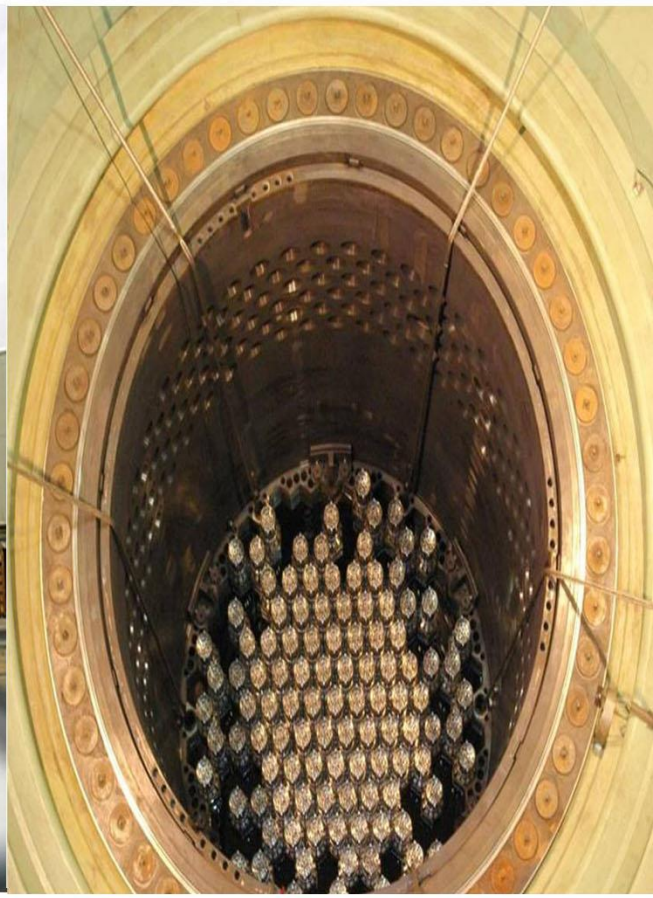
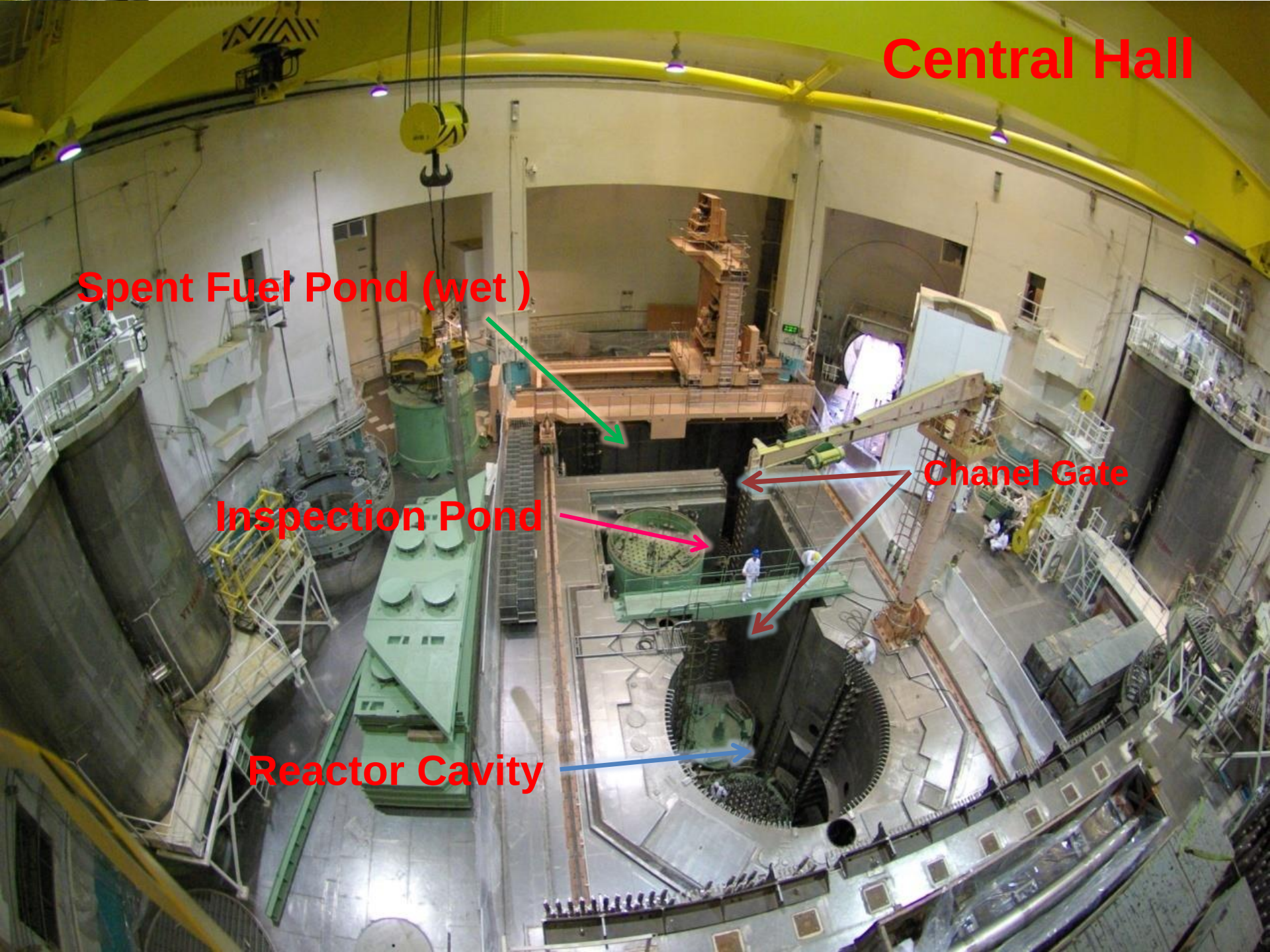


