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COUNTERMEASURE FOR MINIMIZE UNWANTED ALARM OF AUTOMATIC FIRE NOTIFICATION SYSTEM IN THE REPUBLIC OF KOREA

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Abstract

In this article investigated the cause of error through survey to building officials for minimizing the unwanted alarm of automatic fire notification and suggested countermeasure for minimizing the unwanted alarm. The main cause of the unwanted alarm is defective fire detector, interlocking with automatic fire detection system, lack in fire safety warden's ability, worn-out fire detect receiving system. The countermeasure for minimizing unwanted alarm is firstly, tightening up the standard of model approval, Secondly, interlocking with cross-section circuit method fire extinguishing system or realizing automatic fire notification system interlocking with home network, thirdly, tightening up licensing examination of fire safety warden, lastly, it suggested term of use rule of fire detect receiving system.

Keywords: automatic fire notification system, automatic fire detection system, cross-section circuit method, home network, fire safety warden.

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In this article investigated not only cause of the errors via an analysis of frequency from Dec. 1st., 2014 to Dec. 30th., 2014 against total 400 firefighters such as 200 firefighters in the Seoul metropolitan city and the local metropolitan city, and also 200 firefighters in each province by carrying out the questionnaires for the person concerned with building that the automatic fire notification system has been installed in order to minimize some malfunctions of the automatic fire notification system, but also this study has suggested it's countermeasures for the sake of some malfunctions of the automatic fire notification system.

- The analysis of the questionnaires against the person concerned with the automatic fire notification system.

Table 1

The results of the questionnaires

Questionnaires	Headcount	Percentage (%)
1. Have malfunction instances of automatic fire notification system in building existed or not?	400	100
Malfunction instances have existed.	232	58
② Malfunction instances one have never existed.	168	42
2. If malfunction instances have existed, have how many times of malfunction occurred yearly?	400	100
Once-twice	192	48
② Thrice-4 th .	88	22
③ 5 th - n 6 th .	52	13
④ 7 th . Over	68	17

Table continuation 1

3. When you activate the automatic fire notification system, What should we do?	400	100
<input type="checkbox"/> First of all, keep an eye on whether fire breaks.	348	87
<input type="checkbox"/> First of all, we should report to a fire station.	28	7
<input type="checkbox"/> We should interrupt a power source of the automatic fire detect receiving system.	16	4
<input type="checkbox"/> We should receive help from neighborhood residents.	8	2
4. In case that malfunction of the automatic fire detect receiving system was confirmed, what is the measures that we should take?	400	100
We should interrupt to supply power source of the automatic fire detect receiving system.	24	6
② We should restore to the original state by a self-inspection.	256	64
③ We should receive help from firefighters by reporting some fire occurrence to a regional fire station.	24	6
<input type="checkbox"/> We should take a proper measures by keep in touch with The fire fighting facilities management enterprise.	96	24
5. In case that the automatic fire detect receiving system is operated, what idea comes to mind first?	400	100
<input type="checkbox"/> And also malfunction of the automatic fire detect receiving system was generated, because someone touched with hands.	88	22
<input type="checkbox"/> The unbelievable automatic fire detects receiving system.	20	5
<input type="checkbox"/> How do we tranquilize some astounded persons?	204	51
<input type="checkbox"/> We should do alternate it with a new product.	88	22
6. What do you think of main causes of malfunction of the automatic fire detect receiving system?	400	100
On account of the aged deterioration of the automatic fire detect receiving system, malfunction is occurred.	180	45
② A fire safety warden is likely not to manage the fire protection system well.	56	14
③ Malfunction of the automatic fire detect receiving system is also attributable to a low-priced product.	56	14
<input type="checkbox"/> The reason is attributable to a shoddy and fault construction of a certain fire protection facilities construction company.	60	15
<input type="checkbox"/> Etcetera.	48	12
7. What are indispensable particulars for the purpose of malfunctioning prevention of the fire detect receiving system?	400	100
Performance improvement of the fire protection system.	128	32

End table 1

<input type="checkbox"/> Professional education that is aimed at the parties concerned.	96	24
<input type="checkbox"/> A shoddy and fault prevention of the fire protection system.	48	12
<input type="checkbox"/> Thorough management of a certain fire protection facilities management company.	84	21
<input type="checkbox"/> Introduction of the aged deterioration system for the product.	44	11
8. What is your frank opinion about the automatic fire notification system?	400	100
We think that the automatic fire notification system is not necessary.	12	3
<input type="checkbox"/> The automatic fire notification system is indispensable.	304	76
<input type="checkbox"/> We think that the automatic fire notification system should be managed and controlled, should be included in home network.	72	18
<input type="checkbox"/> We think that the automatic fire notification system is wasteful.	12	3

Data report: Extracted from Cheon Il Ryeon etc. (2014)

2. Countermeasures to minimize malfunction of automatic fire detect receiving system.

Malfunction cause and countermeasures to minimize malfunction that is based on questionnaires aimed at the persons concerned in building that the fire detect receiving system was installed is as follows:

Malfunction cause and the countermeasures to minimize malfunction of the automatic fire notification system

Malfunction cause	Countermeasures to minimize malfunction
Defects of fire sensors.	Criteria reinforcement for type approval Of the fire sensors.
Interlocking with the automatic fire detection system.	Interlocking with the fire extinguishing system of cross-section circuit method.
	Embodiment of the automatic fire detects receiving system that was interlocked with home network.
Ability shortage of fire safety warden.	Strengthening of a qualifying examination for a fire safety warden.
Deterioration of the automatic fire detects receiving system.	Regulation of Service life for the fire detects receiving system.

