

The Shut Down of Nuclear Generation in Italy

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Luxembourg

Grand-Duchy of Luxembourg

Decommissioning Situation



NPPs and installations:

- TRINO, CAORSO, LATINA, GARIGLIANO (NPPs)
- ENEA SALUGGIA, CASACCIA ROTONDELLA (R&D inst.)
- FN BOSCO MARENGO

Decommissioning Situation

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Decommissioning sites



Decommissioning Situation



Legal Framework:

- D.Lgs. 230/95 and s.m.i., L. 1860 of 1962 and procedures foreseen by D.Lgs. 152/06 and s.m.i. The so called «Environmental Code».
- Deactivation Instance (art. 55 D.Lgs. 230/95). It foresees a complete strategy and the involvement of the main Public Bodies (Min. of Economic Development, Min. of the Environment, Min of the Internal Affairs, Min. of the Health, Region, Municipality).
- Modification of systems: L.1860 of 1962 (eventual).
- OVERALL PGM COST: 3.8 G€ to «green field», up to now 2.1 G€.

Decommissioning Situation



- **TRINO** NPP 270 MWe, PWR Westinghouse.
- GRID CONNECTION: 1 January 1965
- OVERALL PRODUCTION: 25 TWh
- SHUT DOWN: 1987

COMPLETED ACTIVITIES:

- Demolition of conventional buildings.
- Demolition of diesel generators building and cooling towers.
- Demolition of the secondary loop, removal of the steam turbine and other conventional components.

Decommissioning Situation



- DEACTIVATION INSTANCE: 2 August 2012
- Interventions to be executed through 4 Deactivation Projects (PDD), defined by Particular Projects (PP) and Operative Plans (PO), all submitted to ISPRA.
- Supercompaction of 1497 drums which produced 2° Cat. Radioactive wastes (301 «overpacks» of 380 l/each).
- Radioprotection control and monitoring.

FORESEEN ACTIVITIES:

- Retrofitting of n.1 and n.2 Deposits.
- PO for the removal of the activated components
- PO for the new system for the effluents treatment of the plant.

Decommissioning Situation



- **CAORSO** NPP 870 MWe BWR Ansaldo, GE.
- GRID CONNECTION: 1981
- OVERALL PRODUCTION: 29 TWh
- SHUT DOWN: 1986
- The decree of now MiSE (Min. of Econ. Dev.) 4 August 2000, allowed decommissioning activity.

COMPLETED ACTIVITIES:

- Decontamination of the primary loop
- Demolition and removal of the steam turbine and alternator.
- Dismantling of the gaseous effluents treatment system (2010).

Decommissioning Situation



- All the spent fuel transferred in F to be reprocessed in the period dec. 2007-June 2010.
- Low activity radioactive wastes conditioning in Sweden completed.
- Issued the tender for the dismantling of the nuclear island.

Decommissioning Situation



- **LATINA** NPP 210 MWe. GCR Magnox natU, graphite moderated, CO2 refrigerated.
- GRID CONNECTION: May 1963
- OVERALL PRODUCTION: 26 TWh
- SHUT DOWN: 1987

COMPLETED ACTIVITIES:

- Dismantling of the upper and lower piping
- Dismantling of the fuel loading system, of the equipment of the turbine building, of its turbine system.
- Demolition of the dock connected to the intake of the NPP (Sept.2011).

Decommissioning Situation

- Completion of the containment structure of the extraction and conditioning of radioactive sawages.
- Restart of works for the new temporary storage facility.
- Restart of the works for completion of LECO system for sewage treatment and conditioning.
- Activities propedeutical to the decontamination of the SF pool.

ONGOING ACTIVITIES:

- Authorizations issued by MiSE for the Construction of the facility for the conditioning of materials coming from the dismantling activities (12/2012).
- ITEA definitive design. (Effluents treatment system).

Decommissioning Situation



- Executive design of the intake unit, supply of inox vessel.
- Fuel shipment in the early nineties in the UK for retreatment.
- Monitoring and control of all the radioprotection aspects.

