INSTITUTO DE RADIOPROTEÇÃO E DOSIMETRIA

CNEN Comissão Nacional de Energia Nuclear

Social License and Environmental Protection: When Compliance with Regulations is not Enough

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Presentation Outline

- Background
  - The fundamental question
    - Answering the fundamental question;
  - What is Social License ?
  - Regulation x Social License
- Our Case Study
  - Background
  - Study area
    - Unit of Uranium Concentration (URA)
  - Regulatory Framework
  - Environmental Impact Assessment
  - Denouncements
    - Analyzing the “contamination” in the Juazeiro community;
    - Consequence of the denouncements;
    - Public hearing;
  - What is missing?
  - Understanding the situation of Caetité
    - Failure to respect Social License to Operate (SLO)
- Conclusions;
- Suggestions;

The fundamental question

→ Is it possible to the uranium mining industry to operate without gaining the Social License?

Answering the fundamental question

Experience shows that independently of the size of a particular mining operation several projects have been stopped or delayed due to strong opposition of local communities and Non-Governmental Organizations (NGO's)

it has been recognized that without the so called "Social License" businesses can be seriously affected, even if the operation holds the necessary legal licenses (environmental, nuclear, etc).

Social License → What is Social License ???

What is Social License ?

- As an abstract idea it has no consensus on definition or application;
- It depends on the point of view on which this concept is being examined (Government, Industry, NGO's, etc.);
  - *"acquiring free, prior and informed consent from indigenous peoples, and local communities through mutual agreements"*. World Bank, 2003.
  - "*a comprehensive and thoroughly documented process to have local stakeholders and other vested interests identified and to have their values and beliefs taken into account in the environmental impact assessment of the proposed project…*". Richard Shepard, 2008 (President and CEO of Applied Ecosystem Services, Inc.);

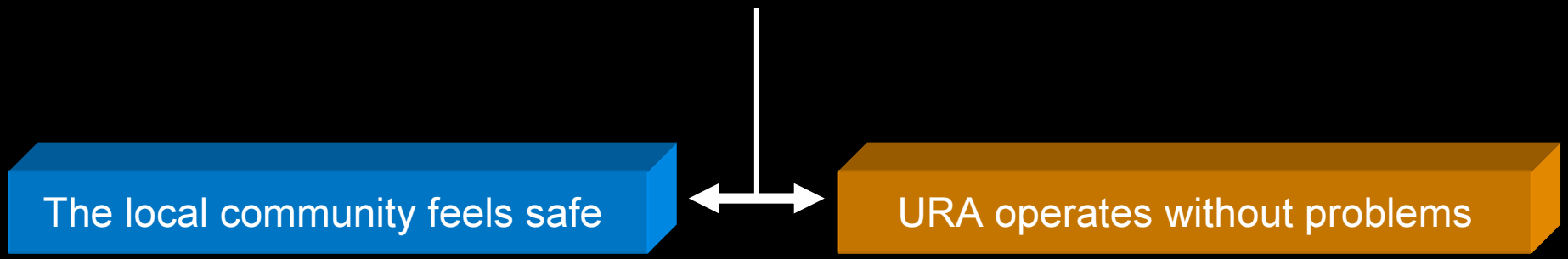
Unwritten acceptance of an industry by society which allows it to operate

Regulation x Social License

- Traditionally, the corporations see compliance with the legal requirements, as synonym of observance of social obligations
  - Legal obligations are not the sole measure of societal expectations;
- Sometimes, the conditions demanded by the “social licensers” may be more restrictive than those imposed by regulation
  - Regulatory approval does not equal societal approval → beyond legal compliance;
- Regulation represent **minimal** societal expectations;
- Compliance with regulations is the **minimal** demand of society

The study case: The situation of the only uranium production center in operation in Brazil (URA)

Where the compliance with the legislation and the consequent environmental protection is not enough to guarantee that

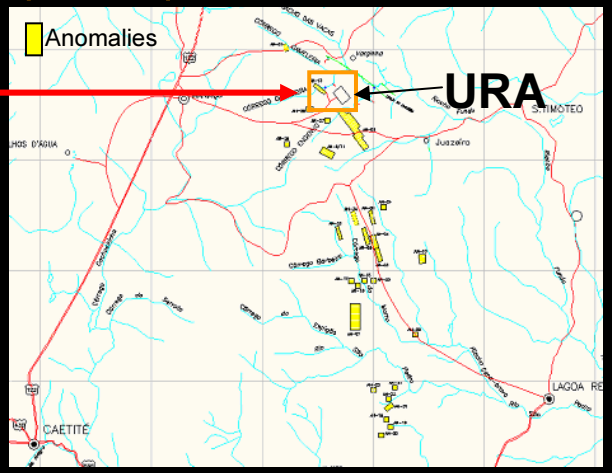


Objectives

- Analysis of the socio-environmental aspects involved in gaining the Social License to Operate the URA,
- Discussion of the different mechanisms to bring more confidence to the population on the safety of the operations of this installation

Study area

Unit of Uranium Concentration (URA)



(Photo and map courtesy INB)

- Main Characteristics:

• Located at a U-District that extends over 1,200 km² (34 anomalies dispersed in the area);

• The district hosts about 60,000 people;

• **Main economic activities comprise poorly developed farming and cattle breeding**;

• The surface drainage is marked by intermittent streamlets;

• **Water (surface and groundwater) is used to human consumption, irrigation and cattle watering**.

