



Report of Committee for JAEA Internationalization Initiative

(Translated Document)

Committee for JAEA Internationalization Initiative

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Japan Atomic Energy Agency

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Committee for JAEA Internationalization Initiative

Japan Atomic Energy Agency

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In global circumstances surrounding nuclear energy, the role expected by the Japan Atomic Energy Agency (JAEA) is becoming increasingly important. JAEA has promoted an initiative for an international hub in order to increase the scientific competitiveness of Japan and make international contributions, by gathering excellent researchers from the entire world with the latest facilities. Also, JAEA has established the “Committee for JAEA Internationalization Initiative”, which will discuss issues such as environmental improvement for accepted foreigners, direction of efforts for internationalization initiative and strategies to improve the current situation.

This report mentions the results of the committee’s discussion including current issues for the initiative and recommendations for their solution, as well as issues to be discussed in order to enhance international awareness of JAEA staff.

The following is the summary of the recommendations for the initiative:

- Set up local teams that focus on the situation of each site in order to provide detailed support for foreigners from diversified backgrounds
- Develop systems for emergency situations to provide information for safety swiftly for foreigners and confirm their safety, in addition to preparing emergency goods
- Prepare bilingual documents and systems that foreigners need to use for their work based on importance and frequency of use of such systems and documents

Keywords: Internationalization

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国際拠点化推進委員会報告書

(翻訳資料)

日本原子力研究開発機構

国際拠点化推進委員会

[2013 年 3 月 28 日受理]

世界的な原子力を取り巻く環境の中で、国際基準作成への貢献やアジアの人材育成など(独)日本原子力研究開発機構（以下、機構という。）が果たすべき役割が増してきている。機構では最先端施設を核として世界の優秀な研究者を集結し、我が国の科学技術競争力を高めるとともに国際貢献を果たすべく、「国際拠点化」を推進してきた。さらに、外国人の受入環境整備をはじめとして、国際拠点化に関する方向性、改善策を検討するため、「国際拠点化推進委員会(Committee for JAEA Internationalization Initiative)」を設置した。

本報告書では、本委員会で検討した国際拠点化に向けた現状の課題とその解決への提言、並びに機構職員自らが世界を意識して活動していくために今後検討すべき課題について記載する（本報告書で提案した国際拠点化にむけた主な提言は以下のとおりである。）

- ・ 多様化する外国人に対してきめ細かな支援を行えるようにするため、各研究開発拠点の状況に合わせたローカルチームの設置
- ・ 東日本大震災における経験も踏まえ、外国人の安全を確保するための緊急時における外国人への迅速な情報発信と緊急時に備えた安否確認や生活支援の体制、物品の整備
- ・ 外国人が業務上必要となる機構内文書やシステムの利用頻度や重要度も踏まえた英語化

本報告書は 2013 年 3 月に発行された報告書(JAEA-Review 2012-054)の翻訳である。

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Contents

Introduction	1
Foundation of activities	1
1. Establishment of local teams	3
2. Recommendations of the Committee for the issues	7
2.1 Issues concerning safety	7
2.2 Documents, systems in bilingual	11
2.3 Issues related to use of systems	13
2.4 Issues to tackle with the cooperation of local communities (Accommodation, transportation, education, etc...)	15
3. Efforts to promote staff's international awareness	19
Conclusion	21

Appendix

No.1 Member of Committee for JAEA Internationalization Initiative	23
No.2 Good practices, Issues and Proposals regarding Internationalization	27
No.3 Progress of English translation at JAEA (December 2012)	31
No.4 Issues to be solved in JAEA Internationalization Initiative	33

目 次

はじめに	1
委員会における活動の進め方	1
1. ローカルチームの設置について	3
2. 各課題に対する委員会の提言	7
2.1 安全に係る課題について	7
2.2 書式類、システムの英語化について	11
2.3 システム利用に関する課題について	13
2.4 地域とともに取り組む課題について(宿泊、交通、教育など)	15
3. 機構職員自らが世界を意識して活動していくための取組	19
おわりに	21

付録

1 委員名簿	23
2 国際拠点化にかかわる良好事例、課題、提案について	27
3 原子力機構内における英語化の対応状況	31
4 国際拠点化推進に向けた解決すべき課題の取り組み状況について	33

Introduction

In the circumstances surrounding global nuclear energy, there are rising expectations for the Japan Atomic Energy Agency (JAEA) contribution to the development of the global standards, international expansion of shared use of facilities, contribution to nuclear nonproliferation and denuclearization, human resources development in Asian countries, etc. JAEA has been promoting the Internationalization Initiative, by gathering excellent researchers from all over the world by its state-of-the-art facilities, aiming to increase Japanese competitiveness in the field of science and technology and to make international contribution.

In 2010 the “Committee for JAEA Internationalization Initiative (the Committee)” was established as a consultative body of the president of JAEA with the executive director of international affairs assigned as chair and representatives from R&D departments and sites as members. (See the list of members attached as Reference Material 1.) To become an International hub in both name and reality, JAEA is required to achieve R&D results that will lead the world in the field of nuclear energy. To this end, JAEA staff need to turn their attention toward the world and transmit those achievements globally in a way that attracts foreign researchers, while the environment to accept excellent foreign researchers should be improved as appropriate for its attraction.

Until now the Committee meeting was held four times and discussions have been made for the development of environments to accept foreigners (for which specific challenges including urgent ones have been identified), the direction of the Internationalization Initiative and the solution of related issues. We made recommendations on several issues and each of the sites of JAEA has addressed the recommended matters from what it can do.

This report discusses the current issues in promoting the Internationalization Initiative and provides related recommendations. Also, the efforts to promote staff's international awareness, which need to be discussed, are mentioned.

Foundation of activities

The Committee decided to develop discussion and activities to promote internationalization actively and effectively based on the following ideas.

- (1) The world latest research and facilities attract outside researchers, and also they need to interact with outsiders to be more sophisticated.

- (2) Accordingly, we will check the organizations, operating structure, facilities and equipment to see whether JAEA and its sites have an appropriate environment that supports international interaction actively.
- (3) Based on the result, we will develop action plans, which will be shared in JAEA and also with local communities.

In developing action plans, the following points should be kept in mind:

- (i) Identify good practices of JAEA and foreign research institutes and introduce them to the sites so that they can learn from such good practices and their efforts for internationalization can reflect them.
- (ii) Investigate the issues faced by each site.
- (iii) This Committee will make recommendation for solving issues, as well as encourage the sites to start what they can do now following the practices.

In “Good practices, issues and recommendations regarding internationalization (Reference Material No.2)”, the good practices the Committee selected were sorted into several categories showing relating organizations. Through the investigation into issues, issues related to securing safety in emergencies, improvement of transportation, and insufficiency of acceptance structure for foreigners and scarce bilingual documents emerged. Also, it turned out that needs are different depending on factors such as the length of stay. For example, among foreigners of a short-term stay such as users of the Japan Proton Accelerator Research Complex (J-PARC) and trainees, demands for environment supporting they start work at JAEA smoothly are high. On the other hand, long staying foreigners such as JAEA employees, who often come to Japan with their families, have demands related to their families, such as education for their children and employment for their spouses, in addition to housing with a comfortable size. To prioritize these issues, the Committee graded them in three levels (A, B and C) from the perspective of cost, manpower, time to be required, structural restriction, and urgency/importance/feasibility. Possible efforts have already been started to improve the situation. Issues graded as A are discussed in the chapter 2 as well as activities to address them. It also indicates specific measures discussed in the Committee.

