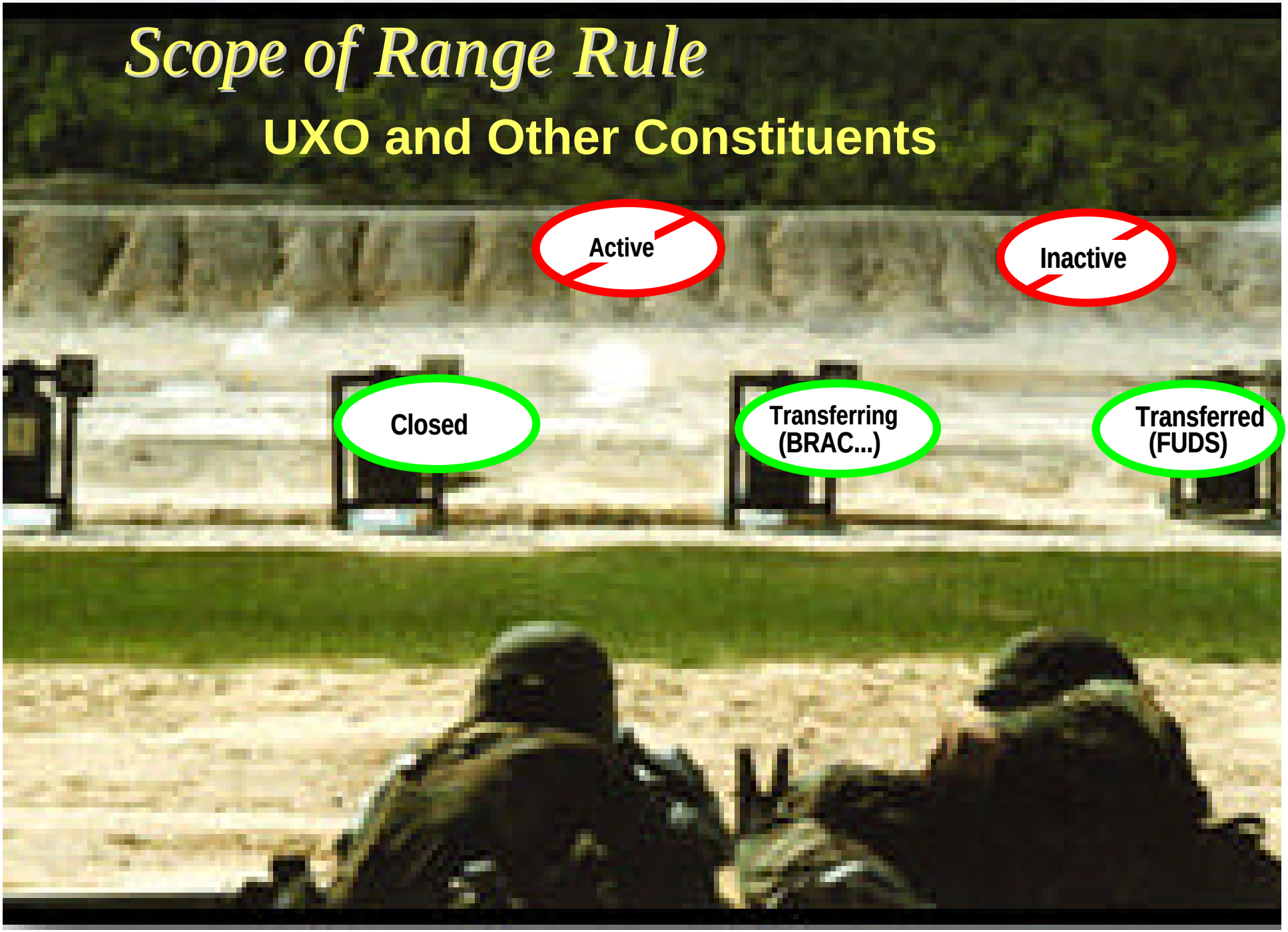
BRAC Clean-up Team Workshop 1998

DoD Range Rule

Scott Hill
Army Environmental Center
Range Rule Team

Scope of Range Rule

UXO and Other Constituents



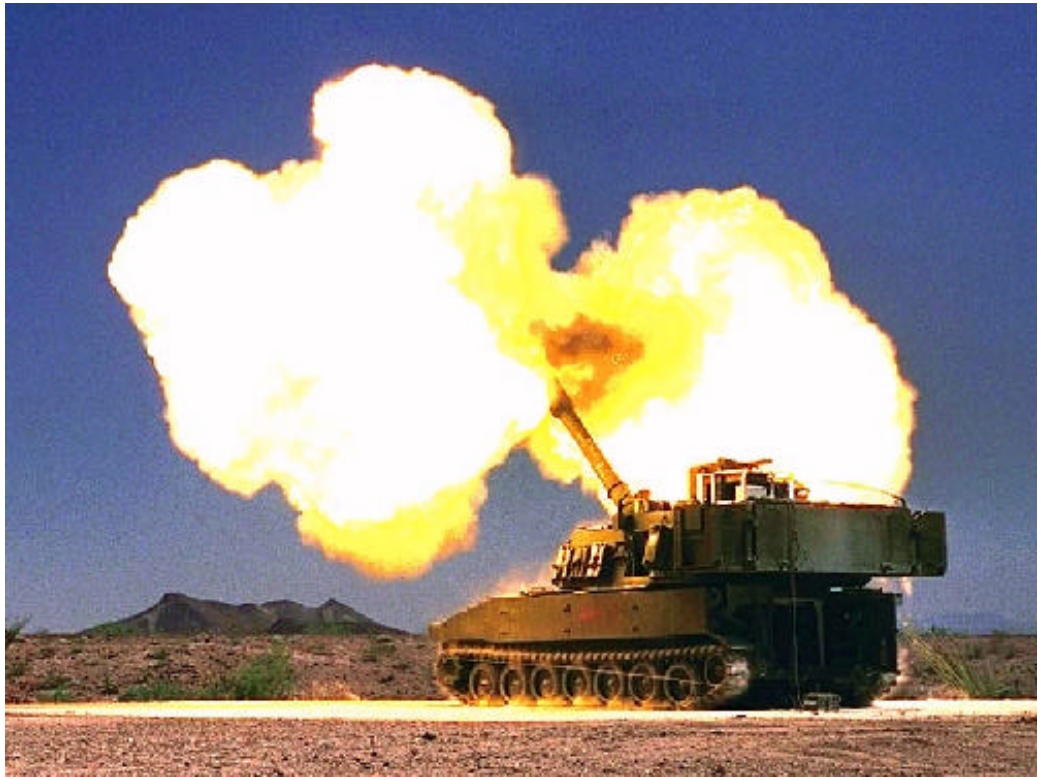
Why Range Rule?

- **Need for cohesive process to address UXO and other constituents on Closed, Transferring, and Transferred Ranges**

- **Ranges contain military unique compounds**
  - DDESB is explosives safety authority
  - DoD has explosives safety expertise

Range Rule Development - Overall Process

- **Develop draft proposed rule**