Regulatory Framework

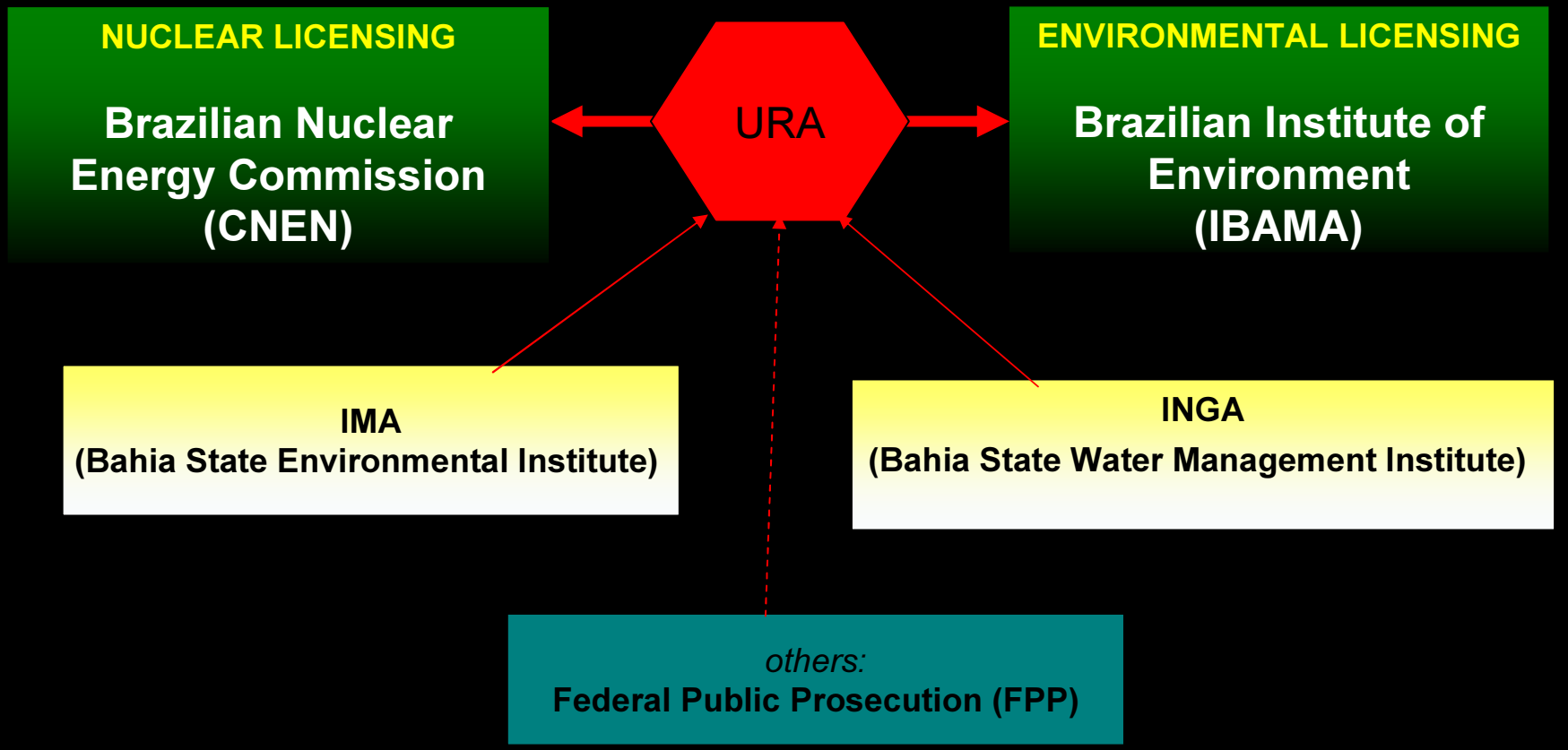
Brazil follows Internationally Accepted Safety Standards

