ICSCoE draws attention due to the Tokyo 2020 Olympic and Paralympic Games

Industrial Cyber Security Center of Excellence (ICSCoE) has been cultivating the industry-ready professionals who will be capable of playing the essential roles after their returning to his or her own company. Within the Core Human Resource Development Program, we provide our trainees with the exercises using the substantive control systems used for actual industries. We operate our practice facility privately due to its nature. However, we have been accepting the visitations by personnel, including domestic and international government officials, since the Tokyo 2020 Olympic and Paralympic Games are right around the corner.

Critical infrastructures require robust cybersecurity measures; thus, we provide those visitors with an opportunity to experience the possible cyber incidents while supporting the formulation of security policies for each industry through discussions.

A Visit by Mr. KAJIYAMA Hiroshi, Minister of Economy, Trade and Industry (December 2019)

In December 2019, Minister of Economy, Trade and Industry, Mr. KAJIYAMA Hiroshi, visited ICSCoE. We explained to him about the features of our one-year-program, the Core Human Resource Development Program, and demonstrated the cases of possible incidents caused by the cyber attacks against critical infrastructures while using the simulated plants ICSCoE owns. After Minister Kajiyama's having observed the demonstrations, he actively asked regarding the trends in technical measures for control systems security and the progress of developing the human resources, who would be in charge of cybersecurity, and we actively exchanged the information.

Ministry of Economy, Trade and Industry (METI) has been undertaking a series of activities as the measures for the cybersecurity risks

Minister Kajiyama observed the demonstration using our simulated plant.

arising from leaks of sensitive information from the cyber attacks against critical infrastructures or power outage and facility shut-down from the attacks against control systems to support Japanese industries from policy aspects. Also, METI has been developing and publishing the cybersecurity guidelines (ex. Cyber/ Physical Security Framework) as part of its efforts.

ICSCoE will have continued its practical and effective efforts so that the ICSCoE projects will be able to contribute to developing guidelines for the various areas of critical industries.

* CPSF : Cyber/Physical Security Framework. METI organizes the whole picture of the security measures necessary for Japanese industries to ensure the cybersecurity throughout the supply chains.

Minister Kajiyama indicated the importance of this project.

"Kanae-kai" was launched with the goal of the following three pillars when the trainees completed the first Core Human Resource Development Program:

"Keep our knowledge and skills up-to-date,"
"Utilize the networks fostered through the program beyond the different completing years of the program,"
"Contribute the knowledge and know-how we learned back to industries and societies."

We briefly introduce its activities as follows:

1 Kanae-kai General Assembly

The alumni of this program gather together and hold the general assembly to foster the systematic relationships among the participants beyond the different completing years. The general assembly holds the lectures by the experts and the updates from the alumni, and the alumni not only can collect the latest information and know-how but also learn the efforts operated by others. As a result, these events are providing an opportunity to increase their motivation.

2 Information Sharing

On the membership portal site (SIGNAL), they share the insights contributing to strengthening security such as vulnerability information and incidents and the trends in cyberspace. Besides, Kanae-kai uses this portal site as a communication tool and disseminates the knowledge and skills to its members.

3 Kanae-Kai Subcommittee

With the lead by the alumni of the Core Human Resource Development Program, they organized an industry-government-academia community and established Kanae-kai Subcommittee, a subcommittee of Kanae-kai, to disseminate information and develop awareness and human resources. By utilizing the networks fostered through the one-year-program, Kanae-kai contributes the knowledge and know-how the alumni learned to back to the various industries and societies.

The Alumnus–Trainee Collaboration Team Participated in A Video Transmission Experiment of the "Sapporo Snow Festival 2020" (February 2020)

ICSCoE has been participating in the demonstration experiment in which transmits the ultra-high-resolution live videos (8K non-compressed videos) of the Sapporo Snow Festival to three locations: Tokyo, Osaka, and Okinawa, in real-time (organized by National Institute of Information and Communication Technology) ※. This year, approximately 200 people from 58 organizations participated in the broader sized video transmission experiment than the prior year. The trainees (3rd Cohort) and the alumni experimented for a consecutive two years (2nd Cohort) of the Core Human Resource Development Program formed a new collaboration team and challenged the demonstrations.

