**Appendix 4.2**

**[Cyber to Real World Integrated Testbed for**

**Dam Safety Management and Water Governance System]**

**[Symposium and Meeting]**

**Report Form**

**I. Organizer:**

|  |  |
| --- | --- |
| Name: | Mr. Kanokvate Tungpimolrut |
| Position: | Research Fellow, Research Group Director |
| Institution: | National Electronics and Computer Technology Center (NECTEC) |

**II. Program:**

Date: 8 – 10 May 2024

Venue: 1. Mercure Bangkok Surawong Hotel, Bangkok, Thailand

2. Srinagarind dam, Kanchanaburi province, Thailand

**Program Agenda:**

|  |  |  |
| --- | --- | --- |
| 8 May  *Symposium* | 09:00 – 12:00  9.00-10.30  10.30-10.45  10.45-12.00 | **Venue**: Hotel’s meeting room   1. Overview of ASEAN IVO project by Kanokvate 2. NICT present on utilization of CyReal Testbed  * Overview of CyReal Testbed and its usecace by Dr. Miyachi * Training of CyReal Testbed Part 1: Basics of CyReal Testbed (StarBED/TENTOU) by Dr. Miwa and Mr. Miyakawa   Coffee break:   * Training of CyReal Testbed Part 2: Hands-on of CyReal Testbed (StarBED/TENTOU) by Dr. Miwa and Mr. Miyakawa * Discussion of how to emulate dam safety management and water governance system |
|  | 12:00 – 13:00 | Working lunch |
|  | 13:00 – 17:00  13.00 – 15.00  15.00-15.15  15.15-16.45 | **Venue**: Hotel’s meeting room   1. Ms.Pothikul Vivithkeyoonvong, Civil Engineer of Dam Safety Review Section, EGAT, *"Dam Safety Overview”.* 2. Prof. Kantoush Sameh Ahmed, Disaster Prevention Research Institute, Kyoto University, *“*Development of a **D**am **S**afety for **M**ulti-hazards **A**lert and **R**isk reduc**T**ion (**Dam-SMART**) in the ASEAN basins."[via online] 3. Ms. Patsorn Rakcheep*,* Head of Aquatic Ecology Section, EGAT*, “Water Management in Thailand”.* 4. Discussion   **Coffee break:**   1. Prof. Warakorn Mairiang, Department of Civil Engineering, Faculty of Engineering, Kamphaeng Saen Campus, Kasetsart University, *"Dam Instrument”.* 2. Dr. Rangsarit Vanijjirattikhan*, S*enior Researcher, NECtEC, *“Dam Safety Remote Monitoring System“.* 3. Discussion |
| 9 May  *Symposium* | 08:00 – 12:00 | **Venue**: Srinagarind dam   1. Depart from hotel to Srinagarind dam |
| 12:00 – 13:00 | Working lunch |
| 13:00 – 15:00  15.00 – 19.00 | **Venue**: Srinagarind dam   1. Mr. Sirichete Samrangyoodee, “*Instruments in Dam Safety Remote Monitoring System”.* 2. See the sensors and system around dam site 3. Depart from Srinagarind dam to hotel |
| 10 May  *Meeting* | 09:00 – 12:00 | **Venue**: Hotel’s meeting room  Share information on current status and technical requirement of each member country   * NUOL team   **Coffee break:**   * CADT team * UCSY team |
|  | 12:00 – 13:30 | Working lunch |
|  | 13:30 – 17:00 | **Venue**: Hotel’s meeting room   * Conclude the output of symposium   **Coffee break:**   * Conclude the future plan |

