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Technical Meeting on Integrated Management Systems for the Sustainable Safe Operation and Effective Utilization of Research Reactors

Agencia Boliviana de Energía Nuclear

CENTER FOR NUCLEAR TECHNOLOGY RESEARCH AND DEVELOPMENT IN BOLIVIA: Research Reactor Management System development for future operation

June, 2025

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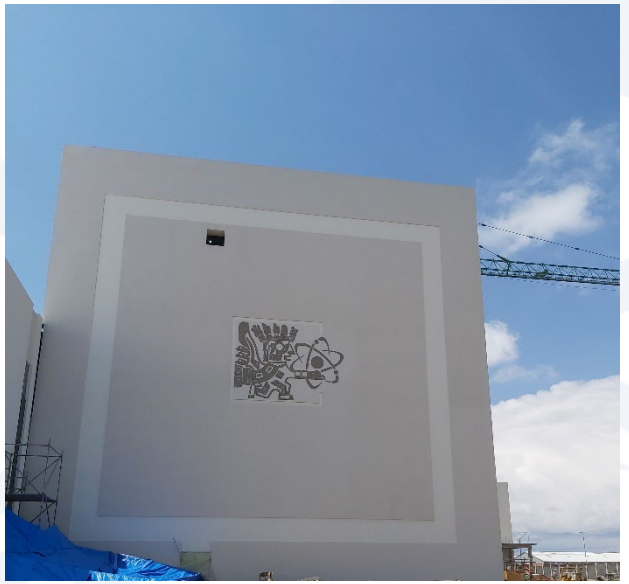
1. INTRODUCTION

Research Nuclear Reactor RB-01

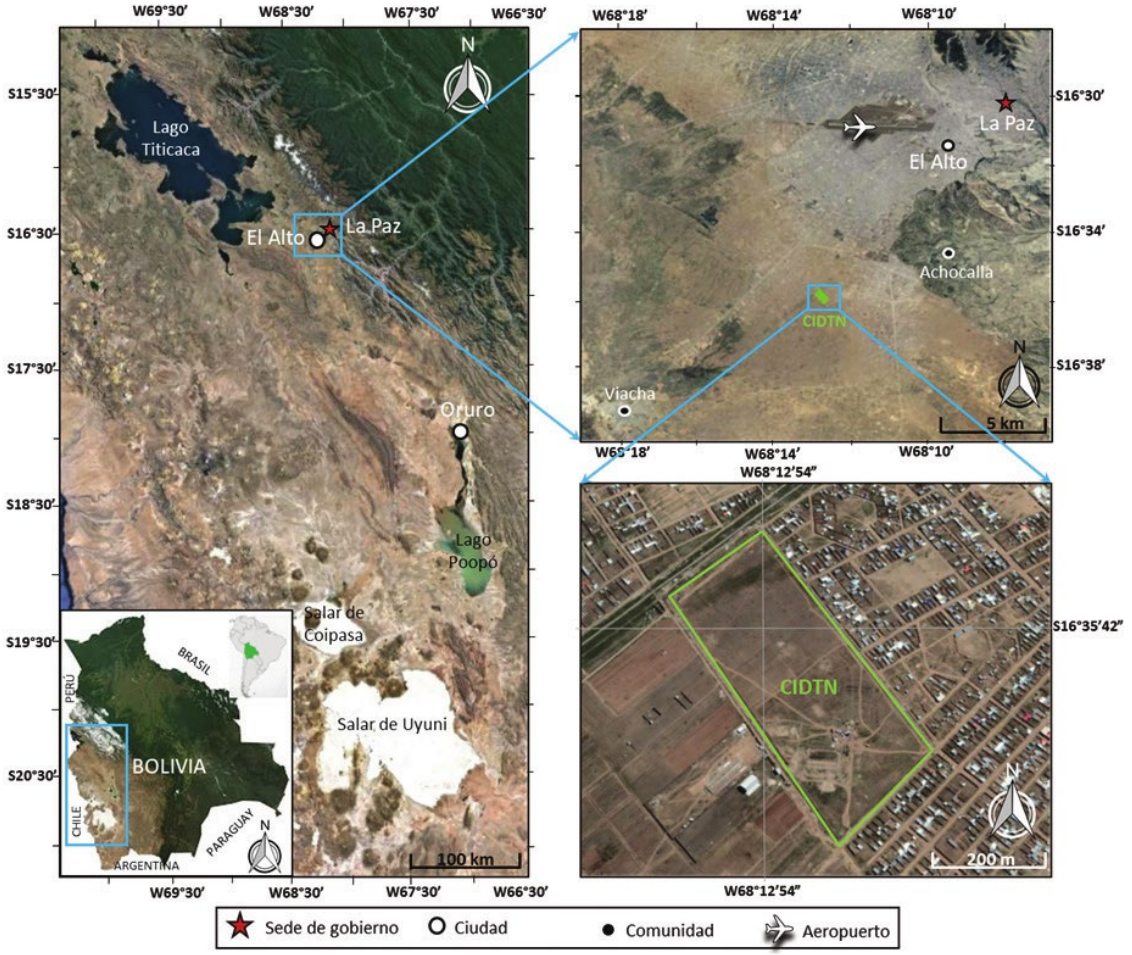
- Reactor complex Building
  - Radioisotopes production Laboratory
  - Neutron Activation Analysis Laboratory
- Radioactive waste treatment and storage Building



