Experience of decommissioning RADON-type legacy storages

Yulia Gorlova
Department of Decommissioning Projects, TVEL
yegorlova@tvel.ru

ABSTRACT

Rosatom features successful experience in decommissioning of RADON-type legacy storages of radioactive waste (RW).

Major causes leading to Radon-type storages decommissioning in Russia include loss of leak-tightness due to natural degradation of engineering barriers and modification of legislation on RWM in 2011.

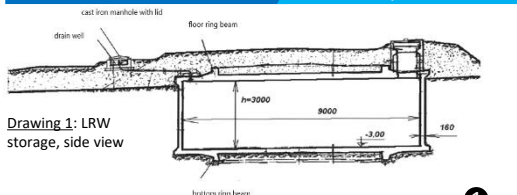
Typical RADON-type storage is given on the example of the facility located in Murmansk, decommissioning approach is described.

BACKGROUND / INTRODUCTION

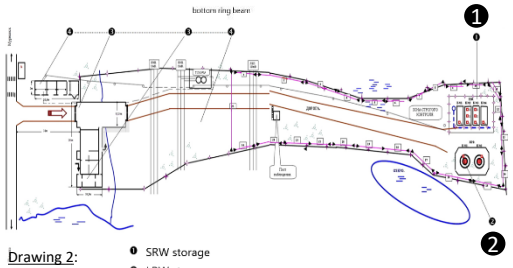
Natural degradation of engineering barriers → Loss of structural integrity of a number of storage facilities

Update of legislation in field of RWM → Storage of non-conditioned RW is prohibited

→ Recovered RW must be conditioned, packaged and transferred for disposal



Drawing 1: LRW storage, side view



Drawing 2: Murmansk Radon Facility layout

1. SRW storage
2. LRW storage
3. Checkpoint for personnel and vehicles
4. The building of the diesel point, including: diesel generator, switchboard

Murmansk SRW storage facility comprises a block of four buried reinforced concrete tanks, 200 m^3 each (total 800 m^3). Dimensions: d - 14.7 m, w - 4.8 m, d - 3.2 m. In the same facility a LRW storage is also present, including another two buried reinforced concrete tanks 200 m^3 each, lined with stainless steel (R= 4.44 m, H= 3.2m).

METHODS/ CHALLENGES/ IMPLEMENTATION

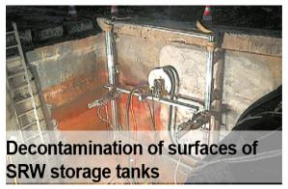
In 2012-2019 Murmansk dept. of Federal Ecological Operator (FEO) (till 2020 – RosRAO) performed pilot project of Radon-type facility decommissioning. This included works on RW extraction and conditioning, development of decommissioning project, decontamination of internal structures of the storage, partial removal of concrete structures. The approach is and sequence of actions is given below.

RW storage → RW unloading → Storage facility decontamination → Loading SRW from decontamination into PU-2ETs-SH → Transportation to special organization

RW → Primary packaging (BZ1A2-210 barrels) → Radiation monitoring → Marking → Certification → Transportation to special organization

Stage 1 Prep work | **Stage 2** LRW storage D&D | **Stage 3** SRW storage D&D | **Stage 4** Rehabilitation


Breaking concrete floors at the work site and RW removal


Decontamination of surfaces of SRW storage tanks


certification of RW packages

RESULTS

ID: 157

LRW storage area

SRW storage area

Upon completion of decommissioning of storage, expert examination was carried out, on the basis of which former RW storage was removed from specialized state control as nuclear facility.

CONCLUSION

Accumulated experience of RADON-type legacy storages decommissioning may serve for consideration during planning of further projects of similar nature, thus potentially saving financial resources and leading to shorter duration of such projects. As a result, radiation safety of the landfill was improved.

Based on this pilot project, following cases were implemented: Kazan branch of FEO, Blagoveshchensk branch of FEO, Khabarovsk branch of FEO, Grozny branch of FEO (all in period 2016-2020), Leningrad branch of FEO (2013-2020).

ACNOWLEDGEMENTS / REFERENCES

Source: D. Vlasov, D. Zamaskin, O. Kaminskiy, A. Kamorniy, A. Lukashin, A. Sobolev, FGUP RosRAO, Moscow "Decommissioning of RW storages of Murmansk branch of North-West Region of FGUP ROSRAO". "Radioactive waste" journal, 10.02.2020
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