**III. Participants:**

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| **No.** | **Name** | **Organization** | **Itinerary** |
| 1 | Dr. Somsanouk Pathoumvanh | NUOL | 7/5/2024 (in)  11/5/2024 (out) |
| 2 | Dr. Kamla Non Alinsavath | NUOL | 7/5/2024 (in)  11/5/2024 (out) |
| 3 | Dr. Ly Rottana | CADT | 7/5/2024 (in)  12/5/2024 (out) |
| 4 | Dr. Cheab Sovuthy | CADT | 7/5/2024 (in)  11/5/2024 (out) |
| 5 | Dr. Thin Lai Lai Thein | UCSY | 7/5/2024 (in)  11/5/2024 (out) |
| 6 | Ms. Zin May Oo | UCSY | 7/5/2024 (in)  11/5/2024 (out) |
| 7 | Dr. Toshiyuki Miyachi | NICT | 7/5/2024 (in)  11/5/2024 (out) |
| 8 | Dr. Shinsuke Miwa | NICT | 7/5/2024 (in)  11/5/2024 (out) |
| 9 | Mr. Shinichi Miyakawa | NICT | 7/5/2024 (in)  11/5/2024 (out) |
| 10 | Dr. Hiroshi Emoto | NICT | 7/5/2024 (in)  10/5/2024 (out) |
| 11 | Mr. Hisanori Nishino | NICT | 8/5/2024 and  10/5/2024 |
| 12 | Ms. Nanthiya Raphitphan | EGAT | 8/5/2024 |
| 13 | Ms. Patsorn Rakcheep | EGAT | 8/5/2024 |
| 14 | Mr. Jirayu Kontoengern | EGAT | 8/5/2024 |
| 15 | Mr. Pakkapol Aueteerasarun | EGAT | 8/5/2024 |
| 16 | Ms. Pothikul Vivithkeyoonvong | EGAT | 8/5/2024 |
| 17 | Assoc.Prof.Dr.Warakorn Mairaing | Kasetsart U. | 8/5/2024 |
| 18 | Dr.Wiphada Thepchantra | RUTS | 8/5/2024 |
| 19 | Dr. Kanokvate Tungpimolrut | NECTEC | 8/5/2024 to  10/5/2024 |
| 20 | Dr. Rangsarit Vanijjirattikhan | NECTEC | 8/5/2024 |
| 21 | Ms. Rungtip Nuntawattanaririchai | NECTEC | 8/5/2024 |
| 22 | Ms. Paramaporn Jinthanakorn | NECTEC | 8/5/2024 |
| 23 | Dr. Sasiya Usomsuk | NECTEC | 8/5/2024 |
| 24 | Mr. Pakorn Lopattanakij | NECTEC | 8/5/2024 |
| 25 | Mr. Sutiwat Khamhaeng | NECTEC | 8/5/2024 |
| 26 | Prof. Kantoush Sameh Ahmed | Kyoto U. | 8/5/2024 (Online) |
| 27 | Mr. Sirichete Samranyoodee | EGAT | 9/5/2024 |
| 28 | Dr. Jittiwut Suwatthikul | NECTEC | 9/5/2024 |
| 29 | Mr. Kampee Suksomboon | NECTEC | 9/5/2024 |
| 30 | Mr. Anan Jomtarax | NECTEC | 9/5/2024 |
| 31 | Mr. Thaweesak Thanasapthawee | EGAT | 9/5/2024 |
| 32 | Mr. Wachira Piamsapong | EGAT | 9/5/2024 |
| 33 | Mr. Naruepon Premgamonwijit | EGAT | 9/5/2024 |
| 34 | Mr. Pornthep Methapituk | EGAT | 9/5/2024 |
|  |  |  |  |

*Remark:*

* *RUTS : Rajamangala University of Technology Suvarnabhum*
* *Mapua University team could not attend to this symposium and meeting because of their primary activities in Manila were rescheduled due to postponements caused by extremely hot weather (hear index advisories.*

**IV. Summary of the activities corresponding to the objectives**

In this symposium and meeting, there are the following 3 objectives. The meeting could be successfully completed as scheduled. The summary of each meeting is shown below.