Data report: to be arranged on the basis of a questionnaire survey that is aimed at the persons concerned in building

2.1. Criteria reinforcement for type approval of the fire detector.

In case that the fire detect receiving system functions, notwithstanding that a fire safety warden should take a measure for the sake of the fire extinguishing, notification, evacuation, the persons who keep an eye out immediately whether fire actually occurred first of all occupied not only 78%, but also occurrence of malfunction occupied 22% because someone handled the fire detect receiving system, and the persons who should take the tranquilizing measures occupied 51%. These facts are grasped as phenomena that are appeared by increasing of malfunction rates of the automatic fire detect receiving system owing to the faulty sensor that receives the signal fire. It is necessary to prepare how to decrease malfunction

rates by improving the high quality of the fire sensor, strengthening the type approval standard of the fire sensor as a complementary countermeasure.

2.2. Interlocking with gas type fire extinguishing system of cross-section circuit method.

The automatic fire notification system can decrease malfunction due to the fire sensors via system improvement to be interlocked with the existing automatic fire detection system. Whenever only a fire sensor is functioned, in case that only one sensor function, after the sensor circuit method is interlocked with the fire protection system such as the automatic fire detection system and preaction sprinkler system, gas type fire extinguishing system, when more than 2 sensor circuit was functioned, it is necessary to decrease malfunction that is occurred because of the fire sensor by telecommunicating fire signal to the automatic fire detect receiving system after altering to the method that telecommunicate fire signal[4].

Table 2 2.3. Embodiment of the automatic fire notification system that was interlocked with home network.

Opinions that performance of the fire protection system should be improved in order to prevent malfunction of the automatic fire notification system was the most as 32%. Because the existing automatic fire notification system is functioned by receiving fire signals from the automatic fire detection system, it is difficult to secure reliability for fire[5]. In a questionnaire survey, just like 18% of respondents respond that should be included to home network. The existing automatic fire detection system is necessary to judge accurately whether actual fire was occurred or not, interlocking with the video camera

images as a security system in order to receive the fire warning signal via heat sensors and smoke sensors of the existing automatic fire detection system [6].

2.4. The qualifying examination strengthening of the fire safety warden.

In case to be confirmed that the automatic fire notification system was malfunctioned, ratio to be restored according to self investigation and the way how the concerned persons handled the situation is the most as 64%, and ratio that measures are taken contacting to fire-fighting facilities management company was investigated as 24%, but the meaning of self-investigation mean level degree that block out power source of the automatic fire notification system, and capability that can grasp it's cause and cope with itself seems to be insufficient[7]. Fire safety

warden operate the automatic fire notification system and should carry out jobs such as composition of the initial response system, operation and management, education, evacuation shelter's facilities, fire compartment and maintenance management of fire-prevention system, but job performance of fire safety warden is grasped to be low[8]. And also opinions that professional education for the concerned persons in order to prevent malfunction of the automatic fire notification system is necessary occupy a large numbers as 24%. Therefore it is necessary to strengthen theory-centered education, decision of the success or failure from a written examination, fire notification, problems for shortage of evacuation course, practical service centered education, alteration from assessing methods to theory and practical training, fire notification and evacuation course as educational course[9].

2.5. Regulations on a service life of the automatic fire notification system.

Opinions that main cause of malfunction of the automatic fire notification system is occurred on account of deterioration of facilities are the most as 45%. In case of the current automatic fire notification system, once the current automatic fire notification system is installed, unless someone build a new building, and also before the building demolition, because the cases that the automatic fire notification system continue to be maintained are plenty of, the cases that be reluctant to alternate on account of cognition as so-called unnecessary facilities and consumption of high cost, although alternation is necessary is occurred [10]. Therefore regulating a service life enough to be criteria of the automatic fire notification system, the deteriorated automatic fire notification system is necessary to enforce by defining by law so that the regular alternations for the automatic fire notification system may be achieved. In conclusion, as a countermeasure for minimization of malfunction, firstly, reinforcement of the type approval standard for the sake of quality improvement of fire sensors, secondly, instead of interlocking method with the automatic fire detection system, interlocking with gas type fire extinguishing system of the cross-section circuit method or embodiment of the automatic fire notification system to be interlocked with home network, thirdly improvement reinforcement of a qualifying examination for fire safety warden, fourth, regulation on service life of the automatic fire notification system for the sake of alternation of the old facilities and so on are necessary.

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МОДЕРНИЗАЦИЯ

СОВРЕМЕННЫЕ МЕРЫ ПО МИНИМИЗАЦИИ ЛОЖНЫХ СРАБАТЫВАНИЙ ОБОРУДОВАНИЯ АВТОМАТИЧЕСКОЙ ПОЖАРНОЙ СИГНАЛИЗАЦИИ В КОРЕЕ

Гон Хасон

Аннотация

В настоящем исследовании в целях минимизации ложных срабатываний оборудования автоматической пожарной сигнализации в результате проведения опроса среди управляющих зданиями и частотного анализа определяются причины ошибок и предлагаются меры по минимизации ложных срабатываний. Основными причинами ложных срабатываний являются брак в пожарных датчиках, синхронизация с автоматическими системами обнаружения пожара, недостаточность навыков ответственных за пожарную безопасность, старение автоматических пожарных извещателей и т.п. В качестве мер по минимизации ложных срабатываний предлагаются, во-первых, ужесточение нормативов утверждения моделей пожарных датчиков, во-вторых, синхронизация с системами пожаротушения по методу перекрестного замыкания или реализация оборудования автоматической пожарной сигнализации, синхронизированного с домашней сетью, в-третьих, ужесточение квалификационных экзаменов для ответственных за пожарную безопасность, в-четвертых, определение сроков использования автоматических пожарных извещателей

Ключевые слова: автоматическое устройство по оповещению при пожаре; устройство автоматического определения; метод перекрестного замыкания; домашняя сеть; ответственный за пожарную безопасность.

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