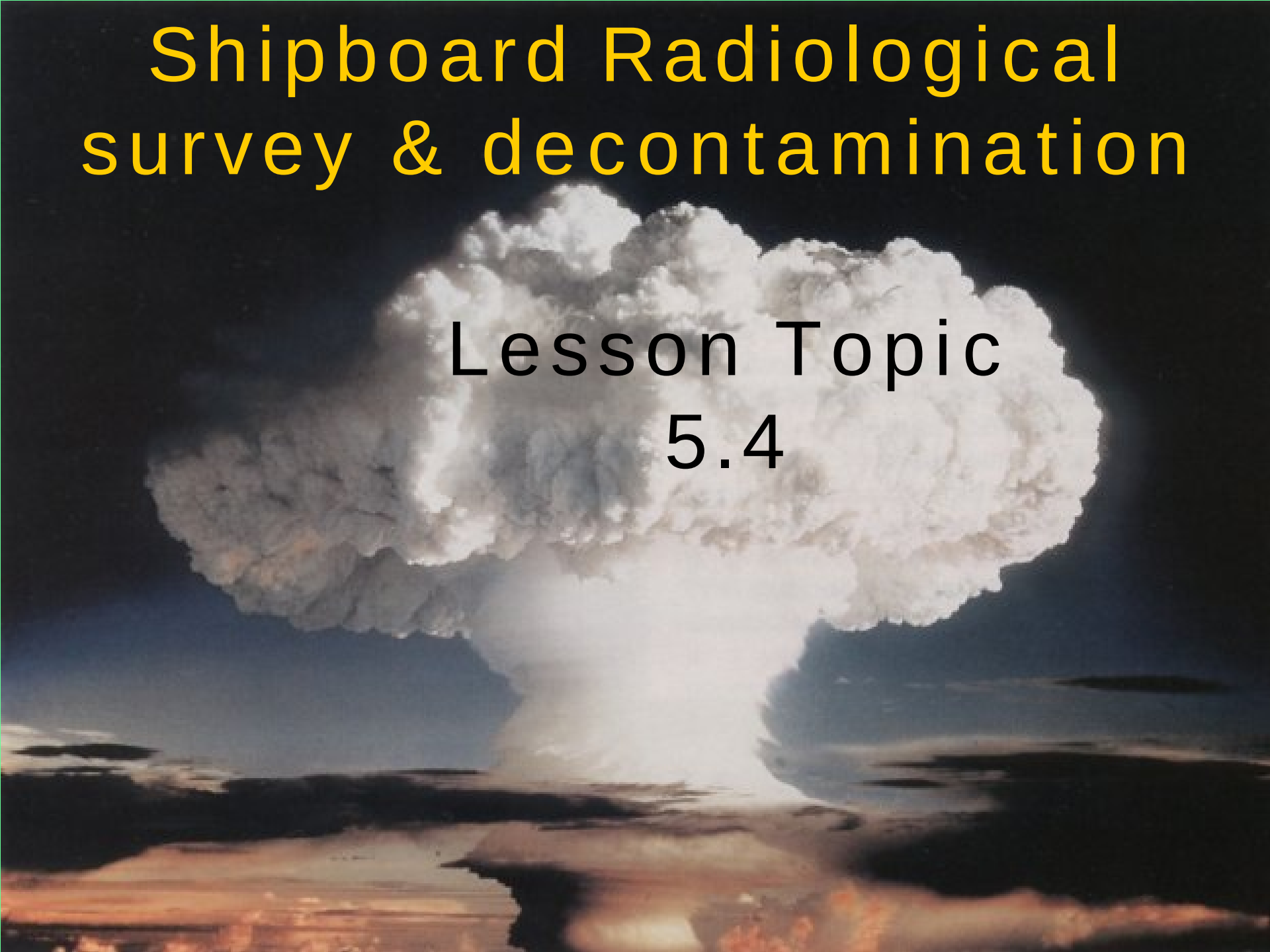
Shipboard Radiological survey & decontamination



Lesson Topic 5.4

Enabling Objectives

- Perform gross and detailed radiological survey procedures, marking, and recording
- Describe shipboard radiological countermeasure procedures, to include radiation surveys and ship and personnel decontamination

