

NDEP as a platform for nuclear cleanup of sunken objects in the Arctic Sea

This Policy Brief summarizes the key outcomes and recommendations from the Northern Dimension Expert Seminar: Nuclear Waste Cleanup in the Arctic¹, which gathered together leading international experts and key stakeholders on nuclear cleanup projects.

The Northern Dimension Environmental Partnership's Nuclear Window (NDEP NW) is an established platform for eliminating nuclear hazards inherited from the Soviet nuclear fleet operations in the Arctic. The strength of the NDEP NW projects is their operating model, where the NDEP grants administered by the EBRD act as a catalyst for local and complementary national funding, including in kind support from the beneficiaries.

After years of terrestrial nuclear cleanup, Russia and international actors are taking the remediation of hazardous sunken objects as a strategic priority, and the recent European Commission funded feasibility study identified 17,000 sunken nuclear objects in the Arctic Sea, and drafted a four-step action plan for the management of six most hazardous objects.

The Expert Seminar concluded that the nuclear cleanup of the most hazardous sunken objects should start from the lifting and dismantling of the most urgent ones: nuclear submarines K-27 and K-159, and that the NDEP NW would be a feasible platform for these projects. The learnings from the expert seminar lead to following recommendations for future nuclear cleanup projects on sunken objects in the Arctic:

- **Recommendation 1:** To encourage the Russian Federation to continue its work on establishing a legal and regulatory framework for cleanup of sunken nuclear objects.
- **Recommendation 2:** To inform international donors about how Russian legislation would enable/constrain international cooperation in the potential lifting operation.
- **Recommendation 3:** To seek infrastructural and other synergies with existing NDEP funded projects and with bilateral nuclear cleanup projects.
- **Recommendation 4:** To allocate sufficient complementary national funding to secure operational costs not funded by the NDEP grant.
- **Recommendation 5:** To have a flexible technical and management approach in project design and implementation to account for regulatory and other uncertainties.
- **Recommendation 6:** To ensure efficient knowledge sharing and collaboration between project implementing bodies and key external stakeholders.

Sunken objects in the Arctic Sea as a global nuclear hazard and steps taken to address it

In the Cold War era ocean dumping was a common international practice for disposing nuclear and radioactive waste. This led to the accumulation of **17,000 “sunken objects” in the Arctic Sea**. In addition to the intentionally dumped objects, the Arctic waters contain nuclear submarines of the Soviet fleet that were sunken in accidents.

The sunken objects comprise a serious **environmental hazard**, as they are often damaged in the dumping or in the accident. Therefore, there is a serious **risk of leakage of nuclear fuel** that poses a threat to marine life. The nuclear contamination of waters would lead to the **accumulation of radiation and its transmission** up the food chain from plankton, fish, marine mammals and eventually, to humans.

The **need to evaluate environmental hazards** associated with the sunken objects in the Arctic in view of their future mitigation has been **acknowledged by several actors**. On the national level **Russia is shifting its focus on the marine environment** after years of terrestrial clean-up. **Bilateral nuclear programs** such as the joint Norwegian-Russian expeditions to dumped and sunken objects, and French-Russian cooperation on clean-up of terrestrial nuclear objects have produced **alarming information on the overall condition** of these objects in general and of their reactor isolation material in particular.

The findings of these bilateral initiatives **catalyzed a European Commission funded feasibility study** (2015-2019) to make an **inventory** of the sunken objects and **identify the most hazardous** among them, and to prepare scenarios and an **action plan** for management/disposal of these objects. **Rosatom** was the beneficiary of the study which as implemented by a consortium of European companies and agencies, led by the Italian company Sogin.

The study resulted in a **shortlist of the 6 most hazardous objects** of which two, nuclear submarines **K-27 and K-159**, were recommended for lifting and dismantling. The other four would need long-term monitoring but no other immediate action.

The six most hazardous sources identified in the Feasibility Study:

- **Nuclear Submarine K-159**, sunken in 2003 @ -238m
- **Nuclear Submarine K-27**, dumped in 1981 @ -30m
- **Shielding Assembly of Icebreaker “Lenin” OK-150**, dumped in 1967 @ -49m
- **Reactor Compartment of NS K-19 and RC NS K-11**, dumped in 1965 @ -20m
- **Reactor of NS K-140**, dumped in 1972 @ -300m

The recommended action plan for the **lifting and dismantling of K-27 and K-159** consists of four steps. The first one is the establishment of a **legal and administrative framework** by the Government of the Russian Federation.

Interestingly, this administrative **work has already been launched** with the signing of the Presidential Decree on the Strategy of Development of the Arctic Zone of the **Russian Federation** in October. The Decree envisages the **remediation of hazardous sunken objects by 2030**. In addition, a **roadmap** and a draft of the Presidential Order is currently being prepared under the leadership of the Ministry for the Development of the Far East and the Arctic, and it is foreseen to be ready in January 2021.

The **other three steps** of the 4-step Action Plan (survey, design and execution) are recommended to be implemented in **international collaboration** between a Russian Federation nominated organization, executor, international partners and suppliers.

The **results of the Feasibility Study have been discussed** in a number of international forums, including bilateral and multilateral ones, such as the Nuclear Operating Committee of the Northern Dimension Environmental Partnership (**NDEP**) that has an impressive track record on catalyzing and financing international nuclear cleanup projects in Northwest Russia. NDEP would therefore provide a **well-functioning platform** for the lifting and dismantling of K-27 and K-159.

