Application for Asia-Pacific region project furtherance

A Study Activity Result Report

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Result Report of Application for Asia-Pacific region project furtherance

1. Result

As the first step of the effort to solve the theme of Thailand National Railway, based on the analysis result of the place where the past disaster occurred, we set up observation instruments at three points where damage occurred.

Meteorological Observator Installation Location

・Khun Tam Railway Station
・Huai Rai Railway Station
・Khao Chumthong Railway Station

Khun Tam Railway Station (June 27,2017)

Before

After

Huai Rai Railway Station (June 27,2017)

Before

After

Khao Chumthong Junction (June 29,2017)

Before

After

Observation Data

http://www.potekanet.com/

2. Theme of Research/Activities

Initiatives for safe and stable transportation measures by understanding weather

characteristics along high-speed railroads scheduled for construction and delay due to natural disasters caused by Thailand National Railway.

3. Action Plan of Research/Activities

・Goal of Research or Activities

In order to protect the lives of trains and passengers and crews aboard it from natural disasters caused by heavy rain and wind storms, we formulated train operation control rules aimed at avoiding weather risk, aiming to reduce and eliminate railway accidents as a goal There.

Establishment of weather observator this time will be the first step towards this goal, statistical arrangement and analysis of meteorological and disaster characteristics along the railway line of Thailand, using observation and finally observed data using future data I do.

・Necessity of Research/Activities

We are considering establishing operation regulation rules to keep high safety in train operation management of high-speed railway which is planned to be constructed in the future. There are meteorological risks such as floods due to heavy rain and landslides in Thailand National Railway Line, but measures to avoid these in advance are insufficient. It is an important mission for Thai Railways to transport railway users safely to their destinations and it is essential to win the trust of the people by that.

Avoidance of the current weather risk is to slow down or stop before the natural disaster occurs or before the train reaches the disaster site. In order to decelerate or stop,

- Operator and operator of the operation control room can grasp the weather conditions correctly and in real time
- The weather risks ascertained are objectively and quantitatively shown and that anyone can make the same judgment by using it
- Establish ground observation infrastructure and observe rainfall as a means to objectively and quantitatively show weather risk is necessary.

In the future, when the high-speed railway is completed, there is an operation regulation rule to avoid the weather risk, so that safer train operation is realized. For this, it is necessary to accumulate meteorological data by conducting meteorological observation along the railway line before the high-speed railway is completed, and create a database for establishing regulation rules.

When a disaster occurs during the observation data accumulation period, analyze the current weather conditions for each case and construct a disaster database showing the correlation with the disaster.

・Originality of Research or Activity

Currently, Thailand National Railways does not quantitatively measure weather conditions along the railroad tracks or grasp the risk of disaster occurrence. Quantitatively and accurately measuring the weather condition with the observation machine, it is possible to estimate the risk of the occurrence of a disaster, and it becomes possible to establish the operation regulation standard for safety management against this. By making operation regulation standards, everyone can judge the correspondence for train safety at the same level, and it will be able to protect the safety of trains, passengers and crew.

In formulating the operation regulation standard value, we will refer to examples of railway managers from other countries, but we will formulate our own operation control rules commensurate with the weather characteristics and work flow of Thailand National Railways.

・Specific Method of Research or Activity

(1) Survey of disaster occurrence situation and determination of installation candidate area

Investigate past weather disaster history in Thailand National Railway to investigate which lines and areas frequently occurred incidents. Establish an observation device in the area where the occurrence frequency of disasters is high. (See Attachment 1)

(2) Selection of weather station

Investigate and select appropriate observation machines for weather observation along Thai National Railway Line. In the selection of the weather observation machine, in addition to the performance and specification of the instrument, investigate the environment of the installation site and make a judgment comprehensively, such as a communication system and a data stock stock server, and make a selection.

(3) Installation of weather observation equipment

In setting up the selected observation device, investigate whether power source and

communication environment at the installation site can be secured on site. Also, to avoid failure or loss of the instrument and peripheral devices due to external factors, devise measures such as hard measures. We plan to install 5 units.