Until the prior year, the ICSCoE team of the time (participated by 2nd Cohort) had assessed unicast transmissions between a single source to a single receiver. This year, however, the newly-formed collaboration team conducted the first attempt in the 2020 experiment that demonstrated multicast transmissions (communication between a single sender and multiple receivers). The ICSCoE team expects multicast video transmissions utilized for large-scaled relay events in the future, but there are no security products, which sufficiently respond to the multicast transmission. Thus, verifying vulnerabilities of video transmission devices is an urgent need. The ICSCoE team assessed a large number of devices this year and performed penetration tests to video systems such as video control systems and network devices. Also, the ICSCoE team analyzed vulnerabilities, including risks that replace arbitrary images through man-in-the-middle attacks.

The alumni and current trainees participating from various critical infrastructure companies, including broadcasting and communications industries, strived to gain the insights from the experiment to contribute back to each industry and company by utilizing the systematic relationships built among the participants.

※Testbed Topics: Succeed in the ultra-high-resolution 3D scenography image transmission with two non-compressed full-resolution 8K video streams
https://testbed.nict.go.jp/english/news_events/yukimatsuri2020-press.html

ICSCoE team assesses
the risks replacing arbitrary images.

The demonstration experiment targets are the video transmission devices on the actual operation sites or for the next generations.

Resource Development Program, "Kanae-Kai"

First Cohort Committee

The alumni from the first Core Human Resource Development Program formed the First Cohort Committee to maintain a bond of common interest even after completing the program. By sharing the experiences and knowledge cultivated after the program beyond the boundaries between industries, the First Cohort Committee, the core member of this committee, strengthens the security systems for each company and builds a cooperative framework for an emergency.

Know-How Sharing Committee

This committee would like to expand the synergistic relationship among the alumni and contribute back to each alumnus and company by sharing the expertise and know-how, which each alumnus has from various industries, beyond the "completing years". Covering various topics, such as businesses, CSIRTs, technologies, and industries, we have been sharing various types of know-how among the alumni.

Community Activities Committee

The alumni formed the Community Activities Committee intending to enhance regional cyber security. As a vanguard, they first established the "Kansai Region Committee" and the "Chubu Region Committee," and these committees have already launched their activities. Besides, the alumni created the "Whole Region Committee" that has the cross-divisional coordination functions to share good practice for each region and develop reciprocally.

Mr. Kyohei Mukai,
Kyushu Electric Power Co., Inc.
(1st Cohort)

Since the members of the First Cohort Committee requested to hold an assembly in local areas, and as my company understood the Kanae-kai's activities that stressed the importance of networking after completing the program, we could carry the first "First Cohort Committee" in the Kyushu Region. I believe that information sharing with the associates, who had studied together at the one-year-program, is very beneficial since obtaining such information is difficult, particularly in local areas.

I have been striving to make the activities more fruitful so that all alumni can proactively participate since each committee provides us with opportunities to strengthen the "bonds" with other alumni beyond the completing years.

"It was good to participate in." To hear such a voice from the alumni, I would like to generate the contents beneficial for the alumni. I would also like to build a mechanism that can develop new collaborations together with the alumni based on the "connection".

Mr. Hiroyuki Hasegawa,
Chubu Electric Power Co., Inc.
(2nd Cohort)

Mr. Kazuya Murakami,
Kyushu Electric Power Co., Inc.
(2nd Cohort)

Unlike the seminars sponsored by enterprises, we can hear the open and honest dialogues from the alumni, who have been engaging in the actual security operations, and share the sophisticated knowledge and techniques with them.

Most importantly, each of us can mutually enhance our knowledge and skills through the earnest discussions among the alumni who studied together at the one-year-program.

Through the discussions with the alumni from the different completing years, I sensed the easiness of sharing information among them since we had improved together through friendly rivalry and shared the same experiences with them. Although these are the newly formed committees, I would like to implement meaningful activities so that "I feel fortunate that I have participated in the Community Activities Committee since then" in the future.
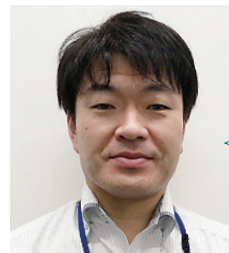
Mr. Yoshiki Terakura,
Toyotsu Syscom Corporation
(2nd Cohort)

Mr. Hideyuki Honda,
Chuden CTI Co., Ltd.
(1st Cohort)

We conduct new efforts to maximize the frame, "the colleagues who completed the Core Human Resource Development Program" through the committee activities.

With our efforts, the alumni can not only share information and discuss issues under normal circumstances but also figure out appropriate solutions together when some of the companies where the alumni belong to face attacks. I believe it must be valuable to us.

As noted above, I would like to build mutually supportive relationships with my colleagues.

