

High radon levels in French homes (Bessines-Limousin)

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Nuclear safety and radiation protection office (MSNR)

- Part of French ministry of ecology sustainable development and energy (MEDDE)
- The missions of the MSNR :
 - In charge of nuclear safety and radiation protection for the government
 - Elaboration of the regulatory framework with the ASN
- Refers to ministries of environment and health
- In particularly, MSNR follows questions about :
 - Uranium Tailing repository
 - Waste rocks reuses
 - Former uranium mining sites
- With local authority : prefect and its service DREAL



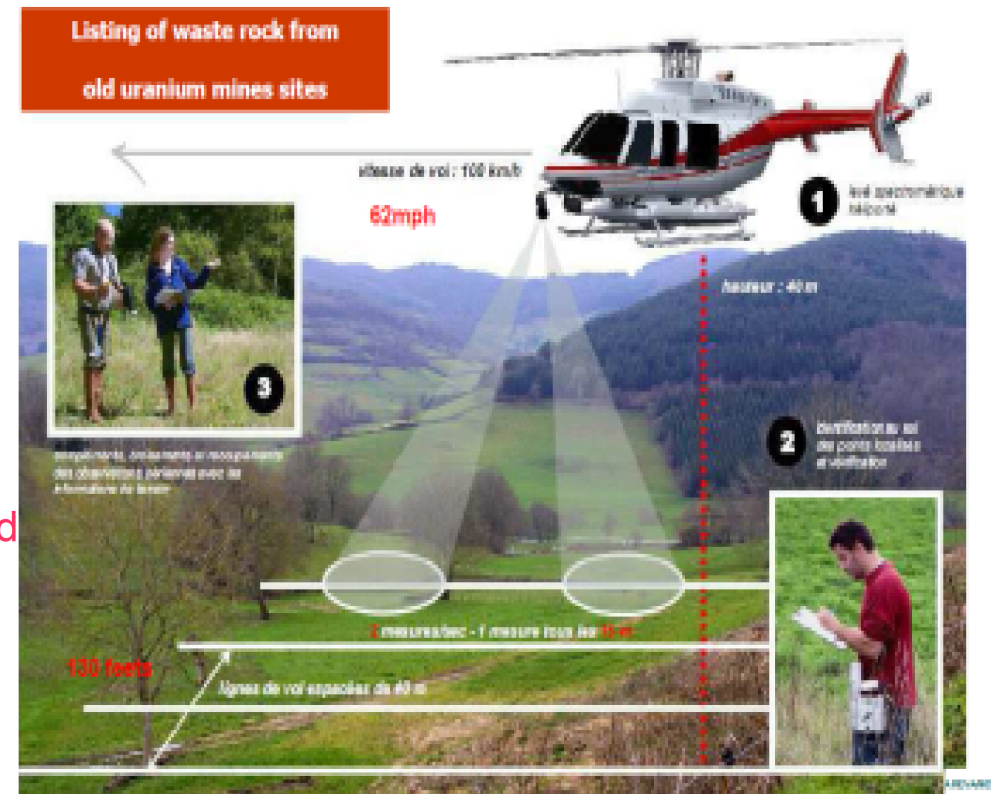
Uranium mining

- The uranium industry was developed after the second world war
 - From 1948 to 2001
 - 250 former sites (wide range of sizes)
 - 8 uranium extraction process plants
 - 17 sites of uranium residues repositories
 - Production of 76 000 tons of uranium
 - 50 millions tons of mill tailings
 - 167 millions tons of waste rocks



Waste rocks reuses

- About 2 % of uranium mining waste rocks were reused as cheap materials for public uses (levelling, earthworks, roads bases, building houses,....)
- **One aim of national action plan set out by the ministry of environment and ASN in July 2009 :**
 - Improve knowledge of waste rock re-use in the public domain
- Investigations made by AREVA have consisted in :
 - Helicoptered air detection of about 3 000 km²
 - More than 9 000 ground controls
- Results :
 - About 1 300 places where waste rocks were reused
- Actions overseen by an instruction of MEDDE (08/08/13)
 - Assessment between exposure levels and uses
 - Elaboration of action for inconsistent situations



High radon level in a house

Situation discovery

- Discovery by AREVA (during the elaboration of the actions plan for the removal of waste rocks near an house) of high radon activity in the air of a house
- Consequently, AREVA started further investigations
- AREVA discovered :
 - A part of the house is built on 1 or 2 meters of tailing
 - Maximal activity in the living rooms : about 30 000 Bq/m³
- AREVA informed the authorities