NDEP as a platform for nuclear cleanup of sunken objects in the Arctic

The **NDEP is a flagship initiative** of the Northern Dimension Policy, set up in 2002 to improve the Environment and **Nuclear Safety** in the ND Area. The prolongation of its mandate until 2027 is currently being discussed.

The Northern Dimension Policy

- The Northern Dimension (ND) was initiated in 1999 as external policy of the EU. Since 2006 it is a **common policy** of the EU, Russia, Norway and Iceland where **all partners are equal**.
- The Northern Dimension area covers **the European North, including the Arctic, Barents and Baltic Sea regions, and Northwest Russia**.
- The **strength** of the ND Policy is its **concreteness**, as it provides **proven instruments and platforms** to **jointly address** topics of **shared concern** and **mutual interest**
- The ND policy is implemented through **thematic partnerships** on **environment, transport and logistics, culture, and health and social wellbeing**, and by other actors and forums such as the university network **ND Institute**, the **ND Parliamentary Forum** and the **ND Business Council**.

The NDEP **operates through concrete investment projects** implemented by International Financing Institutions with the support of **NDEP grants** and **beneficiary country funds**. Most NDEP projects include **complementary funding** from ND partner countries. The NDEP projects are located in **Northwest Russia and Belarus**.

The **NDEP Support Fund** is made up of **contributions and donations from 13 countries**, including the four ND partners, individual EU member states, the UK and Canada.

“The total value of the NDEP support fund in 2020 was €348m, of which the environmental window accounted for €181.6m and the nuclear window €166.4m²”

The **purpose of the NDEP Nuclear Window (NDEP NW)** is to eliminate the **environment hazards of legacies of Soviet nuclear fleet operations** in Northwest Russia. The NDEP nuclear projects are administered by the **EBRD** which is the only international financial institution with **nuclear safety mandate**. The NDEP NW projects focus on **handling, removal and transportation of spent nuclear fuel** in Northwest Russia, geographically focusing on Andreeva Bay³.

The key areas of activity of NDEP NW

- Spent Nuclear Fuel Handling at Andreeva Bay
- Building 5 Spent Nuclear Fuel Removal at Andreeva Bay.
- Lepse Large Storage Package Spent Nuclear Fuel removal and transportation

The **strength of the NDEP** as a platform for international nuclear cleanup projects is its **operating model**. The NDEP grants act as a **catalyst** for local and complementary funding, including in kind support from beneficiaries. The projects demonstrate **efficient division of labor and complementarities** between international and local actors, including **bilateral programs** between Russia and individual countries.

The Case of Spent Nuclear Fuel Transportation System in Andreeva Bay

The removal of spent nuclear fuel (SNF) from Andreeva Bay is a commendable example of multi-lateral cooperation for resolving a complex nuclear legacy problem. The United Kingdom is funding the design and construction of major SNF management facilities. The NDEP supports SNF transportation. Norway contributes by upgrading the site infrastructure (pier, roads, power supply and other auxiliary systems) while Italy provides facilities for radwaste management and constructs a transport ship to remove SNF from the site. The European Commission is developing special automated tools to discharge fuel from the storage facilities. Russia operates the site, overseeing safety and security aspects and performing the actual retrieval of fuel and its transportation to Mayak.

Source: The NDEP website

Action recommendations for nuclear cleanup of sunken objects in the Arctic Sea

To **mitigate the environmental risks associated with the sunken objects in the Arctic**, it is recommended to **start preparing the implementation of the action plan** for lifting and dismantling **K-27 and K-159** as indicated in the feasibility study as NDEP nuclear window projects. In the preparation, the following steps should be taken:

- To establish a functioning **legislative and regulatory framework**. Regulatory support and dialogue with beneficiary country authorities is integral in NDEP projects, so Russia should be encouraged to continue its work on regulatory issues.
- To keep **international donors informed** about how Russian legislation would enable/constrain international cooperation in the potential lifting operation.
- To seek for **synergies** with existing NDEP financed and bilateral projects. For example, the infrastructure built in the French-Russian Gremikha project could be possibly used for dismantling.
- To take into account in planning the necessity of **complementary national funding** for sustainable project implementation, including making the NDEP-funded equipment operational and to fund areas that are not covered by the NDEP grant (e.g. transportation of used fuel)
- To have a **flexible approach** embracing uncertainty and risk, including regulatory risk. Flexibility is needed in technical approach such as procurement rules, and in financial approach such as funding and budget.
- To ensure efficient **knowledge sharing and collaboration** between project implementing bodies and external stakeholders such as international atomic energy agency. The NDI as the “knowledge partnership” of the ND provides an efficient platform for this.

1 The seminar was organized virtually on 25 Nov. 2020. Its program and materials are available at www.northerndimension.info. The information presented in the Policy Brief is retrieved from the seminar presentations, unless otherwise indicated. The seminar was funded by the Finnish Ministry for Foreign Affairs/IBA-funding.

2 Ewa Manik in ND steering group meeting 3 Nov 2020.

3 Andreeva Bay is a radioactive waste repository located on the Barents Sea, close to the Russian city of Murmansk and the Norwegian border.

