

Safety Documentation: A Communication Approach For Safety Management System In Aerodrome Operator

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Abstract: Safety Management System covered a variety of procedures and processes related to aviation safety improvement. All procedures and processes related SMS implementation in Aerodrome Operator should be recorded and documented. It has also been regulated in national and international regulations that all documents and records related to the implementation of SMS should be managed properly and correctly. The aims of this research to determine the extent to which the implementation of Safety Management System Documentation at Aerodrome Operator. This research starts with analyzing the implementation of SMS documentation, identify and seek the factors that influence performance of Safety Management System Documentation using a list of suitable checklist or Gap analysis and conduct interviews to SMS Manager and Officers related to SMS Documentation processes. The result analysed using factor analysis. The results are to provide recommendations in presenting master data and procedures of SMS documentation in order to achieve SMS documentation standard.

Index Terms: Safety Documentation, Safety Management System, Aerodrome Operation

1. INTRODUCTION

PT Angkasa Pura II has planned to improve SMS documentation in 2018 namely safety database integration (big data) internal & external based on information technology (Annual Safety Report PT. Angkasa Pura II, 2017). In which all the existing data related with safety whether it is from the internal or external of the company, it is going to be integrated and collected in one accomodate based on the development of information technology, and this is to facilitate the company in searching the safety data saved. Based on the information above, the intern is interested to contribute in this internship opportunity, in terms of providing the concepts of safety database. An analysis of documentation flow of existing Safety Management System is the first thing to do, and then it would have developed and comply to the international standard (Maselena et al, 2019). Safety Management System (SMS) is needed in an aviation organization to identify the danger and manage the safety risk dealing with during the shipping of products or services (ICAO Doc. 9859 3rd edition, 2013). The basic things of Safety Management System (SMS) are: to identify danger; to do improvement needed in order to maintain the safety performance, sustainable observation and safety performance regular assessment; and continuous refinement of whole safety management system performance. An organization has to develop and maintain the SMS documentation which described the objectives and safety policy, SMS requirements, SMS process and procedure, and SMS output (DGCA No 622, 2015). An organization is authorized to combine the SMS documentation to the existed document, or perhaps do some improvements and maintain a safety management system manual (SMSM) as a communication approach of safety management inside the organization. Effectivity would be achieved when an organization applies the SMS document which shows approach done in order to manage safety in the company and upgrade regularly, documentation also has to fulfil the objectives of organization safety.

1.1 Theory Review

Documentation is part of the quality management which formalizes the handling of documents and records. An airport's SMS program must be comprehensively and accurately

documented. All targets and objectives, policies, duties and responsibilities of key safety personnel, policies and procedures that are part of the SMS program need to be documented. SMS documentation is usually consolidated into an operations manuals or electronic database system. This is to ensure all employees know how to access this SMS documentation.

Compliance is indicated when:

- 1) There is documentation that represents the safety management system and the inter-relationships between all elements of the SMS itself;
- 2) SMS documentation is regularly reviewed and updated with appropriate version control in place;
- 3) SMS documentation is readily available to all personnel; and
- 4) SMS documentation details and references the means for the storage of other SMS related records.

SMS Documentation covers all elements and processes of the SMS (ICAO Doc. 9859 3rd edition, 2013) and normally includes:

a. A consolidated description of the SMS components and elements such as:

- Document and records management (Administration, 2010) (Eurocontrol, 2011);
- Regulatory SMS requirements;
- Framework, scope and integration;
- Safety policies and procedures;
- Safety goals and objectives;
- Accountabilities of key safety personnel;
- Voluntary hazard reporting system;
- Incident reporting and investigation procedures;
- Hazard identification and risk assessment processes;
- Safety performance indicators;
- Safety training and communication;
- Continuous improvement;
- SMS auditing procedures and results;
- Management of change; and
- Emergency response planning;

b. A compilation of current SMS related records and

documents such as:

- Hazards report register and samples of actual reports;
- Safety performance indicators and related charts;
- Record of completed or in-progress safety assessments;
- SMS internal review or audit records;
- Safety promotion records, such as surveys and newsletters;
- Personnel SMS/ safety training records;
- SMS/ Safety committee meeting minutes;
- SMS implementation plan (during implementation process); etc