Issues to be solved in promoting internationalization should be divided into those that should be addressed by the entire JAEA and those that should be addressed by each site based on its condition. For example, situation of accommodation facilities and transportation is different depending on the sites, and also municipalities. This Committee recommends setting up local teams based on the condition of the sites to

implement measures to address issues as shown in the chapter 1.

1. Establishment of local teams

【Background】

Foreigners arriving in Japan need to find accommodation and, before getting used to their work, go through procedures to acquire an e-mail address and apply for the entrance card, in addition to procedures they need for their life such as opening a bank account and registrations at the local government office. Also, if they are with their families, they will have to apply for the welfare service and go through procedures for the education of their children. It is quite a challenge for foreigners to go through these procedures, which are difficult even for Japanese. Therefore, the accepting sites or departments should provide information on these procedures (e.g. place, time and procedure) and assistance to the extent possible. Additionally, the needs of foreigners are different according to their culture such as language, religion and diet as well as their specific practices (the needs get more and more diversified as support to Asian countries increases), and therefore the accepting sites should provide support responding to the different needs.

In order to respond to these trends, JAEA should establish an organizational structure with detailed support systems that respond to the characteristics of foreigners and environment surrounding the sites.

【Good practices】

Some sites have already started activities to support accepted foreigners based on their own situation:

- Tokai Research and Development Center, Oarai Research and Development Center: Existing systems and items for accepting foreigners, which had been established in each of the sections and departments, were revised. Local teams were set up aiming to determine the efforts that the Centers should take to support foreigners in an efficient and integrated manner, and necessary measures are being considered.
- J-PARC : User Office was set up to support foreign users. It provides various support including that for daily living.
 ※However, the target of User Office's support is limited to the users from outside JAEA, and therefore the foreign users performing experiment as part of joint research cannot use this support. Also, the procedures in

J-PARC are often dependent on the management sector, when there are problems, it may take time to solve them.

- Tsuruga Head Office : “International cooperation liaison office”, which was opened in the International Nuclear Information and Training Center to accept foreigners, provides support for procedures and casual interpretation service.
- Takasaki Advanced Radiation Research Institute : Special staff were assigned to support foreigners’ procedures required for visiting the institute and to improve the living environment by activities such as translation of the canteen menu taking religious taboos into consideration.
- Kansai Photon Science Institute : A group mainly consisting of members from Project Promotion Office of Quantum Beam Application Research Sector raises awareness of internationalization, supports international conferences and is preparing websites to introduce activities for foreigners.
- Aomori Research and Development Center : A coordinator, assigned to support foreigners coming to Japan for BA (Broader Approach) Project of nuclear fusion, provides prompt response to inquiries from foreigners.

【Recommendation】

Based on these good practices, the Committee recommends the sites accepting many foreigners to set up local teams. As the activities of local teams, the Committee recommends the following items:

- Improvement of environment for foreigners
Bilingual signs and documents, consideration on the improvement of living circumstances such as accommodation and work place, and coordination among responsible departments and sections
- Identifying and providing information necessary for foreigners
Identifying and providing information on daily life such as necessary procedures, public facilities and hospitals (including contact information for emergencies like a sudden illness or an accident)
- Establishment of a structure for providing information about evacuation and aiding foreigners
Establishing a structure for providing emergency information, guide evacuation and confirm safety of foreigners
- Support in the orientation of starting life in JAEA
Interpretation of the information given in an orientation (procedures

required by the personnel and labor sections, procedures for access to internal services such as the internet and library) . (The contents of an orientation should be appropriate for the expected duration of foreigners' stay.) Provision of all the necessary information at one time in an orientation (development of "Welcome Pack" that includes a set of documents necessary to start life in JAEA).

○ List of counseling staff

Making the list of staff who will provide consulting service for foreigners when they have trouble in daily life

Below are the recommendations regarding local teams:

- The Committee expects the sites that have already established a support system (Tokai, Oarai, Tsuruga, Kansai, Aomori), as mentioned in Good practices, to improve the above mentioned activities. Also the Committee recommends the sites which have not established specific support systems for foreigners as currently there are not many foreigners who need support (Naka) to consider establishment of local teams depending on the future prospect. The sites that already have support systems may regard them as local teams at their decision.

The Committee does not necessarily recommend the other sites to set up local teams, but expect that they share the good practices of other sites through the Committee and address issues to the extent possible by efforts such as making bilingual signs at the sites.

- Local teams, which should be set up as permanent organizations, aim to establish themselves as support desks for foreigners. An introduction period will be placed for voluntary improvement and identification of issues both common and specific to each site. Coordination with Personnel and General Affairs Departments is required to settle personnel and organizational issues of local teams.
- Several members will be selected for the team at each site, and they will lead activities such as identification of foreigners' needs and coordination of possible efforts among related sections, act as a bridge between foreigners and related sections of the site and connect this Committee and each site.
- It is preferable that local teams consist of personnel of human or labor affairs sections of the sites and promotion offices of the R&D sectors, which are often concerned with foreigners. As issues concerning emergency response

and information system (security) need to be discussed, the personnel of the related sections should be included as appropriate. Also, there will be necessity to cooperate with the International Affairs Department, which serves as the secretariat of the Committee, as some issues require efforts by sections of the JAEA headquarters.

- The leader of each team will be served by the member of the Committee from each site or a person who was designated by the member. The leader will compile opinions and activities of the team members actively and communicate major difficulties that the site cannot resolve by itself to this Committee as appropriate.
- Each local team will report its activities to this Committee. The Committee will support the activities of local teams and discuss issues which are difficult to be solved by local teams and concern the entire JAEA.

【Supplemental note】

The activities of local teams are to provide comprehensive support for foreigners, and therefore the members may be required to respond to cases which do not necessarily concern their own work. Originally this support was provided by people in the accepting sections as voluntary services, accordingly the activities were often affected by several factors such as motivation of the section, personnel reshuffle, additionally the available time was limited.

Therefore, each site should clarify the scope of responsibilities of the local team and accepting department, and the extent of life support by the team, as well as designate tasks of the team as the responsibilities of the work so that activities in the team are considered in the personnel evaluation. Also, in order to enable continual support, we may have to discuss the possibility of creating a position dedicated to internationalization to which retired personnel who have experience with accommodating foreign researchers is assigned.

Also, for the development of local teams based on their voluntary improvement, there was a suggestion to solicit opinions of foreigners about good points and points needing improvement through “Exit Interview”, which is a meeting held in Kansai as an opportunity where the local team can talk with foreigners before they leave Japan, or by keeping contact with foreigners after they have left Japan.

2. Recommendations of the Committee for the issues

2.1 Issues concerning safety

(1) Providing emergency information in English

【Background】

At the occurrence of the Great East Japan Earthquake, as Nuclear Science Research Institute did not have English public address system, many foreigners in the institute felt anxiety unable to understand the situation. Providing appropriate information swiftly in an emergency situation may be the most important issue in promoting internationalization.

【Recommendation】

The necessity of providing emergency English public address should be decided by each site based on its situation such as the length of stay of the foreigners it accepts. We expect that the sites learn from the effort of the Nuclear Science Research Institute, which is preparing an English announcement (the institute will play a prerecorded CD which announces the state of emergency and urges foreigners to ask Japanese staff about the situation).

【Supplemental note】

The Great East Japan Earthquake occurred during working hours, and that is one of the reasons why there were not so many serious problems even though emergency information was not announced in English. We have to take into consideration the possibility that emergency situation occurs outside of regular working hours and that foreigners stay at large facilities that operate around the clock. By using prerecorded CDs, response to emergency becomes available on a round-the-clock basis.

Power outages occur not only at the time of earthquakes but also by climate conditions such as typhoons. It is important to consider what may happen at the time of emergency and be prepared for them.