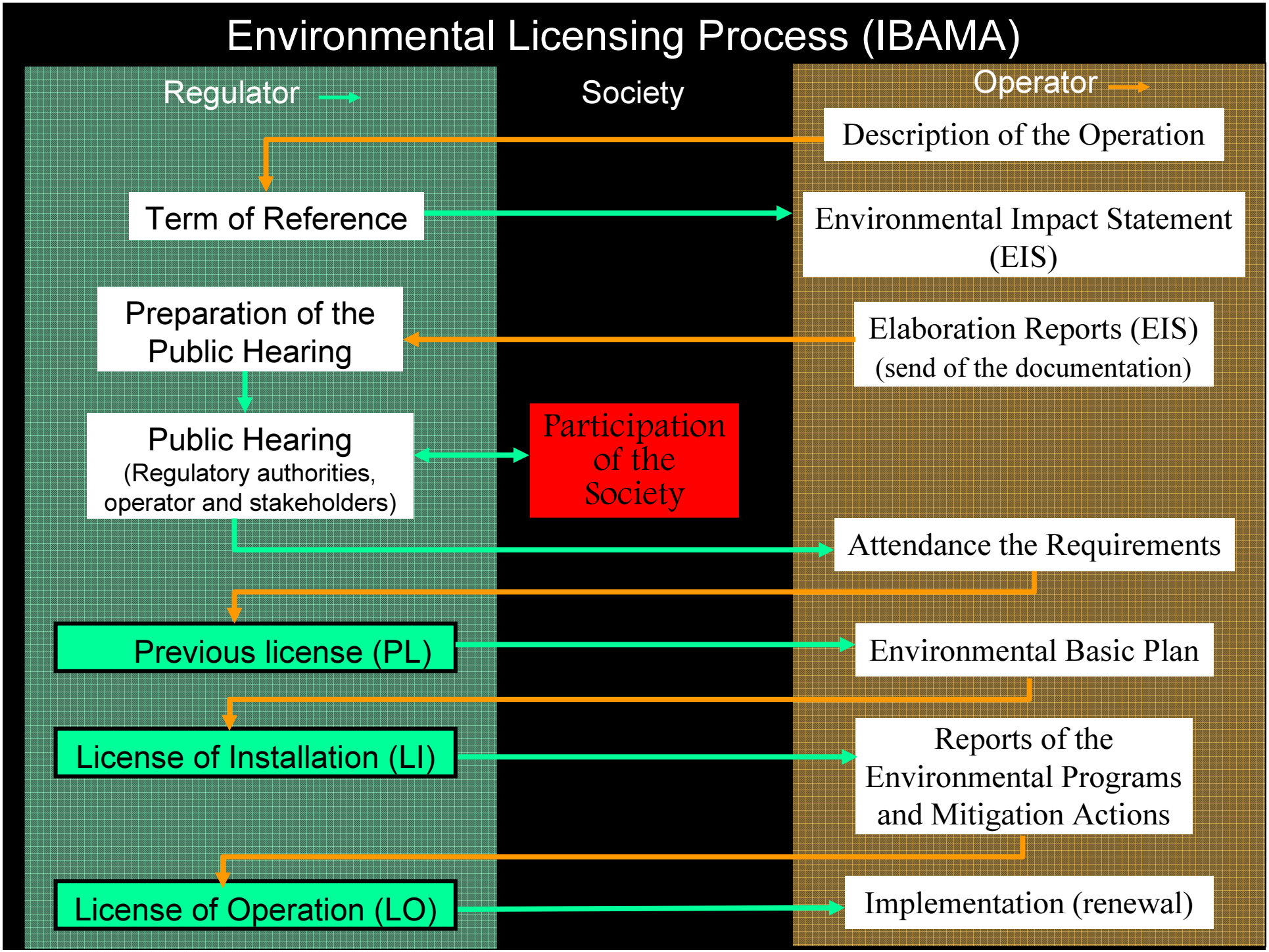
→ Coherent with the recommendations of the
International Commission on Radiological Protection (ICRP)

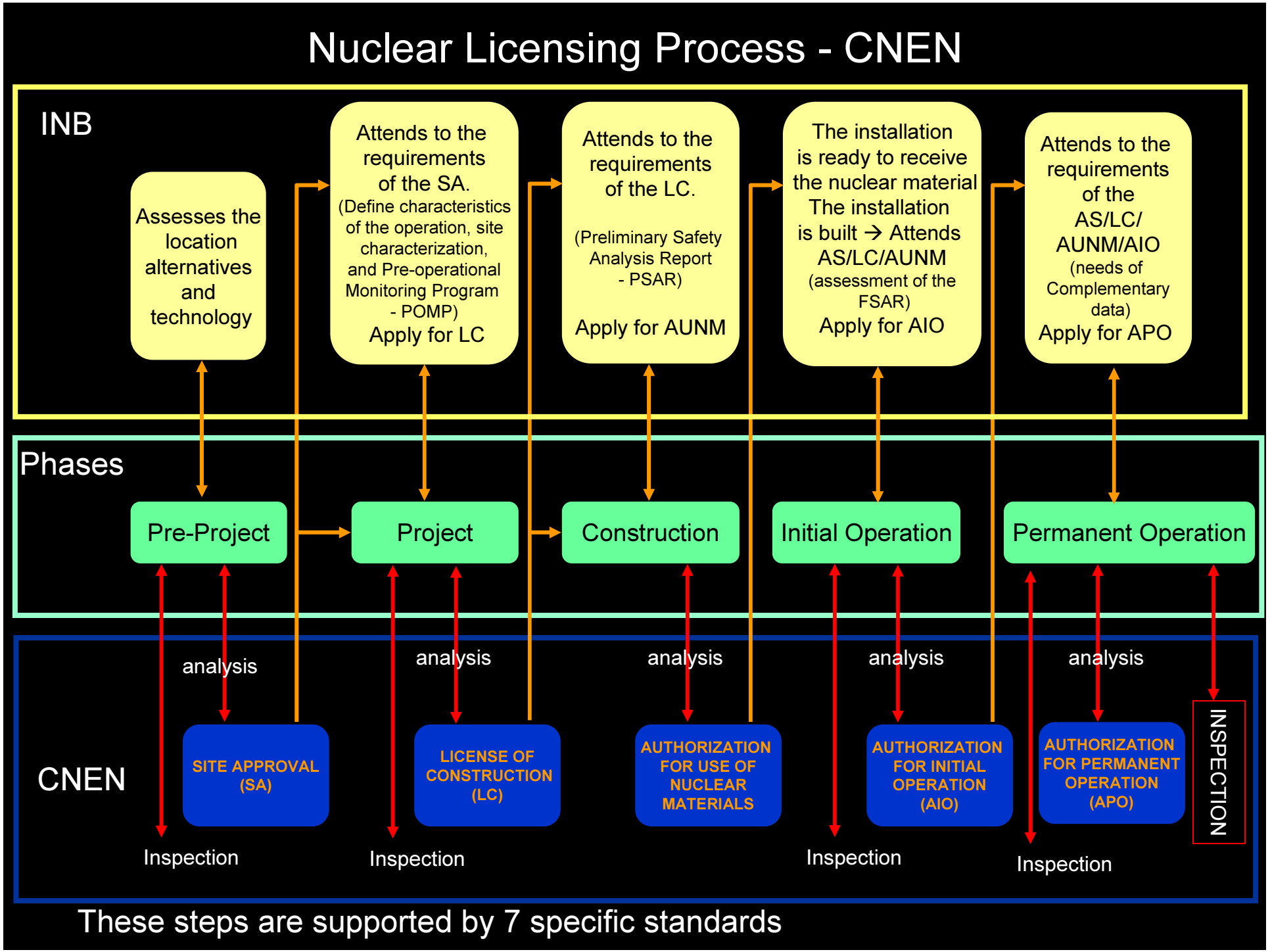
→ Consistent with the Basic Safety Standards of the
International Atomic Energy Agency (IAEA)