- **Internal & federal agency consultation**
- **Stakeholder consultation**
- **OMB review**
- **Publish proposed rule in Federal Register**
- **Public comment period (90 days)**
- **Revise rule per comments received**
- **Internal & federal agency re-coordination**
- **Publish revised ("final") rule in Federal Register**



Range Rule Status

- State/Tribe/Citizen Group input received
- Other federal agency input received
- OMB approval received
- Draft R3M developed with EPA input

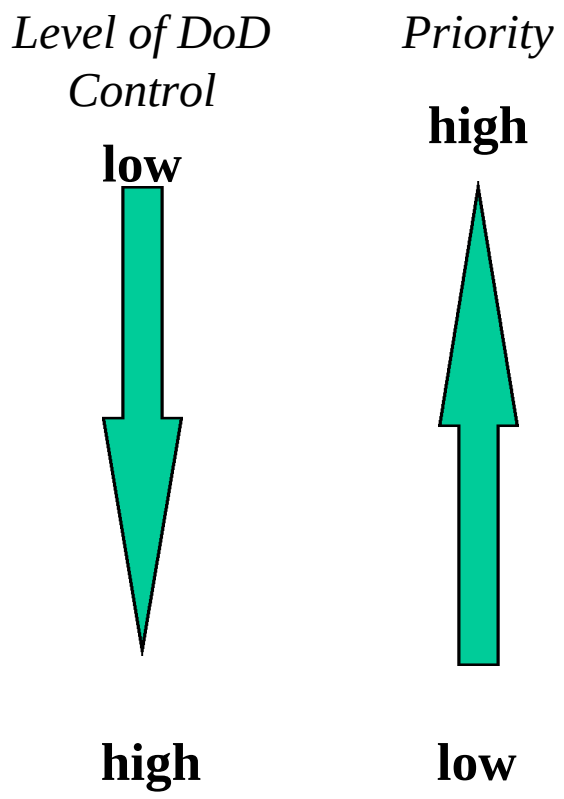
- Published in FR 26 Sept 97
- Comment Period Ended 29 Dec 97
- Received about 800 comments