Counter measures

- Defensive actions that protect personnel from radiation, air blast, underwater shock & thermal radiation
- Enhance survival of the ship's crew

Counter measures available

- Ship maneuvering
- Shielding
- Personnel rotation & reduced manning
- Counter measure Water Wash Down System (CMWDS)
- Ship decontamination
- Personnel decontamination/monitoring

Personnel countermeasures

- Thermal radiation
  - Seek shelter or cover exposed skin before detonation
- Air blast/underwater shock
  - Brace for shock
  - Loose gear is secured

Ships maneuvering

- Maneuver upwind behind the fallout cloud
- Outrun the fallout cloud downwind
- Avoid the area entirely
- Will not provide protection from initial radiation

Shielding

- Significantly decreased intensity
- Protects from initial & residual radiation
- Shipboard shielding stations
  - Deep shelter
  - Ready shelter stations

Personnel rotation and reduced manning

- Used to minimize personnel exposed in unshielded/poorly shielded locations
- Replacing topside personnel with others from more shielded locations will extend the operational capability of the ship

Factors influencing rotation

- Tactical requirement
- Qualifications
- Dose history of crew
  - Past
  - Present
  - Future

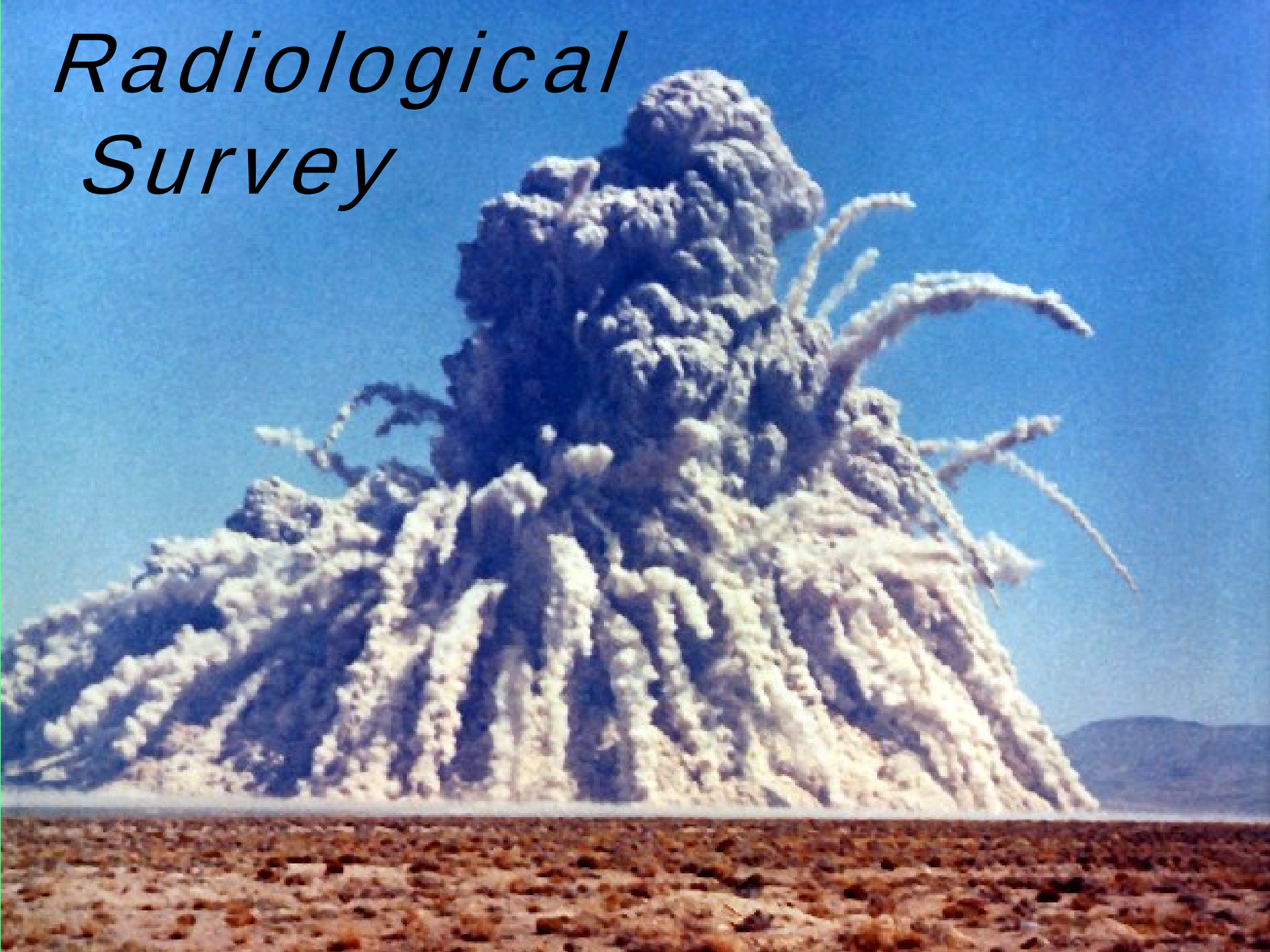
Counter measure wash down system (CMWDS)

