



**RIC 2010**

**Risk Communication –  
Principles, Tools, &  
Techniques**

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# **Radiological Risk and Emergency Communications**

## **Draft NUREG/CR-XXXX**

## Project Objective

“To conduct a comprehensive review of the *research and practitioner literature* on *best practice* in *radiation risk and emergency communication.*”



## Definition

**Risk:** “a threat of loss, real or perceived, to that which we value.”

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**Risk:** “a threat of loss, real or perceived, to that which we value.”

**Risk Communication:** “the exchange of information about risks.”

# Risk Communication Goals

- Enhance knowledge and understanding
- Build trust and credibility
- Encourage appropriate attitudes, behaviors and beliefs

## **Risk Communication: Key Messages**

- Risk communication is a science-based discipline
- High concern situations change the rules of communication
- The key to risk communication success is anticipation, preparation, and practice

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# Risk Communication Literature

- 8000 Articles in Peer Reviewed Scientific Journals
- 2000 Books



## **Risk Communication Literature: Example**

Dr. R. Hyer and Dr. V. Covello

*“Effective Media Communication During Public Health Emergencies: A World Health Organization Handbook”*

World Health Organization, United Nations: Geneva, April 2007  
([www.amazon.com](http://www.amazon.com) or [www.who.int/bookorders](http://www.who.int/bookorders))

## **Risk Communication Literature: Example**

*“The Magic Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information”*

George A. Miller (Department of Psychology, Princeton University)

The Psychological Review, 1956, vol. 63, pp. 81-97

# Risk Communication Literature: Example

*“Five Essential Elements of Immediate and Mid-Term Mass Trauma Intervention: Empirical Evidence,”* *Psychiatry*, 70(4): 2007 Authors: Steven Hobfoll et. al.

## Conclusion of Research

Provide people a sense of:

- Hope
- Self- and community efficacy
- Safety
- Calm
- Connectedness

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# Risk Communication Theories

- Trust Determination Theory
- Mental Noise Theory
- Negative Dominance Theory
- Risk Perception/Outrage Theory

# Risk Communication Theories

- Trust Determination Theory
- Mental Noise Theory

## **Risk Communication: Core Principles**

When people are concerned, stressed, or upset:

- They want to know that you care before they care what you know (Trust Determination Theory)
- Have difficulty hearing, understanding, and remembering information (Mental Noise Theory)
- Focus most on what they hear first (Mental Noise Theory)



# Risk Communication Theories

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## **Risk Communication: Core Principles**

When people are concerned, stressed, or upset:

- They often focus more on the negative than on the positive (Negative Dominance Theory)
- The gaps between risk perceptions and reality often become wider (Risk Perception Theory)

## Risk Perception Theory: Fear/Outrage Factors

### Lower Concern / Fear

1. Trustworthy sources
2. Large benefits
3. Under one's control
4. Voluntary
5. Fair
6. Natural origin
7. Children not victims

### Higher Concern / Fear

- Untrustworthy sources
- Few or unclear benefits
- Controlled by others
- Involuntary
- Unfair
- Human origin
- Children as victims

## Risk Perception Theory: Fear/Outrage Factors

Lower Concern /

Lower Fear /

Lower Outrage

1. Trustworthy sources
2. Large benefits
3. Under one's control

Higher Concern /

Higher Fear /

Higher Outrage

- Untrustworthy sources  
Few or unclear benefits  
Controlled by others

# Risk Perception (Fear) Factors

- Trust
  - Listening / Caring
  - Competence / Expertise
  - Honesty / Transparency
- Benefits / Fairness
  - Societal
  - Community
  - Personal
- Control / Voluntariness
  - Choice
  - Voice
  - Knowledge

# Risk Communication Theories

- Trust Determination Theory
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# Risk Communication Templates

