

Concept for Integrated Fire Management on Terrain Contaminated by Radionuclides in the Chernobyl Exclusion Zone

Sergiy V. Zibtsev^{1*}, Richard Lasko², Victor Myroniuk¹, Vasyl Gumeniuk¹, Olexandr Soshenskii¹, Petro Yavorovskii¹, Johann Georg Goldammer³

ABSTRACT – A concept for Integrated Fire Management (IFM) on terrain contaminated by radionuclides in the Chernobyl Exclusion Zone (CEZ) was developed within cooperative efforts of the U.S. Forest Service, the Organization for Security and Cooperation in Europe (OSCE) and the Global Fire Monitoring Center (GFMC). It aims at formulating a holistic approach for prevention, response, incident management and rehabilitation of burned areas. The concept is focusing on interagency co-operation, common training and use of modern programming tools for support of decisions. The concept includes description of general principals of IFM in the CEZ, land-use, legislation, planning and inter-agency cooperation. As a basis for an IFM system, ignition probability and burn probability models developed by Ager et al. (2019) and expected doses of personal from Kashparov et al. (2017) were used. The Chernobyl Radiological Biosphere Reserve with area 227 000 ha is main land-use type in the CEZ. The Biosphere Reserve Management is responsible for the prevention and suppression of fires and for coordination of action with other agencies. The establishment of three land sectors with different approaches in fire management is proposed: 1) Sector I: Nuclear infrastructure including the Confinement-II complex and facilities for nuclear waste storage with highest priority and strongest protection measures for fire personal, with the aim to minimize additional doses by minimizing of time of fire management personnel working on the fire-line, and to reduce the release of radioactive dust by soil disturbance; 2) Sector 2: Vegetation cover with high level of radioactive contamination and potentially expected high doses of personnel exposed – with highest priority to avoid additional doses by using indirect attack and other approaches including aerial suppression; 3) Sector 3: Vegetation cover and soil with moderate contamination where wide variety of strategy and tactics could be used to suppress fires. Special attention is paid to prevention of fires in CEZ and its vicinity, preparedness, extended attack and complex incident management as well as to developing a methodology of rehabilitation of burned territories and a long-term strategy of fuel management.

Keywords: Radionuclides; Chernobyl; wildfire management.

¹Regional Eastern Europe Fire Monitoring Center (REEFMC), Kyiv, Ukraine

²United States Forest Service, retired

³Global Fire Monitoring Center (GFMC), Freiburg, Germany

* Corresponding author: sergiy.zibtsev@nubip.edu.ua