



The National Fire Fighter Near-Miss Reporting System

Crew Resource Management
Threat & Error Management

www.firefighternearmiss.com

www.iafc.org/safetyAndHealthResources



Goals

- **Introduce the concepts of Crew Resource Management and Threat & Error Management to fire fighters.**
- **Use the concept as a tool that can be used to save fire fighters' lives, reduce injuries and the adverse impacts of human error.**

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...To err is human...

Marcus Tullius Cicero
106-43 B.C.

Managing error
acknowledges that
humans make
mistakes.



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Error Management



Traditional
thinking
focused on
improving
technology
to prevent
disasters.

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The Human Factor

- Cockpit Voice Recordings led analysts to conclude that 70% of all aviation accidents were the result of human error.
- Discovery reformed approach to preventing aviation disasters.



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Innate Abilities & Learned Behaviors

- Led to the development of Cockpit Resource Management, then (CRM), Crew Resource Management, now Threat & Error Management (TEM).
- CRM proponents claim improved decision-making and reduced errors.

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Error Management: Introducing Cultural Change

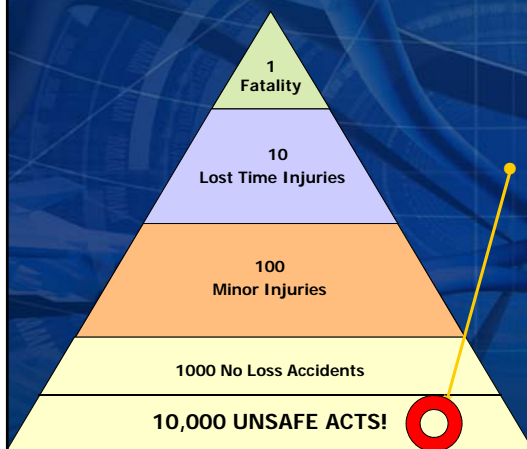
Contemporary thinking acknowledges that error is a way of life.

- **Given the acceptance that human error may occur, the focus has become “How does one effectively manage error?”**
- **Proper error management greatly enhances safety.**

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Heinreich's Theory (1930's)



Intervening at the lowest level saves more lives, pain and suffering.

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Human Factor Error Causes Gordon Dupont's "Dirty Dozen"

- Lack of Communication
- Complacency
- Lack of Knowledge
- Distraction
- Lack of Teamwork
- Fatigue
- Lack of Resources
- Pressure
- Lack of Assertiveness
- Stress
- Lack of Awareness
- Norms

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Helmreich's Error Management Model



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Error Trapping


**Layers of Defense =
Redundancy =
Increased Safety Margin**

- To trap errors, keep as much redundancy in the crew for as long as possible.*

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Layers of defense (redundancy) trap crew errors




Driver Familiar with area

Crew member grew up in complex

On-Board computer provides running route and incident information

Officer-in-charge

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Even good barriers have holes . . .
James Reason's "Swiss Cheese"


Follow SOPs

Use All Eyes & Ears

Maintain Good Situational Awareness

High Level of Proficiency

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Error Mitigation

**Be Vigilant, Stay Focused
(BVSF)**

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“BVSF”

Constantly review and cross check that what you are doing is sensible for where you are, and where your are going (**situational awareness**)

- **Example: Entering a second floor rear window when PPV is operating at the front door.**
- **Responding to Nelson Street vs. Nelson Lane**

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Overlap

“Redundancy” of the three layers fosters effective error management

- **Example: SOPs**
 - **Avoid** – because I am doing things by the SOP, I will avoid the chance of error.
 - **Trap** – SOPs can help catch (trap) errors.
 - **Mitigate** – Referring back to SOPs when things go awry mitigate error.

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Crew Resource Management Threat & Error Management

- Force multiplier
- Error Management
- Maximizes all resources
- Proven
- Institutionalizes Instincts



Photo by Carlos Alfaro, MCFRS

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Crew Resource Management (CRM) is a tool created to optimize human performance by reducing the effect of human error through the use of all resources.

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Principles



Photo by Bob Bartosz, Camden Fire Department

- **Communication**
- **Task Allocation**
- **Teamwork**
- **Critical Decision Making**
- **Situational Awareness**

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Communication

- **Formulate idea**
- **Select medium**
- **Transmit**
- **Receive**
- **Interpret**
- **Feedback**



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Do You Hear What I Say?

- **Barriers and bias block communication**
- **“Standard” language benefits all**
- **Practice “active” listening**
- **Divide duties to prevent overload**
- **Minimize distractions**

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Barriers, Roadblocks & Standard Language

- **Barriers & Roadblocks**
 - Hazardous Attitudes
 - Fatigue
 - Inattention
- **Standard Language**
 - 500 most common words have 14,000 meanings.
 - Say what you mean and mean what you say, but know that what you mean to say may not be taken as what you meant to say.



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Inquiry & Advocacy Skills

Inquiry Skills

- **Be Proactive**
- **Use Clear, Concise Questions**
- **Express Concerns Accurately**

Advocacy Skills

- **Be Respectful**
- **Offer a Solution with your Concern**
- **Know When to Say When**

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Assertive Behavior

- **Authority with Participation**
- **Assertiveness with Respect**

The genuine, complete & direct communication of ideas, wants & needs.