Decommissioning Situation



- **GARIGLIANO** NPP 160 MWe. BWR.
- GRID CONNECTION: May 1964
- OVERALL PRODUCTION: 12,5 TWh
- SHUT DOWN: 1982

COMPLETED ACTIVITIES:

- Drainage of the hydraulic reactor loops, drainage of the SF pool.
- Removal of the asbestos in the reactor building and in the turbine building.
- Completion of temporary storage of radioactive waste (D1)

Decommissioning Situation



- Transfer of the SF partly in the UK for reprocessing and partly in the Avogadro interim depository in Saluggia. This amount will be reprocessed in F. (Shipments started in 2011).

Decommissioning Situation



ONGOING ACTIVITIES:

- Supercompaction of the contaminated asbestos.
- Issued by MiSE the Decree of Authorization Deactivation (28 Sept. 2012).
- 5 Deactivation Projects (PDD) implemented into Particular projects (PP) and Operative Plans (PO), submitted to ISPRA for approval.(Dismanteling of the turboalternator, of the systems and components of the turbine building).

Decommissioning Situation



CASACCIA PLANTS (OPEC1, OPEC2, IPU).

- Scope: «Completion of the nuclear infrastructures deactivation, conditioning , temporary storage of the radioactive wastes related to the fuel cycle and environmental remediation of the various sites, included the shipment to the final storage «.
- ONGOING: dismantling of disused systems, remediation of the buildings and destination of part of them to intermediate storage.
- EUREX, ITREC, Bosco Marengo (FN).

Waste Amount Projection (m³)



STIMA DEL VOLUME DI RIFIUTI RADIOATTIVI CONDIZIONATI DA CONFERIRE AL DNPT

(Proiezione su un arco temporale di circa 40 anni)

BASSA E MEDIA ATTIVITA' (smaltimento a titolo definitivo)					
	ENERGETICI	NON ENERGETICI			TOTALI
	SOGIN	Ricerca	Servizio Integrato**	Altri***	
PREGRESSI (al 31.12.2012)					
Vol Manufatti (mc)	13.400	3.600	7.800	400	25.200
FUTURI					
Vol Manufatti (mc)	31.000	6.000	11.000	1.800	49.800
TOTALI					
Vol Manufatti (mc)	44.400	9.600	18.800	2.200	75.000
	44.400	30.600			

ALTA ATTIVITA' (immagazzinamento a titolo provvisorio di lunga durata)					
	ENERGETICI	NON ENERGETICI			TOTALI
	SOGIN*	Ricerca	Servizio Integrato**	Altri***	
PREGRESSI (al 31.12.2012)					
Vol Manufatti (mc)	4.000	2.500	600	100	7.200
FUTURI					
Vol Manufatti (mc)	6.400	700	900		8.000
TOTALI					
Vol Manufatti (mc)	10.400	3.200	1.500	100	15.200
	10.400	4.800			

	mc	%
TOTALE RIFIUTI ENERGETICI	54.800	60%
TOTALE RIFIUTI NON ENERGETICI	35.400	40%
TOTALE COMPLESSIVO	90.200	

NOTE:

(*) A questi rifiuti vanno aggiunti circa 1000 mc di residui da riprocessamento e combustibile non riprocessabile in cask (nell'ipotesi di implementare lo 'swap' dei residui a bassa/media attività con un equivalente quantitativo di residui ad alta attività)

(**) La produzione futura di rifiuti da Servizio Integrato è assunta pari a 4 volte quella attuale (500 mc/anno) e quindi circa 2000 mc/anno che condizionati diventano circa 200 mc/anno

(***) Include i rifiuti di origine Ministero della Difesa

CONCLUSIONS



REMARK:

- These figures about the situation of the NPP and the related waste production were kindly received by SOGIN further to the audit of this firm at the VIII and X Commission of the Chamber of Deputies on 14 november 2013.

SITUATION:

- MiSE (Ministry of Economic Development) active in this period for the transposition of Council Directive 2011/70/EURATOM of 19 July 2011. The attitude was still prudential and the process under finalization because connected with the intermediate storage national policy.

CONCLUSIONS

- The Council of Ministers issued the decree of transposition of the Directive on 3 December 2013. (Final approval will come from Chamber of Deputies, i.e. Industry Commission etc.) expected reasonably for the end of the year.
- ENEA has the attention and interest in the cooperation with other national organizations to handle technical and R&D issues, under the **supervision** of the Ministry and the control of our regulatory body (ISPRA).

CONCLUSIONS



Thank you for your attention