- CCO
- Rule of 3
- 27/9/3
- Primacy/Recency
- AGL-4
- 1N=3P
- IDK





# Risk Communication Templates

- CCO

# The CCO Template

- Compassion
- Conviction
- Optimism

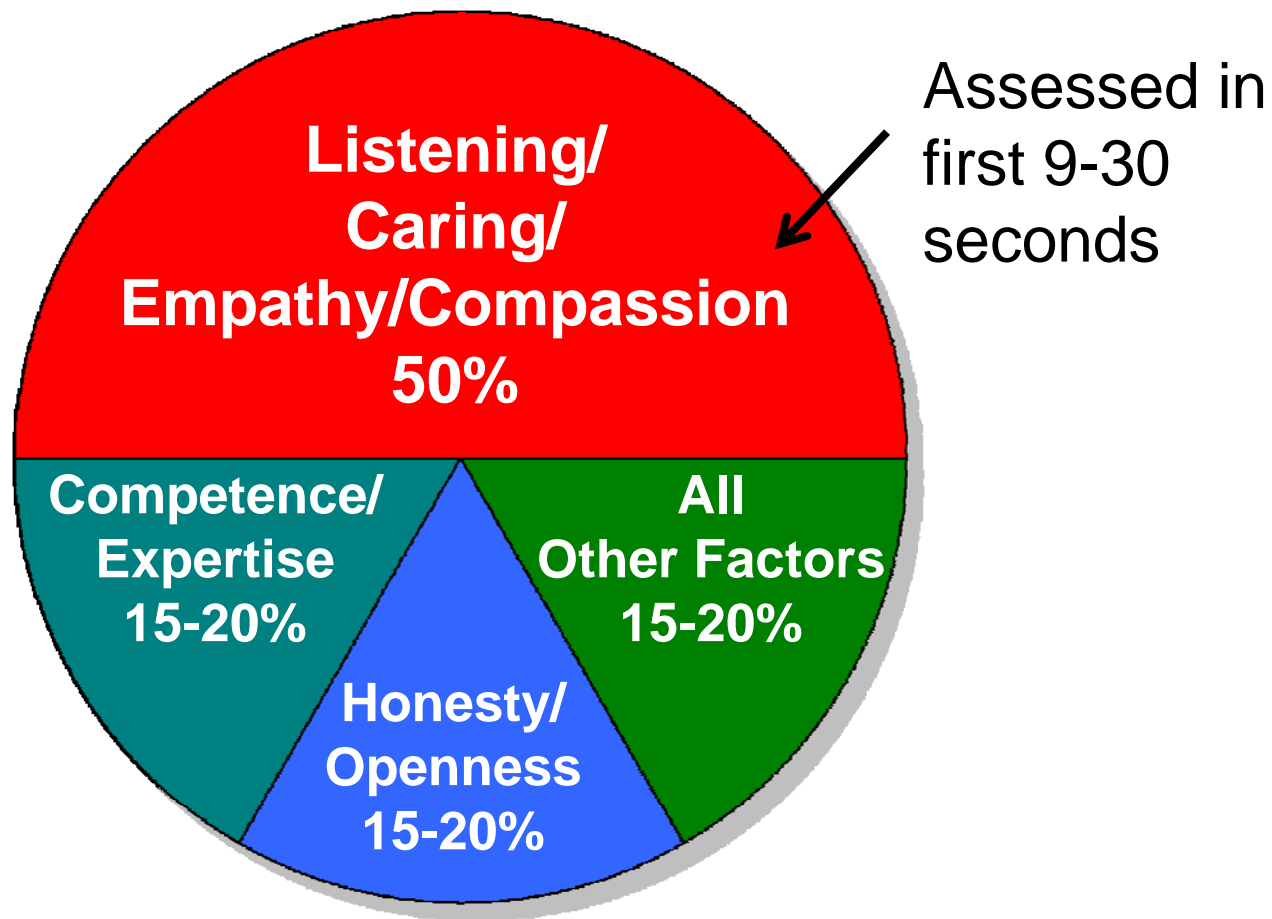
# Caring / Empathy Principle

“When people are stressed and upset, they want to know that **you care before they care what you know.**”

# The CCO Template

- Compassion
- Conviction
- Optimism

# Trust Factors in High Stress Situations



# CCO: Related Templates

- CCO Template  
(Caring, Conviction, Optimism)

=====

- CAP Template  
(Caring, Actions, Perspective)
- CSS Template  
(Caring, Sharing, Sharing)