1.1 GEOGRAPHICAL LOCATION

The RB-01 reactor is located within the Center for Research and Development in Nuclear Technology (CRDNT) facilities, in Parcopata region, in the 8th District at El Alto city, Department of La Paz.

RB-01 is located at 3928 meters above sea level, making it the only reactor located at this altitude.



2. GENERAL CHARACTERISTICS OF RR

The research reactor RB-01 is a 200-kilowatt light water, pool-type reactor with a service life of 50 years.

The RR consists of a primary coolant circuit (which includes the main vessel of the reactor and in-vessel components), heat exchanger, secondary coolant circuit. The ultimate sink is atmospheric air.

TECHNICAL CHARACTERISTIC	VALUE
Nominal power according to design	200 kW
Type	pool
Fuel type	VVR-M2
Coolant	Light water, natural circulation
Reflector	Beryllium
Maximum thermal neutron flux density	~10^{12} $cm^{-2}s^{-1}$
Number of experimental horizontal channels	Radial 1 Tangencial 2

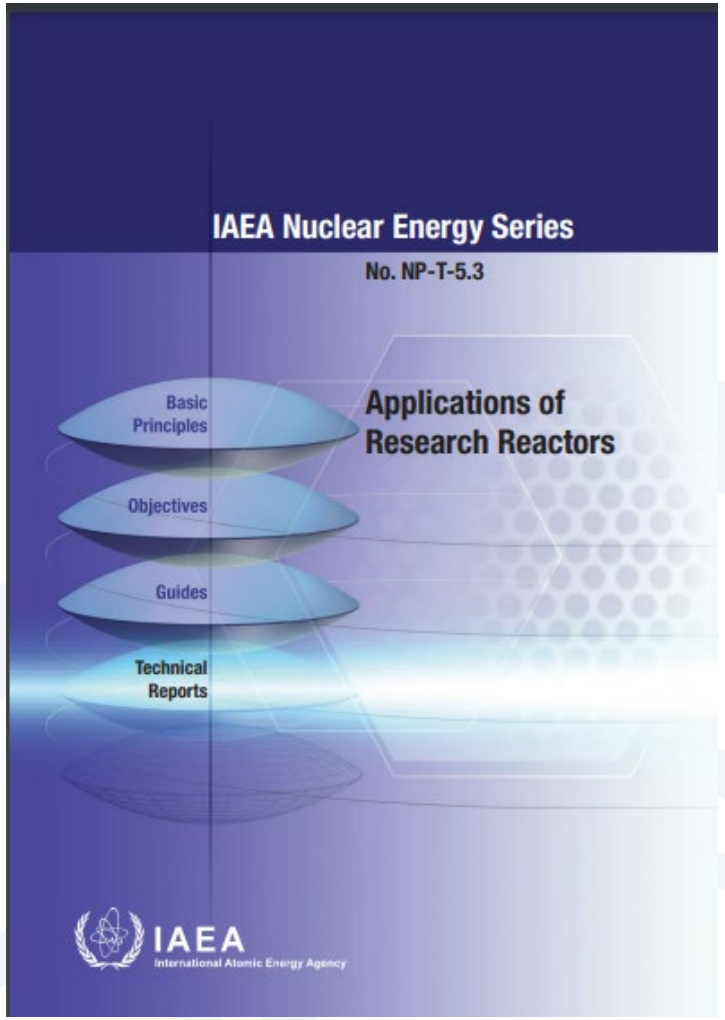
2.1. APPLICATIONS

The RB-01 reactor complex facilities are intended to provide services, products for research and training of young professionals in the nuclear field:

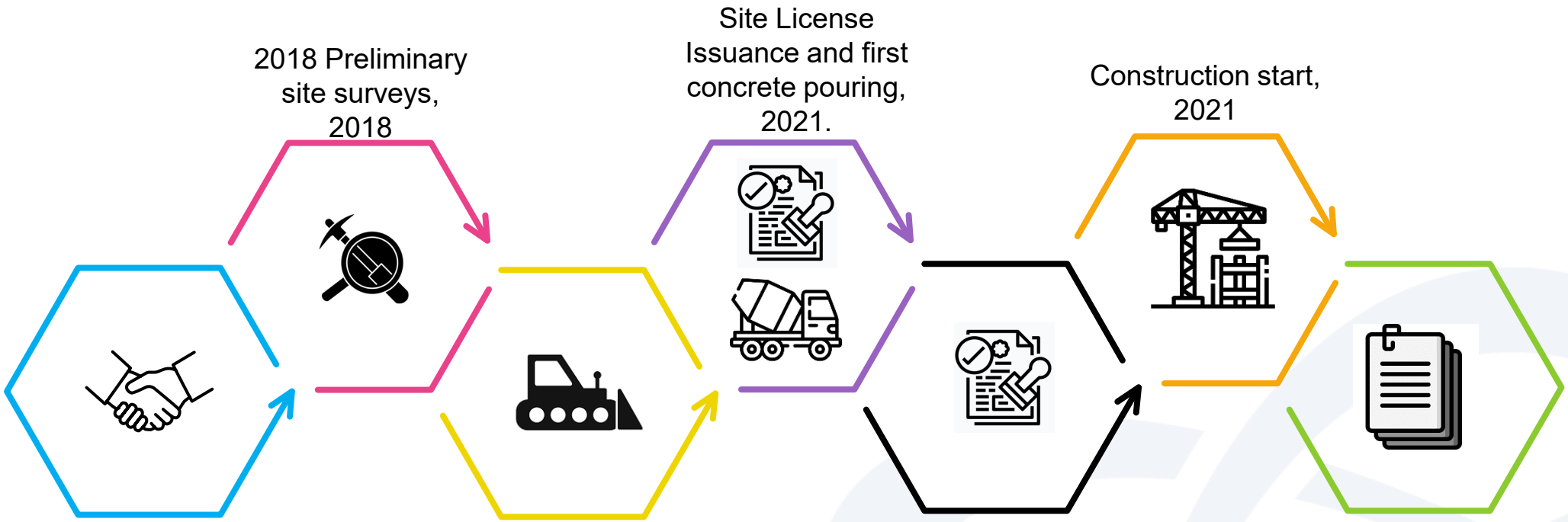
A. Education and Training

B. Neutron activation analysis
   - INAA, PGNAA

C. Radioisotope production
   - Just mentioning a few: P-32, Br-82, Sc-6, S-35, Cr-51 and Na-24



3. PROYECT IMPLEMENTATION - STATUS



4. MS IMPLEMENTATION – IAEA MISSION

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On February, an IAEA mission was carried out.

The mission covered:

- organizational and management structure;

and reviewed technical areas, including:

- safety analysis;
- construction and;
- the commissioning programme.

As a result, the mission recommended "*to develop and implement a management system for the operation phase before of the beginning of the routine operation*".

4. MS IMPLEMENTATION – IAEA MISSION

PRE-OMARR

On April, the IAEA Research Reactor Section conducted an expert mission.

