1. INTRODUCTION

ETELETRONUCLEAR (ETN) has implemented a waste management program in order to reduce the radwaste generation within the NPPs Angra 1 and Angra 2. In addition to the initial storage facility – Waste Center Management – Centro de Gerenciamento de Resíduos (CGR). This program is focused on the development and on the implementations of the following actions:

- Decontamination on the non-compressible metallic wastes generated in NPP Angra 1 by means of the treatment processes applied in NPP Angra 2.
- Super-compaction of the compressible solid radwastes to prevent the premature depletion of the initial storage facility – Waste Center Management – Centro de Gerenciamento de Resíduos (CGR).
- Implementation of a liquid radwaste transfer station to enable the treatment of the liquid radwaste from NPP Angra 1 in Angra 2 radwaste treatment systems.
- Implementation of alternative methods of treatment to replace the waste evaporator for liquid radwaste processing in NPP Angra 1 and also to substitute the bitumen and the cement plants by polymerization and “In Drum Drying System” processes.
- Implementation of the monitoring building facility to improve the segregation and the monitoring of the low and medium level radwaste packages generated in the three NPPs.

2. RADWASTE MANAGEMENT IN NPPs ANGRA 1 AND 2

Waste evaporators are used in both NPPs Angra 1 and Angra 2 for the treatment of liquid radwaste produced in the controlled area. The distillate is sent to monitoring tanks and released to the environment after the chemical and the radio chemical parameters are in accordance with the nuclear limits and environmental regulations.

3.3 COMPRESSIBLE SOLID RADWASTES – PACKAGES’ REDUCTION

- Super-compaction – It has produced 2,027 “pucks” which were placed inside B25 boxes.
- This action has permitted the availability of enough room in the CGR in order to store drums for five more years.

3.3 IMPLEMENTATION OF THE LIQUID RADWASTE TRANSFER STATION

ETN has installed a liquid waste transfer system for the treatment and conditioning of the liquid radwaste from ANGRA 1 in ANGRA 2. This action is being implemented due to several deficiencies, equipment aging and parts obsolescence of the waste evaporator of NPP Angra 1. Nowadays, tests and commissioning of this transfer system are in progress.

3.4 ALTERNATIVES METHODS OF TREATMENT

ETN is now considering the replacement of the waste evaporator from NPP ANGRA 1, as well as the substitution of the radwaste immobilization in bitumen (ANGRA 2) and in cement (ANGRA 1) by new and safer waste treatment processes that could generate less radwaste volumes. Evaluations were made in this sense with the assessment of EPR. The radwaste treatment processes, which are now under consideration, are, as follows:

- Liquid Radwaste Evaporation and Immobilization of evaporator Concentrates and Spent Resins in cement
  - Volume Reduction Factor: 4.25
  - Increase CGR capacity for sixteen years more

- In Drum Drying Systems
  - Volume Reduction Factor: 3.10
  - Increase capacity at least for twelve years more - (Internal Storage in both NPPs)

3.5 IMPLEMENTATION OF THE MONITORING BUILDING FACILITY

This Facility will enable the segregation and the monitoring of the low and medium level waste packages generated in the 3 NPPs in order to provide an efficiency control and management of the CGR. In addition, the segregation of the materials already conditioned in drums will allow their discharge as conventional wastes in the future, as well as the compaction of the ones still containing contaminated material will result in an increase of the storage capacity.

4. CONCLUSIONS

The ETN’s achievements with the strategical managing program to reduce radwaste volume and to increase storage capacity are:

- The treatment of non-compressible solid wastes proportioned its reuse and saved 12 metallic boxes.
- The Super-compaction process filled up 128 B25 boxes. Due this, CGR has availability of enough room for five more years.
- The implementation of the liquid waste transfer from Angra 1 to Angra 2 will reduce about 20% of evaporator concentrate packages.
- The technical evaluation focused on the substitution of the current treatment processes by a selective resin filtering process and “in drum drying system” led to promising results regarding the minimization of radwaste volumes, but ETN still have to look forward towards the approval of the waste packaging to be given by the Brazilian Nuclear Regulatory Commission (CENEN).

5. REFERENCES