# Templates

- Rule of 3
- 27 / 9 / 3

# Templates

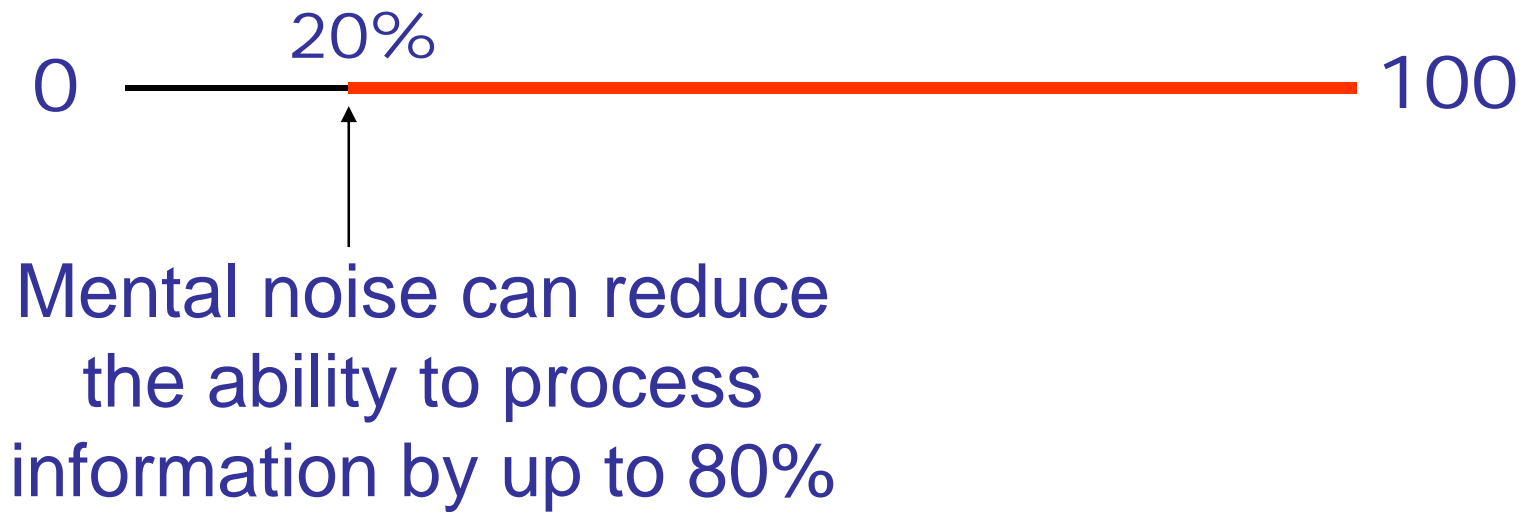
- **Rule of 3 Template:**  
All risk communication messaging in threes
- **27/9/3 Template:**  
Key messages expressed in  
27 words, 9 seconds, 3 messages



## **Risk Communication: Core Principles**

***When people are concerned, stressed, or upset: they often have difficulty hearing, understanding, and remembering information.***

# Risk Communication: Mental Noise





# Templates

- Rule of 3
- 27 / 9 / 3

# The Rule of 3 Template

- Everything in Threes
  - Three key messages
  - Repeat messages three times (e.g. Triple T Model)
  - Key messages supported by three supporting messages of three credible sources



# Templates

- Rule of 3
- 27 / 9 / 3

# The 27 / 9 / 3 Template

- 27 words
- 9 seconds
- 3 messages

# Risk Communication Templates

- CCO
- Rule of 3
- 27/9/3
- Primacy/Recency
- **AGL-4**
- 1N=3P
- IDK

# AGL-4 Template

AGL (Average Grade Level) Minus 4 (Four Grade Levels) Template

“When people are stressed and upset, they typically process information at four grade levels below their average grade level.”



## **AGL-4 Shift**

- Low Stress Situations:  
Brain processes information at **AGL** (average grade level)
- High Stress Situations:  
Brain processes information at **AGL-4** (average grade level minus 4 grade levels)

# Notification of Unusual Event

“Under this category, events are in process or have occurred which indicate potential degradation in the level of safety of the plant. No release of radioactive material requiring offsite response or monitoring is expected unless further degradation occurs.”

