日本福島含氚廢水海洋擴散預報作業系統三周年結果分析

Analysis of 3-Year Results from the Ocean Dispersion Forecasting System for Fukushima Tritiated Wastewater

曾慧婷[1] (Zeng H.-T.) 朱嬿儒[1] (Chu Y.-J.) 鄧仁星[1] (Teng J.-H.)

[1]中央氣象署海象氣候組

[1]Marine Meteorology and Climate Division, Central Weather Administration

摘　要

因應日本自 2023 年 8 月起排放福島 311 事件累積之核廢水（該廢水已透過 ALPS 系統處理去除多數核種，並經海水稀釋），為嚴格把關臺灣周邊海域的輻射安全，中央氣象署、核能安全委員會與國家原子能科技研究院於正式排放前，即攜手建置「日本福島含氚廢水海洋擴散預報作業系統」。該系統不僅提供預報圖資供主管機關作為決策與應變參考，每日預報結果亦同步公開於「放射性物質海域擴散海洋資訊平台」，落實資訊透明。

排放作業啟動至今已逾 3 年，累計執行約 21 批次之含氚處理水排放，釋出的氚總量約達 37.8 兆貝克，各批次排放濃度均介於每公升 250 至 500 貝克之間。根據最新預報顯示，若以每公升 10^7 貝克之濃度線評估，其擴散範圍向東已達西經 149.25 度，向南最遠至北緯 20.25 度。整體而言，主要影響區域仍集中於日本福島東方海域，對臺灣周圍海域尚無顯著影響。

關鍵字：日本福島氚廢水海洋擴散預報作業系統、ALPS

Abstract

In response to Japan's discharge of accumulated wastewater from the Fukushima March 11 incident starting in August 2023 (which has been treated via the ALPS system to remove most radionuclides and diluted with seawater), and to strictly safeguard the radiation safety of Taiwan's surrounding waters, the Central Weather Administration (CWA), the Nuclear Safety Commission (NSC), and the National Atomic Research Institute (NARI) collaborated to establish the "Ocean Dispersion Forecasting System for Fukushima Tritiated Wastewater" prior to the official discharge. This system not only provides forecast maps to competent authorities as a reference for decision-making and emergency response, but also ensures information transparency by publishing daily forecast results on the "Marine Information Platform for Ocean Dispersion of Radioactive Substances."

It has been over three years since the discharge operations began. Approximately 21 batches of ALPS-treated tritiated water have been released, with the total amount of discharged tritium reaching around 37.8 trillion becquerels. The tritium concentration in each batch ranges between 250 and 500 becquerels per liter (Bq/L). According to the latest forecasts, based on the 10^7 Bq/L concentration contour, the dispersion range has extended eastward to 149.25°W and southward to 20.25°N.

Overall, the primary area of impact remains concentrated in the waters east of Fukushima, Japan, with no significant impact on the waters surrounding Taiwan thus far.

Key words : Ocean Dispersion Forecasting System for Fukushima Tritiated Wastewater, ALPS