**Objective #1**: To share information and knowledge of the implemented collaborative project between NECTEC and EGAT (Electricity Generating Authority of Thailand), the Dam Safety Remote Monitoring System (DS-RMS), to all project members by visiting to the dam site. NECTEC and EGAT as speakers will share the best practices from the viewpoint of electronics & computer technology and civil & hydrology engineering, respectively for the implementation of DS-RMS at 14 large dams in Thailand.

* On the first day of the symposium (May 8,2024, afternoon session), two speakers from EGAT presented about Dam Safety Overview and Water management in Thailand and one speaker from NECTEC presented about the Dam Safety Remote Monitoring System. Two invited speakers from Kyoto university (Prof. Kantoush) and Kasetsart university (Prof. Warakorn) also presented about dam safety from the viewpoint of hydrology and geology, respectively. All participants (in total 25 persons) could have a chance to discuss and share their opinions with each speaker.
* On the second day of the symposium (May 9, 2024), a representative of EGAT briefly introduced about instruments in Dam Safety Remote Monitoring System (DS-RMS) installed at Srinagarind Dam and bring all participants (in total 20 persons) to see the sensors and Remote Terminal Unit (RTU) around the dam area. The project member has opportunities to discuss to representative of NECTEC, EGAT staffs both from head quarter and Srinagarind dam.

**Objective #2**: To share information and knowledge of utilization of the CyReal Testbed which was designed and developed by NICT team to all project members as well as participants from NECTEC and EGAT for further research activities in each member country.

* On the first day of the symposium (May 8,2024, morning session), Dr. Miyachi (NICT) presented about the overview of CyReal Testbed and its usecase. Dr. Miwa and Mr. Miyakawa (NICT) organized a training course for all participants (in total 25 persons) which covers Part 1: Basics of CyReal Testbed (StarBed/TENTOU) and Part 2: Hands-on of CyReal Testbed (StarBED/TENTOU). All participants could have an opportunity to download, install and configure all necessary software and documents by themselves. All participants could ask and discuss to the speakers directly whenever they had some problems during the training.

**Objective #3**: To organize a meeting among all project members to conclude the output of symposium and to reconfirm the scope, action plan and output of the project and to identify the tentative activities in each member country in more detail.

* All project members have discussed the goal and scope of the project based on all information gathered from the symposium. An online communication channel for this project has also been discussed and all members decided to use and create an account on “Slack”. A Google drive for sharing all necessary documents such as tutorial material etc., has also been created for all project member.
* Each project member presented about the targeted dam and local partners in their country. More information about targeted dam has been also discussed and confirmed. More discussion about system implementation, simulation and emulation have also been discussed in more detailed.
* Future activities plan and budget plan for the first year (May 2024 to April 2025) has also been discussed. Next online training on CyReal Testbed will be held on either Jun 26 (Wed), 2024 or Jun 28 (Fri), 2024 from 13.00-16.00 ICT (15.00-18.00 JST). NICT team will select one of the existing projects (problem statement) on CyReal and will present in more detail about how to implement everything on Cyreal including required software development, model and input data etc.
* Each project member will coordinate with the local dam operator to share information about our project and collect the requirement for setting scope of R&D in this project. The result of discussion with local dam operators will be also updated during the next online meeting on Jun 26 or Jun 28.
* Each project member should create a plan for publication & conference expenses, system installation and onsite Meeting/Workshop etc., and discuss on the next meeting.
* The preparation and timeline of CRDA signing of this project has also been discussed.

**V. Others**

**Symposium on May 8 2024**

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A person standing in front of a large screen

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A person using a microphone and using a computer

Description automatically generated A group of people in a room

Description automatically generated

A person speaking into a microphone

Description automatically generated A person giving a presentation to a group of people

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A person speaking into a microphone

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A person and person sitting at desks with laptops

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A group of people sitting around a table

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**Symposium on May 9 2024**

A group of people standing in front of a large stone hill

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A group of people sitting in a room with a projector screen

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A group of people standing on a concrete surface

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A group of people standing next to a barrier

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**Meeting on May 10 2024**

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A sign on a wall

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