The Activities of ENEA

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ENEA
The Integrated Service for the Collection of Industrial and Healthcare Radioactive Wastes
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Introduction and Role of the «Integrated Service»

CIPE(The previous Interministerial Committee for Economic Planning), on proposal of the Ministry of Industry Commerce and Craftmanship), through a resolution of 11 July 1980, approved the establishment of a limited company between CNEN (now ENEA) and Agip Nucleare (stake purchased by SOGIN IN 2004), named NUCLECO for the low and medium activity radioactive waste management. It is retained the exclusive jurisdiction of CNEN relatively to the confinement of the conditioned radioactive wastes. It is further confirmed the priority that CNEN must assign to the activities regarding the control of the safety standards to assure the maximum levels of health protection in the processing and storage of the radioactive wastes.

CIPE on 11 March 1980 assigns additional tasks in the sector of low and medium activity radioactive wastes produced in the national field to guarantee the collection, storage and management.

The CIPE resolutions OF 20 March 1986 and 30 march 1989 widen the action field and confirm the ENEA and NUCLECO role in the national framework.

The ENEA Board of Directors, with a resolution of 4 June 1986 Doc. ENEA, (86) n. 33/CA Rev.1 approved the establishment of an «Integrated Service» for the management of low and medium radioactive wastes generated by external operators and defined that such a Service were undertaken partly directly by ENEA and partly entrusted to NUCLECO. The relations between the parties, to apply such a resolution are regulated through a specific Conventionof 15 June 1989, registered at n. C/46007 at the Registration Office of private acts in Rome on 27 September 1989.

THE INTEGRATED SERVICE

- D.Lgs. 52/2007 Implementation of the Directive 2003/122/CE EURATOM on the control of the HASS (High Activity Sealed radioactive Sources) and orphan sources.
- Art. 2 paragraph 1 letter m). «Integrated Service» technical operative tool able to take charge of all the phases of the management cycle of the disused source.
- Art. 17 paragraph 3, The Integrated Service guarantees all the phases of the management cycle of the disused sources like the preparation for shipment, the transport, eventually the conditioning and the temporary storage. All the plants and operators which undertake collection activities and eventual temporary storage of disused sources are allowed to join the Service. (They must be in possession of the relevant authorizations issued by the Ministry of Economic Development as per 230/95 act.

Legislative Decree (D.Lgs.52/07)

The D.Lgs. 6 February 2007, n. 52 G.U. n.95 del 24 April 2007 states:

Art.14

1. **The Prefect prepares action plans for the implementation of safety in the case in which orphan or suspected sources are found.**
3. **L'ENEA provides consultancy and specialistic technical assistance, to protect the workers and the population, to individuals performing radiological activities when they suspect the presence of an orphan source.**

Note: The Prefect is hierarchically under the Ministry of the Interior Affairs, and it is the general representative of the Government on the territory.

The Integrated Service

Art.17 paragraph 4

The Manager of the Integrated Service is ENEA

Art.17 paragraph 2

The National operator is Società gestione impianti nucleari (SOGIN S.P.A.).

The National Operator (art. 17 par. 1) must guarantee the long period disposal in safe conditions of the disused sources in order to achieve the future disposal, ensuring a safe storage for a 50 years period.

