

Integration of Pathogen Inventory System and Storage Control System

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◆ Objectives

For Biosafety and Biosecurity, integration of physical access control system and pathogen inventory management system is very efficient. The synergism is expected. The physical access management such as the security gate with RFID readers or with biometric recognition technology, simply electric padlocks and so on, has already been adopted in a lot of laboratories. However, physical access control has very limited efficiency, because these physical devices can only control opening and shutting of the freezer doors etc. On the other hand, the advantage of pathogen inventory system is deterrent effect in the overall security. It is useful for the deterrence of an illegal operation that the access record in the pathogen is automatically acquired regardless of worker's intention. Therefore the collation of a pathogen management system and a physical access control is very useful. Then, we propose the new combined system for the total security management of pathogen storage.

◆ Methods

We tried to construct a more advanced total security system with the pathogen inventory system that developed in the past and storage control systems. This pathogen inventory system automatically records the handling history of an individual sample at each handling step. Concretely, the pathogen inventory system authorizes each permitted person to access to an individual sample in the pathogen storage respectively. In addition, the device that automatically records both the ID of accessed person and the opening and shutting time was installed in the pathogen storage. The recording device is the padlock type, this lock is able to open only by permitted person, and this device sends the current condition and information to the inventory system automatically. As a result, the user can access to only the permitted storage, and this action is recorded automatically. The inventory system collates individual sample information with the access record of the storage, and verifies the consistency of both records.

3 points for security strengthening of access control.

1. Appropriate user authorities

In the pathogen management system, only selected person is authorize to handle the appropriate pathogens, and inappropriate pathogens are not shown in the list with respect to the authority of the person.

2. Common IDs and authorities between the inventory management systems and the access control system.

In the physical access control system, the opening and the closing of doors or gates are controlled by the same IDs and authorities which are given by the pathogen inventory management system.

3. Combine these operation history data of these two systems.

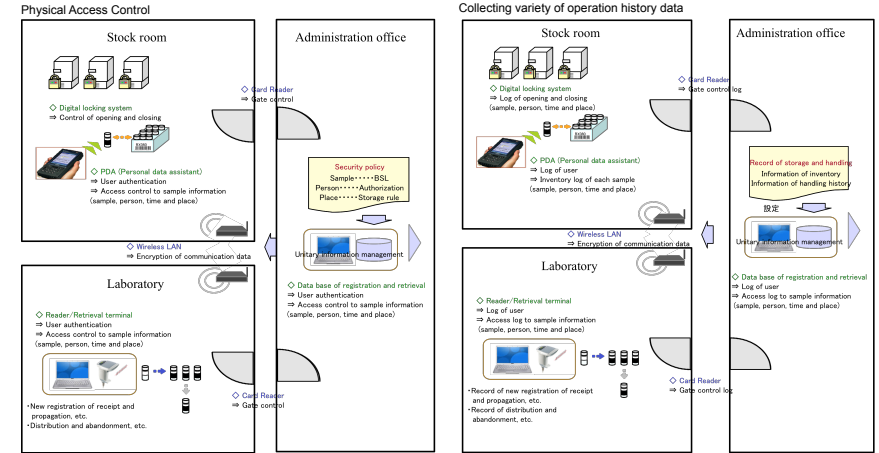
The information of "who, when, which storage, which sample and where" collected from the system is combined and shown in one table.

◆ Results and Conclusion

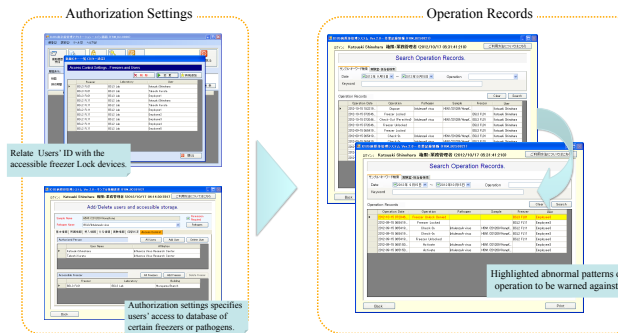
As a matter of fact, the efficiency of the physical access control is limited unless the pathogen samples are managed individually and continuously. In order to enable this management method, it is very important to maintain the history data consistent and coherent. However, in many cases the inventory management system is frequently off-line to protect the computer and its data from harm or loss. As a result, we can not observe the condition of storage through all time.

Then, we recognized that it was very useful in pathogen security to collate the inventory record with the gate control record. Actually, each recording time is synchronized between physical access control device and the pathogen inventory management system. As a result, those history data is able to be put together and shown in one table. The advantage of this method is to find irregular behaviors of the workers easily and track not only the status history of who but also that of what a sample tubes individually. It seems that this combined system is useful for more advanced pathogen storage management.

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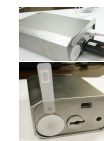
Find abnormal operation records by sorting operation history from the device and management system.



Examples of Physical Access Control Devices



To unlock this pad lock, unique Key ID and 4 digits pass code which is written in the key is required.



Electric devices which collects history data is efficient. This padlock requires users insert IC Keys with authorized ID Numbers.



Key terminal is also very useful because attachment to your freezer is not necessary.