When an earthquake occurs, the alert is announced or appears on the individual computer screen. As these services are not provided in English, on-site English broadcasting or support by Japanese staff should be considered.

(2) Unified information management of foreigners and safety confirmation in emergencies

【Background】

At the Great East Japan Earthquake, JAEA could not respond promptly to confirm the safety of foreigners for organizations and embassies of the countries they belong to. That is because JAEA did not have a unified database on foreigners. We learned from this experience that we should systematize the structures of managing foreigners' information, safety confirmation and ensuring safety.

【Recommendation】

For the purpose of understanding the overall information about foreigners accepted in JAEA such as the place they are assigned to, accommodation and emergency contact information, we organized it under the following five categories. The Committee recommends, based on this analysis, to assign staff (or a section) in charge of emergency communication at each department to communicate the information about foreigners to International Affairs Department.

【Supplemental note】

Safety confirmation of foreigners at night or on a holiday will take more time than during working hours. Therefore, consideration will be necessary to develop a system for safety confirmation and living support for foreigners where local teams cooperate with the personnel in charge in an emergency, in line with the degree of development of the local team of the site. Also, the Committee will discuss development of the structure to coordinate smoothly with related sections and departments in emergency situations.

【Categories of foreigners coming to JAEA】

	Category	Responsible department	Duration of stay	Number of people	Current information management
①	Employees (including fixed-term employees)	Personnel Dept.	Long (3 years for fixed-term employees)	50	Personnel Dept. manages database (same as Japanese employees).

②	Invited people (including trainees)	International Affairs Dept.	Short~long (Several days ~1 year) For attendance at international conferences: Several days The Nuclear Researchers Exchange Program: Several months Trainees (Human Resource Development Center):Several weeks Invited foreigners (International Affairs Department budget):Several weeks	400	International Affairs Dept. manages information of foreigners.
③	Users of facilities	Each facility	Short~long (Several days ~Several months)	1,100 (J-PARC: 1,050)	J-PARC User Office or Industrial Collaboration Promotion Dept. manages information of foreigners. (including university users)
④	Visitors to facilities	International Affairs Dept. (Responsible sections of institutes/ centers know schedule)	Short (Several days)	1,800	J-PARC User Office or Industrial Collaboration Promotion Dept. manages information of foreigners. (including university users)

⑤	Other		VIP, inspector, etc.		The General Affairs Section of each institute/center manages VIP information, and Dept. of Science and Technology for Nuclear Material Management manages inspectors' information.
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※Also there are small number of foreigners who are working at Nuclear Science Research Institute who are paid from the budget of other organizations.

(3) Support at international dormitories/ stock of emergency goods

【Background】

Foreigners who had stayed in the Akogigaura Club before the Great East Japan Earthquake moved either to the Masago International Dormitory during evacuation or the short-stay accommodation of J-PARC to stay until they returned to their country. Japanese employees who were to support such foreigners and the janitors of the dormitories also suffered from the earthquake. They could not support them and the foreigners were temporarily left alone in the dormitories. However, as some of the staff of the International Affairs Department and janitors helped them on a voluntary basis by providing food and arranging transportation, all foreigners could return to their country without large problems.

As there was not a stock of emergency food and water at the Masago International Dormitory, and cooking equipment did not work due to power failure, they had to make a fire outside to prepare meals. Also there was not a first-aid kit, and therefore first aid could not have been administered if there had been injuries. Furthermore, while KEK prepared its own bus for to Tsukuba City for J-PARC users, JAEA, whose sites in Ibaraki Prefecture were all suffered from the earthquake, could not provide such service.

【Good practices】

Since the earthquake, J-PARC has been preparing for building a storage area to store materials such as generators and lights for emergencies. Also, based on the discussion of the Committee, emergency supplies were stocked at Masago International Dormitory in Tokai area, which is an accommodation facility for foreigners.

【Recommendation】

At the occurrence of disasters such as the Great East Japan Earthquake that affect a large area, foreigners who cannot speak Japanese are very vulnerable and securing food becomes a matter of life or death for them. Therefore, it is required to secure food for them until the support by municipalities starts and to provide such support information so that they do not miss it, as well as to coordinate with municipalities beforehand so that foreigners can get support immediately in emergencies.

The Committee recommends that, for ensuring safety of foreigners, staff of the department managing each dormitory and the local team of each site, in consultation with each other, prepare emergency supplies at each site and dormitory, and the local team arrange coordination with the municipality and develop emergency action guidance based on it.

2.2 Documents, systems in bilingual

【Background】

Inability in Japanese is a major hurdle for foreigners when they are working and living in Japan. Even though the foreigners coming to JAEA are not limited to English natives, we should respond to the demand for English documents and systems. (Many foreigners completing our survey requested immediate improvement on this issue.)

The documents/systems concerning foreigners are different in three stages. The first stage is the period before foreigners come to Japan, and in this stage there is information on access to JAEA's laboratories posted on the JAEA's website and various notices sent to foreigners from contact personnel or User Office. The second stage is the period after they arrive at JAEA and before they start working, and in this stage there are the documents used in orientation and the documents required for new staff. The third stage is the period after foreigners start JAEA life, and in this stage there are documents for work management and budget execution.

Among these documents and systems, demand for English is high especially regarding documents necessary soon after they come to JAEA. Also, foreigners working

as proper employees are required to submit various documents related to labor management and salary, and these documents should be made in English.

【Good practices】

The Committee surveyed through the secretariat the progress of English translation of the documents and materials for various procedures such as for salary and labor issues, which are used in orientation.

Based on the survey results, some documents/materials were translated. Also, responding to the request and as a result of the increased number of foreigners, a bilingual system of work management has been organized through the cooperation of the International Affairs Department and Personnel Department. Current operation of the system is shown in Reference Material 3.

The International Affairs Department started in October 2012 the English intranet portal web, where foreigners will find necessary documentary forms and living information, based on the department's intranet pages. Posting of the information responding to demands at each site through cooperation with the local team of the site will be considered.

【Recommendation】

The work should be conducted by making general consideration such as cost-effectiveness, and then progressively expand the target documents starting with those that are in high priority and relatively easy to be completed. Also, the Committee recommends preparing the English version of plans of facilities of the sites within the acceptable range with consideration of the contents in line with required security. Furthermore, it recommends English search system of telephone extension numbers for better environment. The quality and convenience of those English versions of documents and systems should be improved based on the feedback from foreigners.

【Supplemental note】

In the discussion on advancing English translation/bilingualism, issues related to revision of information and expense involved in it, in addition to security requirements, were often raised as a problem. For example, once the English search system of telephone extension numbers has been organized, the system should be revised at the time of personnel reshuffles and costs will be incurred every time. Also, an English version of the plans of facilities of sites should be made sensitively due to physical protection.

While English is recognized as an international language, foreigners in JAEA are not always proficient in English as recently many researchers come from Asian countries. While advancing English translation is inevitable in promoting internationalization, we should also examine measures such as using simple Japanese or English if multilingualism is difficult. The Committee will continue to discuss this issue.

2.3 Issues related to use of systems

(1) Use of the network of foreigners in JAEA

【Background】

Many of foreign researchers and trainees coming to JAEA for joint research and training belong to the universities or institutes of their own countries, and want to use systems that allow easy communication from JAEA to the organizations of their countries.

The access to the intranet of JAEA, which JAEA employees are using, is not allowed to foreigners, because it includes sensitive information related to nuclear material control and in the event that such information leaks, JAEA will lose the public trust. Instead of that, JAEA has developed “Guest Net” system for foreigners using the internet. This system allows communication with an outside network using the existing JAEA network and not via intranet to which access is severely restricted. Foreigners can use Guest Net just by signing the written pledge regarding terms of use prepared by Center for Computational Science & e-Systems, which is much simpler compared to the former complicated procedures. The pledge is written in Japanese and English.