Overview of Range Rule Process

- **Range identification**
- **Range assessment/accelerated response (RA/AR)**
- **Range evaluation/site-specific response (RE/SSR)**
- **Recurring review**
- **Administrative close-out of response action**

1st Phase: Range Identification

- **Military Range Inventory**
- **Central Inventory Database**
- **General Prioritization**
  - FUDS
  - Transferring DoD properties (e.g., BRAC sites)
  - Closed ranges on DoD installations



2nd Phase: Range Assessment/ Accelerated Response (RA/AR)

Range Assessment

- **Limited scope**
- **Assesses risk posed by:**
  - UXO
  - Other constituents

Accelerated Responses - some examples

- **Source removals/surface sweeps**
- **Posting warning signs**
- **Controlling access**
- **Community education/awareness**
- **Monitoring program**
- **Other appropriate engineering, institutional, or exposure controls**

3rd Phase: Range Evaluation/ Site-Specific Response (RE/SSR)

Range Evaluation

- **Detailed investigation**
- **Fully characterizes risks posed by UXO, or other constituents**
- **Determines if Accelerated Responses are adequate or if site-specific response necessary**
- **Requires collection/ analysis of quantitative information**

Site-Specific Response Evaluation

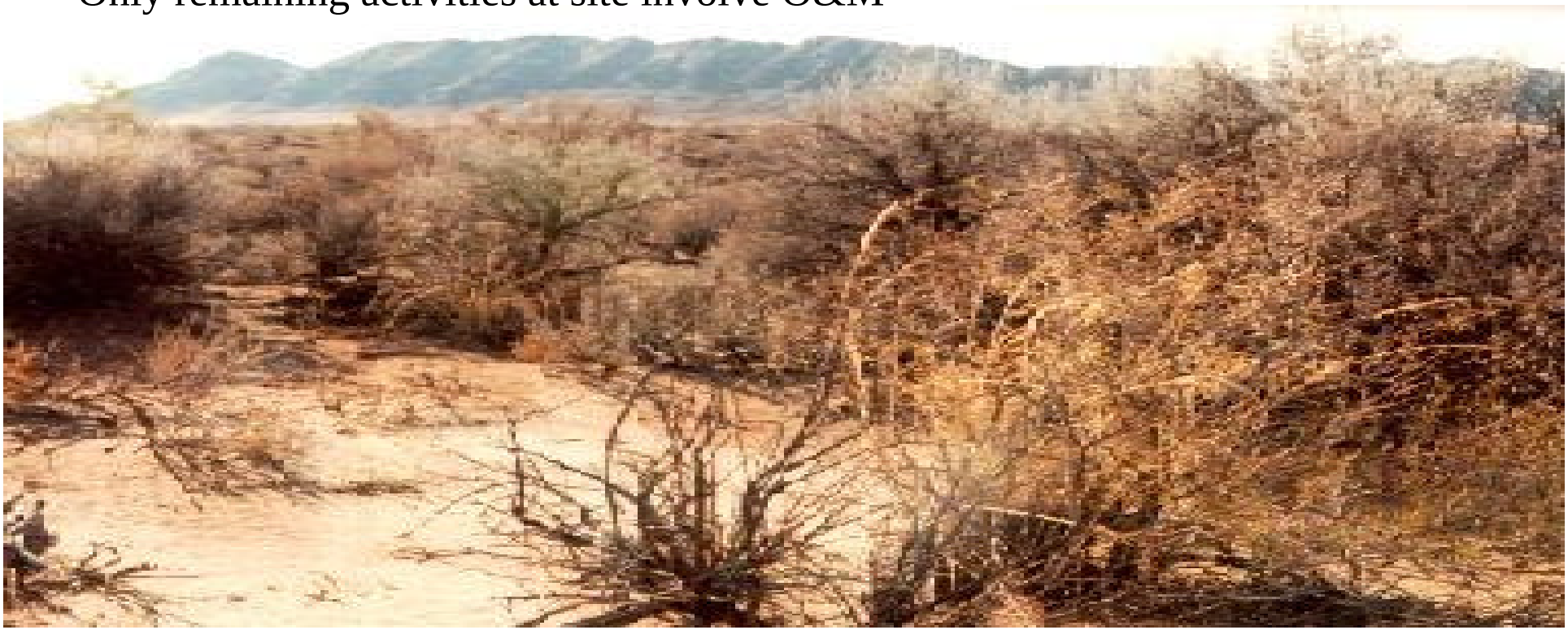
- **Highly focused investigation of response alternatives**
- **Screen site-specific response alternative against evaluation criteria**
- **Prepare RE/SSRE Report**