1.2 Prior Research

Based on Eurocontrol ESSAR 3, 2004, Safety Documentation is a collection of documents arising from an organization's safety policy statement to develop and document a Safety Management System to achieve its safety objectives. Based on FAA AC 120-92A, the 2010 safety documentation is also a record, proof of the results achieved or activities carried out. In this context it is different from documentation because records are documentation of the SMS output. Based on this statement it can be considered that the safety documentation includes the SMS documentation and safety records. Based on EUROCONTROL, 2011, Safety procedures must be described in a practical and actionable manner in order to comply with the SMS. Every safety procedure must be understandable, actionable, auditable and mandatory. All SMS safety procedures can be tied together and all staff are given access to the full set, forming a manual. An alternative approach is for departments to have procedures available that are relevant to their own work and this may be a better approach in a larger organization.

2. RESEARCH METHODS**2.1 Place and time**

This research was conducted in Corporate Safety Management Unit of PT. Angkasa Pura II (Head Office). PT. Angkasa Pura II (Airport Company) is one of the State-Owned enterprises engaged in the airport services in Western part of Indonesia. PT. Angkasa Pura II has earned the trust of the Government of the Republic Indonesia to manage and operate 15 airports in Indonesia. The selection of research locations was chosen intentionally with consideration of the object to analyzed. This research was conducted from March to August 2018.

2.2 Sampling Technique

Soekarno-Hatta International Airport used as a sample research implementation of SMS documentation in operational areas. because of the three indicators displayed, Soekarno-Hatta International Airport was ranked top with the following figures: 54,48% Aircraft Movement; 59,74% Number of Passengers; 46,51% Number of Employees. It can be interpreted that Soekarno-Hatta International Airport can represent all airports owned by PT. Angkasa Pura II because in terms of the complexity of handling in total 53,57 % operation at the Soekarno-Hatta International Airport (Annual Safety Report, 2017).

Table 1. PT. Angkasa Pura II airports information

No	Airport	Aircraft Movement		Passenger		Employee	
		Number	%	Number	%	Number	%
1	Halim Perdanakusuma International Airport	67.390	8,21%	6.920.074	6,56%	231	4,72%
2	Kualanamu International Airport	81.203	9,89%	10.054.292	9,53%	732	14,97%
3	Soekarno-Hatta International Airport	447.390	54,48%	63.024.844	59,74%	2.275	46,51%
4	Supadio International Airport	35.897	4,37%	3.790.397	3,59%	204	4,17%
5	Minangkabau International Airport	27.421	3,34%	3.955.664	3,75%	210	4,29%
6	Sultan Mahmud Badaruddin II International Airport	41.755	5,08%	4.655.750	4,41%	216	4,42%
7	Sultan Syarif Kasim II International Airport	31.788	3,87%	3.898.178	3,70%	244	4,99%
8	Husein Sastranegara International Airport	29.361	3,58%	3.537.592	3,35%	162	3,31%
9	Sultan Iskandarmuda International Airport	10.231	1,25%	1.201.728	1,14%	160	3,72%
10	Raja Haji Fisabilillah International Airport	4.446	0,54%	351.727	0,33%	113	2,31%
11	Sultan Thaha Airport	17.419	2,12%	1.766.366	1,67%	155	3,17%
12	Depati Amir Airport	23.100	2,81%	2.053.972	1,95%	143	2,92%
13	Silangit Airport	3.787	0,46%	282.586	0,27%	46	0,94%

2.3 Data collection

The method used in this research are interview and observation using a list of suitable checklist or Gap analysis.

2.4 Data analysis method

In this research for processing the data collected using qualitative research method (ICAO Doc. 9859 3rd edition, 2013; Irmayani et al, 2018; Lian et al, 2018; Tobari et al, 2018; Wandasari et al, 2019; Apriana et al, 2019; Fitria et al, 2019; Khasanah et al, 2019).