【Good practices】

J-PARC has introduced a new guest network system, J-PARC LAN (JLAN), for users from both inside and outside of Japan. Basically, this system is open to users outside of JAEA, and the content included in the intranet of JAEA is accessible after the application.

【Recommendation】

Guest Net is a system relatively accessible to foreign users. The Committee recommends advertizing it widely to expand the users.

【Supplemental note】

While Guest Net is useful to access the internet, it cannot meet the needs of foreign researchers to analyze the data stored in the intranet with the equipment owned by the organization they belong to through their private computers. Guest Net was originally developed in order to have a system separate from the intranet of JAEA, and accordingly the user of Guest Net cannot access data including research materials that are posted on the intranet and use peripheral equipment such as printers at their workplaces.

Overseas research institutes manage guest nets setting the accessible range according to the status of the foreigners. As indicated in Good practices, J-PARC also allows foreigners to access the intranet of JAEA through J-PARC LAN (JLAN). With consideration of the way to reduce the security risk, issues related to the access to the intranet should be solved by taking measures such as setting an accessible range according to the status of foreigners following the examples of other foreign institutes.

(2) Use of Skype**【Background】**

JAEA appoints some renowned foreign researchers as Invited Researchers. There are demands among these researchers for using Skype (Internet telephone service using P2P technology provided by Microsoft) for meeting with the Invited Researchers living abroad and they record the time as worked hours using a log.

【Recommendation】

Skype is not included in the items of prohibited software listed in “Standard for Information System Security Countermeasures[18 ｼ(Notice) No.2]”, and therefore may be used as other generally used software in conformity with rules such as the software management rules. The Committee considers that as Skype is a useful tool in communicating with overseas researchers, use of Skype subject to security rules should be allowed.

【Supplemental note】

Skype, which has file-sharing functions, is at risk for information leak. If the use of Skype is allowed, the number of computers on which Skype is installed should be limited to the necessary quantity, and sufficient countermeasures against information leak should be taken.

2.4 Issues to tackle with the cooperation of local communities (Accommodation, transportation, education, etc···)

(1) Issues related to accommodation

【Background】

Accommodation facilities owned by JAEA (Akogigaura Club and Masago International Dormitory) were provided for foreign users of J-PARC. However, as Akogigaura Club is closed due to the earthquake, the accommodation facilities for short stay foreigners are insufficient in Tokai area. The accommodation for short stay that KEK constructed before the earthquake provides accommodation for a certain number of foreigners, but still it is not enough.

As other options, there are hotels in Tokai Village. However, many of those hotels are originally targeted to the workers coming to Tokai Village for the regular inspection of nuclear facilities. Therefore, they lack English speaking staff and internet connection service and do not allow returning and leaving at midnight or early morning. Also, according to the questionnaire survey of foreigners in J-PARC, there are complaints that they had to share a room with a stranger of a different gender and that there was no English explanation on how to use the bathroom, they had trouble using it.

Also, there are foreigners staying in hotels outside Tokai Village, as transportation in Tokai Village is inconvenient. However, J-PARC users are required to be at their research facilities at the assigned beam times, so that they can return there between times for experiments. Still the need for accommodation facilities near to the research facilities is high.

【Reference cases】

While it is difficult for JAEA to newly construct buildings as accommodation facilities, the local government built accommodation facilities for foreigners at the Aomori Research and Development Center. Also, for foreign visitors to the European Organization for Nuclear Research (CERN) of Switzerland, the local government provided funds for building accommodation facilities.

【Current situation】

Under the circumstances where it is difficult for JAEA to own accommodation facilities, the members of the Committee started to reach out to local governments for building accommodation facilities for the foreign staff of JAEA.

In Tokai area, Tokai Village, which aims for an internationalization of the village

(Concept of TOKAI Nuclear Science Town), is positively developing an environment for accepting foreign employees, by making English signs of facilities and other efforts. As part of this activity, the village set up “the Coordinating committee for TOKAI Internationalization Initiative” in FY 2012, where opinions on issues related to internationalization are regularly exchanged between the village and JAEA. Currently, the meeting discussions are being made for realizing accommodation facilities with specifications that respond to the demands of foreigners, which were clarified in the questionnaire survey conducted with J-PARC users in the first half of FY 2012.

Recently hotels were built around the Mito and Katsuta stations in the redevelopment projects. If issues related to transportation can be solved, those hotels will be useful for foreigners in Tokai area. We will have to consider these issues.

(2) Issues related to transportation

【Background】

Means of transportation available for foreigners who come to laboratories of JAEA from their countries are, in the case of Tokai area, pickup by official cars of JAEA, public buses and taxis. However, JAEA’s official cars cannot cover the needs of all the foreigners coming to JAEA, and the bus service is limited. Accordingly, except for expensive taxis, bicycles are the only option for foreign trainees when they go to the center of the village on weekends.

Because of this inconvenient transportation condition of Tokai Village, many of the foreigners coming to JAEA with the status of the invited researchers and trainees who commute to work at JAEA use accommodation facilities, apartments and hotels in Mito City or Hitachinaka City, which have means of transportation that are better than those for Tokai Village, and are convenient for going out or going shopping.

【Good practices】

Foreign research institutes such as CERN and RAL (Rutherford Appleton Laboratory of UK) provide convenient transportation service for foreigners, such as rental cars and pickup service. CERN has launched the project to connect a tramway from its nearest stop to its laboratories located in the suburbs.

【Current situation】

The Committee is exploring the possibility of using a shared taxi service organized by the village through the Coordinating committee for TOKAI Internationalization

Initiative. As the sites of JAEA prohibit entrance of people unless they obtain permission in advance, shared taxis may not enter the sites, and there may be other problems. However, we should consider this possibility and survey the demand among foreigners.

(2) Issues related to medical service

【Background】

One of the concerns of foreigners living in Japan is about medical service. Not only is the system widely different depending on the country, but also some foreigners have language problems. Despite these problems, there are times when they need medical treatment urgently. Overseas researchers and their families may have substantial anxiety about taking medical treatment in a foreign country. It is desirable that there exists a medical environment around them that can provide sufficient service for foreigners.

【Current situation】

Some prefectures release information of medical facilities where English and other languages are available, and we plan to provide such information for foreigners by the intranet of the International Affairs Department.

Tokai Village is considering the establishment of a medical volunteer team. Also, some municipalities have provided medical consultation service for foreigners. Cooperating with local teams and gathering information of each region, we will examine measures to provide required service.

(4) Issues related to education

【Background】

Foreign employees of JAEA are often living in Japan with their families, and among those foreigners there are concerns about education of their children. The Japanese educational system does not correspond to the educational systems of other countries. Therefore, even if they have graduated from Japanese high schools, children of foreign researchers are not certified to enter universities of their own countries. Accordingly, children of foreign researchers usually return to their countries soon after they have graduated from elementary and junior high schools.

【Good practices】

- Aomori Research and Development Center : An international school was established with the cooperation of the national and prefectural governments.
- ITER Organization : In the international school established in Manosque, France, student can obtain certifications to enter overseas upper schools.
- Large cities like Tokyo : There are international schools where students can obtain certifications to enter overseas upper schools (International Baccalaureate).

【Current situation】

Japanese educational systems are under the jurisdiction of the Ministry of Education, Culture, Sports, Science & Technology (MEXT), and issues related to it cannot be solved by the authority of local governments. The Committee will analyze the needs for education among foreign researchers in Tokai area, which has a number of foreign researchers, and reach out to the local government through the Coordinating committee for TOKAI Internationalization Initiative to consider the establishment of international schools shown in Good practices or providing similar service using existing public/private schools.