INFORMATION ACTIVITIES

Technical and scientific support to authorities

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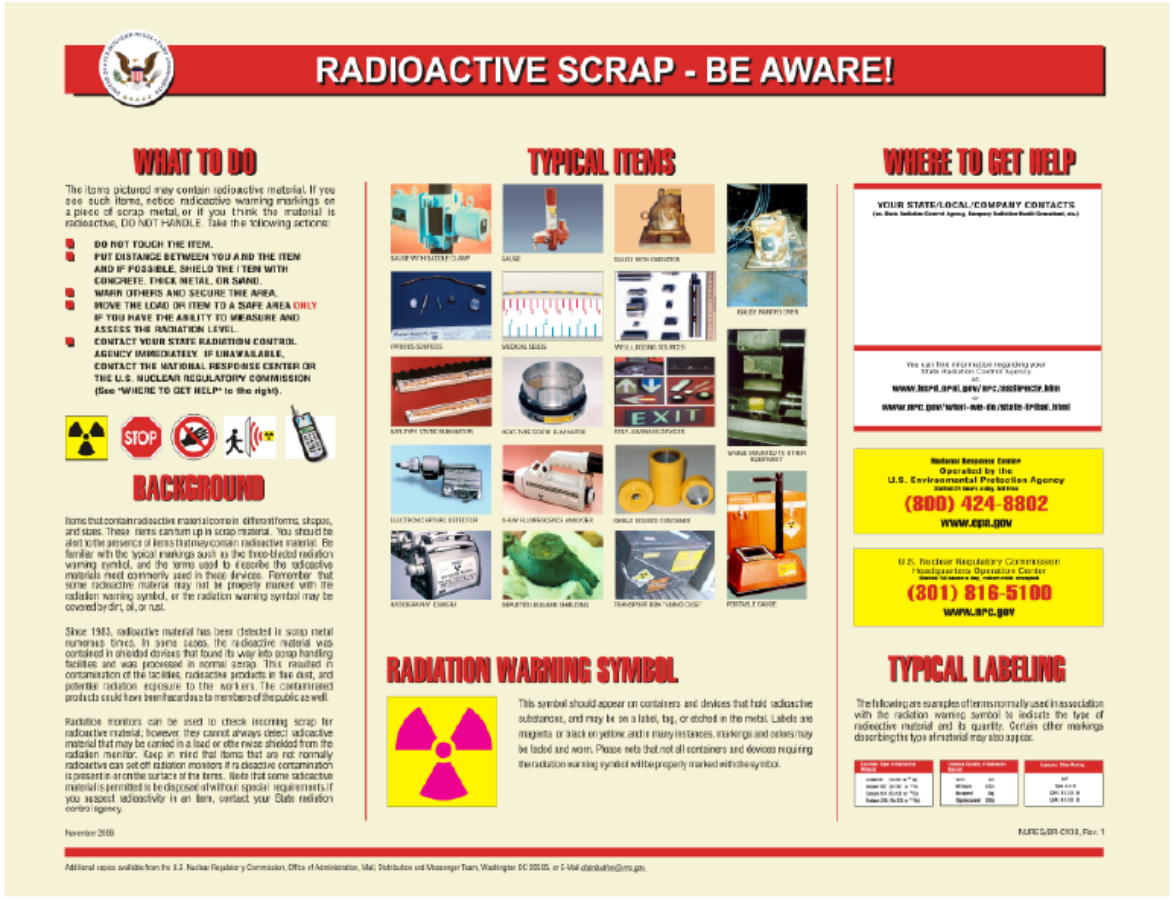
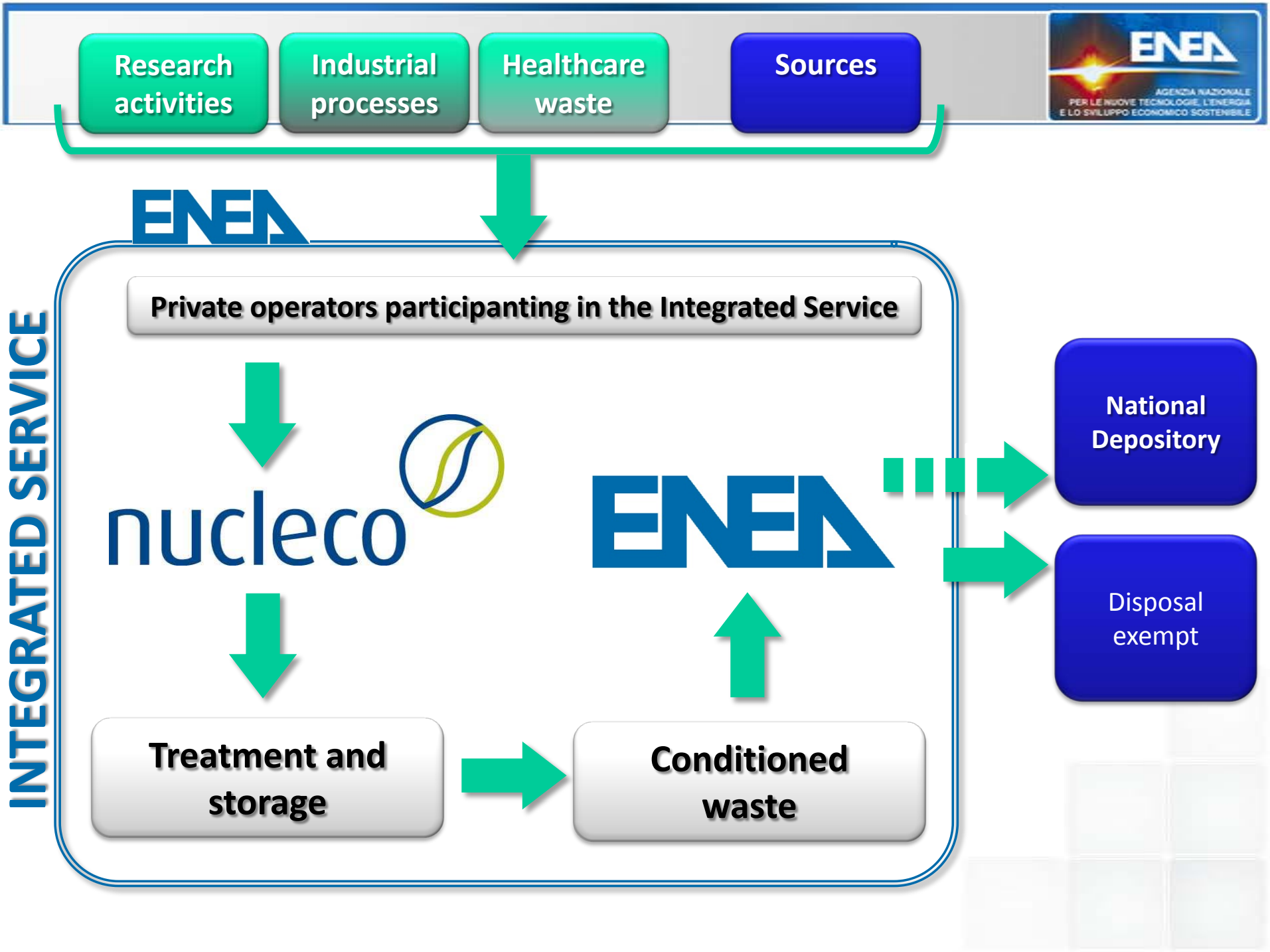
Information immediately understandable to police, customs, harbors