A. Observation**Table 2. problem identification based on observations**

No	Indicator	Problem Identification
1	SMS Document & Record Procedure	Lack of archiving system, all records related to the implementation of SMS still scattered on each of the officers carrying out the SMS activity there has not been a documentation process that identifies the types of records in accordance with the sms framework SMS records are stored by document control officers but there are still some records that are still scattered and have not been collected, which can be difficult in the search that records when needed
2	The management	Amendment of SMS manual has not been validated by civil aviation authority due to technical problems experienced by the Civil aviation authority The task of controlling documents is an additional task for designated employees

B. Interview**1. SMS Documentation and Record Management**

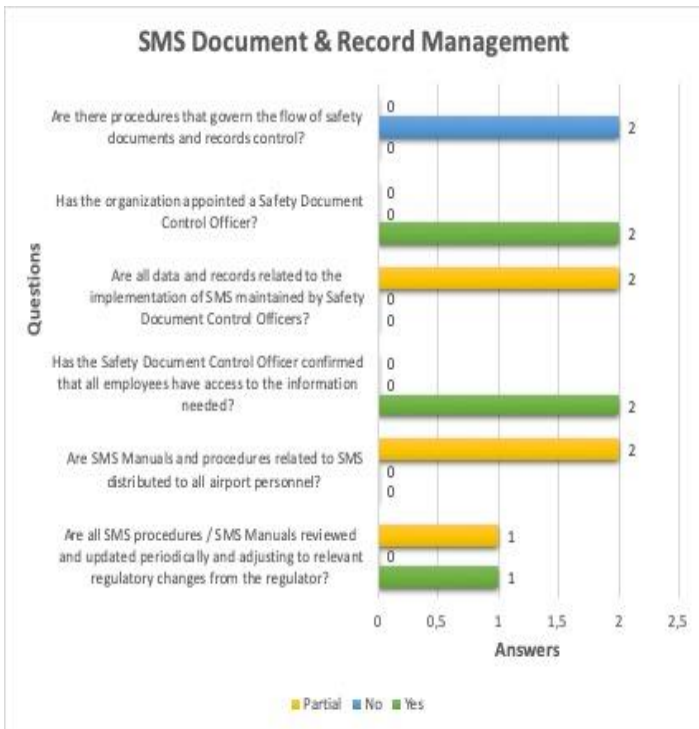


Figure 1. Interview result for SMS document & record procedure

Table 3. Interview Analysis in SMS Document & Record Procedure

No	Indicator	Problem Identification
1	SMS Document & Record Procedure	<p>Procedure that govern the flow of safety documents and records control were not yet available</p> <p>all documents and records related to the implementation of SMS have not been completely stored by the document control officer</p> <p>SMS Manual is only shared with senior managers and stakeholders involved in flight operations at airports</p>

Table 4. Interview Analysis in Supporting Media and Facilities

No	Indicator	Problem Identification
1	SMS Supporting Media and Facilities	<p>There is no procedure that regulates the process storing, archiving, protection, and withdrawing the right document of all related with SMS activities documents</p> <p>Safety document storage system are not yet available</p> <p>The organisation has not uses the most appropriate media for the delivery of documentation at both the corporate and operational levels</p>

C. Recommendation Based on Gap Analysis

From conducting gap analysis, I comes with a conclusion that the process of SMS Documentation in Soekarno-Hatta International Airport almost as a whole refers to the applied regulation, however there are some points need to be fulfilled by the corporation, in order to have a better Implementation of SMS documentation. These point and the recommendations will be explained in the table.

Table 5. Recommendation based on gap analysis

No	Problem Identification	Possible Solution	Output
1	Collecting and placement of SMS related and manual documentation not well organized	Create a master list of Safety documents and records of internal and external, that adjusted to each element in the SMS framework so that it is easier to classify the documents and records	Master list of sfety documents and records
2	There is no procedure that regulates the process storing, archiving, protection, and withdrawing the right document of all related with SMS activities documents	Compose a documentation procedure to manage the documentation process for all documents and records related to the implementation of the SMS	Standar Operating Procedure / manual of SMS Documentation
3	Safety document storage system (safety database) are not yet available, especially based on information technology	Design a safety database based on the use of information technology (digital safety library) to make it easier to search documents and records when needed	Digital safety library
4	No latest SMS-manual document accepted by the civil aviation authority	Make a latest sms-manual that signed by the accountable manager and accepted by the Civil Aviation Authority	Latest SMS-Manual