ICSCoE Overseas Partnership Activities
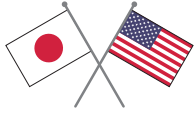
Japan-US Industrial Control Systems Cybersecurity Training for Indo-Pacific Region
(September 2019)

▶ Overviews

From September 9 through 12, 2019, under the collaboration with the federal government of the United States, ICSCoE, a part of the Information-technology Promotion Agency (IPA), jointly hosted the exercise with the Ministry of Economy, Trade and Industry (METI) regarding the cybersecurity for control systems instructed by the experts from Japan and the United States.

In this exercise, 69 trainees from the Core Human Resource Development Program participated, and we invited 35 trainees from the Indo-Pacific region. We held the lecture given by the US experts and a workshop where sharing the issues and measures regarding the security of control systems for each country and region among the participants, and we actively exchanged the information beyond boundaries.

The scene of the group work beyond boundaries

The lecture given by the US expert

Comments from Participants

Trainees from the Core Human Resource Development Program:

- Since we have fewer opportunities to understand the security issues outside of Japan, it was very fruitful to be shared the challenges and efforts that the ASEAN were experiencing.
- I could perceive that each country was experiencing common issues and reaffirm the significance of the ICS initiatives.

Trainees Invited from Overseas:

- This practical training was highly effective as a cybersecurity expert. The training itself was fascinating, and I believe that the knowledge absorbed from it would be beneficial to my country.
- It was profoundly useful for examining solutions to get myself ready for a challenge.

Overseas Deployment Exercise

The Core Human Resource Development Program has been conducting the Overseas Deployment Exercise with the aims of understanding the progressive approaches of each country and building a network of personal contacts with top-class local institutions.

A Deployment Exercise in France
(September 2019)

From September 23 through 24, 2019, the Core Human Resource Development Program held a two-day deployment exercise visiting France, and 20 trainees participated in it. The French governmental agencies and industrial security experts

Introduced the Japanese initiatives and exchanged opinions with the French experts

lectured us on the latest researches and efforts in cybersecurity, including the methodologies of detecting bugs using the formal methods and the analyses of the life cycle of malware distributed within the industrial world.

During the inspection visit to IRT SystemX, an industry-government-academia research institution, the trainees saw the demonstration that used more secure autonomous driving systems and IoT devices, which were designed enabling us to identify and anticipate the threats of cyber attacks, and detected the signs of cyber attacks facing the whole city. Also, the trainees actively discussed with the research institution to understand its efforts.

During the opinion exchange session, the trainees introduced the security efforts for whole industries based on the final project conducted by the alumni. The French experts interested in our security efforts craved for our private materials, the final project, used for the session and piled the trainees with questions.

Comments from Participants:

- I could have a meaningful discussion with the French experts by not only understanding the efforts in France but also sharing the security issues that my company and the Japanese society were facing with.
- It was a precious opportunity for me to visit the research facilities of "SystemX," the joint efforts of the industry, government, and academia sectors, and indeed see and learn the latest research details from the institute.

Deployment Exercise in the United Kingdom
(December 2019)

From December 2 through 3, 2019, the Core Human Resource Development Program held a two-day deployment exercise visiting the UK, and 37 trainees participated in it. The trainees took the lectures on the cybersecurity efforts given by the representatives from the UK government, automotive industry, start-up companies, and participated in the lively question and answer sessions with these representatives.

The lecture on the cybersecurity strategies by the UK government

The United Kingdom has been diligently engaging in its nationwide efforts to export the cybersecurity industry to the world. The representatives explained the distinctive approaches taken by the nation: the UK supports overseas marketing research and trade opportunity acquirement in 108 locations worldwide, and various UK governmental agencies tackle to enhance the cybersecurity level for the whole nation under the National Cyber Security Strategy 2016 to 2021. In terms of the security measures for the UK supply chain, which currently come under the spotlight, the nation has been not only building support tools and frameworks but also establishing the non-profit-organizations, who assist in those creations. Thus, the representatives indicated that the UK was gradually constructing its mechanism that could pursue at the field level.

On December 4 and 5, the trainees (applicants only) attended the global information security event held in London, "Black Hat Europe 2019", and gathered information on the latest information security including the global trends of and the supported technologies against cyber attacks.

Comments from Participants:

- I strongly felt that the UK government proactively had been offering supports to security ventures.
- I understood that the UK had been working on the security field as the next pillar of industries.
- I understood that the companies in the UK were making a large sum of investment in cybersecurity insurance. Thus, I could realize that UK companies were taking a strong stance on security with regards to corporate management compared to Japanese companies.