(5) Issues related to the job of families

【Background】

The spouses of foreign researchers often had employment before coming to Japan, and also through questionnaire surveys it turned out that many spouses want mediation service for employment in Japan.

【Current situation】

It is difficult for JAEA as a public institute to mediate employment for foreigners, and there are language problems and restrictions imposed by the status of residence. However, if a support system for employment of spouses is established, more foreigners can stay in Japan to work at JAEA. The Committee will reach out to the local government to consider employment support through the Coordinating committee for TOKAI Internationalization Initiative, as well as to provide information about an employment consultation service organized by municipalities on the intranet page of International Affairs Department.

(6) Issues related to cultural events and sightseeing on holidays

【Background】

Training programs of foreign countries generally include weekend events to provide opportunity to experience the culture of the country and excursions to visit sightseeing spots. Foreigners taking training at JAEA want to participate in such events on weekends, but currently JAEA does not have a budget for that.

Also, there is no section in JAEA for weekend support of invited foreigners, and therefore people in the department who accept them are providing support on a voluntary basis.

【Good practices】

A volunteer group of JAEA employees interested in international interaction and foreign users started activities in Nuclear Science Research Institute, and provides various information including that for events for foreigners.

【Current situation】

It is important to establish systems in the place of voluntary effort to hold cultural events and excursions to offer hospitality to foreigners. The Committee looks forward to the cultural interaction events and excursions organized by municipalities and international cooperation institutes, and the activities shown in Good practices.

3. Efforts to promote staff's international awareness

Through the experience obtained in supporting foreigners in the aftermath of the Great East Japan Earthquake, a number of issues to be solved became recognized, and discussions have been made with a focus on improving the environment for foreigners accepted in JAEA. Meanwhile, as was mentioned in the beginning, based on the recognition that efforts to turn the awareness of JAEA staff toward the world are important for the internationalization of the organization, there was a suggestion to make specific efforts addressing the following issues:

(1) Improved global transmission of information and increased openness

- Improvement in the release to overseas press and the quality of English research papers:

For the efficient and effective transmission of information, it is important

to convey information immediately in a way that ordinary people can understand it. This might be beyond the capability of ordinary staff, and therefore the employment of science writers should be considered.

To improve the quality of research papers of JAEA staff to be published, an advising system using researchers including foreigners, retired staff and contract staff should be considered.

○ Improvement of English website

Aiming to improve the international transmission of information, efforts are being made toward renewing the English website of JAEA, under the leadership of the Public Relations Department. The plan is to identify the points requiring improvement or renewal and then, after determining priorities, develop the English version in order of priority, so as to transmit information drawing high attention from overseas such as issues related to response to the accident at the Fukushima No.1 nuclear power plant. Efforts for creating webpages that can attract visitors both visually and functionally will be made in stages under the cooperation between International Affairs Department and Public Relations Department, gaining the cooperation from the sites that are the sources of information.

(2) Staff's development of international sense and improvement of language skill in line with the International Initiative

Raising awareness of the staff is essential to realize the recommended matters for the promotion of the Internationalization Initiative, such as promotion of the activities of local teams. The Personnel Department has already started related efforts by conducting English tests targeting administrative staff and language training at sites. Also the department is considering sending staff to a training program on the ocean organized by an outside organization and overseas research institutes in order to develop their international sense. In the future opportunities for working at overseas research institutes, studying abroad and overseas business travel should be increased for the staff, and strategies for making use of their experience abroad should be developed. For raising awareness of the staff, transmission of information by the management in a top-down fashion and active release of information on the activities of the Committee are also important.

Conclusion

Almost three years have passed since this Committee was established. For this period, the Great East Japan Earthquake and the nuclear accident drastically changed Japanese nuclear power policy, and the circumstances surrounding JAEA, including budget, are becoming more and more severe.

There are systematic and budgetary restrictions to solve issues in promoting internationalization, and it takes time to solve respective issues. However, it is important to make steady progress based on the idea that “even if there are only one or two issues out of ten that we can solve now, it is important for our future efforts to promote internationalization, to accumulate such small achievements and to identify the obstacles for unsolved issues (Address of Chairman Okada at the first Committee Meeting)”.

We have identified some obstacles in solving issues, clarified the situation of JAEA, and discussed demands which had been overlooked before in the discussion of Committee meetings and following activities. These issues and progress of our efforts are shown in Reference Material 3 and 4. Even though there remain many unsolved issues due to the influence of the earthquake, we regard the solved issues as a great result.

In order to promote internationalization the Committee will continue to analyze issues and develop constructive discussion on how to clear obstacles and assess alternatives.

The Committee also developed recommendations for actions to be taken by each department. We hope that the internationalization of each department will proceed.

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Appendix No.1 Member of Committee for JAEA Internationalization Initiative

氏名(Name)	職位(Job Title)	任期(Term)
池田 要	特別研究員	委員 Member(2011.1～2012.3)
Kaname Ikeda	Scientific Counselor	
池田 裕二郎	J-PARCセンター長	委員 Member(2012.4～)
Yujiro Ikeda	Director, J-PARC Center	
岡田 漱平	特別顧問	委員長 Chairman (2011.1～2012.3) 委員 Member(2012.4～)
Sohei Okada	Special Adviser to the President	
小川 徹	原子力基礎工学研究部門長	委員 Member(2011.1～2012.3)
Toru Ogawa	Director General, Nuclear Science and Engineering Directorate	
小川 益郎	原子力水素・熱利用研究センター長	委員 Member(2011.1～)
Masuro Ogawa	Director, Nuclear Hydrogen and Heat Application Research Center	
荻野 伸明	青森研究開発センター所長	委員 Member(2012.4～)
Nobuaki Ogino	Director General, Aomori Research and Development Center	
加倉井 和久	量子ビーム応用研究部門長	委員 Member(2012.4～)
Kazuhisa Kakurai	Director General, Quantum Beam Science Directorate	
河村 弘	大洗研究センター副所長	委員 Member(2011.1～)
Hiroshi Kawamura	Deputy Director General, Oarai Research and Development Center	
佐久間 実	敦賀本部産学連携事業統括	委員 Member(2011.1～2011.3)
Minoru Sakuma	General Manager, Industrial Collaboration Promotion Department	
佐藤 一彦	東海研究開発センター長代理	委員 Member(2011.4～)
Kazuhiko Sato	Deputy Director, Tokai Research and Development Center	
杉本 純	原子力人材育成センター長	委員 Member(2011.1～2011.9)
Jun Sugimoto	Director, Nuclear Human Resource Development Center	
鈴木 侃	青森研究開発センター所長	委員 Member(2011.1～2012.3)
Tsuyoshi Suzuki	Director General, Aomori Research and Development Center	
千崎 雅生	核不拡散・核セキュリティ総合支援センター長	委員 Member(2011.1～)
Masao Sensaki	Director, Integrated Support Center for Nuclear Nonproliferation and Nuclear Security	

