

Environmental responsibility management of nuclear energy: what is changing in Ukraine?

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Abstract

This article presents the latest tendencies of ecological responsibility management of Ukrainian nuclear energy sector and dynamics of the emissions in recent years. The problem of utilization of nuclear wastes and construction of the Central Spent Fuel Storage Facility (CSFSF) is highlighted. Analysis of positive changes in the system of environmental responsibility and the problems identification are steps of development a qualitative environmental policy for the nuclear energy sector.

Keywords: nuclear energy, ecological responsibility, ecological safety, green power generation, ecological audit, ISO - 14001

1 Introduction

In conditions of environmental deterioration, degradation of biodiversity, shortage of natural resources, climate change, and environmental safety of enterprises has paramount importance. According to the researches of Ukrainian scientists, the level of reflection in reports key environmental responsibility indicators for Ukrainian enterprises are extremely low (on average, 35.6%) [1; p. 15]. It demonstrates the need for an in-depth analysis of the problem. The issue of environmental safety is important for nuclear energy, which in Ukraine is represented by state enterprise "National Nuclear Energy Generating Company" Energoatom ". The Company operates four nuclear power plants with 15 power units and provides about 55% of Ukraine's need for electricity, during autumn-winter periods this figure reaches 70%. In accordance with the Law of Ukraine "On the Use of Nuclear Energy and Radiation Safety", NNEGC "Energoatom" is assigned the functions of the operating organization responsible for safe electricity production.

2 Overview of the study area

One of the Company's priorities is to reduce the environmental footprint of nuclear power units. NNEGC "Energoatom" adheres to Ukrainian environmental laws, principles of European environmental laws and EU Directives on environmental protection, as well as to international standards (IAEA) and Energoatom Environmental Action Programme 2017-2019.

In 2017, Energoatom was one of the first Ukrainian companies to certify its integrated management system in line with new ISO standards 2015, including ISO 14001:2015 "Environmental management systems". The level of nuclear, radiation and ecological safety at Ukrainian NPPs is fully in line with the national and international laws on nuclear power use, including European directives [3].

Environmental protection and minimisation of environmental footprint at all stages of nuclear energy production are among the key priorities of Energoatom. In 2017, the Company put in place a revised Energoatom

Environmental Protection Action Programme 2017-2019. The document aims to improve the Company's activities in this area, in particular, to minimise the environmental footprint of non-radiation factors and ensure the rational use of natural resources [4].

The main methods of NNEGC "Energoatom" environmental policy implementing are:

- Conducting chemical control over the state of the environment;
- Conducting internal environmental audits (over 50);
- Setting the reference and technological levels of emissions and discharges of radioactive substances;
- Analysing causes of possible exceedance of the reference and technological levels in NPP operations;
- Using modern technologies and equipment to reduce emissions and discharges.

One of the positive change is a good emissions reduction trend. Compared with 2016, there was a significant decrease (almost twofold drop) in total emissions of sulfur compounds, from 6.43 tonnes to 3.37 tonnes. Total air emissions decreased by 4.09 tonnes. A vivid example of advantages of nuclear power plants over other sources of electricity is the comparison of air emissions by Zaporizhzhya NPP and Energodar CHPP located next to it: over the past five years, the gas emissions from Zaporizhzhya NPP made 78 tons, while those from the CHPP were 110,000 tonnes [3].

In 2018, NNEGC Energoatom entered the top five Energy Intelligence Group rating "Best Green Power Generation" (Top Green Power Generators: Carbon-Free Generation Capacity) [2].

Energoatom recognises its contribution to the low carbon future of the country and seeks to continue efforts to minimise greenhouse gas emissions at various production stages. One of such measures was a decision to build a 13.6 MW solar power plant at Zaporizhzhya NPP. The project area is 37 hectares, with the plant consisting of about 5,000 panels [4]. Following implementation of this pilot project, the Company will make a decision on the further action in the field of renewables.

An important element of the environmental policy of

NNEGC "Energoatom" is communication with the public. Among its communication channels are:

- Printed and online media, corporate newspapers and publications, informational brochures, leaflets, and booklets;
- Official and theme-based pages in social media (Facebook, Twitter, Google+, Slideshare), a YouTube channel;
- Public hearings and discussions, participation in conferences and roundtables, informal meetings with stakeholders, press tours, etc.

However, in spite of an effective environmental safety system, some issues require increased attention. It should be emphasized that the issue of reprocessing spent nuclear fuel one of the main problems. Ukraine has spent about 2 billion US dollars on spent fuel exports for temporary storage to the Russian Federation (200 million dollars annually). On July 6, 2017, "NNEGC Energoatom" received from the State Nuclear Regulatory Inspectorate of Ukraine a license for the construction and commissioning of the Centralized Storage for spent nuclear fuel (CSSNF) at the Exclusion Zone. The Central Spent Fuel Storage Facility (CSFSF) will give the Company its own capacities for long-term and safe storage of

TVEL and Westinghouse spent fuel in Ukraine. The facility will be located in the Chernobyl Exclusion Zone. The facility is planned to be fully operational before 2065. The first start-up facility including all necessary infrastructure and four storage systems should be completed in 2019 [5].

3 Conclusion

Environmental safety management is a priority task for the Ukrainian nuclear energy industry and the main direction of its social responsibility. Increasing positive changes in the transformation of approaches to environmental policy, emission reductions, cooperation with specialized international organizations, and growing number of environmental projects and programs are observed in recent years. However, there are many opened issues, one of which is the construction of the Central Spent Fuel Storage Facility (CSFSF). Despite common agreement of necessity to national security and effective environmental policy of Ukraine's nuclear energy social responsibility, the project is currently in the process of implementation and still requires significant investment and technical support from foreign partners.

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