Research activities
Industrial processes
Healthcare waste
Sources
ENEA
AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE, L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE
ENEA
INTEGRATED SERVICE
Private operators participanting in the Integrated Service
nucleco
ENEA
National Depository
Disposal exempt
Treatment and storage
Conditioned waste

Medical and industrial Sector Supervision

ORPHAN SOURCES MANAGEMENT

Lightning rods: Am-241, (2-1000 MBq), Ra-226 (4-400 MBq)

Smoke detectors, Am-241

ORPHAN SOURCES MANAGEMENT

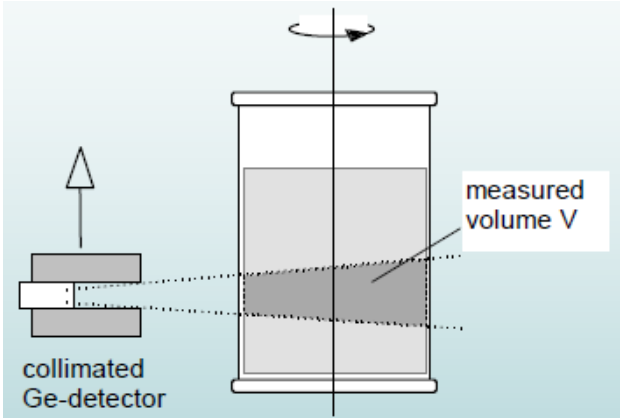
Findings in metallic scraps for metallurgy, extra U.E. military or medical surplus etc.

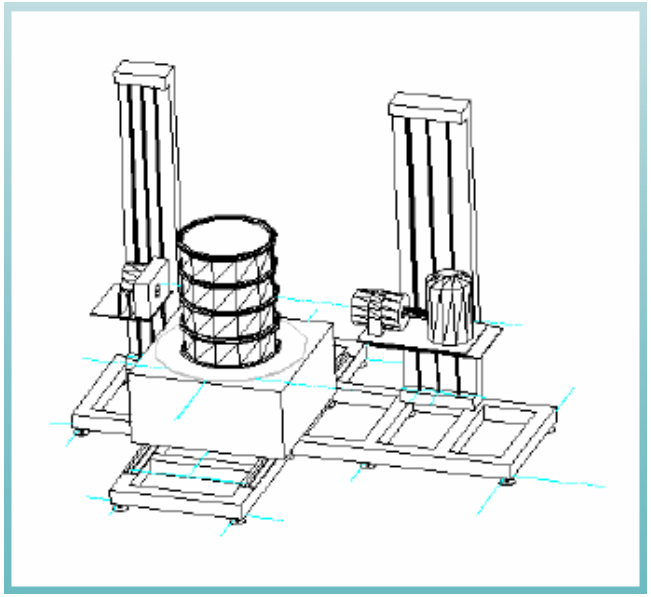
Radioactive Waste Management in Casaccia Research Centre

