# Bio-Nucleic Reactor Safety System

## 1. Abstract

This paper proposes a biosafe, recyclable nuclear reactor safety system based on the intrinsic radiation-absorbing properties of nucleic acids. By introducing DNA or RNA extracted from agricultural waste or lab-discarded PCR samples into reactor coolant water, the system provides an initial molecular-level radiation absorption layer. These nucleotides, once destabilized by heat and radiation, are enzymatically decomposed, sterilized by UV treatment, and returned to the system for continuous use.

## 2. Core Hypothesis

- All nucleic acids (regardless of sequence) naturally absorb radiation  
- Exposure to radiation and thermal conditions induces mutations  
- Enzymatic breakdown (via proteases or nucleases) follows mutational destabilization  
- UV disinfection ensures sterility  
- Filtered byproduct nucleotides are collected for industrial or chemical applications

## 3. Technical Features

- Low-cost, high-availability input: agricultural waste or failed PCR samples  
- Radiation-degraded nucleic acids are enzyme-digestible  
- Final product is sterile, non-toxic, and recyclable  
- Compatible with existing cooling systems and fully modular

## 4. Process Flow

1. Extract nucleic acids from biological waste  
2. Inject into coolant system  
3. Radiation/heat triggers degradation  
4. Enzymatic breakdown  
5. UV sterilization  
6. Water recycled; nucleotides filtered for reuse

## 5. Circular Bio-Security System

Degraded nucleotides are filtered out and repurposed for industrial use (e.g., buffers, catalysts, biopolymers). As long as the environment remains sterile, the cycle continues with no biological contamination risk. The system creates a self-regenerating safety layer that is both useful and clean.

## 6. Broader Applications

- Emergency containment layer for reactor accidents  
- Nuclear waste pre-treatment buffer  
- Microreactors or nuclear-powered aerospace systems  
- Safe, recyclable biobarriers for high-radiation environments