→ For sure one of the most strictly regulated uranium operations in the world

Organizations involved in the Licensing Process of URA



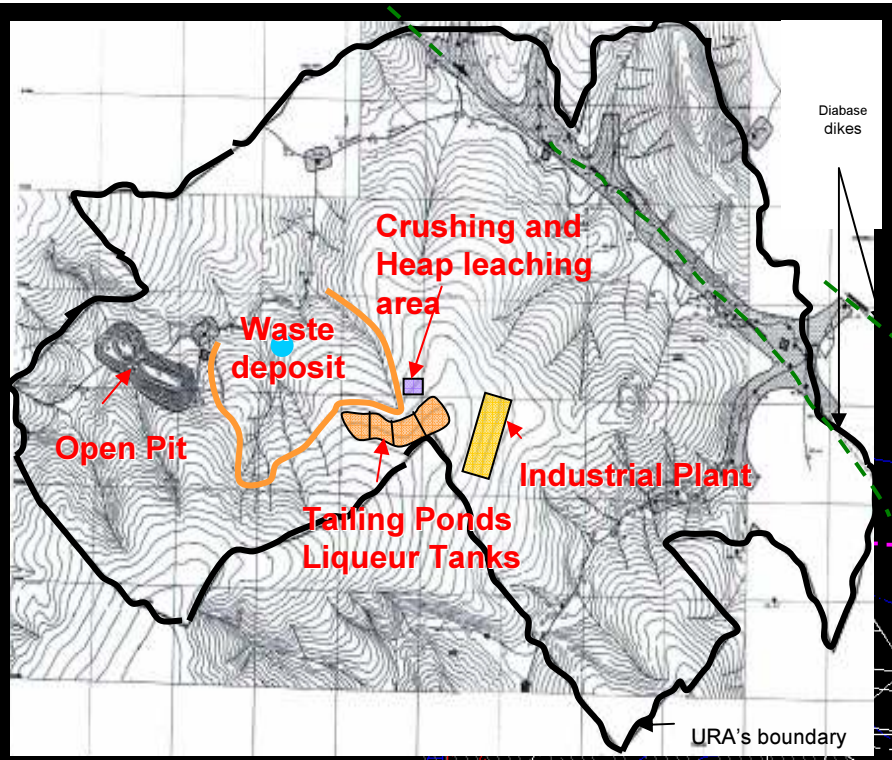

Environmental Licensing Process (IBAMA)
Regulator
Society
Operator
Description of the Operation
Term of Reference
Environmental Impact Statement (EIS)
Preparation of the Public Hearing
Elaboration Reports (EIS) (send of the documentation)
Public Hearing (Regulatory authorities, operator and stakeholders)
Participation of the Society
Attendance the Requirements
Previous license (PL)
Environmental Basic Plan
License of Installation (LI)
Reports of the Environmental Programs and Mitigation Actions
License of Operation (LO)
Implementation (renewal)