Source: [NRC Web Site](#)

## **Notification of an Unusual Event (revision for media and public communication)**

An Unusual Event is the lowest of the four emergency levels at a nuclear power plant.

- It involves a minor problem at the plant.
- Local and state emergency organizations would be notified but not asked to respond.
- No protective actions for the public would be required.

## **Risk Communication: Key Messages**

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# Risk Communication Strategy: 7 Steps

- 1) Identify a risk related issue or scenario
- 2) Identify key stakeholders (audiences)
- 3) Identify stakeholder questions and concerns
- 4) Develop key messages consistent with risk communication principles
- 5) Develop supporting information
- 6) Conduct testing
- 7) Plan for delivery

## **Risk Communication: Core Principles**

“Most of the concerns and questions of upset or concerned people can be predicted in advance.”

# Stakeholder Predictability

“50 Most Frequently Asked Questions by  
Terminally Ill Patients”

# Stakeholder Predictability

“77 Most Frequently Asked Questions by Journalists in a Disaster”



# Stakeholder Predictability

“65 Most Frequently Asked Questions about Pandemic Influenza”

(Google: [pandemicflu.gov](http://pandemicflu.gov), message maps)

“ 205 Most Frequently Asked Questions Following a Water Security or Water Contamination Event”

(USEPA, “Effective Risk Communication during Water Security Emergencies” EPA/600/R-07/027)

## **Research Finding: Radiological Events**

- Over 450 questions from the media and the public
- 14 categories of questions (for example, questions about evacuation, sheltering in place, health and safety, KI, and economic impacts)



**Stakeholder  
Question or  
Concern:**

# Message Map

**Key Message**  
9 words on average

**Key Message**  
9 words on average

**Key Message**  
9 words on average

**Supporting Info.**  
**1.1**

**Supporting Info.**  
**2.1**

**Supporting Info.**  
**3.1**

**Supporting Info.**  
**1.2**

**Supporting Info.**  
**2.2**

**Supporting Info.**  
**3.2**

**Supporting Info.**  
**1.3**

**Supporting Info.**  
**2.3**

**Supporting Info.**  
**3.3**

k C

**West Nile  
 Virus Map**

**Overarching  
 Message Map**

**Key Message**  
**“Remove  
 Standing Water”**

**Key Message**  
**“Wear Protective  
 Clothing”**

**Key Message**  
**“Use Insect  
 Repellent”**

**1.1**

**Unattended  
 swimming  
 pools**

**2.1**

**Long Sleeves**

**3.1**

**DEET**

**1.2**

**Flower  
 Pots/Bird  
 Baths**

**2.2**

**Long Pants**

**3.2**

**23%**

**1.3**

**Cup of Water**

**2.3**

**Dusk and  
 Dawn**

**3.3**

**Medical  
 Research**

## **Message Map: What is meant by sheltering in place during a radiological emergency?**

**Key Message 1:** Sheltering in place is a protective action which includes going indoors at your current location.

**Key Message 2:** People may be asked to shelter in place rather than evacuate.

**Key Message 3:** Staying indoors for a short time can protect people from exposure to radiation.

## What is meant by sheltering in place during a radiological emergency?

**Key Message 1:** Sheltering in place is a protective action which includes going indoors at your current location.

### Supporting Facts

- Indoor locations include home, business, the office, school, or a shopping mall.
- Depending on the type of building, sheltering in place can result in a reduction of radiation of up to 80% compared to those who are outdoors and unsheltered.
- People who shelter in place should listen to a radio or television station for updates, close all windows and doors, close exterior vents, and turn off heating and air conditioning equipment using outside air.

# Message Maps

- Used to respond to high concern questions
- Contain clear, concise, layered information
- Contain vetted or screened messages for anticipated questions

# Message Mapping Goals

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**“If I had all day to cut a large tree,  
I would spend most of the day  
sharpening my axe.”**

**- Abraham Lincoln**



**“It takes me an average of two weeks to  
prepare an impromptu speech.”**

**- Mark Twain**