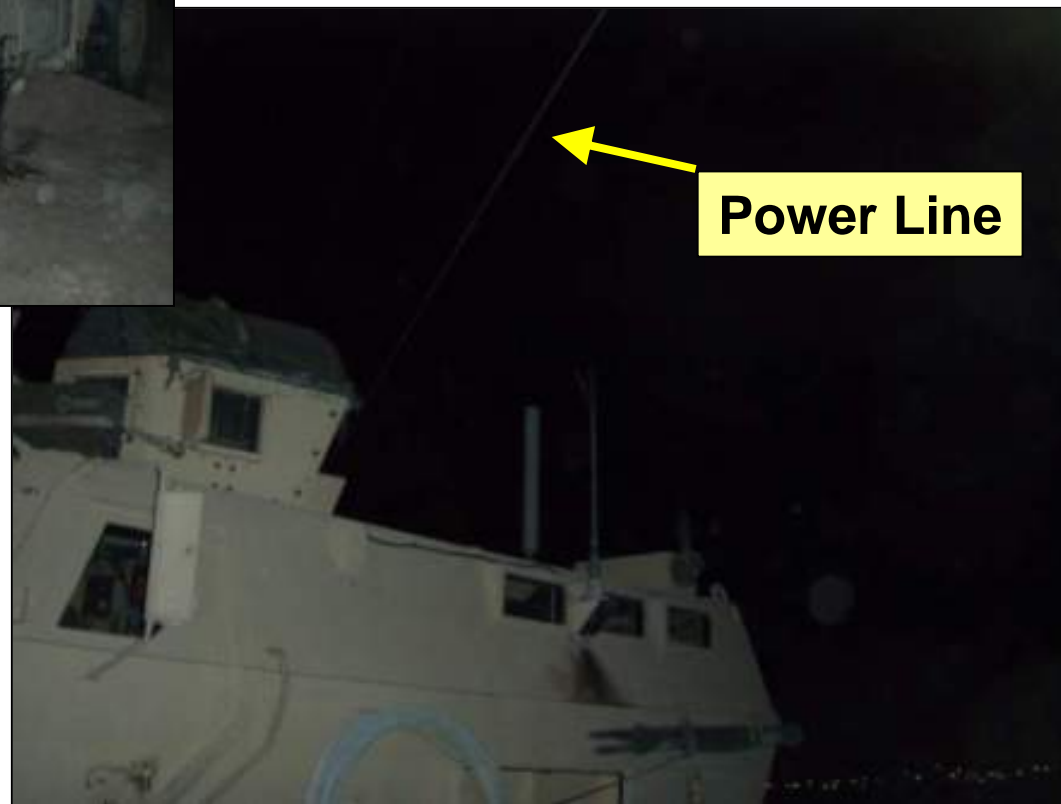
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Some of the Challenges – Power line Entanglement