Through the subsidiary company NUCLECO:

1. Custody of solid waste materials: 4400 mc, liquid waste materials: 500 mc (2014)
2. Collection of radioactive wastes produced by Casaccia Research Centre (about 10 mc per year)
3. Financial Turnover about 1,3 M€/a
4. Facilities for the treatment of solid and liquid wastes (ICS 42 and ITLD22 Plants).

CHARACTERIZATION TECHNIQUES





Gamma-segmental and tomographic techniques

OPERATIONAL LAB. INSTRUMENTATION IN ENEA

Spettrometry α
Detection of α–emitters activity located in potentially contaminated samples suspected of illicit trafficking

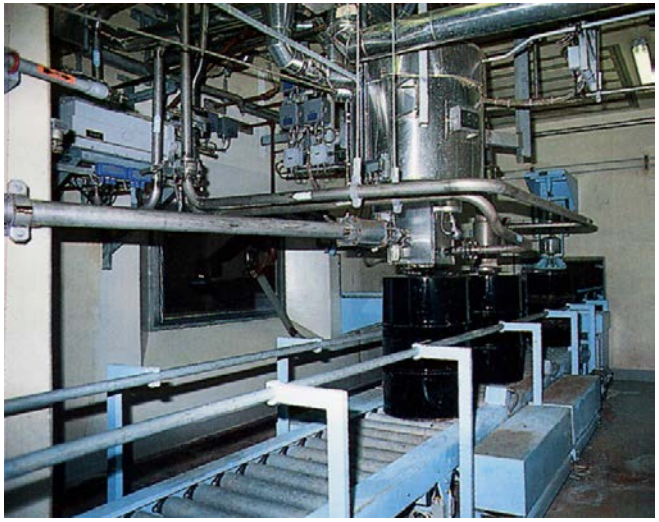
SRWGA (Sea Radioactive Waste Gamma Analyser): System for the characterization of potentially containing γ-emitting materials .
It implements different measuring techniques that allow the reconstruction of the radionuclides activity distribution in handworks containing radioactive materials, furthermore the distribution of the density of the containment matrix.

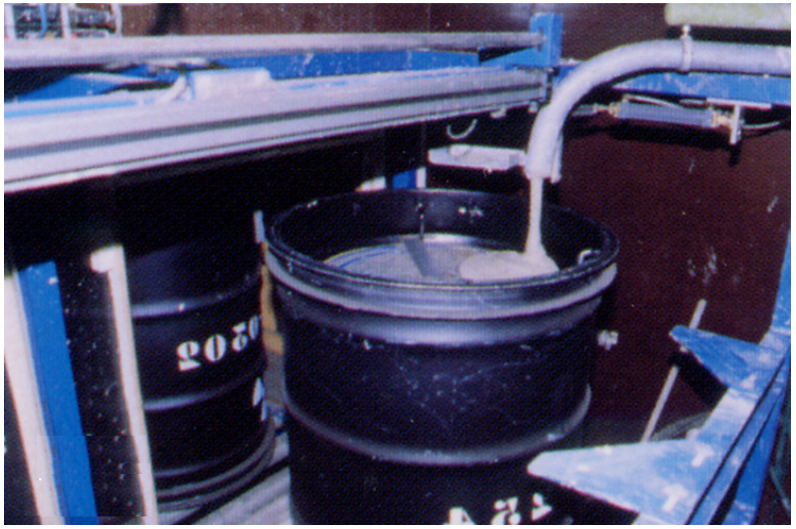
ICP-MS Spectrometer
The mass spectrometry allowes, through the light-matter interaction the elemental analysis in unknown samples with extremely high sensitivity (ppb e ppt).

Sistema Anti-Compton
Thanks to the minimization of the Compton background, this instrument is used to detect radioactive materials in extremely low concentrations (activation analysis and forensic science).