4th Phase: Recurring Reviews

- **Determines if response still:**
  - Minimizes explosive safety risks
  - Protects human health/environment
- **For findings of Technical Impracticability, provides an opportunity to assess applicability of new technology**

5th Phase: Administrative Close-Out of Response Action

- Demonstrate UXO or other constituents pose minimal risks
- Specific response objectives have been achieved/monitoring confirms
- Response is fully operational and performing to design specifications
- Only remaining activities at site involve O&M



Regulatory/Public Participation

- **Extended Project Teams**
  - DoD
  - EPA
  - State regulators
  - Native American Tribes
  - Federal Land Managers
- **RABS**

Response Action Selection

- Overall Protection of Human Health and the Environment (including explosives safety)
- Compliance with ARARs
- Long-term Effectiveness and Permanence
- Reduction in Toxicity, Mobility, Quantity, or Volume
- Short-term Effectiveness
- Implementability
- Cost
- Regulatory Acceptance
- Community Acceptance

Technology Development

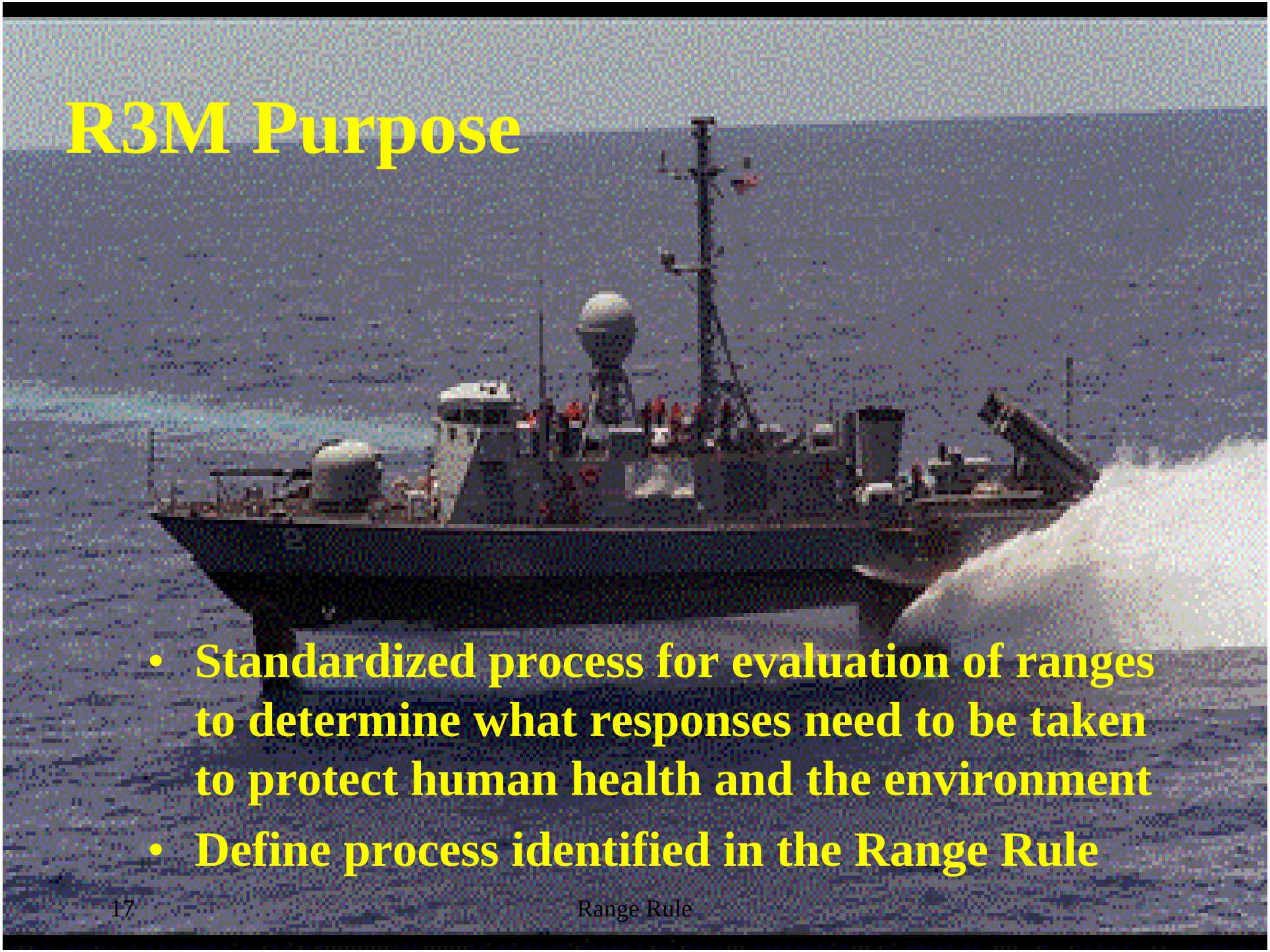
- **Detection**
- **Discrimination**
- **Removal**
- **Development of “green” munitions**