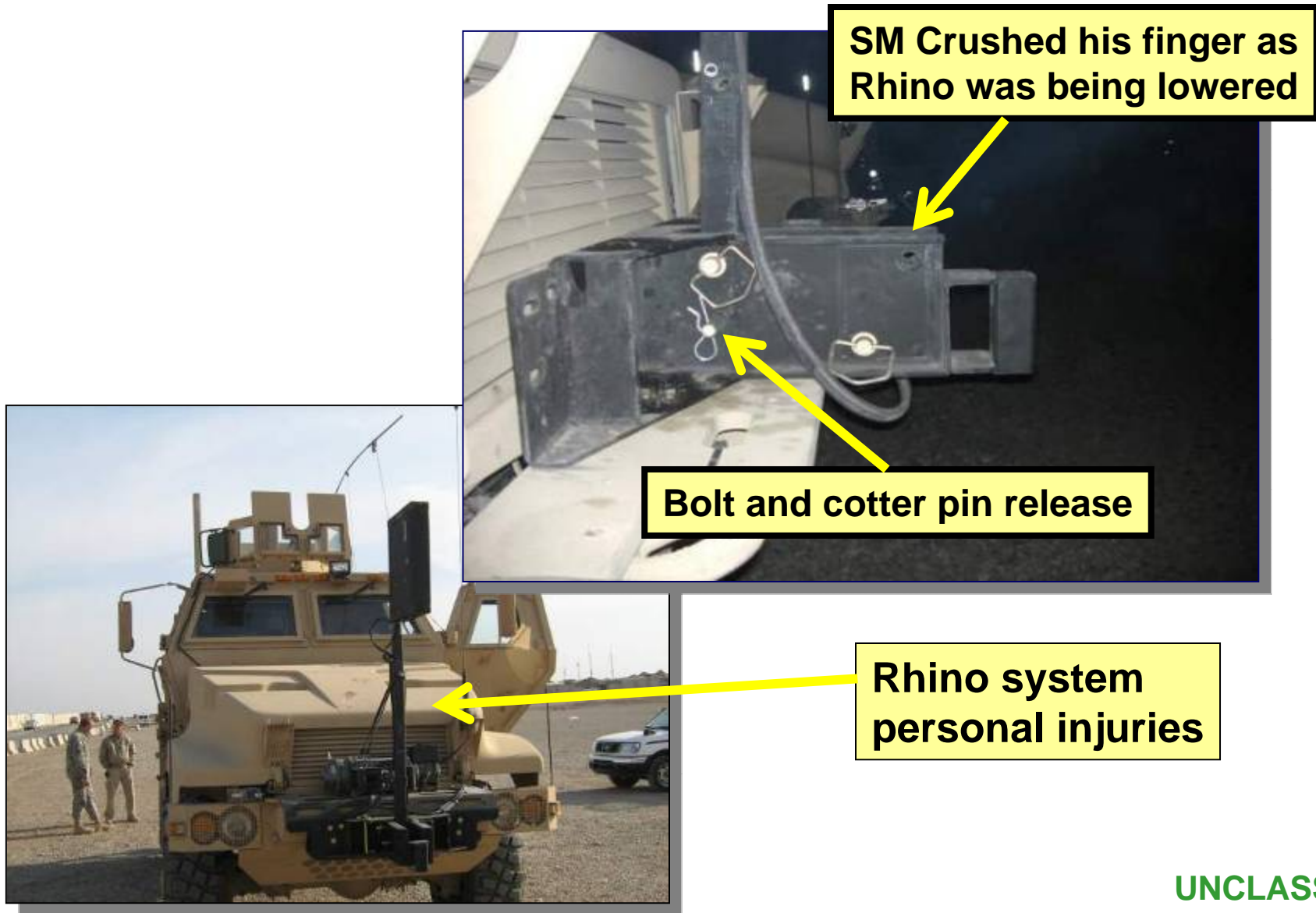


**Blown Tire
TC Side**



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Some of the Challenges – Crushed Hand Injury



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Some of the Challenges – Vehicle Recovery



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MRAP Joint Project Office (JPO)

- **Concerns**

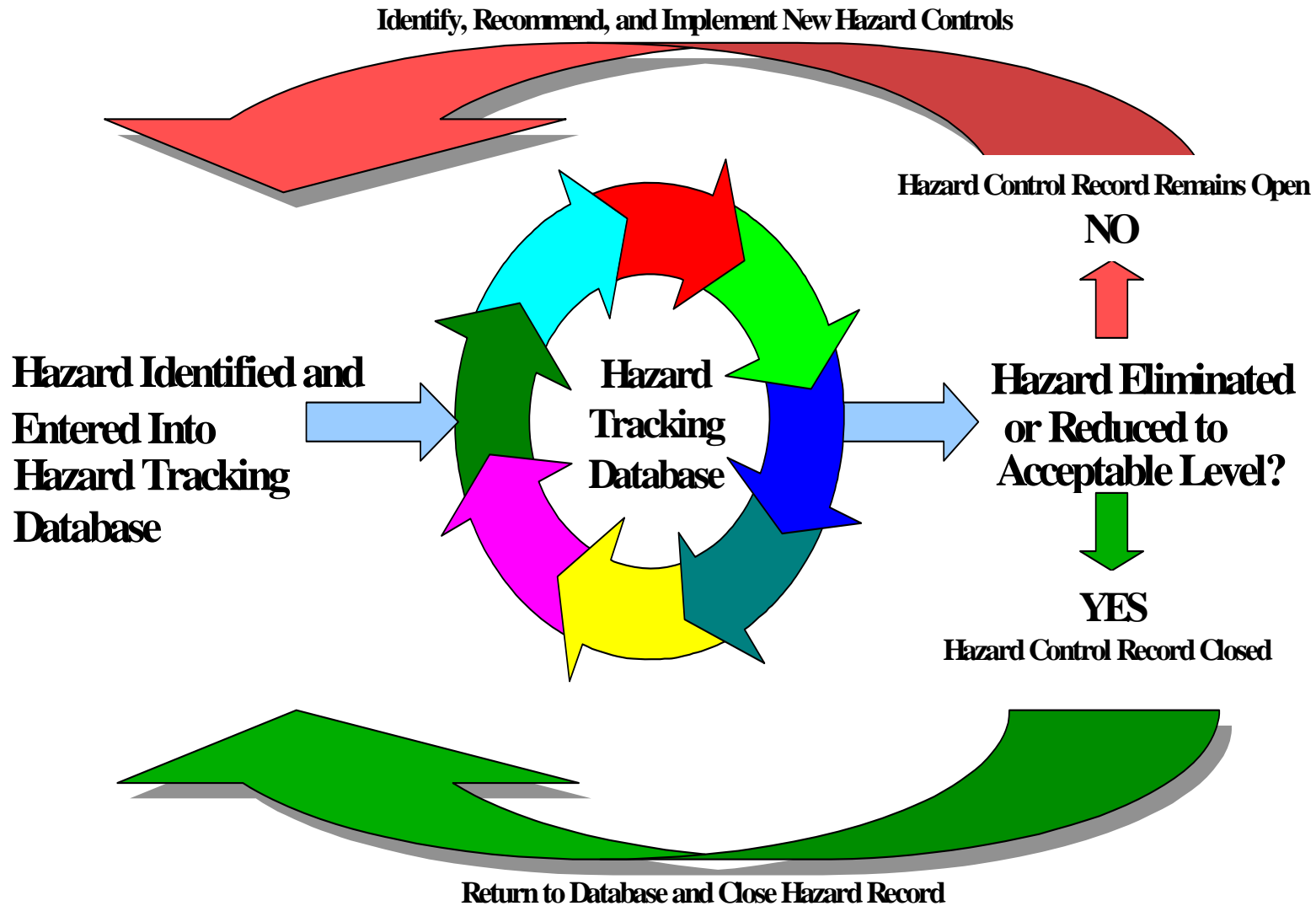
- Field changes without hazard assessments
- Safety of Use messages not reaching all users/operators
- Difficult to implement recommended safety mitigations
- High number of serious risks were accepted prior to fielding