- A significant countermeasure
- Wetting down by CMWDS prevents bonding of material to weather surfaces
- Material is either washed over the side or held in suspension until
- Removes up to 85% of radioactive contamination if activated prior to entering fallout area

Counter measure wash down system (CMWDS)

- In conjunction with manual scrubbing 90-95% of all surface contamination can be removed
- Permanently installed
- Disadvantages
  - Ineffective operations in cold climates

Radiological Survey



Radiological Survey

- Survey may be either gross or detailed
- Gross surveys
  - Conducted initially to obtain a quick estimate
- Detailed surveys
  - made later to determine the radiation levels (gamma & beta) on or in specific areas

Radiological monitoring team

- Comprised of as many as 4 personnel
- Monitor
  - In charge of the team & is equipped with a RADIAC & IM-143/PD
- Recorder
  - Records the intensity readings
  - Time, location, etc...

Radiological monitoring team

- Marker
  - Writes the information obtained by the monitor on the contamination warning signs
- Phone talker/messenger
  - Relays the dose rate readings, obtained by the monitor, to DCC

Gross (Rapid) Internal and External Surveys

- Internal investigations shall be conducted after the shock wave has passed the ship
- Rapid internal survey is made soon after the cessation of fallout
- The rapid external survey will be conducted after the internal survey

Gross (Rapid) Internal and External Surveys

- The extent of the surveys & the priority of locations depends upon the urgency of the tactical situation
- Survey is to determine gamma levels
- The surveys should yield basic information while keeping the exposure of the monitoring team to a minimum

Gross (Rapid) Internal and External Surveys

- Team will consist of two personnel
- Monitor & recorder
- Each team assigned vital areas

Gross (rapid) internal survey

- Immediately after cessation of fallout
- Surveys are performed at vital stations that are inside the ship & at the closest points inside the ship to external vital stations
- Locations are found in the CBR Defense Bill

Gross (rapid) external survey

- Conducted after internal survey
- Used to obtain more precise radiation levels at external vital stations

- Monitor holds the RADIAC at waist level & moves about the survey location recording the highest reading
- Data obtained by the external survey team should also be forwarded to damage control central where the measurements can be plotted according to their location and time

Detailed monitoring survey

- Slow & methodical
- Careful inspection of all accessible areas, equipment & systems that have been exposed to contamination
- Conducted after counter measures have been employed

Detailed monitoring survey

- Detailed radiological survey teams will consist of four personnel
  - Monitor
  - Recorder
  - Marker
  - Phone-talker/messenger

Survey Procedures

- The RADIAC instrument should always be held at the same distance from the object or surface being monitored
- The RADIAC instrument should always be held in the same attitude during entire survey
- Usually the waist-high method

Survey Procedures

- Contamination will vary with locations, type of surface, & position of objects within the area
- Objects having poor drainage will give higher intensity readings
- Large number of readings are needed to give an accurate picture of the radiation field

