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# Knowledge Preservation of Atucha type Reactor

## Practical Approaches & Lessons Learned

Ing. Marta O. De Eppenstein

Atomic Energy Commission

Argentina



# Knowledge Preservation of Atucha type reactor

## Introduction

- The nuclear option is born in Argentina in 1950
- Argentinean nuclear area registers a hierarchy and a scientific and technological dimension important
- Some of the most outstanding achievements in this activity are:
  - . Research reactors export
  - . The production of nuclear fuels
  - . The installation of nuclear power plants

## Nuclear Power Plants

1974, Atucha I - Siemens -HWR- net connected

1984, Embalse - AECL - CANDU - net connected

1981, Atucha II - Siemens - HWR - in construction



# Knowledge Preservation of Atucha type reactor

## Situation

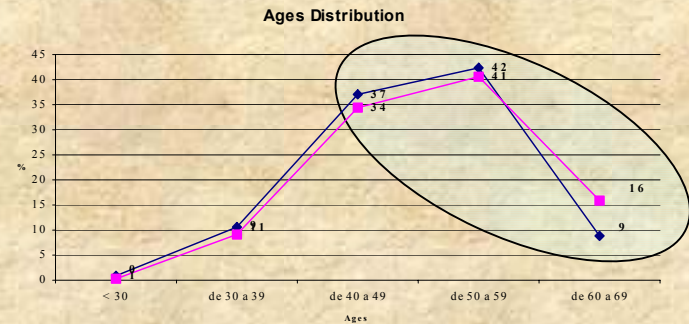
- Siemens has transferred its nuclear activity to Framatome ANP
- Argentina must undertake the knowledge preservation of this type of reactor.
  - life extension is decided for the operating Atucha I NPP
  - ending the construction of Atucha II is decided
- aging and increasing retirement of personnel in the nuclear field,
- the small number of young people in nuclear related disciplines at the universities.



# Knowledge Preservation of Atucha type reactor

## Human resources

50 % of professionals is over 50 years old  
Many will be retiring in the next five or ten years.



- The eventual loss of knowledge caused by the experts retirement
- The generational change as a result of new personnel employment

# Knowledge Preservation of Atucha type reactor

This situation motivated CNEA to implement a Knowledge Management system (KM), in order to capture and capitalize the tacit and explicit knowledge, to spread it and share it, making use of the technical and suitable tools through the organization.



# Knowledge Preservation of Atucha type reactor

The strategy was on recognizing the critical knowledge to be preserved.

**Knowledge Map** 

- a tool to structure the capital knowledge of an area or domain.

- uses the cognitive surfing in order to access to the organization heritage knowledge

- a comprehensive visualization of the domains of available knowledge in the company

# Knowledge Preservation of Atucha type reactor

## Different approaches of the map

There are different approaches to organize the cognitive resources of the company or organism or in this case the reactor.

- Those based on the **organizational structure**
- Those based on the **processes**
- Those based on **activities, topics or domains**

In this particular case, the most appropriated way is the one of topic or domain of knowledge classification



# Knowledge Preservation of Atucha type reactor

The key axes or areas, with their corresponding Atucha type reactors domains and sub-domains, which represent the skills and specific experience from the very design and the operation, are as follows:

Axis 1: Reactor design

Axis 2: Reactor fuel

Axis 3: Mechanical components and accessories

Axis 4: The systems

Axis 5: Safety

Besides, there is a transversal axe of support functional tasks linked indirectly to the reactor.



## ***Identification of the critical knowledge: Approaches.***

A knowledge domain is critical because it needs to be capitalized, shared or it requires innovations

We made use of a library of approaches to evaluate the knowledge criticality

Four possible thematic topics for knowledge type

### **1) Rare or unable of replacement:**

The company is the only one that holds this knowledge

.....

### **2) Usefulness for the company**

This knowledge belongs to a key area or department in a company, which is considered strategic

.....

### **3) Difficult to obtain:**

It is difficult to identify the sources of the knowledge

.....