- **Successes**

- Expedited fielding of survivable vehicles to AOR
- Completed safety hazard analysis and risk acceptance on all 5 variants for 12 unique missions within 1 year
- Pushed for creative “safety” solutions in a non traditional rapid acquisition program
- Used “Real Time” CENTCOM accident data/trends



MRAP JPO Closed Loop Hazard Tracking Process



DOTF and MRAP JPO Collaboration

• From DOTF tracking

	Date	Description	Code
1	7 Nov 07	JERRV vehicle rolled over and sustained damage	ROU
2	10 Nov 07	MRAP (Cougar) traveling on an MSR and rolled over. One injury.	ROM
3	11 Nov 07	RG31 rolled over. Soldier driving the vehicle was trying to avoid pothole and made a sudden maneuver resulting in the rollover. Vehicle sustained \$165K in damage. Four personnel were injured. Class C	ROM
4	21 Nov 07	JERRV While conducting drivers training, traveling 45mph, the driver lost control and rolled the vehicle over on its roof.	ROM
5	27 Nov 07	Soldiers hand was crushed in electrical turret. Class C injury.	PI
6	30 Nov 07	RG-31 rolled over while trying to avoid a collision with another vehicle. No injuries (OEF)	ROM



• To MRAP JPO tracking

POINTS OF CONTACT - MARCORSSYSCOM MRAP JPO		Mishap Metrics						
Mr. Adam Gambriell, Ctr. agambriell@egginc.com, 540-858-8089								
No.	Date of Incident	Variant	System/ Subsystem	Mishap	Effect	Cause	Resolution	Status
1	7-Nov-07	FPII Cougar (JERRV)	Vehicle	Roll Over	Equipment Damage	Unknown	Training	See Note 1
2	10-Nov-07	FPII Cougar	Vehicle	Roll Over	Injury	Unknown	Training	See Note 1
3	11-Nov-07	GDLS RG31	Vehicle	Roll Over	Equipment Damage / 4 injuries	Soldier made sudden maneuver to avoid a pothole, resulting in a rollover. Vehicle sustained 165K in damage.	Training	See Note 1
4	21-Nov-07	FPII Cougar Cat II	Vehicle	Roll Over (Inverted)	Equipment Damage	While conducting drivers training, traveling 45mph, the driver lost control and rolled the vehicle over on its roof.	Training	See Note 1
5	27-Nov-07	Unknown	Electrical Turret	Hand Crushed by Turret	Class C injury	Soldiers hand was crushed in electrical turret	Training	See Note 1