Radioactive Waste Management

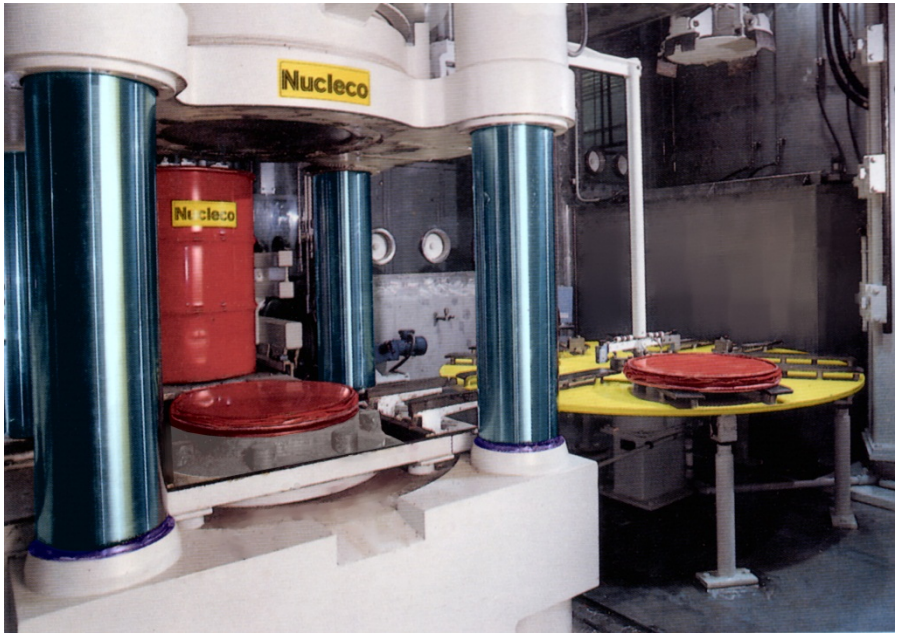
Completion of the Integrated Service Activities, i.e. conclusion of the cycle.





Compaction, drumming, cementation and temporary storage of low-activity non energy wastes

SOLIDS TREATMENT AND CONDITIONING ICS-42 PLANT

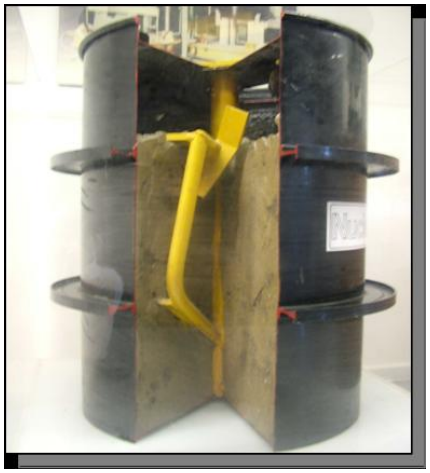


Preparation of approved mortars by ISPRA

Supercompation section includes a 15 000 kN component (1 500 t) able to process 200 l drums containing solid radioactive wastes obtaining low volume cylinders subsequently plunged in 400 l drums capacity named “Overpacks”

LIQUIDS TREATMENT AND CONDITIONING THE ITLD-22 PLANT

Liquid wastes



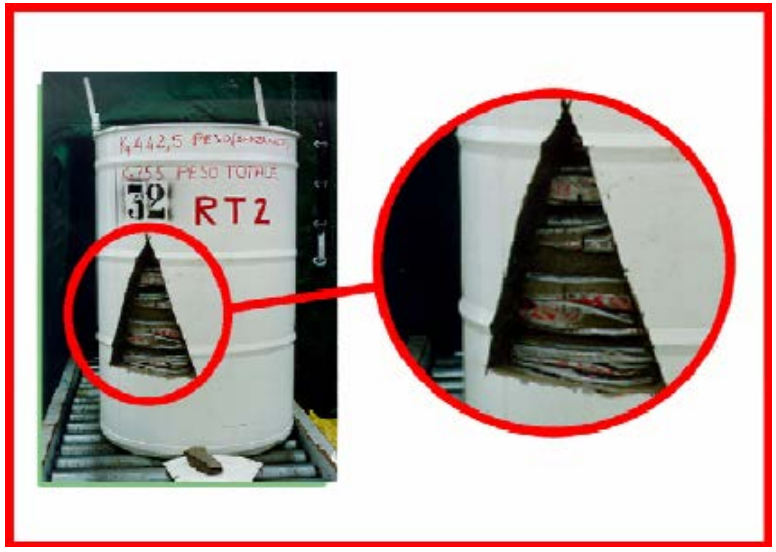
Final Handwork
MOWA 400 l drum

ITLD-22 essentially is able to process 1 m^3/shift with a maximum activity of 3 700 Bq/cm^3