Spent fuel storage system of BNPP-1

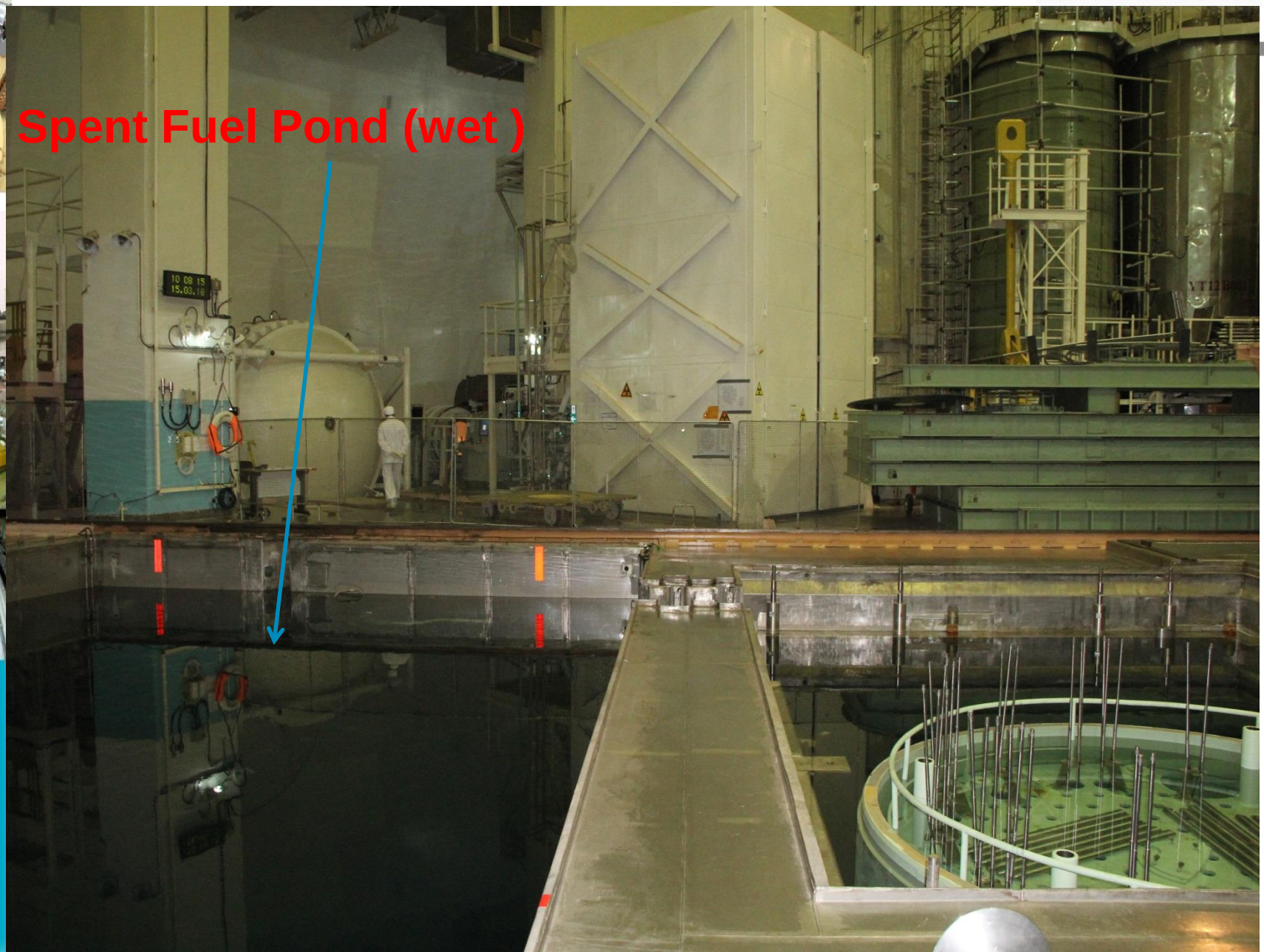
Keyvan Tafazoli – Alireza Setorg

The spent fuel storage system (SFSS)

It’s designed to store and cool down the spent fuel

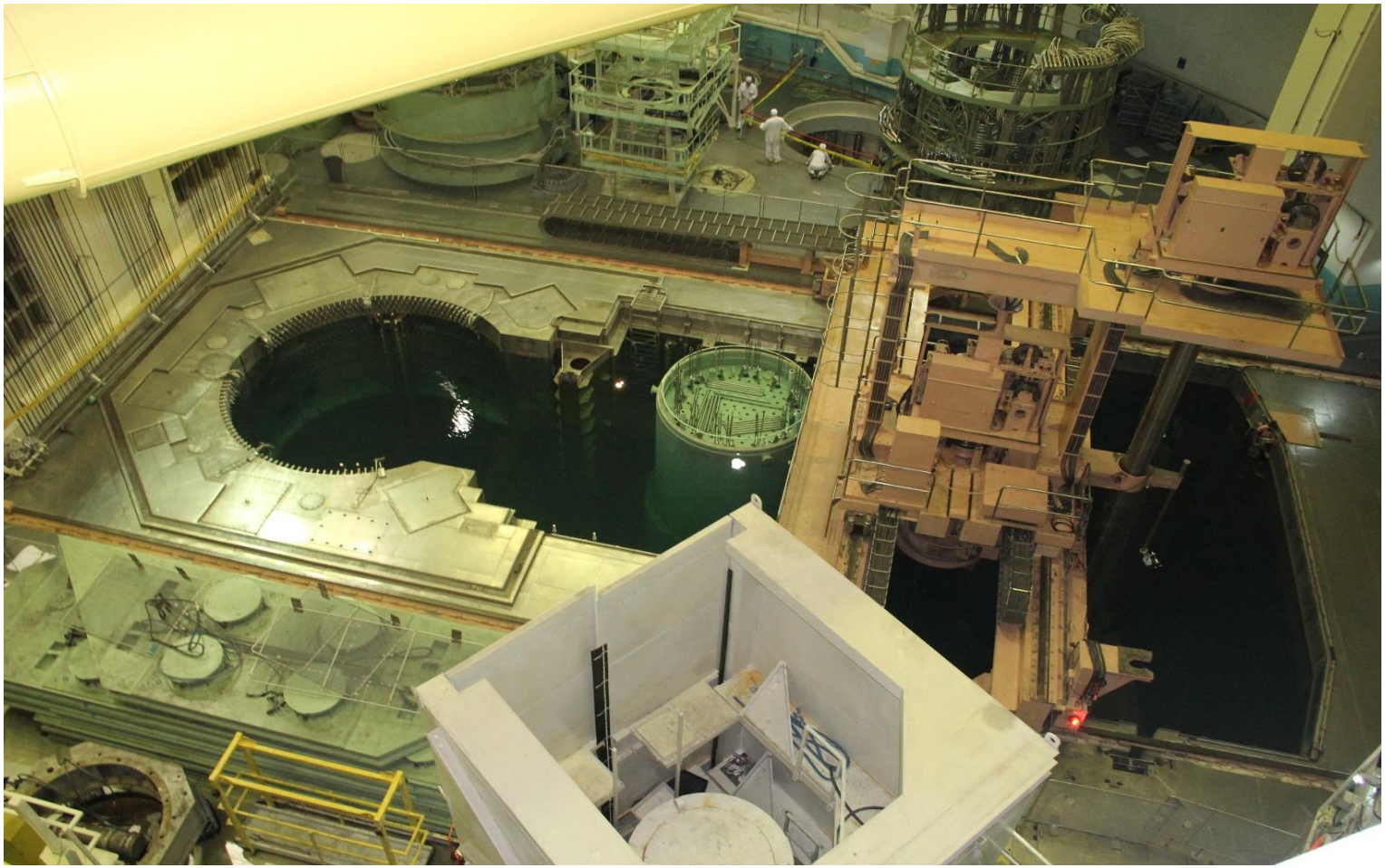

Central Hall
Spent Fuel Pond (wet)
Chanel Gate
Inspection Pond
Reactor Cavity

Nuclear Power Production & Development Company of Iran






Refueling Machin






Shipping of spent fuel from the BNPP1

Shipping of spent fuel from the BNPP-1 includes the following procedures:

- **Preparation and installation of transport Spent Fuel Container(SFC) into SFP container cell;**
- **Loading of SFC with spent fuel assemblies;**
- **Installation of the cover on SFC;**
- **Transportation of SFC to decontamination plant with a vertical bar of the polar carne;**
- **Decontamination, Drying, pressurization, measuring of temperature inside the container cavity and control of SFC pressurization;**




Continue

- Installation of SFC to the transfer trolley with a polar crane, turning SFC to horizontal position;
- Transportation of SFC on the transfer trolley through the lock to the transport trestle of the reactor building, assembly of the shock absorber on SFC;
- Installation of SFC to the heavy trailer in a horizontal position with the help of a horizontal bar of the half-portal crane, disassembly of the shock absorber.
- Transportation the SFC to storage location.




SFP Requirements

- The SFP is a normal operation system which is important for safety and it is connected to safety systems;
- The spent fuel storage system must meet safety requirements during normal operation and design-basis accidents;
- The system must not cause excess of irradiation doses for personnel and public, and radioactivity releases to the environment;
- Also restrict such effect during beyond-the-design-basis accidents.

Regulatory Documents

- General provisions of nuclear plant safety;
- Safety rules of storage and handling of nuclear fuel;
- Design rules for a seismic nuclear plants;
- Civil engineering standards for nuclear plants;
- Radiation safety standards;
- Requirements for quality assurance program for nuclear plants.




Safe Operational Limits for the Spent Fuel Storage System

- **Effective neutron multiplication factor (KFeff) ≤ 0.95:**

Controls of level, temperature, clarity, chemical composition, reference radionuclides activity and boric acid concentration in water of SFP / spacing between FA's / using absorbers and etc.

- **Not exceeding of allowable limit irradiation doses for personnel, public, and to the environment:**

Using gamma / neutron shield

- **Heat removal from FA's:**

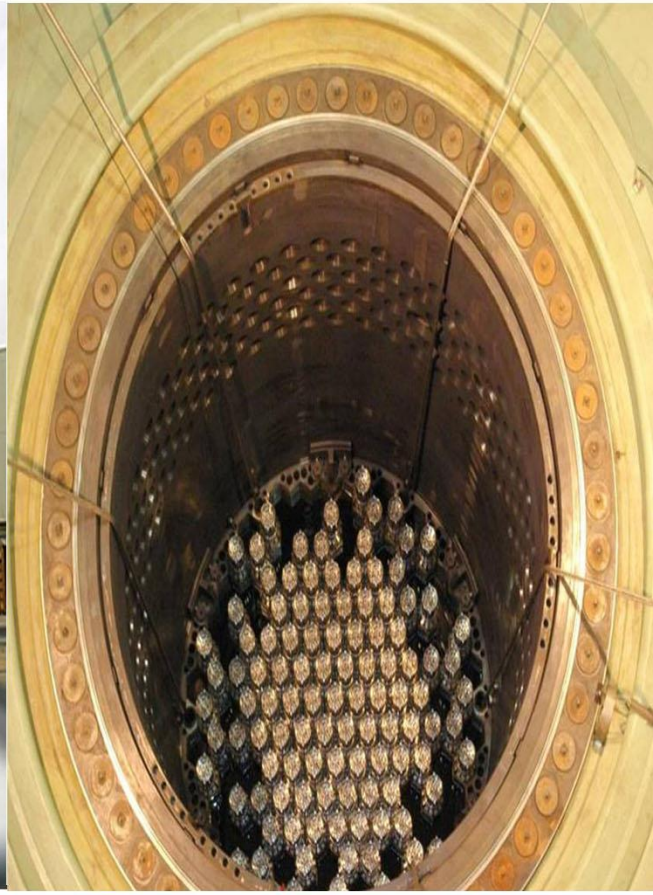
By water circulation / forced ventilation

- **No other weights are transported above the SFP.**

The Main Problems of SNF in BNPP-1

- How to Remove the Leaking FA from the SFP;
- Drying the SFC to the Standard Level.





Thank You