2. Supporting Documentation Media & Facilities

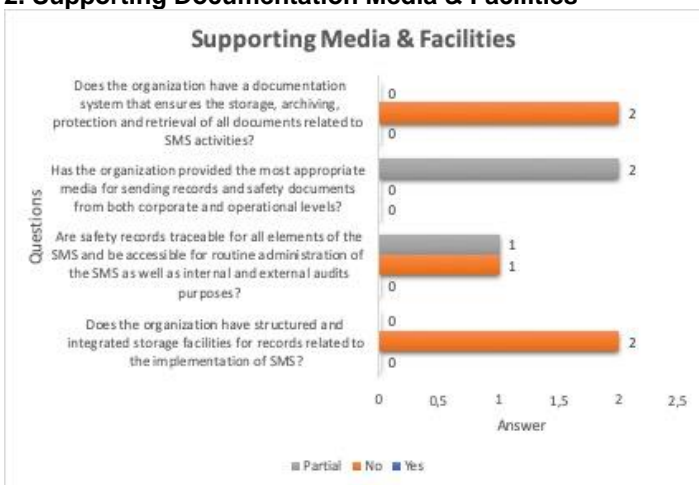


Figure 2. Interview result for supporting media and facilities

3. RESULTS AND DISCUSSION

3.1 Implementation of possible solutions

In implementing the new system, a scheme is needed in determining the system. Among others :

- a. brainstorming,
- b. design,
- c. develop,
- d. safety review meeting,
- e. socialization, and
- f. evaluation.

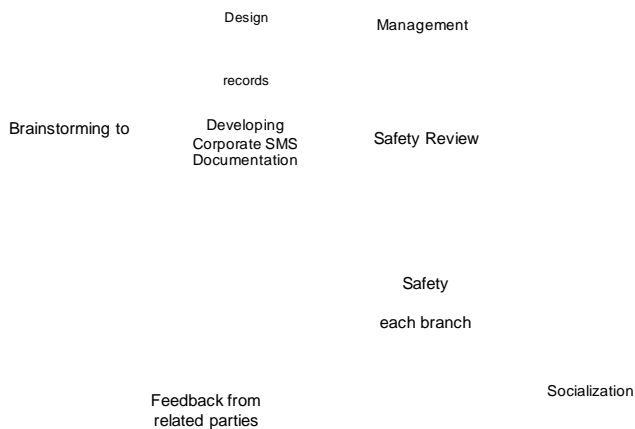


Figure 3. Work scenario of problem solution

3.2 Design Master list of SMS documents and record

At the stage of determining documents and records required by regulations related to the implementation of safety management system (what should be in place), Me, with the participant of safety review meeting composes a master list designed for the corporate scope of PT. Angkasa Pura II. This master list, can be used as a reference for making safety data base integration based on information technology which is, safety data base is, a concept/media to facilitate the document control officer in this case SMS & OHS analyzers in controlling safety documents and records. Master list (ISO 9001:2015, 2015) creates in three categories, they are :

- Master list of internal safety documents;
- Master list of external safety documents;
- Master list of safety records.

The types of documents in each master list are determined based on the elements and processes of the Safety Management System (ICAO Doc. 9859 3rd edition, 2013).

A. Master list of internal safety documents

Table 6. Design master list of internal safety documents

No	Airport	Document Category	Document Title	Document Number	Verified by	Date of Issue	Revision
1	Soekarno Hatta International Airport (CGK)	Safety Policy and Objectives	Airport Safety Policy				
		SMS Requirement	Aerodrome Manual SMS Manual HSE Manual				
		SMS Processes and Procedures	Document and records management procedure Voluntary hazard reporting procedure Mandatory Occurrences Reporting procedure Safety investigation procedure Hazard identification and risk assessment processes Continuous improvement and safety audit procedure Emergency contingency planning Airport Safety Inspection procedure Safety training need analysis procedure Management of Change (MOC) procedure Safety Performance Indicator (SPI) preparation procedure Safety Communication procedure (other)				

B. Master list of external safety documents

Table 7. Design master list of external safety documents

No	Airport	Document Title	Document Number	Author	Date of Issue	Number of Pages	Save Time
1	Soekarno Hatta International Airport (CGK)	ICAO Annex 19 on Safety Management Manual	ICAO Annex 19 2nd edition Amendment 1				
		ICAO Doc 9859 on Safety Management Manual	ICAO Doc.9859 4th edition 2018				
		Republic of Indonesia's Law number 1 on aviation	UU RI no.1 year 2009				
		Regulation of Indonesia Minister of Transportation on Safety Management System	PM.62 year 2017				
		Regulation of Indonesia Director General of Civil Aviation on Staff Instruction of Civil Servant Investigator on Civil Aviation	KP.622 yaer 2015				
		(other)					

