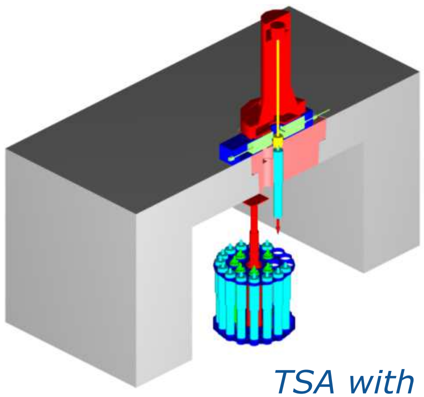
Session 5 - posters

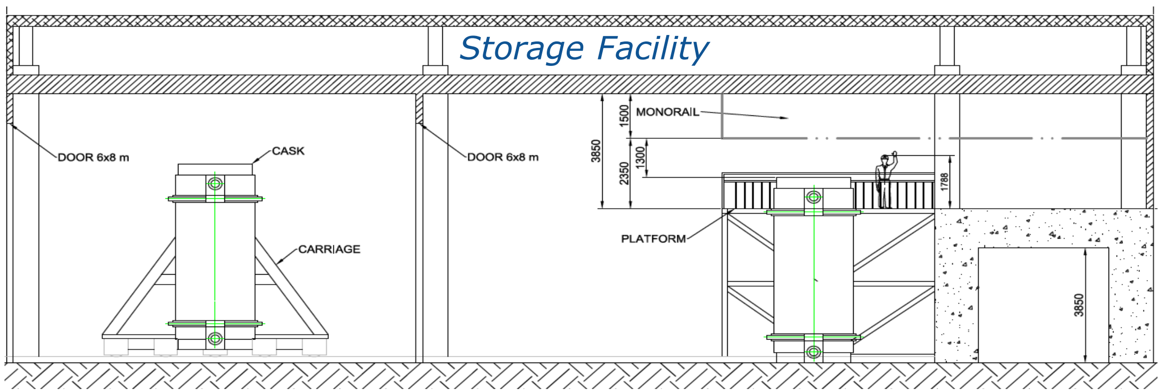
ID 47:Dry Storage of Irradiated Nuclear Material (INM) in Dual Purpose Cask at the JRC-Ispra Site

Main steps of INM management at the JRC Ispra site:

- need to store different types of spent fuel coming from research activity in DPC (various burn-up, phisical and chemical forms, whole and segments of pins, pellets)
- preliminary repacking campaign to be performed in hot-cell, INM transferred into pots (cylindrical containers)
- transfer of repacked pots material in Temporary Storage Area (TSA)
- construction of dry storage facility for DPCs
- dry loading of DPCs and storage in to the Storage Facility



TSA with pots



ID 117 -Progress towards a solution for intermediate storage of spent nuclear fuel in Norway

Peter Bennett, Erlend Larsen, Barbara Oberländer and Ole Reistad,
Institutt for energiteknikk, Norway

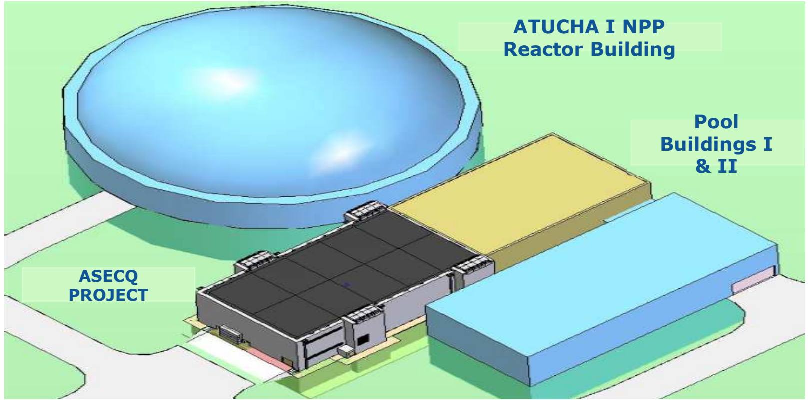
- SNF from Norwegian RRs is currently stored on the reactor sites by the reactor operator (IFE)
- Organisational and financial arrangements for long-term SNF management have not been defined
- Main recommendations made to government by expert committees:
  - Reprocess legacy metallic U fuel
  - Construct an interim storage facility on the Halden Reactor site
- Strong opposition to reprocessing and local government opposition to siting proposals
- A recent Concept Evaluation Study recommends reprocessing as giving the largest social and economic benefits
- The next stage is an independent review of the Concept Evaluation Study

Comisión Nacional de Energía Atómica

ID 120: First experience in basic design of a dry storage facility for spent fuel in Argentina

ASECQ Project of Atucha I NPP: Spent Fuel Dry Storage Basic and Final Design

Authors: Ing. O. Beuter; Ing. H. Luna Dávila; Ing. E. Maset; Ing. M. Furriel; Ing. L. Casais and Ing. H. Quirós
Comisión Nacional de Energía Atómica - Argentina



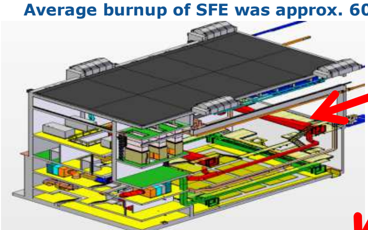
ATUCHA I NPP - TECHNICAL FEATURES

Fuel Element: natural uranium (0,7 % U235).

