Implementation of Waste Tracking System for LLW & MLW

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1. Introduction

The real-time Waste Tracking System (WTS) has been implemented for the integrated management of LLW & MLW from the receiving time at the production area till the managing period after the shutdown of disposal site. The relevant information by each process on take-over and receiving plan, preliminary inspection, receiving, transportation, site inspection, disposal and shutdown is over all managed by WTS.

2. Methodology and Implementation

WTS is focused on the mutual data communication, suitable access by users and easiness of the operation according to disposal satisfaction business process (refer to Fig. 1) required by Atomic Act and relevant regulations. The peripherals like PDA, Barcode printer/reader, RFID Fixed Reader and AP(Access Point) are used to inter-operate, translate, read and identify the data on radioactive waste drum accurately. WTS is a WEB-based system. In order to handle the information on each process (receiving, transportation, inspection, disposal, etc) automatically for many users and various organizations as well as other legacy systems can be connected to WTS easily. GIS and GPS are adopted to make the real-time tracking of the wastes.
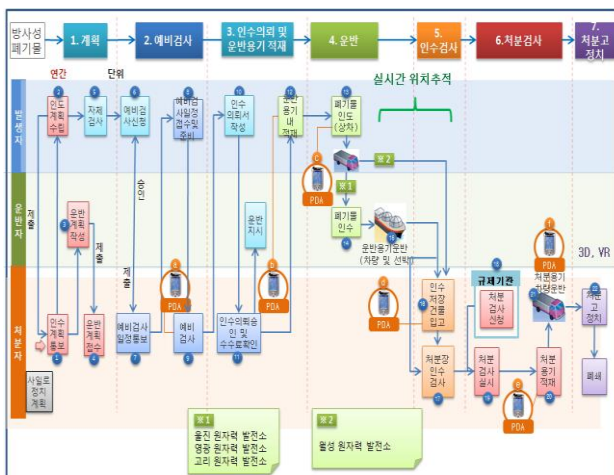

Fig.1. Radioactive Waste Disposal Suitability process

WTS is composed of three modules; waste history management module, document management module and information provision module. In addition to these modules, location information for unloading coordinate of the waste containers, unloading simulation by using 3D virtual reality and real-time tracking function can be provided in WTS. The information can be easily converted to Excel and PDF files. The main screen of WTS is shown in Fig. 2.

Fig.2. Main Screen of WTS

2.1 Waste History Management Module

Waste history management module provides all the data related to the waste. It is able to transfer the relevant information from database at the place of origin to the WTS database by one step process. The historical data contain the waste characteristics information, so they are to be used consistently at each process of receiving, transportation, inspection, disposal, etc. These data can be input remotely by using PDA and RFID Fixed Reader.

2.2 Document Management Module

Document management module stores the various types of document; each process documents (official document and attachment), records of relevant regulations, reports, etc. This module provides the easy document search feature which users want to find.

2.3 Information Provision Module

Information provision module provides an overall information such as radioactive waste information on receiving, transportation, inspection, disposal, and information utilized by regulatory authority and managers, each report for internal and external reporting and the current status information. This module can also provide the inventory capability by calculating the remaining radioactivity in storage area and WACID data are provided by this module as well.

2.4 Provision of Simulated Storage Coordinate

By simulation program the real-time radioactivity can be calculated so that the loading capabilities of each silo are known with detailed coordinate. This simulation considers mechanical stability and radiological safety. The location coordinate report can be printed out.

2.5 Verification of Container-Unloading by 3D Virtual Reality

Storage area's information can be identified by 3D virtual reality environment operating on the web page (refer to Fig. 3). This system provides the information on radioactive waste and its background, unloading location, quantity identification by zone for better understanding of the situation.
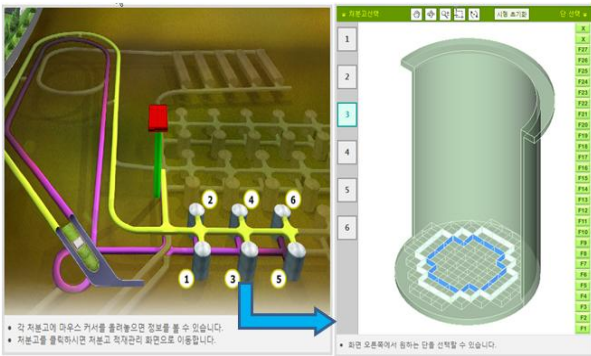

Fig.3. Display of 3D Virtual Reality in Storage Area

2.6 Real-time Tracking Management

The real-time tracking system provides the tracking of transportation path, disposal information (drum) from the place of radioactive waste origin to disposal site. The extraordinary situation can be detected, resolved and reported by this system and the relevant data are linked to waste history management module.

Fig.4. GPS monitoring screen

3. Expected Effect

Because WTS can manage many useful information by real-time tracking system, the safety on radioactive waste management can be enhanced and the reliability on the utilization of nuclear power as well as the relevant authorities can be improved toward citizens.

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