

Campoverde Decommissioning of Former Controlsonic Deposit – 14036

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ABSTRACT

In Summer 2012 Campoverde, the Italian leader company in the management of radioactive waste, won a tender for the decommissioning of Controlsonic deposit. Controlsonic was a company that went bankrupt in the early 2000, and left its deposit full of I and II category radioactive waste. The main aim of the tender, and subsequently of the work, was to put is safety all the radioactive waste and leave no contaminated area in the warehouse, in order to have the chance to use it again for other purpose.

INTRODUCTION

Controlsonic was an Italian company which main task was the withdrawal, the treatment and the disposal of radioactive waste mainly coming from hospitals. In the early 2000 the company went bankrupt and was forced to close. Its deposit, located in Tortona (a small town in the province of Alessandria, about one hour by car south of Milan, direction to Genova), was left there abandoned, controlled by the local authorities (ARPA - Regional Agency for the Protection of the Environment).

An official tender for the disposal of all the waste was issued only in 2012: during that 12 years, Campoverde helped in the monitoring and supervision of the area. Campoverde won the tender, and started the operations in order to assure that the deposit would have been left uncontaminated and reusable for other purpose.

According to the registers left by Controlsonic, in the deposit there should have been 2.159 drums, disposed on metallic pallet in scaffolds. The list of the drums have been summarized as follow:

Table I. Drums in the deposit

Decay Time	Physic State	Volume of the drum	Quantity
< 75 day	Liquid	60 L	576
> 75 days and < 365 days	Liquid	60 L	205
> 365 days	Liquid	60 L	665
> 365 days	Liquid	200 L	3
> 365 days	Solid	200 L	710

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First category nuclides were mainly ^{125}I , ^{35}S , ^{32}P , ^{51}Cr , almost totally decayed, considering the period of time they were left abandoned in the deposit.

Second category nuclides were ^3H and ^{14}C , with trace of ^{36}Cl .

From a radioprotectonal point of view, the adopted procedure followed the ALARA standard (As Low As Reasonably Achievable), with the objective of minimize the dose for the operators, for the population and for the environment, by preparing operational procedures and adequate facilities to minimize the exposure time of the operators.

All the procedure had followed the regulatory framework, defined by the following regulations:

- 1) Legislative Decree n. 257, 09/05/2001. Supplementary and corrective dispositions of legislative decree n. 241, 26/05/2000, having fulfilment of the Euratom disposition 96/29, in the field of health protection of the population and of the workers, against the risks coming from ionizing radiations.
- 2) Legislative Decree n. 241, 26/05/200. Fulfilment of the Euratom disposition 96/29, in the field of health protection of the population and of the workers, against the risks coming from ionizing radiations.
- 3) Legislative Decree n. 230, 17/03/1995. Fulfilment of the Euratom dispositions 80/836, 84/647, 84/466, 89/618, 90/641, 92/3 about ionizing radiations.
- 4) Legislative Decree n. 81, 08/04/2008. Fulfilment of article 1 of the Law n. 123, 03/08/2007, about the protection of health and safety in work places.
- 5) Legislative Decree n. 152, 03/04/2006. Regulation about environmental matters.

METHODS

The work had a first part of preparation, in order to study in which order analyze the drums, mainly because the space available was very limited, as shown in the figure 1 and 2.



Figure 1 and 2 – Controlsonic deposit, with no space for the movement of the drums.

Thanks to its authorizations, Campoverde can deal with nuclides with decay time under 365 days as they are nuclides with decay time under 75 days. Consequently, depending on the type of the waste (liquid contaminated by nuclides with decay time under 365 days, liquid contaminated by nuclides with decay time greater than 365 days, and solid waste), Campoverde operators acted in a different way.

Disposal of liquid waste with decay time less than 365 days

The area for the intervention consists of a steel tank on which was placed, one by one, the drum that had to be checked. The first thing done was the test of the bottom and the internal side of the drum (as shown in Figure 3); if these would have been ruined or unsuitable for the transportation, the drum would have been replaced with one validated for the transportation (type A drum). On the substituted drums, smear test were taken, in order to determine the future of the empty drum: reuse (if the drum wasn't contaminated) or disposal as a radioactive waste (if contaminated). On the small tank inside the drum both Campoverde and ARPA were doing measurements. Once confirmed that the waste was no more radioactive, the drum was directed to the final disposal.



Figure 3 – The bottom of the drum is checked: in this case, the drum isn't replace for the transportation.

Disposal of liquid waste with decay time greater than 365 days

The area for the intervention consists of a steel tank on which was placed, one by one, the drum that had to be checked. The drums had been divided, depending on the COD (i.e., chemical oxygen demand), in aqueous liquids (COD less than 20 gr/l) and in organic liquids (COD greater than 20 gr/l, or undefined). The drums that turned out to be contaminated and / or not adequate for the transportation had been replaced and the content had been inserted in other drums. . On the substituted drums, smear test were taken, in order to determine the future of the empty drum: reuse (if the drum wasn't contaminated) or disposal as a radioactive waste (if contaminated).

After the "on site" operations, the drums were transferred to Campoverde facilities in order to be treated: liquid with similar COD had been poured in 1 m³ tanks, which are more manoeuvrable for the final disposal.

Disposal of solid waste with decay time greater than 365 days

Inside the deposit, an area for the treatment of the solid waste has been created: a steel tank was put above some plastic cloths. Then, a small house has been built, with wooden beams, plastic covering and an aspiration system (Figure 4).



Figure 4 – The “little house” for the treatment of the solid waste.

Each drum containing solid waste was taken inside the house and, once opened, the vials were divided from the dry solid and the liquids thanks to a grill: the bag containing the vials was opened on the grill (Figure 5) in order to make the liquid drain on a underlying tank, while dry solid and vials were put in two different drums. In this way there has been a clear distinction between the three kind of waste (liquid, dry solid and vials).



Figure 5 – The grill on which the drums were opened.

Anomaly

In some drums, Campoverde operators found something different from what reported in the registers. Between them we point out:

- drums containing ^{99}Tc between the liquid waste with decay time less than 365 days;
- drums containing ^{14}C bactec between the liquid waste with decay time less than 365 days and between solid drums;
- drums containing sources, both decayed and not decayed, between the I category liquid drums.

CONCLUSIONS

After two months of real hard work, Campoverde completed the decommissioning of Controlsonic deposit. All the repackaged wastes had been transferred to Campoverde deposit, and the warehouse was left with anything inside (Figure 6).



Figure 6 – Controlsonic deposit after the decommissioning.

In the weeks after the end of the operations, ARPA Piemonte did some measurements inside the warehouse (smear test to check the surface contamination, controls with a portable

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spectrometer), in order to exclude the presence of contaminated areas. All the measurements pointed out that there was not any surface contamination. So, for the local authority, the warehouse had to be considered free from any radiological constrain, and therefore available to host any kind of conventional activity.