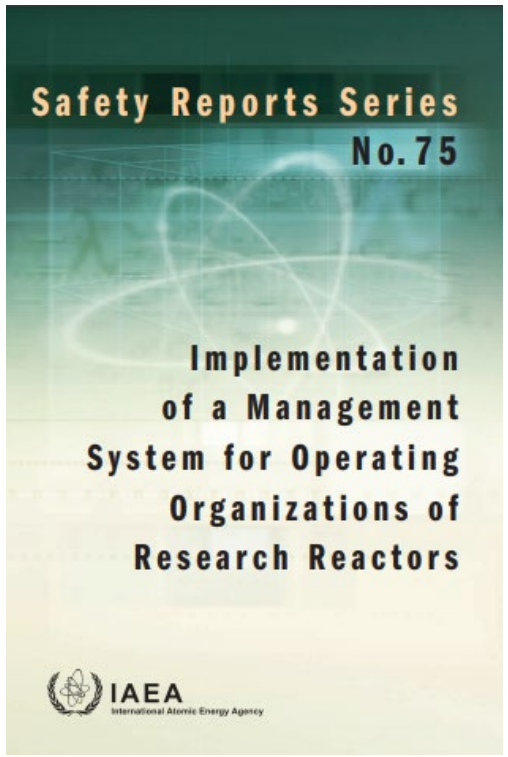
The IAEA staff and two O&M experts from Argentina, visited the facility, reviewed documents, and held discussions on technical aspects related to:

- commissioning,
- operation,
- maintenance,
- organization,
- and future utilization.

“The importance of the implementation of a management system for the operation phase was emphasized during this mission”.

4.1. IMPLEMENTATION STRATEGY

Based on the Safety Reports Series N° 75.



1. Secure Management Commitment
2. Designate a Dedicated Project Team
3. Establish Budget and Schedule
4. Conduct a process analysis
5. Perform an Inventory
6. Develop the Documentation
7. Implement the system
8. Assess the system
9. Pursue official Certification

4.2. PROGRESS ON STRATEGY

1. • Secure Management Commitment
2. • Designate a Dedicated Project Team
3. • Establish Budget and Schedule
4. • Conduct a process analysis
5. • Perform an Inventory
6. • Develop the Documentation
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ABEN's General Director

- Approved a plan to address the recommendations made by the missions and designated the responsible for each task

Designated team

- DATN – permanent staff
- Interns – for the operation

Current activities

- Inventory of documentation
- Processes analysis

Financial issue

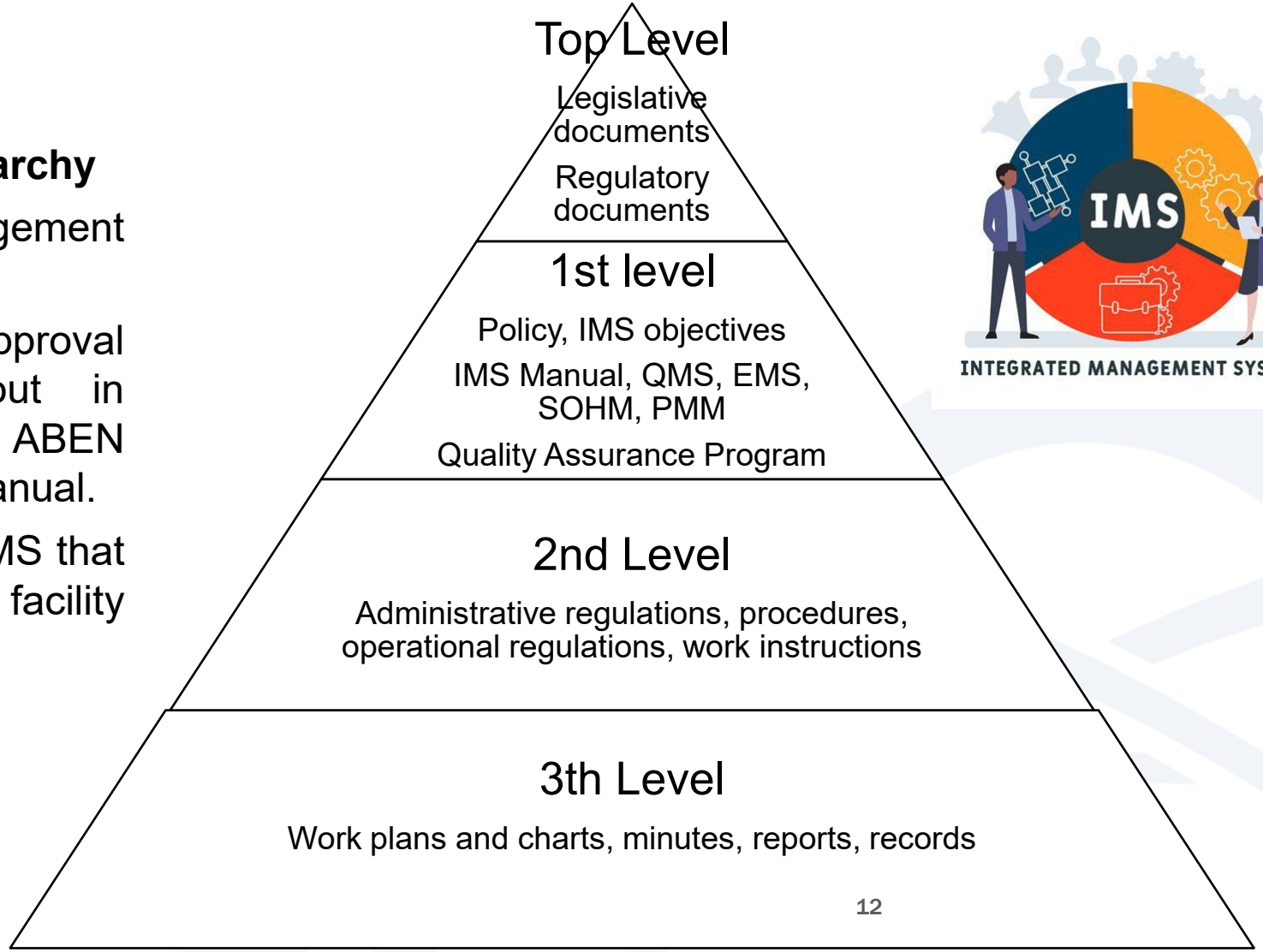
- In discussion by the General director and the designated team

