

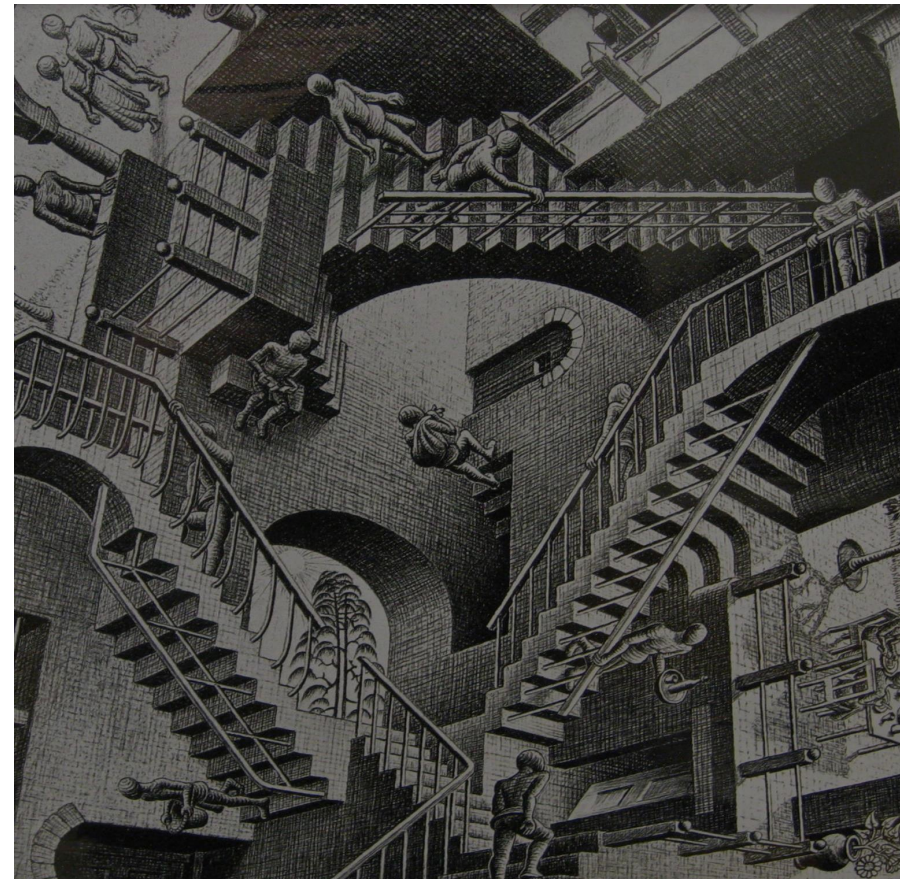


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Optimization and Robustness of Intervention Strategies

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Emergency exposure situation strategy (ICRP)

- Setting a reference level
 - generic (or specific to the scenario) in the preparation
 - effective dose between 20 and 100 mSv
- Division of the intervention into phases and zones (to facilitate the application of protective measures)
- Selection of intervention measures
 - Justified measures (do more good than harm)
 - “Optimized” measures
- Setting triggers for interventions
 - Intervention level (IL) on the effective dose
 - Operational intervention level (OIL) on an easy appreciable parameter



Acute phase of intervention (before the release)

- Base of decision : provisional
 - Will the release take place ? What will be the source term ?
What will be the weather conditions ?
- Simultaneity of external / internal exposures
- Same protection measures
 - Sheltering/evacuation, with iodine tablet intake
- IL on the effective dose and equivalent dose to thyroid
- OIL = UAL (urgent action level)
 - fixed on a parameter describing the probability of the release
 - e.g. core temperature, activity in the confinement



Optimization principles in the acute phase of the intervention

- Situation dominated by the uncertainty
- Extremely critical situation
- Extremely rare situation



No time for procrastination
Implement “generous” protective measures



Optimization under stress of robustness



Intermediate phase (just after release)

- Basis of decision: field measurements (on the spot)
 - Maps of the dose rate and deposited activity
- Link between measurements and exposure pathways
 - External exposure : limitation of stay outside, evacuation
 - Internal exposure : ban on harvesting and grazing, measures concerning foodstuffs
- Setting of independent OIL's for each exposure pathway
 - Dose rate for measures related to external exposure
 - Deposited activity (contamination) for the measures targeting internal exposure



Optimization principles during the intermediate phase of the intervention

- Relatively defined situation
- Possibly difficult situation
- Waiting for quick decisions



Act in calm (sang -froid)
“Calibrate” the response to the situation



*Optimization under constraint of **efficiency and speed***



Transition phase (stabilized situation)

- Basis of decision: analysis of the doses in the practical situations encountered
 - Detailed knowledge of exposures in the context of daily life
- Conditions of stay linked to the external exposure
 - Stay on site without constraint
 - Stay on site with constraint
 - Temporary evacuation or relocation
- Conditions for internal exposure
 - Control of food contamination
 - Strategy specific to agriculture
- Decisions made on the basis of specific analyzes
 - No more IL and OIL



Transition phase (stabilized situation)

- First protection measures applied
- Adaptation of measures to local conditions and developments
- Time for reflection and medium-term planning



Public participation in decisions



Optimization under constraint of societal acceptance



Optimization in emergency exposure situation

- Evolution of optimization modalities
 - *Robustness* ➡ *efficiency-rapidity* ➡ *societal acceptance*
- Simplification of models and transparency of decisions
 - *Decision-makers will not be the developers of the concepts*
- No economy in the acute phase (even doing too much in case of uncertainty)
- As soon as the situation is known, renounce adopting a too conservative attitude
- Protecting the decision-maker against criticism is not a parameter of optimization



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THANKS FOR YOUR ATTENTION