Range Rule Actions - Future

- Address comments received/revise rule
- Recoordinate with EPA/other federal agencies
- Publish interim final risk model/protocol - Before final rule
- Complete NEPA Analysis - Before final rule
- Publish final rule - Summer 1999
- Publish implementing guidance

Range Rule Risk Model

R3M Purpose



- Standardized process for evaluation of ranges to determine what responses need to be taken to protect human health and the environment
- Define process identified in the Range Rule

R3M Development Process

- Develop Interim Model
- Preliminary Validation
- Final Interim Model
- Full Validation
- Risk Management Strategy
- Final Version

R3M Overview

- Methodology vs. Model
- Three tier method
- Based on refinements to current practices
- Uses qualitative and quantitative data
- Acceptable risk concept is foundation
- Explosives Safety Risk vs. Other Constituents
- R3M is NOT Decision Maker
- Details the Range Rule Process

R3M Structure and Flow Simplified

Inventory

Qualitative Risk Evaluation

QRE

Streamlined Risk Evaluation

SRE

Detailed Risk Evaluation

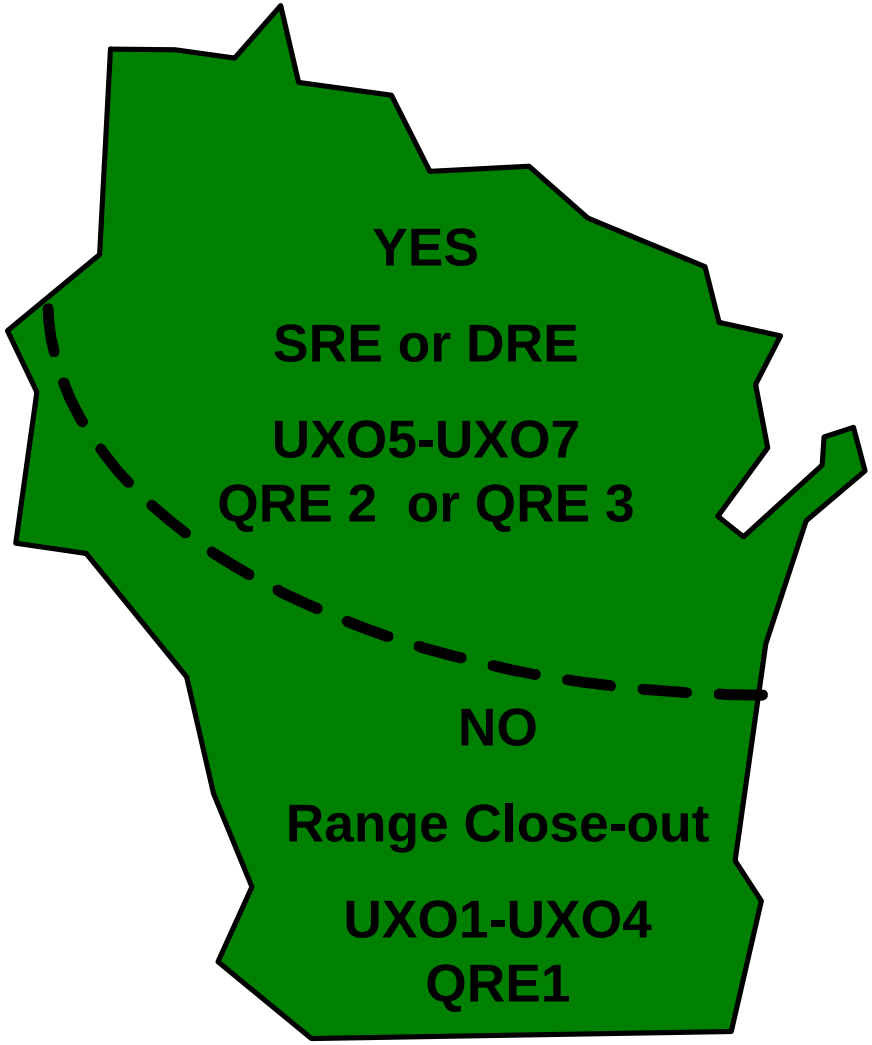
DRE

Response Action - Close out

Qualitative Risk Evaluation

- **Archives Search - Firing Records, ASP Records, Aerial Photos Maps, Deeds, Personnel Information**
- **Range Reconnaissance**
- **Future Land use**
- **Possible Outcomes**
  - Range Closeout / Delination
  - SRE or DRE
- **Data Collection and Evaluation**
  - CERFA-like Parcel Designation (UXO1-UXO7)
- **Qualitative Risk Evaluation (RAC process)**
  - Hazard Factors
  - Range Designation (QRE Scores 1-3)