* DATN - Department of nuclear technology applications

4.3. OVERVIEW OF DOCUMENTATION STATUS

The ABEN IMS documentation hierarchy

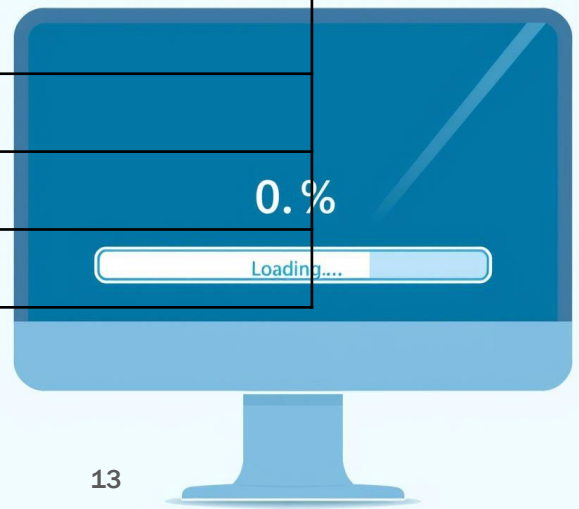
- Part of ABEN's integrated management system.
- The preparation, evaluation and approval of documents are carried out in accordance with the requirements ABEN 01-009 Document Management Manual.
- There are documents in ABEN's IMS that can be adapted for the nuclear facility operation management system.



4.3. OVERVIEW OF DOCUMENTATION STATUS

Initial Status - Existing documents current status for the facility

#	Document	Status
1	License for reactor operation	Preparing documentation for application
2	Operating Rules	Under Development
3	Operating limits and conditions	Under review
4	Emergency plan	Under Development
5	Operational Instructions	Under review
6	Reactor maintenance procedures	Under Development
7	Final safety Assessment	Under review
8	Radioactive waste management	Should be adapted



5. MAIN CHALLENGES TO OVERCOME

- Lack of commitment

- Inadequate training

- Insufficient resources
  - Financial issues
  - Incomplete staffing

CONCLUSION

- The Bolivian nuclear energy agency is committed to comply with the safety requirements for the operation of the RR. The necessary efforts to address the IAEA recommendations will be done.
- The MS implementation for the operation will ensure compliance with safety standards and requirements. Moreover, improving operational efficiency and the overall performance of the organization.
- Considerable work is required for MS implementation, first steps have been taken, knowing the initial status and the resources available will allow us to have a clear and realistic approach to the process.

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THANKS FOR YOUR ATTENTION