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Todd Bishop's Assertive Statement

- **Opening/attention.**
- **State concern/owned emotion.**
- **State the problem as you see it.**
- **State a solution.**
- **Obtain agreement (aka buy-in).**



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Teamwork

- **Leadership**
- **Followership**



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Leadership

- Authority
- Mentoring
- Conflict Resolution
- Mission Analysis



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Leadership

- Mandated by rank
- Truly derived through respect
 - Personal competence
 - Technical competence
 - Social competence
- Risk vs. Gain
- Develop strategy

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Followership



- **Self Assessment**

- ✓ Physical Condition
- ✓ Mental Condition
- ✓ Attitude
- ✓ Understand Human Behavior

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Followership Skills

- **Respect authority**
- **Personal Safety**
- **Crew Safety**
- **Accepts authority**
- **Knows authority limits**
- **Leader success**
- **Good communication skills**
- **Learning attitude**
- **Ego in check**
- **Balance assertiveness/authority**
- **Accept orders**
- **Demand clear tasks**
- **Admit errors**
- **Provide feedback**
- **Adapt**

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Task Allocation

- Know your limits.
- Know your crew's limits.
- Capitalize on strengths.
- "Eat the elephant one bite at a time."



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Task Allocation

- Proper use of automation
- Control distractions
- Follow SOPs
- Delegate
- ICS
- Use **CRM**



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Critical Decision Making

Traditional Decision Making

- Identify problem
- Assess hazard
- Assess resources
- Solicit solutions
- Select best option
- Monitor results

Fire Service Decision Making

- Recognition Primed Decision Making
- Naturalistic Decision Making
- Cue Based Decision Making

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Recognition Decision Making

- Rapid, intuitive process
- Looks for critical causes
- Relates to previous experiences
- Recalls previous conclusions & best actions taken
- Issues direction
- Experience

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Cue Based Decision Making

- Individual is prompted to act based on “cues” from event.
- Cues are sensory elements (sights, sounds, smells) that recall previous actions under similar circumstances.

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Ways to Improve Decision-Making

- **Experience**
- **Training**
- **Communication**
- **Preplanning**



Photo by Carlos Alfaro, MCFRS

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Situational Awareness



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The skill of becoming aware of the situation as it actually exists.

Reality times Perception still equals Reality.

- The Killer Equation

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- ***“Fight the fire!”***
- **Assess problems in the time available.**
- **Gather info from all sources.**
- **Choose the best option.**
- **Monitor results – alter as necessary.**
- ***Beware of SA loss factors!***

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Situational Awareness Loss Factors

- **Ambiguity**
- **Distraction**
- **Fixation**
- **Overload**
- **Complacency**
- **Improper Procedure**
- **Unresolved Discrepancy**
- ***“Nobody Fighting the Fire”***



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Elements of Good Situational Awareness

- **Good crew coordination**
- **Proper task completion**
- **Understanding**
- **Smooth ride**
- **Crisp and appropriate radio calls**
- **Use of checklists**

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Preventing Loss of Situational Awareness

- **Crew mental joggers**
 - “What do we have here?”
 - “What’s going on here?”
 - “How are we doing?”
 - “Does this look right?”



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Preventing loss of Situational Awareness

Personal Mental Joggers

- What do I know that they need to know?
- What do they know that I need to know?
- What do we all need to know?

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**If we continue on the current
LODD/injury path, the fire
service will experience 1000
fatalities and 100,000 injuries in
the next ten years.**

*“If not now, when?
If not us, who?”*

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- **Human error is the leading cause of accidental injury, death and property damage.**
- **Errors can be effectively managed and mitigated through the consistent use of CRM.**
- **The aviation, military and medical industries have over 25 years of experience that validates the value of Crew Resource Management and Near Miss Reporting.**

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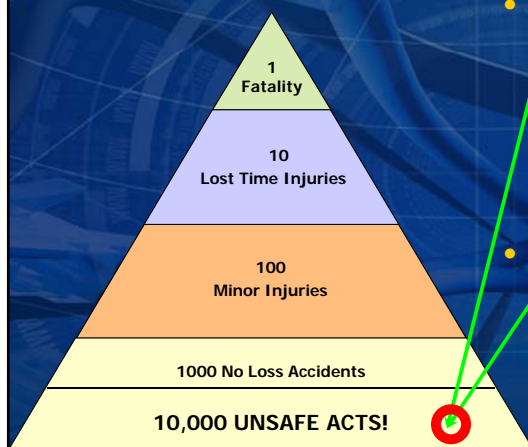
CRM & Near Miss

- **What are the ties between the two?**
- **Can you do one without the other?**
- **Which one is more effective?**
- **Who else is using this stuff?**

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Ties That Bind



- Near Miss Reporting
 - Intervenes @ “Unsafe Acts”
 - Greater ratio of opportunity for intervention
 - All members participating
- CRM
 - Targets “Unsafe Acts” area
 - Most eyes/ears working
 - All member commitment

Lowest Level Intervention Minimizes Impact on Pain, Suffering and Property Loss!



CRM & Near Miss

- Compliment and support each other.
- Effectiveness is based on commitment and support of department leadership.
- All major U.S. air carriers, U.S. Military, Wildland fire service, individual fire departments.

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www.firefighternearmiss.com

- Voluntary
- Confidential
- Secure
- Web based
- Free



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ROTW

- Free feature
- Good training tool
- Provides quick, Effective drill
- nearmiss@iafc.org – type “subscribe-crm” in subject line.



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QUESTIONS?

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