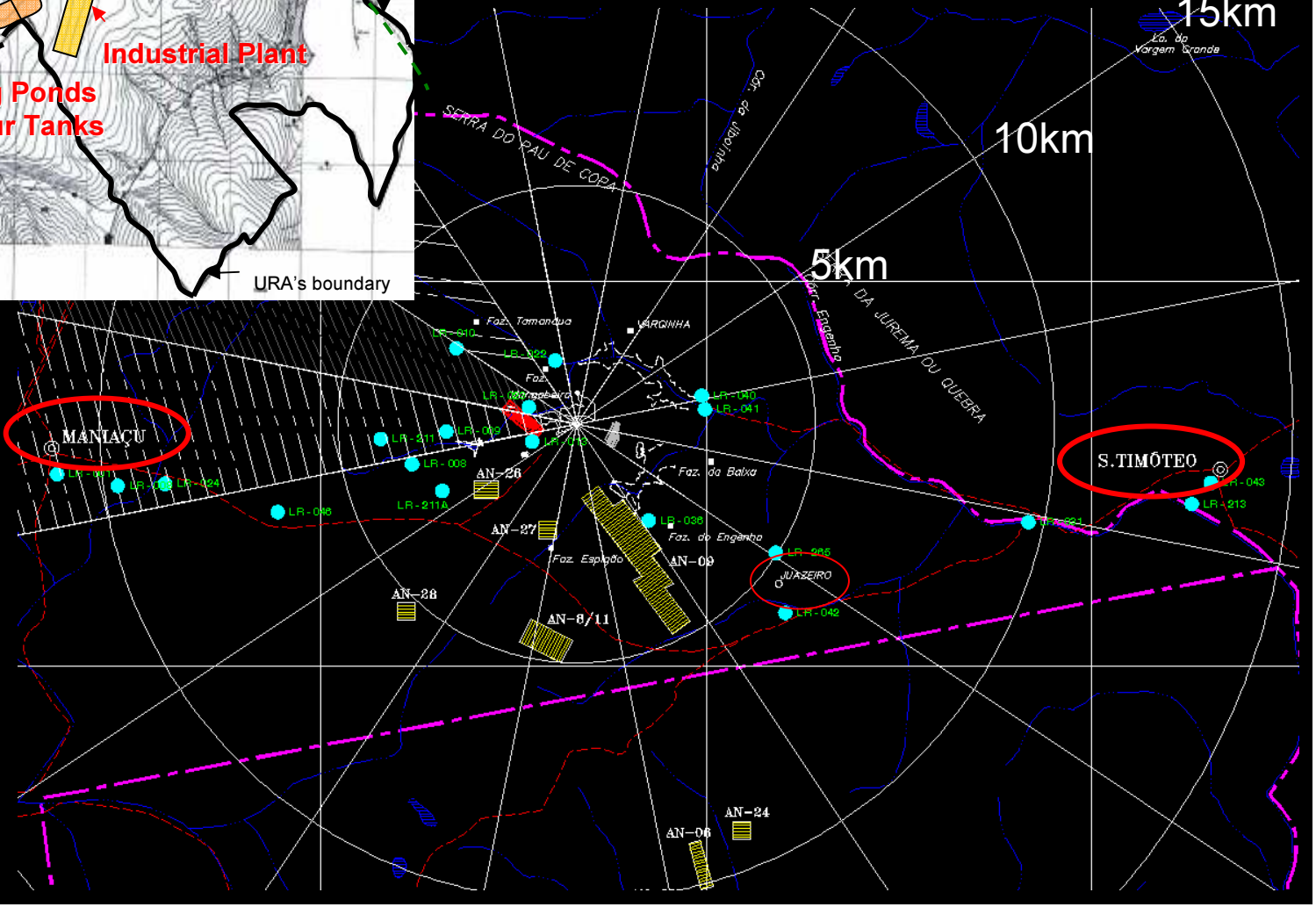

Nuclear Licensing Process - CNEN
INB
Assesses the location alternatives and technology
Attends to the requirements of the SA. (Define characteristics of the operation, site characterization, and Pre-operational Monitoring Program - POMP) Apply for LC
Attends to the requirements of the LC. (Preliminary Safety Analysis Report - PSAR) Apply for AUNM
The installation is ready to receive the nuclear material The installation is built → Attends AS/LC/AUNM (assessment of the FSAR) Apply for AIO
Attends to the requirements of the AS/LC/ AUNM/AIO (needs of Complementary data) Apply for APO
Phases
Pre-Project
Project
Construction
Initial Operation
Permanent Operation
CNEN
analysis
analysis
analysis
analysis
analysis
SITE APPROVAL (SA)
LICENSE OF CONSTRUCTION (LC)
AUTHORIZATION FOR USE OF NUCLEAR MATERIALS
AUTHORIZATION FOR INITIAL OPERATION (AIO)
AUTHORIZATION FOR PERMANENT OPERATION (APO)
INSPECTION
Inspection
Inspection
Inspection
Inspection
These steps are supported by 7 specific standards

URA
Environmental Impact Assessment

- Monitoring Program
- Dose assessment

Area of Influence – Monitoring Program





The monitoring program conducted by INB

Summary of the Pre-operational Environmental Monitoring Program (1989 - 1999)