C. Master list of safety records

Table 8. Design master list of safety records

No	Airport	Record Category	Record Title	Date of Record Retention	Storage Location	Save Time
1	Soekarno Hatta International Airport (CGK)	Hazards report register and samples of actual reports	Hazard Report : January 2018 Hazard Report : February 2018 Records of MOR (other)			
		Safety performance indicators and related charts	SPI Chart : January 2018 SPI Chart : February 2018			
		Record of completed or in-progress safety assessments	Risk Assessment reports			
		SMS internal review or audit records	Safety Audit Reports 2018			
		Safety promotion records	Safety Promotion Reports Report of Safety Promotion Achievement			
		Personnel SMS/Safety training records	Safety Training Record Report of Safety Training Achievement			
		SMS/Safety committee meeting minutes	RST and SAG Implementation Reports ERP Document Preparation Reports Safety Annual Report			
		(other)				

3.3 Developing Safety Documentation Procedure

SMS Documentation procedures of Soekarno Hatta International Airport have not been registered in SMS Manual. The complexity of the procedures does not cover the entire flow of sending and archiving documents and records from both the corporate and operational levels. Therefore I gives a recommendation to PT. Angkasa Pura II to update and to revise the SMS documentation procedures as required by the applicable provisions. In order for the implementation of SMS documentation at PT. Angkasa Pura II to be more structured and systematic. To follow up the findings, I designing a draft of the sms documentation procedure, which is to be the input for the company in the application of sms documentation. To follow up on the findings the intern designed a draft of the sms documentation procedure, which is to be the input for the company in the application of sms documentation. The design of the draft SMS Documentation procedure includes the following:

A. Legal Basis

- 1) The Indonesian laws Number 1 year of 2009 on Aviation;
- 2) The regulation of transportation minister no. PM 83 year of 2017 about civil aviation safety part 139;
- 3) The regulation of director general of civil aviation number : KP 622 year of 2015 about technical procedure of the civil aviation safety part 139-08, airports safety management system implementation acceptance;
- 4) Annex 19 Safety Management, 2nd edition, 2013;
- 5) ICAO Doc.9859 Safety Management Manual, 3rd edition-2018;
- 6) ISO 9001:2008 Document control clause.

B. Procedure Objectives

The objectives of this procedure is to regulate the procedure's manufacture, approval, distribution and document saving related with safety management system (manual, procedure, work instruction, safety data, pictures, standard, safety record) whether it is internal document or external document.

C. Scope of Procedure

This procedure applied and implemented in Corporate Safety Management PT.Angkasa Pura II environment, in terms of :

- 1) Internal Safety Document control which includes the activities such as drafting, approving, identification, establishing, duplicating, distributing, maintenance, withdrawing, changing or revision, and disposing the safety management system implementation document,
- 2) External safety document control includes identification, maintenance, and distribution of document related with safety management system implementation.
- 3) Safety records control that include identifying, maintaining, and dispose of their SMS records.

D. Responsibility

Management representative and all in charge personnels who are assigned in manufacturing, reviewing and distributing the documents are responsible for the procedure implementation.