(4) Accumulation of observation data

Accumulate the installed observation data as a database. We prepare a mechanism that you can retrieve the accumulated data as electronic data in the form of csv etc. at a later time.

(5) Maintenance of weather station

To observe stable weather data, periodically check and clean up observation data acquisition environment and observation installation environment.

(6) Analysis of observation data

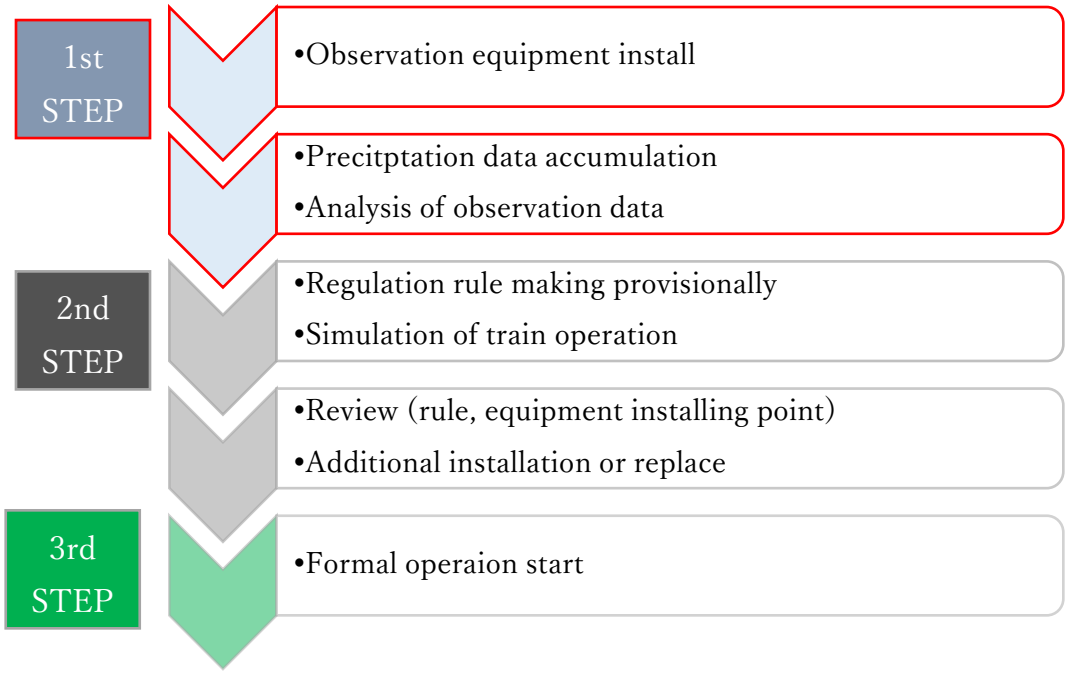
a. Weather situation survey by time

When we observe weather data, we organize it after the time such as day, season, month, etc. after. In order to grasp the meteorological characteristics of each period, observe and analyze not only for one year but also continuously. By doing this, it is possible to create statistical data, and by grasping the trends, it is possible to search for and implement more appropriate weather risk countermeasures.

b. Investigation of weather conditions at incident occurrence

In addition to the meteorological situation survey for each period, if a weather disaster incident or a train accident accompanying it occurs, we extract the weather data of the time and analyze the correlation with the disaster by looking at the trend.

As points of focus of observation data utilization in the analysis of a, b, time rainfall, continuous rainfall, day rainfall etc. are confirmed in chronological order. We will also consider utilizing meteorological observation data that can be obtained as external data other than installed observation equipment.



STEP till regulation rules are formulated

・Expected Result

- Weather situation survey at the time of disaster occurrence will be an effective material for determining train operation restriction standard value.
- It is possible to extract problems to operate and manage meteorological observation machines and to utilize them for improvement examination of future operation methods.
- We can consider further utilization of weather observation data. For example, we are planning to use not only actual measurement of weather but also weather forecast information, construct mechanisms such as weather situation and advance notification of influence of train operation to users, study of system design for easier treatment of weather information Such.

What we did in First Step, what I could not do

What you can do

(1) (2) (3)

However, (3) only three observation machines are installed.