Environmental compartment	Nº of the Sampling Stations	Nº of Samples	Analyzed fractions	Total N of Analyses	Parameters
Gamma measures	21	1226	-	1226	Gamma Rate
TLD measurements	11	54	-	54	Dose
Aerosol	5	50	-	350	Gross alpha, gross beta, U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Radon (air)	11	82	-	82	Radon concentration
Precipitation	5	37	-	185	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Milk	3	12	ash and fresh	120	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Grass	3	10	ash and fresh	100	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Palm	4	7	ash and fresh	70	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Manioc	4	23	ash and fresh	230	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Manioc Flour	4	27	ash and fresh	270	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Corn	4	26	ash and fresh	260	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Bean	3	21	ash and fresh	210	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Fish	1	7	ash and fresh	70	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Surface water	15	2163	part and sol	25956	U-nat, Ra-226, Pb-210, Th-nat, Ra-228 and K-40
Sediment	15	110	leach 1, leach 2 and total (U-nat and Th-nat)	990	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Soil	6	48	each 1, leach 2 and total	720	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Groundwater	8	73	part and sol	730	U-nat, Ra-226, Pb-210, Th-nat and Ra-228
Groundwater	24	44	total	1432	Bacteriological analysis and Physical-chemical Parameters
Total POEMP	147	4020	-	31623	-

Source: INB

The monitoring program conducted by INB

Average number of Analyses performed Annually in the Operational Environmental Monitoring Program

Environmental compartment	Number of samples	Kerma rate	Rn conc.	Radionuclides activities	Conc. of stable elements	Physical-chemical parameters	Frequency	Total number of Determinations by year
Gamma radiation	26	(a)					every three month	104
Radon in the air	26		(b)				every three month	104
Aerosol	7			(c)			every three month	140
Precipitation	7			(c)		pH	3 composed samples by year	126
Groundwater	11			(c)	(d) for only 2 points	pH	Monthly	1128
Groundwater	36			(c)	(d)	(e)	every four month	2808
Well (hydrogeological studies)	47 (however only 23 wells possess water)			(c)	(d) about 15 with enough volume	pH and conductivity	monthly, if there is water	4548
Agricultural products	14			(c)			Annual	70
Associated soil	14			(c)			Annual	70
Raw and Leached ore	2			(c)			each pile (about 6 by year)	60
Surface water	12			(c)		pH	every four month, if there is water	216
Pluvial waters (Mine and the Plant)	13			(c)	(d) for only 8 points	pH and conductivity	Depends on the rainfall	1218
Efluents from the Plant	6			(c)	only Cl^-	pH and conductivity	Monthly	576
Liqueur and processed water	2			(c)	only Cl^-	pH	Monthly	168
							Total Annual	**113336**

a) Kerma rate;

b) Radon Conc.;

c) U-nat, ^{226}Ra, ^{210}Pb, Th-nat and ^{228}Ra;

d) Cl^-, Mg^{+2}, Ca^{+2}, Ba^{+2}, Mn^{+2}, Fe^{+2}, Al^{+3}, SiO_2, P, SO_4^{-2}, Na^+, K^+, F^- and NO_3;

e) Physical -Chemical Parameters (pH, conductivity, color, hardness, turbid, alkalinity and acidity)

Source: INB

The monitoring program developed so far demonstrated **NO** alteration (increase) in the radionuclide concentrations in the different monitored environmental media

Dose Assessment

- Open pit
- Crushing and Heap leaching area
- Waste deposit

- Rn Exhalation
- Aerosols

Impact Atmosphere
0,09mSv/y

- Open pit
- Waste deposit
- Industrial Plant

(pluvial drainage)

- Effluents
- Infiltration

Surface Water
non continuous discharge (only in times of great floods)

Groundwater
without exposure pathways

Aquatic impact
0,29mSv/y

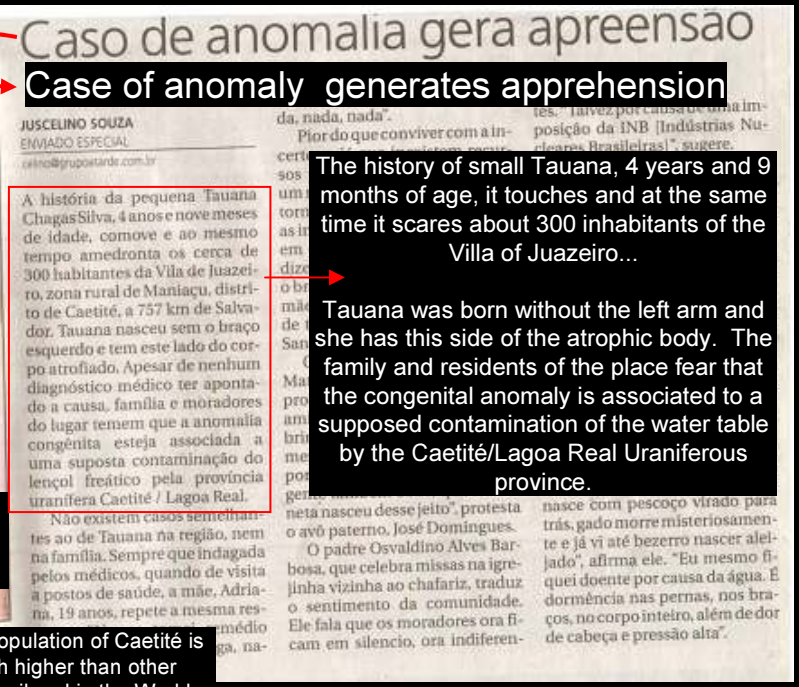
- Open pit
- Waste deposit
- Tailing ponds
- Liqueur tanks
- Industrial Plant

URA is working in compliance with the limits established by the Nuclear Regulatory Authority (CNEN)

However the local community still feels insecure !!!!