QRE Results



ALSO

Historical Use

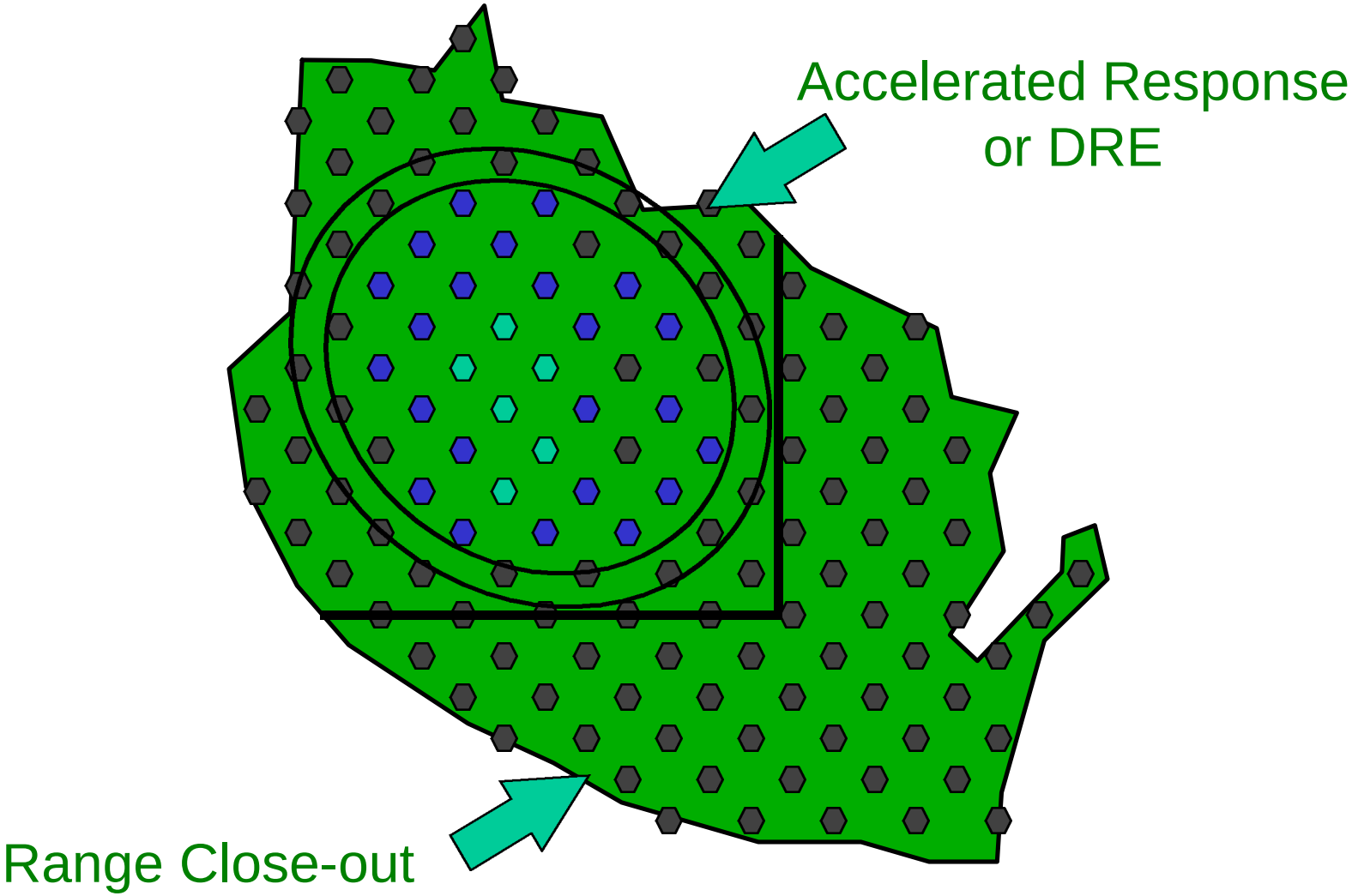
Current Use

Future Use

Streamlined Risk Evaluation

- **Delineate range Quantitatively**
- **Quantitative Risk Assessment Methods**
- **Focus is on the "Most Exposed Individual"**
- **Establishes minimum standard for data collection**
- **Possible Outcomes - Range closeout, Accelerated response action, move on to DRE**