E. Safety Document Control

- 1) Safety document control flowchart

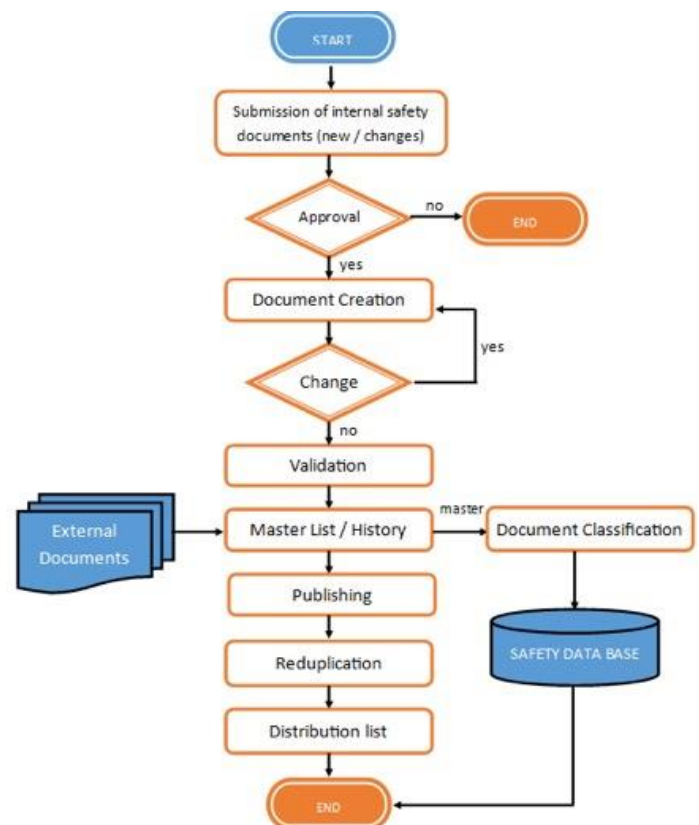


Figure 5. Safety document control flowchart

- 2) Safety Document manufacture and establishment
 - In charge officers prepare the document draft needed,
 - Prepared document draft then reviewed and approved by the authorities,
 - Approved Document stamped as MASTER and saved by the safety document control officer; the SMS & OHS analysyst,
 - Safety document control officer made a list/ history about new documents or proposed changes, both in internal or external document (appendix xx : master document list)
 - Document with MASTER stamp on it would be duplicated and distributed in accordance with document receiver distribution list,
 - Safety document control officer in charge in internal document establishment and check its validity, number, revision, and total number of pages.
- 3) Safety Document Maintenance
 - Safety document control officer identify periodically the compatibility of all documents which are used at least once in a year,
 - When the control officers find defected and expired documents, they could withdrawn the document and replace it with the suitable and upgraded one,
 - Documentation has to be saved for at least 5 (five) years or for shorter period of time as it is stated in the Safety Management System manual.
- 4) Amendment of Safety Document
 - Each branch offices safety unit allowed to propose changes toward an internal document which is predicted to result in abnormalities/ cause problems for the aviation safety, by giving memo to the corporate safety management,

- Corporate safety management together with the proposer branch offices safety, discuss and decide the changes in documents,
- The amendmently changing process made in the amendment sheet in accordance with the amendment form,
- Safety document control officers duplicate the amendment results and distribute it based on the document distribution list to be attached in amended document.

F. Safety Record Control

1) Safety record reporting

Each safety unit of branch office have to report and collect all records related with safety management system implementation through documentation media to the corporate safety management.

2) Safety record classification

The safety record classification and archiving proses done by the safety document control officer at the corporate safety management, with the safety record classification requirements stated as follow :

- Registered Hazards report and actual reports samples;
- Safety performance indicators and related charts;
- Record of completed or in-progress safety assesments;
- SMS internal review or audit records;
- Safety promotion records;
- Personnel SMS/Safety training records;
- SMS/Safety committee meeting minutes; and
- SMS implementation plan (during implementation process).

3) Flowchart of safety record control



Figure 6. Safety record control flowchart

This research is expected to give some additional knowledge and insight development, and training to think scientifically. The lesson that SMS documentation is one of the foundations for implementing a safety management system, because all activities in implementing SMS in this case at airport

operations will be more structured and controlled with all the activities documented. A good safety documentation can makes the company easier to develop and com municate Safety Management System to the organisations. The existence of safety document control system in corporate safety management PT. Angkasa Pura II could improve the performance of safety management system unit. In process of manufacturing, storing, searching or distributing the document and record related with the SMS implementation itself. SMS Documentation as it is required in the applied regulation, in which document management is a core requirement of every aviation safety management. SMS documentation become as the foundation of the company and as the first pillar in SMS framework which means that is one of the basic of the SMS itself. The usage of standard completed manual and procedure which are arranged and well managed, would ease the company in implementing elements in the safety management system.

2. CONCLUSION

From the results of the research that has been conducted, the following conclusions can be drawn the obstacles found in safety management system documentation implementation in airports under PT. Angkasa Pura II management as follows: 1) Inavailability of the procedure and technical manual of SMS documentation that regulate the procedure safety document and record management; 2) Inavailability of appropriate media for the delivery of documentation at both the corporate and operational levels; 3) Safety document storage system (safety database) are not yet available, especially based on information technology to ensure the storing, archiving, protection, and withdrawing the right data of all documents related with SMS activity which one of it related with recording.

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