Denouncements

Uranium contaminates water in rural town of Caetité



Case of anomaly generates apprehension

The history of small Tauana, 4 years and 9 months of age, it touches and at the same time it scares about 300 inhabitants of the Villa of Juazeiro...

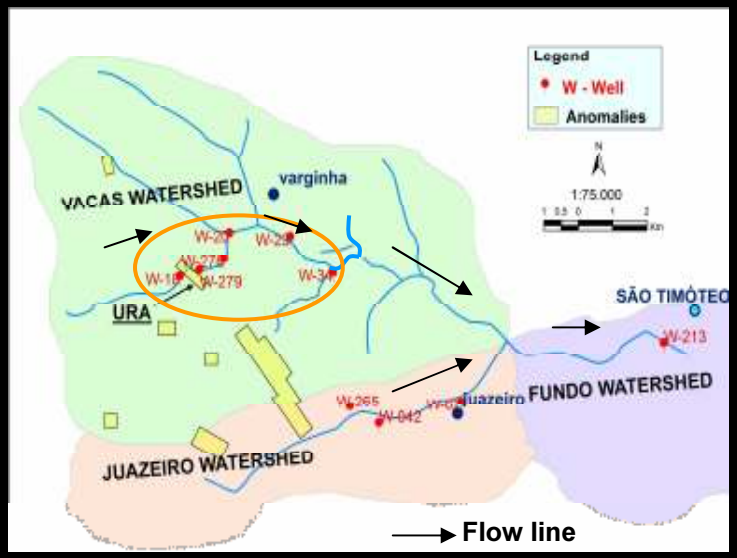
Tauana was born without the left arm and she has this side of the atrophic body. The family and residents of the place fear that the congenital anomaly is associated to a supposed contamination of the water table by the Caetité/Lagoa Real Uraniferous province.

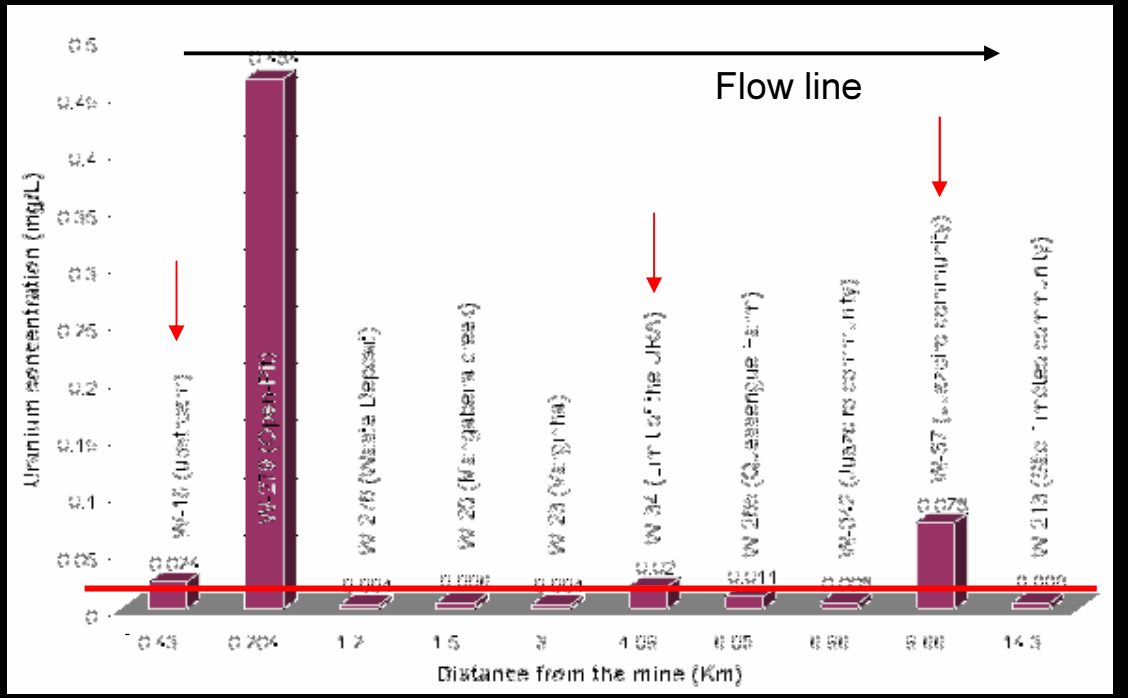
Radioactive ore is also found in human teeth

"According to the researcher, the population of Caetité is subject to radiological risks much higher than other populations from other areas in Brazil and in the World, and those circumstances can take to serious problems of health as the cancer occurrence".

... groundwater contamination of the Juazeiro Community

Analyzing the “contamination” in the Juazeiro community





→The Juazeiro community is localized in another sub-watershed;

→The high uranium concentrations observed in Juazeiro community (located in an U province) are linked to geochemical process of uranium dissolution from the rocks and cannot be attributed to the mining and milling operations → Natural process;

→ From the radiation safety point of view the doses associated with these uranium concentrations are not relevant. On the other hand, if the chemical toxicity of U is taken into account, some observed values will be above of Brazilian standards (0.015 mg/L of U).