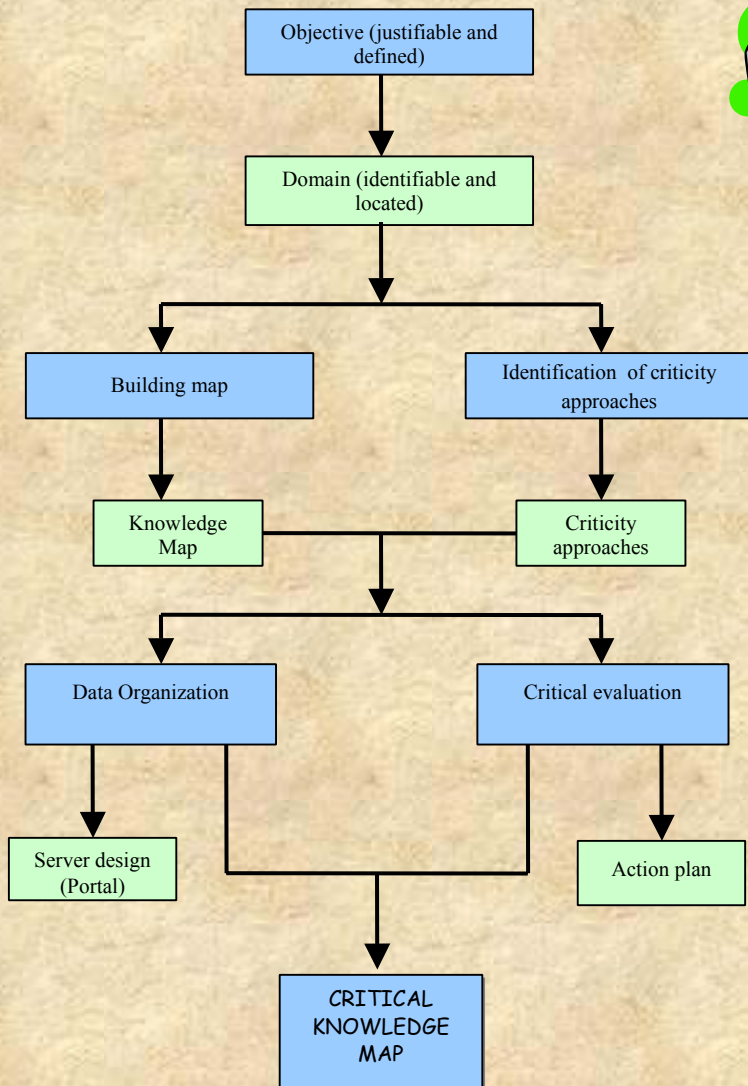
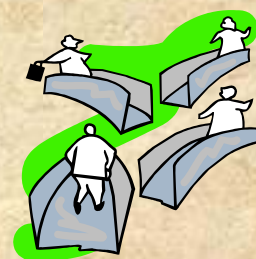
### **4) Difficult to use:**

This knowledge is deep and complex

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# Critical Knowledge Map Building



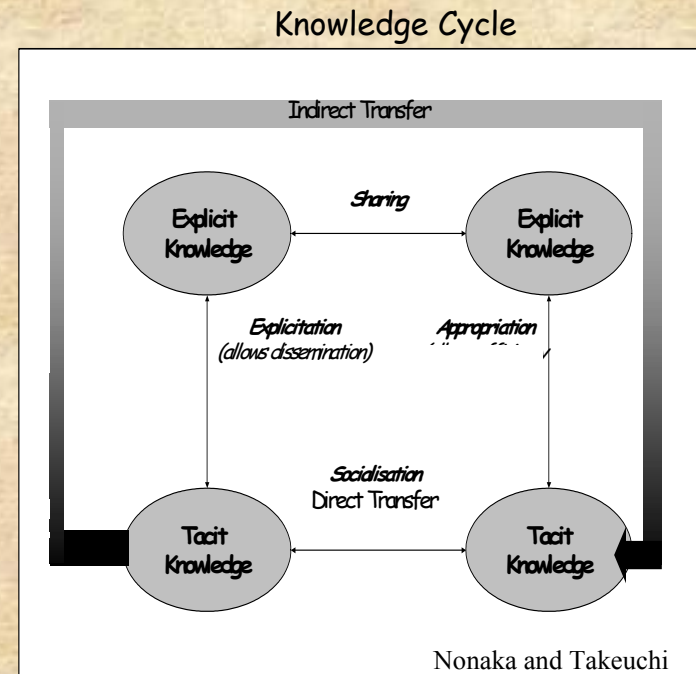
# Knowledge Preservation of Atucha type reactor

## Knowledge transfer and Capitalization

Capitalizing and sharing processes.

direct transfer: socialization

indirect transfer: elicitation,  
sharing,  
appropriation



The MASKmethod: a knowledge engineering approach  
Method of Analysis and Structure of Knowledge (J.L. Ermine)



# Knowledge Preservation of Atucha type reactor

## Conclusions

The knowledge preservation project of the Atucha type reactors use different kinds of techniques and methodologies to identify the critical knowledge domains of the reactor and its criticality by means of a knowledge map. This tool will enable us to access to the application of the KM processes and to design a knowledge portal.

Experience obtained through the KM system development shows how training techniques are put into practice, in order not to interfere with normal plant operation, and how to initiate the KM processes in order to improve the criticality