氏名(Name)	職位(Job Title)	任期(Term)
田那部 俊勝	東海研究開発センター長代理	委員 Member(2011.1～2011.3)
Toshikatsu Tanabe	Deputy Director, Tokai Research and Development Center	
茅野 政道	原子力基礎工学研究部門長	委員 Member(2012.4～)
Masamichi Chino	Director General, Nuclear Science and Engineering Directorate	
中明 勝彦	敦賀本部産学連携事業統括者	委員 Member(2011.4～)
Katsuhiko Nakaaki	Senior Officer, Collaboration Project with Industries and Universities, Tsuruga Head Office	
南波 秀樹	理事	委員 Member(2011.1～2012.3) 委員長 Cairman(2012.4～)
Hideki Namba	Executive Director	
永宮 正治	J-PARCセンター長	委員 Member(2011.1～2012.3)
Shoji Nagamiya	Director, J-PARC Center	
二宮 博正	那珂核融合研究所長	委員 Member(2011.1～2012.3)
Hiromasa Ninomiya	Director General, Naka Fusion Institute	
橋本 和一郎	国際部長	委員 Member(2011.1～2011.9)
Kazuichiro Hashimoto	Director, International Affairs Department	
藤井 文人	東濃地科学センター所長	委員 Member(2011.10～)
Fumito Fujii	Director General, Tono Geoscience Center	
ポール・ボルトン	光医療研究連携センター副センター長	委員 Member(2011.1～)
Paul Bolton	Deputy Director, Photo Medical Research Center	
前川 禎通	先端基礎研究センター長	委員 Member(2011.4～)
Sadamichi Maekawa	Director, Advanced Science Research Center	
森 雅博	那珂核融合研究所長	委員 Member(2012.4～)
Masahiro Mori	Director General, Naka Fusion Institute	
山下 清信	原子力人材育成センター長	委員 Member(2011.10～)
Kiyonobu Yamashita	Director, Nuclear Human Resource Development Center	
吉川 隆志	国際部長	委員 Member(2011.10～)
Takashi Yoshikawa	Director, International Affairs Department	
吉田 東雄	東濃地科学センター所長	委員 Member(2011.1～2011.9)
Azumao Yoshida	Director General, Tono Geoscience Center	

※理事、特別顧問は現在の職名、その他委員は当時の職名

※Dr. Namba, Executive Director and Dr. Okada, Special Adviser to the President, their job titles are present one.

Other Member's job titles were assigned when they were the members of JIL.

【事務局 Secretariats】

氏名(Name)	職位(Job Title)	
及川 哲邦	国際部 次長	
Tetsukuni Oikawa	Deputy Director, International Fellowship Section, International Affairs Department	
星野 淳子	国際部 国際交流課長代理	
Junko Hoshino	Deputy General Manager, International Fellowship Section, International Affairs Department	
笹島 栄夫	国際部 国際交流課 研究副主幹	
Hideo Sasajima	Assistant Principal Researcher, International Fellowship Section, International Affairs Department	
海老澤 宏文	国際部 国際交流課	
Hirobumi Ebisawa	Officer, International Fellowship Section, International Affairs Department	

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Appendix No.2 Good practices, Issues and Proposals regarding Internationalization

1 Good practices 【Efforts made at centers of JAEA and other institutions】

Internationalization strategy /funds	1	Continuous efforts are made to promote the attraction of the institution with developing annual plans for facility investment. Investments are made in building and remodeling of facilities, accommodations and canteens.	CERN
	2	A large some of money is successfully acquired by aggressively concluding international cooperative agreements, which supports sustained investment.	RAL
Cooperation with foreign institutions	3	Cooperate with Korea and institutions such as ISIS, SNS and CERN. Utilize Asia Community Association and funds from overseas.	J-PARC
Internationalization exploratory organization	4	Established the International Exchange Committee.	KEK
	5	Established the Internationalization Committee.	J-PARC
Assistant section, Contact person	6	Users' office, Welcome office	KEK, J-PARC, CERN, ITER, RAL, Aomori
	7	Assigned a BA coordinator who will provide support all the time. (Emergency response is available 24 hours a day, everyday)	Aomori
Status of residence	8	Repeatedly appealing to the concerned authorities for the smooth issuance of visa to Indian researchers.	KEK
Accommodation	9	Sequential expansion of accommodation buildings for short stay (60 rooms →120 rooms →180 rooms (plan))	RAL
	10	Introduce and mediate accommodation facilities in cooperation with the local real estate and local government as well as taking related procedures for foreign researchers.	CERN, ITER, RAL, Aomori
	11	Prepared accommodation facilities for users (49 rooms).	J-PARC (KEK)
Means of transportation	12	Shared rental cars are available.	CERN
Living environment	13	Two canteens, a bank, post office, shop, health center, travel agency, nursery, kindergarten, sports facilities and consideration to the families	CERN
	14	Enhanced online service (Application can basically be made for all services through its website.)	CERN
	15	Canteen menus include English.	KEK, Tokai, Kansai, Aomori
	16	Vegetarian menus are available.	KEK
	17	Made an detailed action plan to improve the environment.	Aomori
	18	Established an collaborating emergency response system in cooperation with the fire department and police station, and taught foreigners how to make emergency calls based on the system.	Aomori
	19	Provide individual support for immigration control, various checkups, hospital visit, emergencies, acquisition and renewal of driving license, etc. in addition to support to participate in local events.	Aomori
	20	Made an English living information manual and translate documents important in daily life such as interview sheets, receipts and contracts.	Aomori
	21	Made an English living information manual, "Life in JAEA"	International Affairs Department
	22	Provide links on its website to the websites of Ibaraki International Association and Ibaraki Tourism and Products Association	J-PARC
	23	Provide information of accommodation facilities and English available restaurants. Convey information such as foreigner's requirements.	J-PARC
Education	24	Conducted survey on actual condition of elementary and junior high schools (regarding foreigner's condition)	KEK
	25	Encourage high schools to accept foreign students.	KEK
Research environment	26	Made English versions of the safety textbook and emergency manual for radiation protection	International Affairs Department
	27	Ad English on invitations for seminars.	KEK
	28	Enhanced online service (Electric conference, Storage of research results).	CERN
	29	Groups of users make accounts and research materials can be procured through the account.	CERN, KEK
	30	Make English announcement over organization's public-address system.	KEK, Aomori
	31	Provide English indication of buildings and rooms.	KEK, Aomori
	32	One stop service using request forms (ID card, room, laboratory, furniture, PC, network, accommodation, transformation measure, etc)	RAL

JAEA-Review 2013-014

Conversational ability	33	Provide English training courses for administrative staff.	KEK
	34	Provide Japanese courses for foreigners.	KEK
Communication with users	35	Set Opportunities for talk between the administrative department of CERN and representatives of users.	CERN
	36	The management department of the prefecture set up periodical meetings with delegates of EU researchers. (Also, MEXT and the village government organize meetings with researchers and their families.)	Aomori
	37	Established Users' Committee.	RAL
	38	Established Users' Office Committee.	KEK
Training of users	39	Plan various programs for students, teachers and young researchers.	CERN J-PARC
	40	Provide opportunity for trial use.	J-PARC
Securing of human resources	41	Set "e-recruitment" on its website to recruit student interns.	CERN
	42	All information on public recruitment includes English.	KEK
	43	Hold job fairs abroad.	CERN
Transmission of information	44	Hold symposium abroad. Publish news letters.	J-PARC
	45	Post promotion videos on You Tube. Send information of experiments to Twitter.	CERN
Gaining of local understanding	46	Conduct project explanation meetings in the area near the construction site to obtain understanding of the local people on the research activities. Conduct laboratory tours on regular basis.	CERN, Aomori
	47	When starting new project, make efforts to involve local community as a promoter of community.	RAL
	48	Through Local Liaison Committee formed with 3 nearby research institutions, hold meeting to explain local residents every 3 months. Make efforts to understand local community.	RAL
	49	Convey information on projects at periodic meetings with local community.	ITER, Aomori

