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Introduction on approaches to deal with uncertain information within the decision-making process in nuclear emergency

University of Milan, Italy

The activities of CISAM for the management of RN emergencies

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CISAM

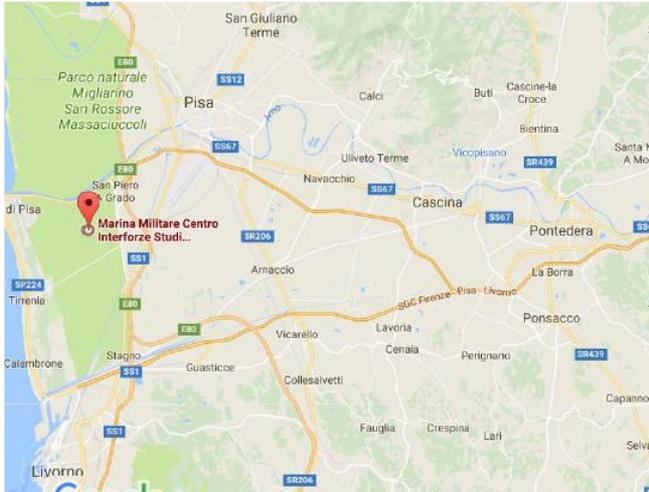
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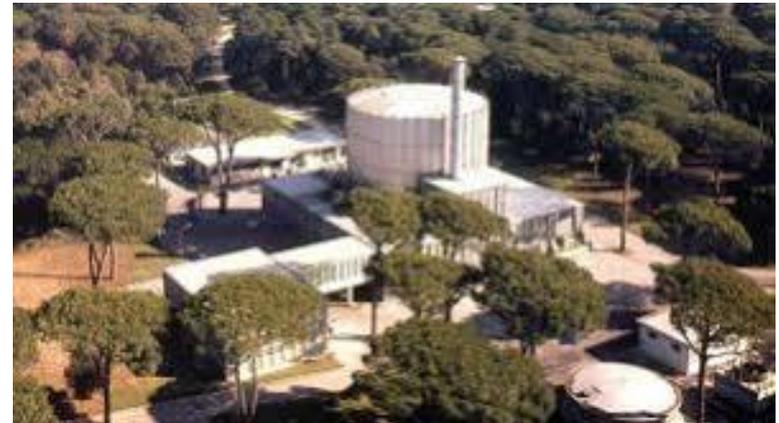


C.I.S.A.M.



The Joint Center for Military Studies and Applications (C.I.S.A.M.)

is in charge of the scientific aspects of the protection of military personnel from the hazards arising from ionizing and non-ionizing radiation.



A short description of such activities follows, with special attention to the management of RN emergencies.

RN emergencies

In the Italian Army, special NBC units are first-responders to RN emergencies and a NBC Regiment was established on December 1, 1999.

CISAM supports the NBC units and the 7° NBC Regiments studying methods, standards and procedures about radiation protection.



7° NBC Regiment Cremona



CISAM's role



CISAM contribution to a RN emergency is activated by the Ministry of Defence Head Quarters and can take place in two ways:

as **advisor**

(for drafting emergency plans or on radiation safety in general)

as a **reference laboratory**

(for radioactivity measurement and dose assesment)



The AJP-3.8 manual and the *reach-back* concept

A special type of “*advisory support*” is the “reach back” as defined in NATO manuals.

The idea is to allow the responders to quickly *reach* a network of scientists and advisors *back* at home in case of an RN emergency



In Italy, CISAM, the Joint NBC School and other military Institutes are part of this network whose focal point is the JCBRN COE in Vyskov (CR).

The AEP-49 SIRA Manual

SIRA is the NATO standard guideline for the measurement of radioactivity in samples.

The NBC Units deal with the task of dose rate measurement and sample collection on the field.



Measurement of radiological quantities

CISAM takes care of the training of the sampling teams that is **sometimes overlooked**.

The samples, after a quick screening on the spot, are sent to CISAM through an uninterrupted **chain of custody**.



Laboratory Measurement

All the procedures, methods and processes adopted by CISAM are compliant with the requirements of the ISO 9001 standard



IT-15/0729



Calibration Center Accredia n. 264

(UNI EN ISO 17025:2017)



TLD Dosimetry

Laboratory Measurement



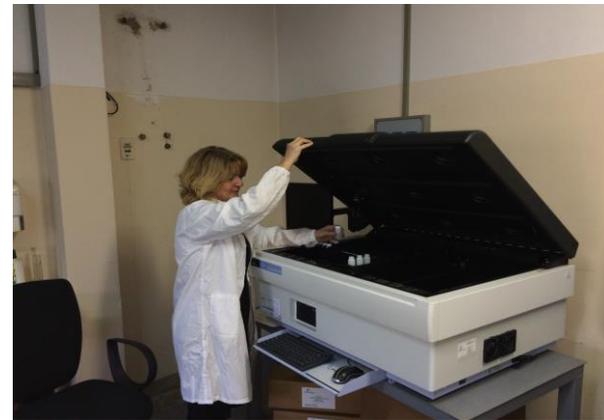
HPGe high resolution gamma spectroscopy



philipmartin.info



Low-background gross alpha-beta count



Liquid scintillation

Dose assessment

IAEA-TECDOC-1162

*Generic procedures for
assessment and response
during a radiological emergency*

In its most general form, this is a formidable task depending on so many parameters (not all of them perfectly known!!!!).

As many other Institutes, we follow Technical Guide Lines like the IAEA TECDOC 1162



Dose assessment

A rough overestimate of the potential exposure is a relatively easy task, but an unreasonable high dose assessment is **misleading** for decision makers.



If a precise dose calculation is not possible, an attempt should be made at least to roughly rank areas by levels: hot (red), warm (orange) and cold (green).

Dose assessment



Hot Spot®, RESRAD® and FRAMES® are excellent computer codes and valuable tools.

Unfortunately the final confidence on the whole assessment depends more on the “*unknown unknown*” rather than the “*known unknown*”.



Actions of remediation/restoration



CISAM runs a unique facility in Italy for radioactive waste storage providing the whole chain of required skills: categorization, decontamination, shielding and containment.



Conclusion

CISAM provides technical support to the military units in planning and management of RN emergencies.

The Center supports both the drafting of emergency plans as an advisor and the surveys as a reference lab.

A relevant part of this support is also a constant evolution and rehearsal of response plans to continually match the increasing complexity of CBRN events.



Thank you for your attention



***“Plans are nothing;
planning is everything.”***

- Dwight D. Eisenhower