Management and Disposal of Radioactive Wastes

Collection, Treatment, Conditioning and Storage of radioactive wastes from no nuclear power activities

Packaging waste at the premises of the manufacturer.
Trasport from the producer to Nucleco plant with authorized carriers.
Reception, characterization, labelling of the materials that enter in Nucleco plant.
Temporary storage fo nuclear materials pending of the construction of the Italian National Depository or pending the disposal as exempt wastes

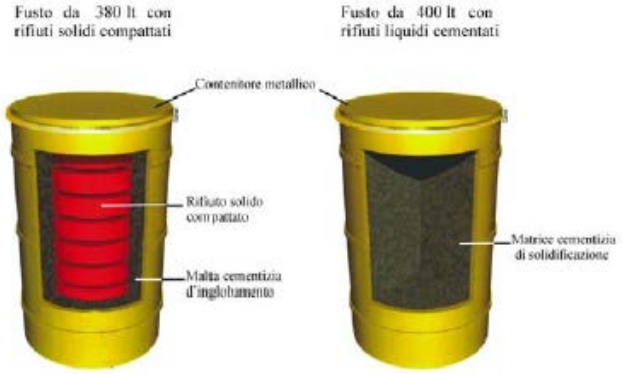


Rad. Mat. and R&D related to the siting of Italian Radioactive Waste Surface or Sub – Surf Depository

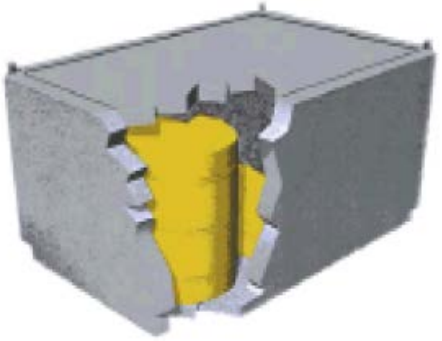
- ENEA Performs the function of the National Integrated Service Manager for non energy radioactive wastes from hospitals and industrial origin, through a framework agreement with the company NUCLECO.
- The Body Manages relations with NUCLECO and SOGIN related to technical aspects of ENEA's Research centers.
- It researches innovative systems for the safe disposal of nuclear waste.
- This Italian Agency provides technical and scientific support to the national authorities participant to international protocols, agreements and partnership.

Management and disposal of radioactive waste

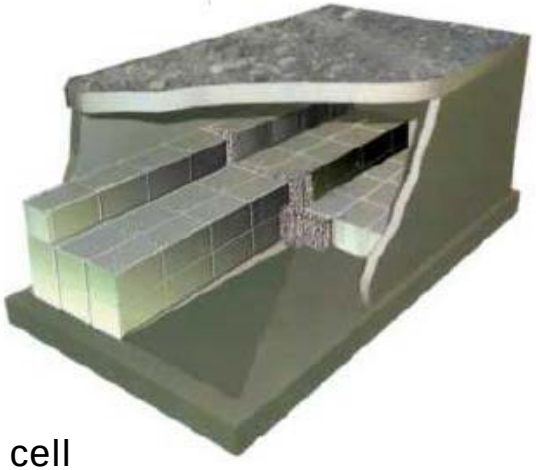
Study on conditioning and isolation of radioactive waste
Contractual relationships with SOGIN.



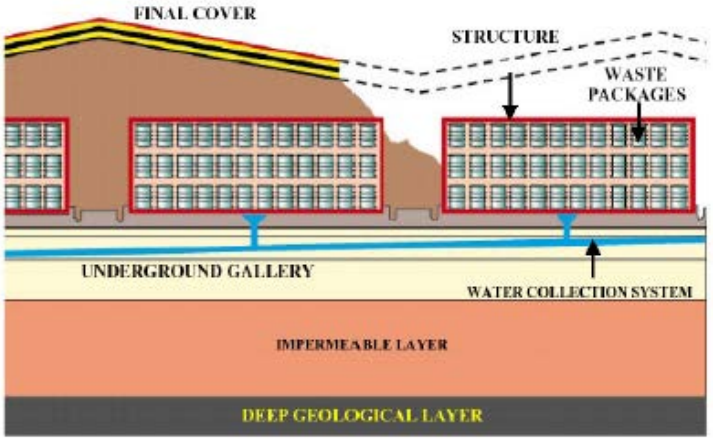
Conditioning



Isolation module



Disposal cell



Multi-barrier system

Thank you for your attention.

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