Range Survey - Delineation

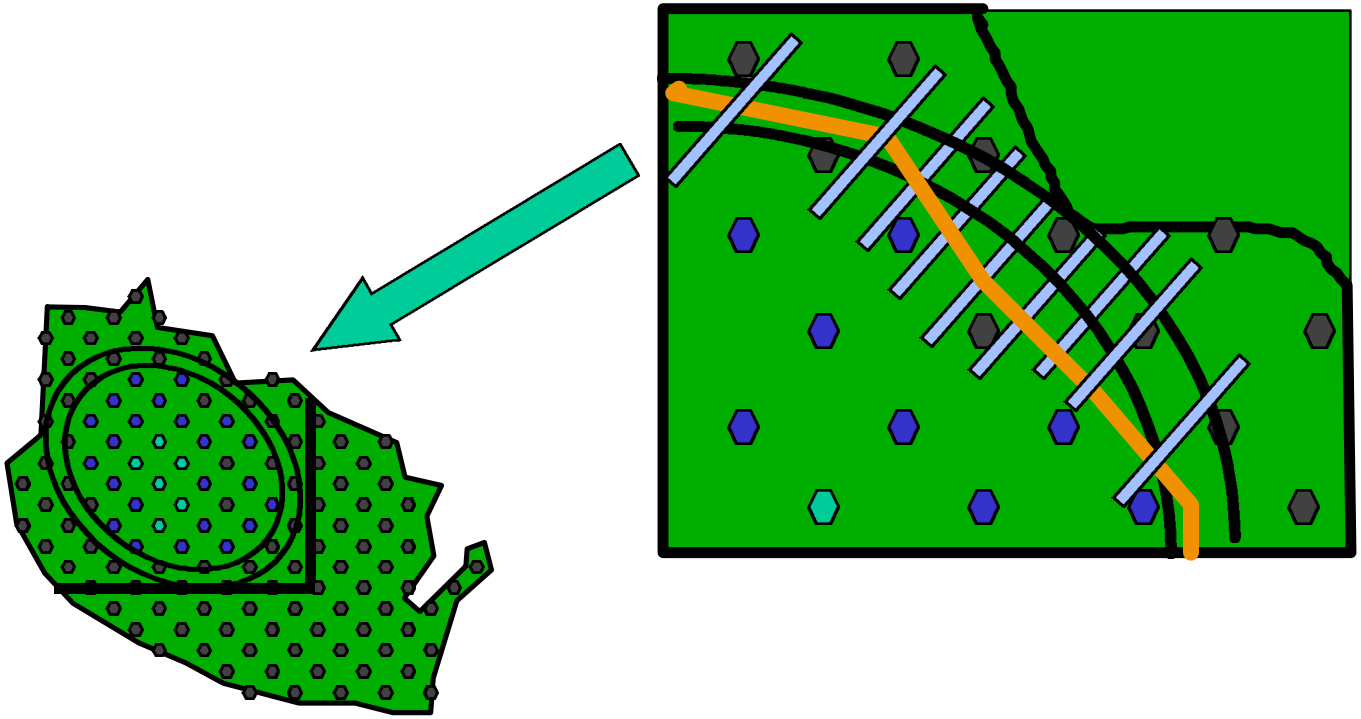


Detailed Risk Evaluation

- **Comprehensive, quantitative characterization**
- **Delineation of Range Sectors**
- **Assessment of All Receptors**
- **Establishes data collection standard**
- **Effectiveness Evaluation for Response Action Selection**
- **Possible Outcomes**
  - **Range Closeout**
  - **Selection of Response Actions**
  - **Recurring Review**

DRE - Data Collection

- **Same process as SRE**
- **May include filling Data Gaps**



R3M Risk Premise

- **Risk - The likelihood that a receptor(s) will encounter a UXO and consequently a detonation occurs that injures the receptor(s)**
- **Risk is a Function of**
  - **Probability of UXO Encounter**
  - **Conditional Probability of UXO Detonation**
  - **Detonation Consequences**

$$R = f[P, C] \quad \text{where} \quad P = f[P_E, P_D] \quad \text{or}$$

$$R = P_E * P_D * C$$

Quantitative Risk - Full Equation

$$R = P_E * P_D * C$$

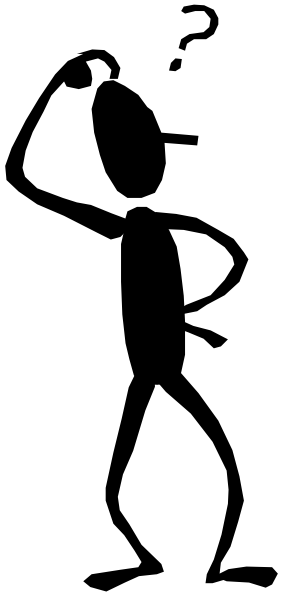
$$R_j = \left[1 - \left(1 - \frac{\prod_{m=1}^{r} \prod_{l=1}^{k} e_{mgjl} a_j}{A_j} \right)^{l_j A_j} \right] \cdot P_{Dj} \cdot C_j$$

Ecological Risk Evaluation

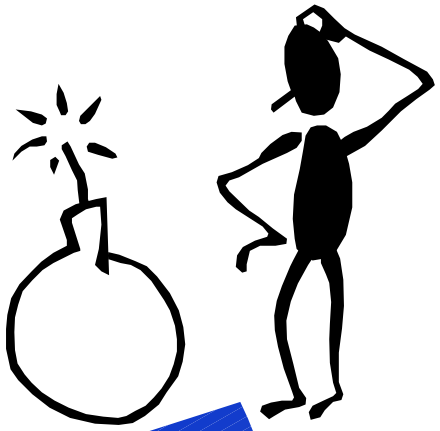