MRAP Safety Improvements

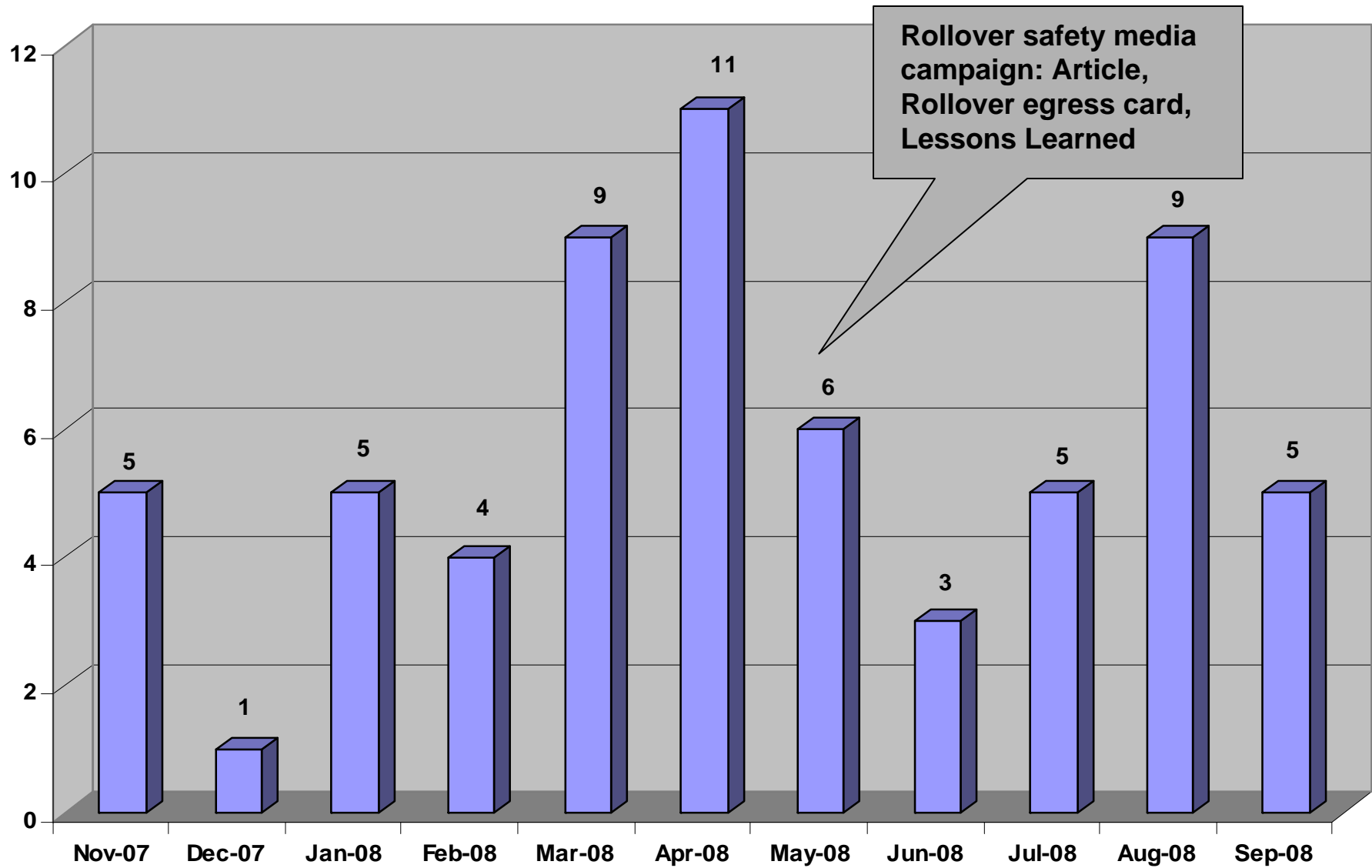
- Mishap trend information sharing
- Safety TTPs and Lessons Learned
 - Protection procedures for working in damaged vehicle (CHPPM, NMCPHC, CALL, USMCCLL)
 - Rollover Lessons Learned (TRADOC, USACRC)
 - Power line entanglements (CALL, USAIC)
- Safety Articles
 - USMCCLL “Safety Corner” June 08
 - USACRC/SC “Knowledge” Sep 08
- Rollover Egress Procedures Graphic Training Aid (TRADOC)
- Disseminate MRAP Smart Book (CALL, USAIC)
- Safety of Use Message (SOUM) Master tracking (JPO, TACOM)
- Posts to CENTCOM MRAP Homepage – SIPR (CENTCOM)
 - <http://www.rel.centcom.smil.mil/sites/MRAP/default.aspx>
- Proposed potential for Rollover Alert Device (JSSWG, JUWG)



MRAP Safety – A Collaborative Effort

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MRAP Rollover/Tip-over 1 Nov 07 – 20 Sep 08



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Questions/Discussion

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