Consequence of the denouncements

Society:

- Stigmatization of the people that live close to the Uranium facility (URA);
- Psychological impact on the local community;
- The local products (milk, watermelon, etc.) were severely affected in terms of their acceptance by neighbor communities causing heavy socio-economical impacts.

Regulators:

- Bahia state environmental and water management institutes (IMA/INGA) → based on one sampling campaign in nov-2008, well-67 (supplied 5 families) in the Juazeiro community was closed → reinforcing the panic generated in the community → new results showed that the U concentration dropped at acceptable levels (jan/2009).

Federal Public Prosecution (FPP)

- The FPP accepts the accusations done by Greenpeace→ Public hearing

Public hearing

• Roundtable composed by: FPP, IBAMA, CNEN, INB, Federal Deputy, Priest, NGOs (Greenpeace and Movimento Paulo Jackson);
• Approximate duration: 6 hours;
• Participation about 1.000 people in the Auditorium of the radio station of Caetité;

• FFP didn't allow any presentation done by the regulatory authorities and operator to clarify the population about the groundwater contamination in Juazeiro community and its relationship with the operation of URA. It just allowed the participants' of the round table to answers the questions posed by the population

• FFP determines the accomplishment of an independent audit

→ In December/2008 - Equip with 5 auditors visited the URA

What is missing?

- **Despite** the robust environmental monitoring program conducted by the operator did not demonstrate any contamination of the environmental;
- **Despite** the doses associated to the operation being of no relevance;
- **Despite** the monitoring and characterization data show that the high concentrations of uranium in the Juazeiro community are not related with the operation of URA;
- **Despite** the Regulatory Authorities (Environmental and Nuclear) confirm that URA doesn't promote any significant environmental impacts in the area (using independent assessment)

The local community do not feel confident about the operation of this U production center (URA)

Why ?
What is missing?

Understanding the situation of Caetité

Operator → Community ←Regulators

- In general, governmental institutions are perceived as non-reliable (**a world-wide phenomena**);
- **In general those who oppose mining operations often do so not because the community inherently reject the activity. Rather they reject their traditional exclusion from the benefits of that activity** → Economic benefits
- Considering that the government frequently lacks in providing appropriate conditions for those communities, locals tend to press INB, rather than the government, to seek that wealth generated by the mine be invested in improving their lives; (Role of Company x Role of the State);
- Once the population doesn't verify the existence of those local benefits, resentment rises in the community → risk of conflict over the loss of what the community considers to be their entitlement

Failure to respect Social License to Operate (SLO)

- Lack of Communication;
- **Over-regulation** → Unnecessary increase of the complexity of the process → Less flexibility → More cost
- **Lack of transparency breeds mistrust**;
- Failure to anticipate and respond to societal expectations;
- "Judicialization" →If the community is not allowed to participate in the process, it will seek access through the courts;

Conclusions (1/2)

- The risks from the environmental issues associated with the URA are known; they are legislated, defined, quantifiable and hence manageable → despite the apparent guarantees, the local community doesn't feel comfortable with the operation of URA → Although this installation is over-regulated;
- In addition to the distrust on the operator, there is also fear that the controls exerted by the Regulatory Authorities are not enough;
- **The operator, as well as the regulators doesn't possess a systematic and institutional program of communication with the community**;
- The lack of understanding the sources of social risks prevents the implementation of an appropriate management strategy to gain the social license;

Conclusions (2/2)

- The public hearings (as specified in the licensing process) have not been enough to guarantee the real involvement of the stakeholders in the development of the operation of URA;
- Gaining the Social License may not be resolved by the efforts of the INB alone; it is quite necessary the involvement of the regulators (CNEN, IBAMA, IMA and INGA) – Regulators and operators should be partners with the ethical limits taken into account;
- Gaining a Social License does not mean an universal acceptance by the society;
- Addressing the risks of community opposition before the project begins is likely to be much more successful and cost-effective than responding to community opposition later on.

Recommendations (1/2)

- External verification by IAEA (Independent and qualified audit):
  - Get support to demonstrate that:
    - URA is operating accordingly to internationally accepted safety standards,
    - The regulatory authorities are effective in this control, as to guarantee the safety of the populations that lives close to the installation
    - A UPSAT (Uranium Production Appraisal Team) mission was already requested by INB
- Commitment of the high hierarchies of the company, regulatory authorities and governmental institutions in promoting the implementation of a program to effectively involve the relevant stakeholders;
- **Coordination** of actions among the different regulatory authorities (CNEN, IBAMA, INGA e IMA)
  - creation of a forum of regulators for debates of the critical situations

Recommendations (2/2)

- Implementation of politics of social responsibility (without assistencialism or paternalism)
  - support technical lectures on uranium mining in local schools
  - The INB shall install some wells and a system of water treatment that will be made available to local communities
  - Support programs developed by Casa Anísio Teixeira public library:
    - Better quality of education for rural teachers,
    - Digital insertion and Internet access to students from Caetité and neighboring communities, etc.)
  - Improve local Infra-structure:
    - Turn it out that the movement of population around the uranium mining and processing plant is made easier.
    - INB should also act for the conservation of vicinal roads.