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WILDFIRES IN THE IRRADIATED FORESTS AROUND THE FAILED CHERNOBYL NUCLEAR POWER PLANT: NEEDS FOR DEVELOPMENT OF EARLY WARNING, DETECTION AND MONITORING CAPACITY FOR DISASTER RISK REDUCTION

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A high wildfire hazard has emerged on the area of 260,000 hectares of forests and former agricultural lands of the Exclusion Zone around Chornobyl Nuclear Power Plant (CNPP). The territory is highly contaminated with long-resident radionuclides of the ^{238}Pu, $^{239+240}$Pu, ^{137}Cs and ^{90}Sr. The greatest wildfire hazard is found in dying Scotch pine forests on a total area of 3,000 ha located eight km South of CNPP Unit N 4. Despite a general prohibition of access to the Exclusion Zone, human-caused ignition is common in the area. During long drought periods and extreme wind conditions there is a risk that large, high-intensity crown fires will occur that will lift radionuclides to the atmosphere with the smoke, resulting in uncontrolled radioactive fallout downwind. There are insufficient levels of technical and human resources in proactive wildfire risk reduction and in fire suppression in the Exclusion Zone. Poorly maintained forest roads and water sources and the lack of an early warning and detection system do not allow rapid response and transportation of fire equipment and personnel to the fire. Large fires will not be suppressed at an early stage before they become catastrophic. Over one million ha of less contaminated forests out of the exclusion zone (on west and north-west direction from the CNPP) are also characterized by increased fire hazard due to reduced forest management and protection activity. Fallout of radionuclides, carried by wind in wildfire smoke up to long distance downwind, will affect human populations and result in secondary contamination of lands and water, as was recorded in the 1990s.

At condition of critical fire danger (droughts seem to become more frequent as a consequence of regional climate change) the amount of radioactive fires, which are already occurring currently, may increase as well as the intensity and severity of fire events. Accordingly, an advanced ground based early detection system in close interaction with operation satellite monitoring system needs to be built to provide early detection and warning of local fire fighting forces to prevent receiving of additional collective doses by population and secondary contamination of agricultural lands and waters. A fire-weather based fire early warning component would increase the efficiency of fire prevention efforts as well as the preparedness for fire disasters.

A consortium consisting of the National University of Life and Environment Science of Ukraine, Yale University, School of Forestry and Environmental Studies, and the Global Fire Monitoring Center (GFMC) is reviewing studies, collecting data, models and methods to assess potential risk and scale of the problem. A decision support system for emergency wildfire situation on contaminated lands will be developed in close cooperation with emergency authority of the contaminated zones.