2 Good practices 【Support by the local community】

Accommodation	1	Built village owned houses for family and apartment buildings for short and middle term stay.	Rokkasho
	2	The Welcome Center of Geneva City implements support providing housing information.	Geneva
Education	3	The Welcome Center of Geneva City implements support providing information on education of children.	Geneva
	4	The local government built and manages international schools.	Cadarache
	5	The prefectural and municipal governments built and manage international schools.	Rokkasho
	6	Established an international school(Certificate of education can be approved).	Tsukuba
	7	The village conducts Japanese courses (twice a week).	Rokkasho
Transportation	8	Put numbers to the destinations of the route bus.	Tsukuba
	9	Driving license test can be taken in English.	Tsukuba
Safety	10	Make disaster prevention announcement in English (The BA coordinator of Aomori Center is in charge of this).	Rokkasho
	11	Set a terminal of disaster announcement system using the village intranet in each house within FY2011 (Also TV phones connected among village people are provided free).	Rokkasho
	12	Introduced the collaborating emergency response system made by Aomori Center to the fire department and police station.	Rokkasho
Life	13	Provide various checkups and events (Invitation cards for concerts at the convention center are sent to foreigners).	Rokkasho
	14	The village provided a field to be used by Japanese and foreigners as vegetable patches.	Rokkasho
Urban planning	15	The tram line from the nearest train station is planned to extend to reach CERN.	Geneva

3 Issues

【Current situation】

【Background/Factors】

Employment of foreigners	1	It is not possible to immediately hire well-qualified people, even when those people were available.	⇒	Neither Director Generals nor Directors have authority for employment. There is not strategic employment measures for hiring staff members such as fixed-term employment system of 3-5-year.	JAEA
	2	Acceptance of foreign researchers is restricted according to their nationalities.	⇒	Non-proliferation/Security policy of the national government	JAEA

JAEA-Review 2013-014

	3	Foreign researchers have difficulty in obtaining research fund in Japan (except from laboratory budget).	=>	There is no strategic measures to obtain budget for foreign researchers nor support systems for foreign researchers to obtain laboratory budget etc.	JAEA
Working situation of the families	4	Difficulties for their spouses and children to get job are the obstacle for many researchers to stay in Japan for a long period.	=>	Challenges relating to language barrier, obtaining visa (working visa). There are not systems for job introduction.	JAEA
Education for the families	5	Very few researchers came with their families due to the education for their children.	=>	Compatibility of the international school and foreign education systems are low.	J-PARC
	6	The international school in Rokkasho includes junior high school classes, and therefore there are cases where children had to leave it during the last year of the junior high school.			Aomori
	7	Japanese researchers' children are not allowed to enter the international school.		Graduation requirements of Japanese schools are not satisfied with those schools because they are categorized as miscellaneous schools.	Aomori
Manpower in JAEA	8	Talents that can be active internationally have not yet developed in JAEA.	=>	Young people tend to be inward-focused and they have less interest in the outer world. Now that the English courses in JAEA have been closed, no efforts are currently made to improve English ability of the staff. Systemic problems for working overseas such as the incompatibility of the pension program Administrative staff transfer to other sections in a few years, and the career path to make use of English ability and international experience is not clear.	JAEA
	9	Shortage of manpower due to the aging of staff population and retirement.	=>	Fostering of young staff is insufficient. Shortage of human resources (Active use of retired staff may be necessary.)	Nuclear Human Resource Development Center
English ability	10	As administrative staff's English ability is low, they cannot support foreigners.	=>	There is not training system.	JAEA
Accommodation	11	There are cases where accommodation problem becomes an obstacle for foreign researchers to bring their families with them.	=>	Accommodation facilities of JAEA are not enough.	J-PARC
	12	Obtaining good accommodation (accommodation facilities equipped with kitchen) is difficult.	=>	Shortage of the budget for welfare	Nuclear Human Resource Development Center, Integrated Support Center for Nuclear Nonproliferation and Nuclear Security
Research environment	13	At CERN, its designer constructs systems for net conference, research database and procurement of materials, instead of outsourcing. JAEA does not have this function.	=>	Structural system is not developed and system designers are not fostered.	JAEA
English translation	14	Translations of indications should be made with care not to use improper English.	=>	There is no department where native check is available.	JAEA
	15	Rules such as "Work Rule for Employees" have not been translated into English.	=>	There is not a translation team.	JAEA
	16	English versions of e-mail address and phone number search systems are not provided.	=>	There is not a translation team.	JAEA
	17	English version of the work management system is not provided.	=>	There is not a translation team.	JAEA

Transportation	18	Transportation is not convenient.	⇒	There is not public transportation services that connects the nearest station and the laboratories. (If any, the service frequency is very low.)	Tokai, Aomori
			⇒	Transportation service is not provided for users.	J-PARC
Shipping support	19	Shipping before and after research in Japan is time consuming (especially the preparation for customs). At CERN, there is a department in charge of shipping, and it takes care of procedures regarding shipping including arrangement for a mover that comes to the house or accommodation to get packages, and delivery of the packages to the place to move into. JAEA does not provide these services.	⇒	JAEA does not have a coherent system to support foreign researchers from time to arrive in Japan to time to leave Japan.	JAEA
Hospitality	20	At JAEA, holding receptions are not easy due to many restrictions regarding meeting expenses.	⇒	The restrictions regarding meeting expenses are strict (Restriction on the use of public fund).	JAEA
	21	Overseas training organization often plans and conducts weekend events such as sight seeing trip. These are not conducted in the training of JAEA.	⇒	The expenses cannot be borne. Necessary people cannot be secured.	JAEA
Opportunity for information exchange	22	There is no place where researchers can exchange information casually such as a cafeteria.	⇒	Shortage of the budget for welfare	JAEA

4 Suggestions

Establish small local teams consisting of motivated administrative staff who are interested internationalization (The members of this committee will take the leadership).

Appendix No.3 Progress of English translation at JAEA (December 2012)

