Cernavoda NPP Unit 1 (600 MWe Standard type) is in operation since December 1996. There are other 4 units already erected in Cernavoda NPP site. Only Unit 2 is preparing to start the work for to be finished, for the moment.

Within the frame of the Radioactive Waste and Spent Fuel Management Program, initiated by RENEL, the topics of studies and researches cover the conceptual design of a Spent Fuel Interim Storage Facility (S.F.I.S.F.).

The analysis developed related to the spent fuel quantity stored in the S.F.I.S.F. have proposed the modular concept for building the facility, because the schedule for commissioning the N.P.P's Units 2 - 5 is uncertain yet, and, also, for distributing the investments according to the real storage requirements.

The N.P.P.Cernavoda project includes a Spent Fuel Storage Bay (S.F.S.B.) with a capacity of spent fuel arising from ten years of one unit operation at 80% loading power factor. In these conditions, the quantity of spent fuel discharged from the 5 units in 30 years is estimated to be about 14400 Ut, with a quantity of about 94 Ut discharged in every year from one S.F.S.B., that means about 5000 bundles per year.

Taking into account the obtained load factor for the Cernavoda first unit (86%, 4), until now, it is expected that the dead line for the commissioning of Spent Fuel Dry Storage Facility to be the year 2005. The particularities of Cernavoda NPP offer two possibilities to use the existing areas and systems for loading and preparation of the spent fuel for dry interim storage. One of these is to use the Reception Bay and the other one is to use the Spent Fuel Bay. If the S.F.S.B. will be used for loading and preparation of the spent fuel for dry storage, the storage capacity of the bay will be reduced with about 2 years. In this case, the deadline will be before year 2004.

The characteristic of CANDU fuel presents advantages and disadvantages in selection and design of the solution for our facility from Cernavoda. The great quantity of the fuel (94t/year), the great number of bundle (aprox 5000/year), small and weight dimensions, low burn up (190 MWh/Ukg), low released thermal power (0.301 W/Ukg), low specific activity (1.216E20 Ci/kg) had been taken into consideration in our comparative analyses.

First of all we have studied the possibility to place this Interim Storage Facility on the site of Cernavoda N.P.P. or in their neighborhood. As a conclusion of these studies (including geological aspects), the optimum site seems to be in N.P.P. boundary. This selection has as a direct advantage the avoidance of the transport on public roads and the simplification of the transfer system.
The position of selected S.F.I.S.F. site, closed to Unit 5 of Cernavoda NPP on natural strata, cannot make a significant perturbation of other activities into this area and have a benefit of existing road, utilities and other services, etc. The storage systems already analyzed by CITON are the following:

a) Ponds
b) Dual purpose casks
   b1) One piece flask (DSC flasks / Ontario-Hydro, CASTOR / GNS, TN / Transnucleaire)
   b2) Canister in a flask (VSC / BNFL - SNC)
c) Vaults
c1) concrete module (CANSTOR / AECL)
c2) modular concrete vault (MVDS / GEC-Alstom, CASCAD / SGN)

For a correct evaluation of these solutions, we performed a multi-criteria analysis using a method with a low degree of subjectivity. We started by consulting IAEA documentation (TRS nr.204 “Technical evaluation of bids for nuclear power plants - a guidebook”, and TRS nr. 378 “Options, experience and trends in spent nuclear fuel management” din 1995), and from a method for evaluation of the technical products level developed by Politehnic University from Bucharest.

Based on these documents and on the characteristics of our SFISF, there were selected 4 criteria for comparing the three solutions, and their weight for comparison: costs, nuclear safety, technical aspects, interface with plant. These criteria were analyzed for each solution, resulting an order among the three solutions. For a proper comparison taking into consideration the weight of each criterion, we allocated notes for each criterion and for each solution based on the order resulted from the analysis.

We have selected 2 solution, for be taking into analysis in the frame of the feasibility study, as is following: - Concrete Monolithic Module, based on CANSTOR Canadian solution; - TranStore TM solution.

We are expecting that the experience gained during the design, construction and commissioning of NPP Cernavoda’s first Unit could be an important factor for the investment cost reduction, in the area of the design and project management for these facilities.

Now we are in progress with the preparation of documentation for obtain the licence for the site and the feasibility study. Results of our studies will be presented in this paper.