Fuel Assembly (FA) has an active length of 5,3 m and has a circular cross section of 0,10 m diameter, with 36 fuel rods plus one structural rod.

The material of the rod is Zircaloy 4. Each FA is loaded with approx. 176 kg of UO2.

Atucha I NPP was fuelled with natural uranium during 27 years of operation. Average burnup of SFE was approx. 6000 MWd/tU.



BASIC DESIGN & FINAL DETAILED ENGINEERING

ASECQ - CONTENTION BARRIERS

1st barrier: Fuel matrix and fuel rod in SFE

2nd barrier: Storage Unit (mechanical cask)

3rd barrier: Silo (Storage vault)

4th barrier: Building (structural system)

BUILDING

Construction of reinforced concrete in-situ. Thickness of concrete shielding wall: 60 cm (minimum).

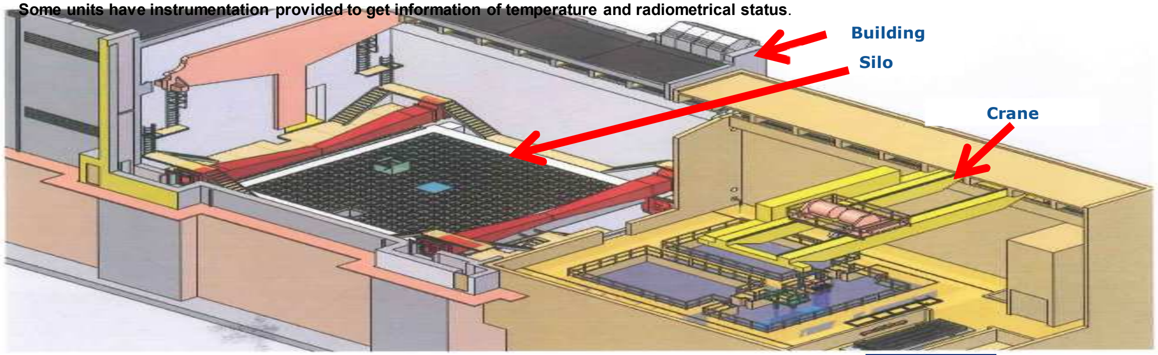
Vertical transfer between buildings. Same crane rails, safety and auxiliary systems.

SILO

Construction of reinforced concrete in-situ. Thickness of concrete shielding wall: 100 cm .
Storage capacity 2754 SFE or 316 Storage Units. Length of each SFE: approx. 6000 mm

STORAGE UNITS

Made of stainless steel with capacity to store 9 SFE each one. Allows locking with lifting tool.
Some units have instrumentation provided to get information of temperature and radiometrical status.



OVERVIEW

Atucha I NPP was started up in 1974, initiating the nuclear energy production in Argentina.

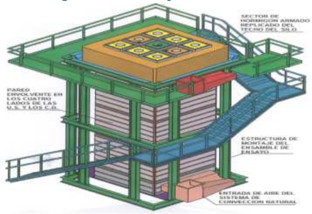
With the purpose of solving the current situation that both fuel pools capacity will be soon complete (Pool Buildings I and II) and considering the future life extension of the Plant, CNEA was asked to develop a project integrating systems in a new building for dry storage of spent nuclear fuels, called ASECQ (acronym in Spanish: Almacenamiento en Seco de Elementos Combustibles Quemados).

ASECQ design was conceived as an extension of the controlled area, focused in Pool Building I enlargement in order to build a vertical underground Spent Fuel Element (SFE) storage facility.

This configuration will facilitate the Operator (NA-SA) to transport the SFE and the National Regulatory Authority (ARN) to control the operation and inventory inside the proper Plant, fulfilling the nuclear surveillance and regulated safeguards.

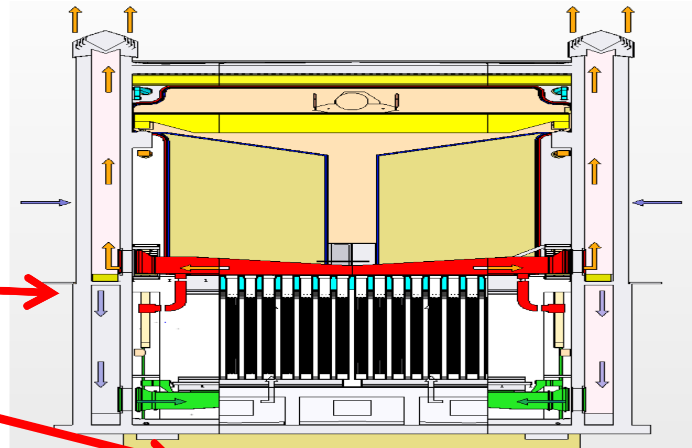
Monitored natural convection of air in normal operation was adopted outside the second barrier of protection. In case of an abnormal event, the natural convection is replaced by an alternative cooling and treatment closed system for the air.

ASECQ is currently under construction and its starting up is planned for 2018.

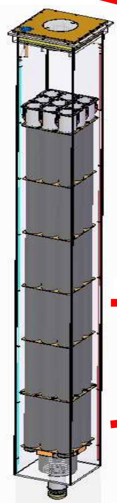


MOCK-UP STRUCTURE FOR MODEL VALIDATION

ASECQ HEAT REMOVAL BY NATURAL AIR CONVECTION



VERTICAL TRANSFER PROCESS



A group of 9 SFE
To Storage Units