Tailings



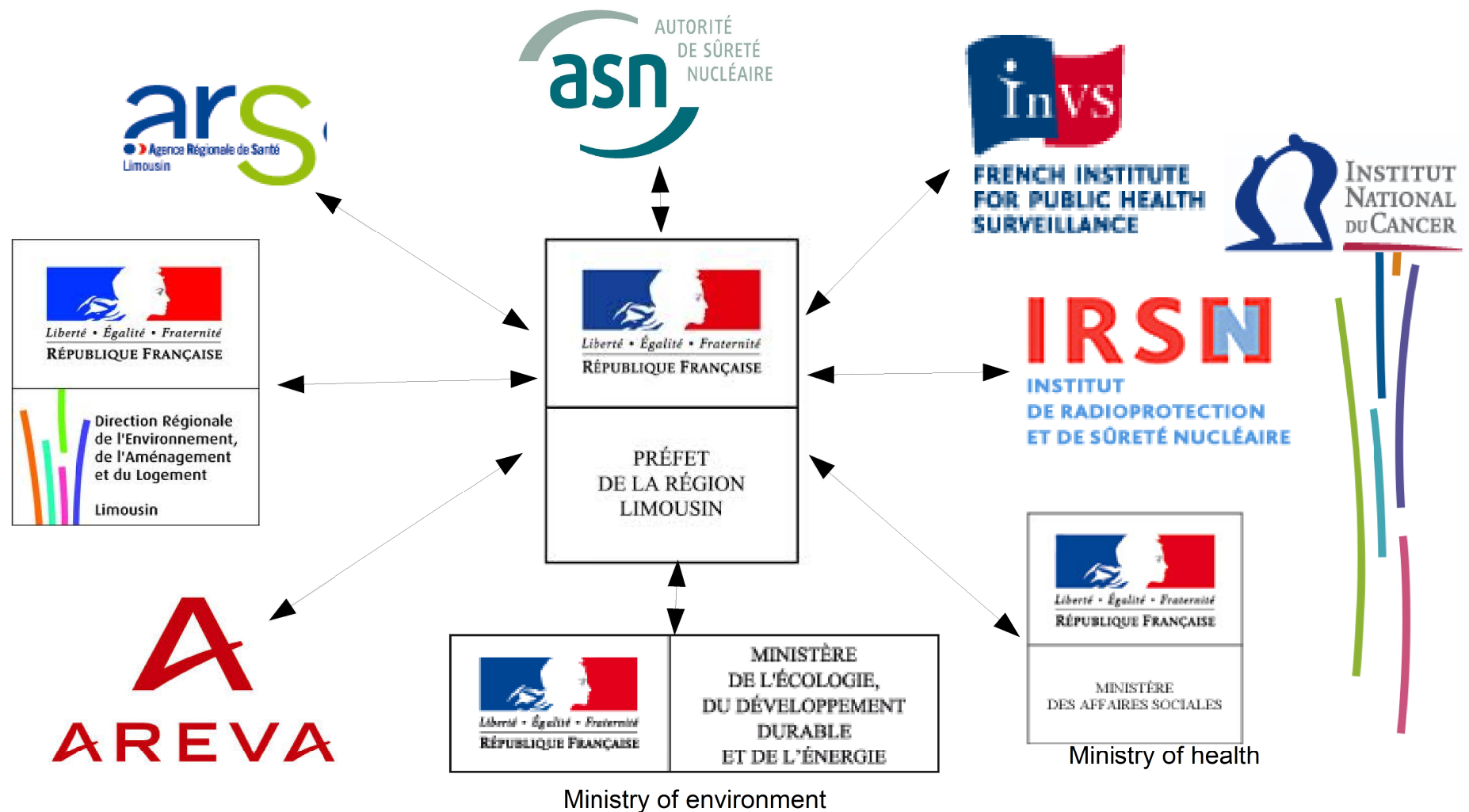
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First decisions

- First decisions (Local authority : Prefect with Ministries) :
 - Relocating the residents (parents and two children)
 - Missioning Institute for radiological protection and nuclear safety (IRSN) to perform radiological assessment
 - Elaborating local and national communication : full transparency on the event
- One of the resident was a childminder :
 - Inquiries to find and inform families of the kids who were exposed to radon
 - Inquiries to find the former owners of the house (former gas station)
 - Inquiries to understand how tailings could be found under a house and to try to determine if other similar situations could exist)

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Many actors to manage the situation



Coordination is a major issue for the management of these kind of situations

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Handling the situation (1/2)

- Coordination : periodic conferences with all actors
- Communication :
 - Families informed in priority, individual interview by public health physicians and IRSN experts
 - Information to the town mayor
 - Press release on the situation
 - Radon measurements in the neighbours house
 - Public meetings with all the stakeholders (after families information)
- Sanitary assessment (IRSN)
 - Medical exams for all the exposed individuals (anthroporadiametry, urine tests)
 - Generic (for public communication) and Personal hazard assesement in order to evaluate the sanitary impact



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Handling the situation (2/2)

- Actions plan about the house
 - Discussions with the operator about buying the house
 - Planning of the tailings removal
 - Finding a repository for the tailings
- National actions plan – French ministry of environment asks AREVA :
 - To check if others situation like this one could exist
 - To accelerate the removal of waste rocks near houses, when it's needed
 - To perform systematic radon diagnoses in building located near waste rocks



Key points

To conclude, we consider that the situation was correctly managed

- Key points to deal with this kind of situation :
 - Full transparency is crucial with the exposed persons and the stakeholders
 - A reactive operator is essential
 - A strong coordination between all actors is needed
 - Simple and understandable facts are needed for communication
- National feedback
 - Systematic radon diagnoses in building located near waste rocks
 - Creation of a national workgroup to prepare tools for handling high radon exposure situations
 - Natural radon context complexifies the situation



Thank you For your attention



Source IFFO RME