Survey Procedures

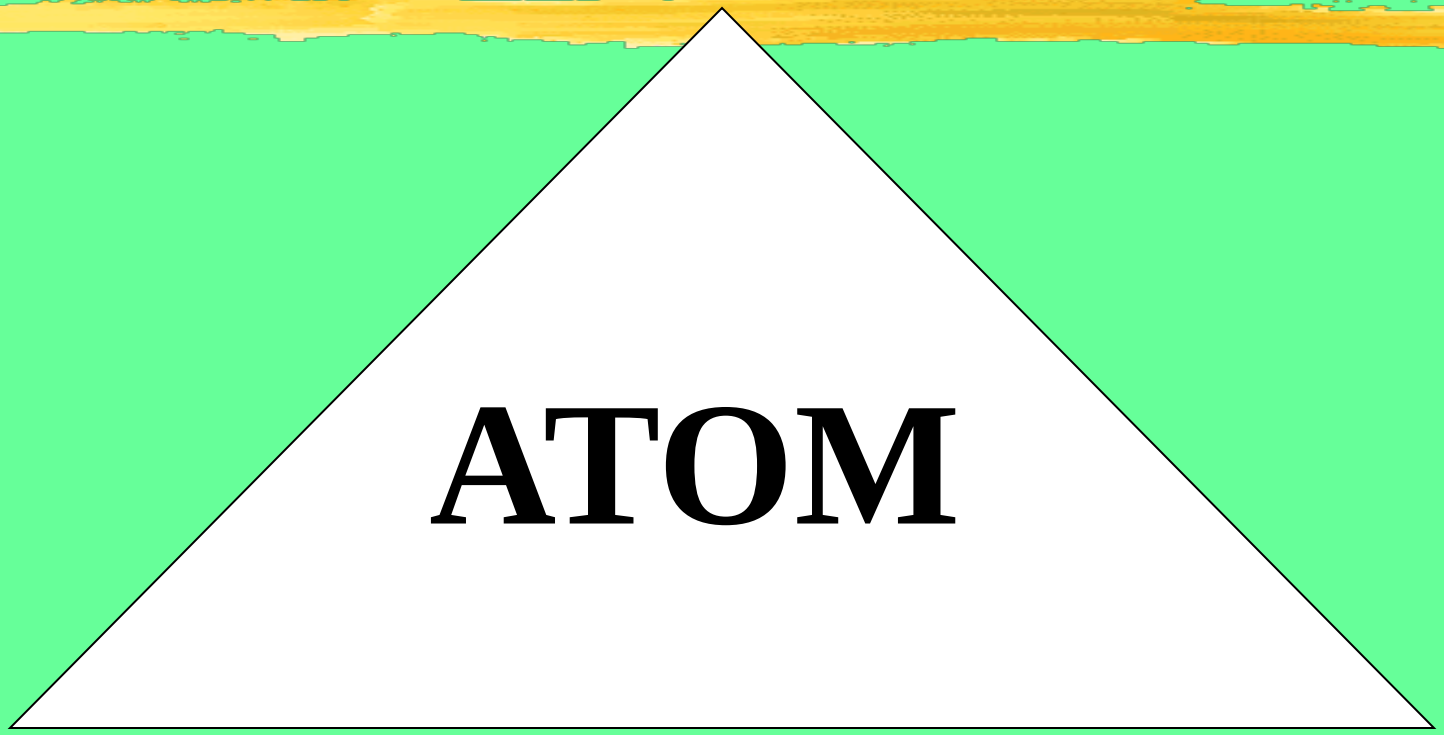
- RADIAC is held at waist height & close to his/her body
- Make a slow, 360 turn while watching the RADIAC meter
- If the total reading drops by 25% or more, a hot spot may be located behind the monitor

Survey Procedures

- In the presence of a hot spot, direct readings should increase by two or more times the average intensity level
- The hot spots identified, they are then decon or clearly isolated & marked to warn personnel
- Monitoring personnel will record the intensity, time & place of each reading

Marking contaminated areas

- Roped off or barricaded depending on the size of the area.
- Post adequate signs to warn personnel
- Radiological contamination marker
  - Triangular shaped 8 X 8 X 11 1/2 inches
  - White background with word "ATOM" in black


ATOM

Dose Rate:

Date & Time:

Time of burst:

Ship decontamination

- Same procedures as BW/CW decon
- Decontamination teams
  - Leader
  - 2-4 hoseman
  - 4-6 scrubbers

Ship decontamination

- Work top to bottom windward to leeward
- Scrub contaminated area thoroughly
- Push contamination away from you
- Rinse with fire hoses

Personnel Decontamination

- Same as for chemical

Summary & review

- Countermeasures
- Radiological Surveys
- Decontamination Procedures