What I could not do

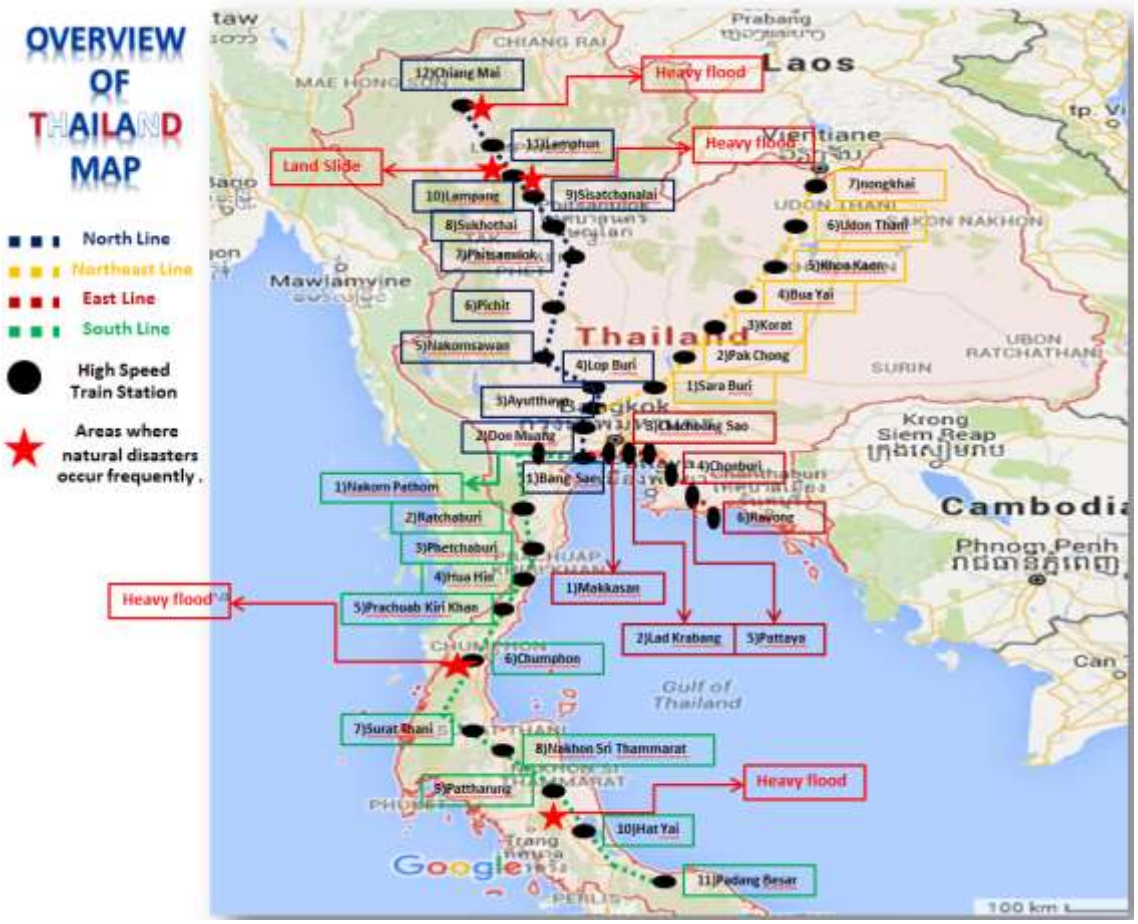
(4) (5) (6)

4. Cost for Study or Activities

item	Number	unit price	Amount of money
Observation machine body	3	80 万円	240 万円
Installation cost (hard maintenance, personnel expenses, etc.)	3	20 万円	60 万円
Communication cost	3	1 万円	3 万円
Annual maintenance cost (including data storage)	1	50 万円	50 万円
total			353 万円

Attachment 1

・High-speed railway to be constructed and climatic disaster occurrence frequent areas along the railway track



・Areas where natural disasters occur frequently

Line	Station	Incident type
North Line	Sisatchanalai	Flood
North Line	Lanmpan	Landslide
North Line	Chang Mai	Flood
South Line	Pattharung	Flood (Flash water)
South Line	Chumphon	Flood