- **Method same as for Human health risk evaluation.**
- **Ecological Risk only evaluated for receptors where a UXO detonation would have significant and detrimental impact to the receptor population.**

Acceptable Risk Question

- **What constitutes "acceptable risk"**
  - Basis
  - Risk Estimate End Point
- **Units of Measurement**
- **Risk Communication**
- **Foundation for Risk Management Strategy**



Application to BRAC



- **Define Regulatory Drivers**
- **Describe Ranges/Sectors/Future use areas**
- **Establish Future use - explicit and detailed**
- **Poll UXO Experts**
  - Similar Experiences
  - Technology Limitations and Advancements
  - Lessons Learned
- **Document Plans in <u>BCP</u>**

Range Rule & R3M Information Sources

- **Web Site - http://www.acq.osd.mil/ens/**
- **Range Rule**

  Hotline (888) 541-1081

  E:Mail: fbarrule@b-r.com

  TDD: (800) 570-6557

  FAX: (800) 570-6547

  Mailing address:

  DoD Range Rule

  POB 4137

  Gaithersburg MD 20878-4137
- **R3M**

  Hotline: 1-888-429-2795

  E:Mail: R3M@PLAII.COM

  FAX: 1-703-916-7984 (ATTN: R3M)

  Mailing Address:

  R3M c/o Platinum International Inc.

  5350 Shawnee Rd., Suite 250

  Alexandria, VA 22312