	Area	Title	Responsible division	Situation	Attack in future
(1) Documents and tools for recruitment	Dispatch of information	JAEA Website	Public Relations Department	Addressed (English available), Under consideration for upgrade	
	Recruitment	Recruitment information (posted on websites)	Personnel Department	Addressed (English available)	
		Job information site "Rikunabi" (only for new graduates)	Personnel Department	Unaddressed	
		JAEA's resume format	Personnel Department	Addressed (English available)	
(2) Documents and tools necessary at the time of employment	Life	Instruction on how to get to the examination hall (posted on websites)	Personnel Department	Addressed (English available)	
		Living information	International Affairs Department	Addressed (English available)	
		Emergency procedures	International Affairs Department	Addressed (English available)	
		Maps of sites	Safety management division of each institute/center	Partly addressed (J-PARC)	
(3) Documents and tools necessary after employment	Salary and labor procedures	Traffic signs in sites and signs of buildings	General affairs division of each institute/center	Partly addressed (Nuclear Science Research Institute, J-PARC)	
		Employment contract (Senior Post- Doctoral Fellow, Post- Doctoral Fellow, etc.)	Personnel Department	Addressed (English available)	
		Direct deposit (change) request (notes)	Personnel Department	Addressed (English available)	
		Direct deposit (change) request (salary)	Personnel Department	Addressed (English available)	
		Direct deposit (change) request (salary and fixed deposit)	Personnel Department	Addressed (English available)	
		Dependent report (example)	Personnel Department	Addressed (English available)	
		Commuting/address report (example)	Personnel Department	Addressed (English available)	
		Housing report (example)	Personnel Department	Addressed (English available)	
		Transfer without family report (example)	Personnel Department	Addressed (English available)	
		Status confirmation on allowances after transfer	Personnel Department	Addressed (English available)	
	Salary and labor procedures	Dependent exemption (change) report (example)	Personnel Department	Addressed (English available)	
		Health insurance nonworking dependents (change) report (example)	Personnel Department	Addressed (English available)	
		List of the attachment documents for insured approval	Personnel Department	Addressed (English available)	
		Dependent situation report (example)	Personnel Department	Addressed (English available)	
		Address change report for the Employees' Insurance (example)	Personnel Department	Addressed (English available)	
		Application for Third Insured Person (example)	Personnel Department	Addressed (English available)	
		Address change report for the National Pension Plan (example)	Personnel Department	Addressed (English available)	
		Lump sum request to the Employees' pension fund (example)	Personnel Department	Addressed (English available)	
		Withdrawal Report of the Employees' pension fund (example)	Personnel Department	Addressed (English available)	
		Health report	Personnel Department	Addressed (English available)	
	Welfare benefit	Lodgings regulation	Personnel Department	Unaddressed	Kick around on a priority basis
		JAEA's residence/dormitory application	Welfare division of each institute/center	Addressed (English available)	
		Instruction for the use of JAEA residence/dormitory	Welfare division of each institute/center	Partly addressed (Masago International Dormitory)	
	System use	E-mail address application (change) form	Center for Computational Science & e-System	Partly addressed (application page)	
	Work management	IP address application (change) form	Center for Computational Science & e-System	Partly addressed (application page)	
		Employment regulation (including related notices)	Personnel Department	Addressed (English available)	
	Training materials	Manual for discretionary labor system	Personnel Department	Addressed (English available)	
		handouts for training of new employees (focused on new graduates)	Personnel Department (Materials are made by each division)	Unaddressed	
	All	Japan Atomic Energy Agency Act	General Affairs Department	Unaddressed	
	Overall procedures	Intranet (the English intranet portal web)	International Affairs Department	Addressed (English available)	
		Extension telephone number search system	International Affairs Department	Addressed (English available)	
	Work management	External presentation/publication permission system	General Affairs Department	Unaddressed	Kick around on a priority basis
		Service managerial system (Lysithea)	Personnel Department	Addressed (English available)	
	Business trip	JAEA's Regulations of travel expenses (including related notices)	Personnel Department	Unaddressed	
		Guidance on the provision of travel expenses	Personnel Department	Unaddressed	Kick around on a priority basis
		Business travel order form	Personnel Department	Unaddressed	Kick around on a priority basis
		Outside duty form (outside duty order/travel expense payment request)	Personnel Department	Unaddressed	
		Overseas business trip system	Personnel Department	Unaddressed	
		Guidance on the provision of travel expenses for international travel	International Affairs Department	Unaddressed	
		Overseas medical-expenses provision application	Personnel Department	Unaddressed	
		Payment slip distribution	Personnel Department	Addressed (English available)	
		Form of retirement payment declaration (example)	Personnel Department	Unaddressed	Kick around on a priority basis
		Report on change in family members	Personnel Department	Unaddressed	Kick around on a priority basis
Salary and labor procedures	Salary	Report on family name/first name change	Personnel Department	Unaddressed	
		Use of maiden name (start/stop)	Personnel Department	Unaddressed	
	Salary and labor procedures	Report on change (correction) in insured/dependant's health insurance information	Personnel Department	Unaddressed	
		Notes on return of leased goods on transferring	Personnel Department	Unaddressed	
		Estimate request for moving	Personnel Department	Unaddressed	
		Estimated moving price check list	Personnel Department	Unaddressed	
		Report on completion of moving/Request for clearance of moving expenses	Personnel Department	Unaddressed	
		Request for expenses to travel to new place of work	Personnel Department	Unaddressed	
		Child care leave application	Personnel Department	Unaddressed	
		Birth report of a child (for childcare leave)	Personnel Department	Unaddressed	
		Childcare leave end report	Personnel Department	Unaddressed	
		Request for extra work (overtime/holiday work) exemption for child care	Personnel Department	Unaddressed	
		Request for extra work (overtime/holiday work) restriction for child/elderly care	Personnel Department	Unaddressed	
	Welfare benefit	Social insurance procedures required when taking childcare leave (briefing material)	Personnel Department	Unaddressed	
		Application for outside lecture classes/Attendance	Personnel Department	Unaddressed	
		Application for overtime/holiday work (exemption/restriction)	Personnel Department	Unaddressed	
		Controlled area entrance/exit record system	Personnel Department	Unaddressed	Kick around on a priority basis
	Welfare benefit	Application for the use of canteen	Welfare division of each institute/center	Unaddressed	Kick around on a priority basis
		Canteen menu	Welfare division of each institute/center	Addressed (English is available, pork and beef are indicated)	
Property administration	Property administration	Application for permission/declaration regarding information processing outside JAEA and application for taking out personal computers or other information equipment	Financial Affairs Department	Unaddressed	Kick around on a priority basis
		Personal computer data elimination confirmation	Financial Affairs Department	Unaddressed	Kick around on a priority basis
	Information management	Webmail login	Center for Computational Science & e-System	Unaddressed	
		Invention report	Center for Computational Science & e-System	Addressed (English available)	
	Intellectual property management	Application for research grant	Industrial Collaboration Promotion Department	Partly addressed (English application form)	
		Regulations on Personnel evaluation	Personnel Department	Unaddressed	Kick around on a priority basis
	Personnel evaluation	Personnel evaluation table	Personnel Department	Unaddressed	Kick around on a priority basis
		Personnel evaluation manual	Personnel Department	Unaddressed	
	Use of library	Application for member card	Intellectual Resources Department	Addressed (English available)	
		Library search system	Intellectual Resources Department	Addressed (English available)	
		E Journal search system	Intellectual Resources Department	Addressed (English available)	
		E books search system	Intellectual Resources Department	Addressed (English available)	
	Computer use	Application of super computers	Center for Computational Science & e-System	Addressed (English available)	
		GLOVIA Contract request form, Budget use form)	Financial Affairs Department	Unaddressed	
	Export control	Export control regulations	Financial Affairs Department	Unaddressed	
		Explanatory material of export control	International Affairs Department	Unaddressed	
	Education	Export control manual	International Affairs Department	Unaddressed	
		E-learning	Each responsible division	Addressed (English available)	
	Compliance	"JAEA compliance" (guidance for employees)	Legal Office	Addressed (English available)	
		Compliance casebook	Legal Office	Unaddressed	
	Compliance	Compliance handbook	Legal Office	Unaddressed	
		Guidance for prevention of sexual/power harassment	Personnel Department	Addressed (English available)	
	Other	Institute/center regulations	Documents division of each institute/center	Partly addressed	

※This is a list of documents and system tools considered to be necessary for foreign employees.
 ※Other notices or information sent by E-mail are not included in this list.

Appendix No.4 Issues to be solved in JAEA Internationalization Initiative(1/2)

【Area】	No	【Current situation】	【Background/Contributing factor】	【responsible body】	【Specific measures】	Priority	Supplemental remarks	Current situation	Plans and issues
Safety	1	Emergency information for foreigners are not sufficient (for disaster, accident, etc.).	The number of foreign users increased beyond expectation.	Institutes/Centers	Make emergency audio announcements in sites in bilingual.	A		【Aomori】Operating English public address system both in ordinary times and emergency. 【Tokai】Jin Emergency public address system (Planned to start in Sept. on a trial basis)	Efforts of Aomori and Tokai should be spread to other Institutes/Centers.
	2	Emergency support system for international dormitories (for disaster, accident, etc.) is not organized.		Safety Administration Dept.	Make emergency earthquake alert system available in bilingual.	A		According to Safety Administration Department, currently English version of emergency earthquake alert systems are not on sale.	Consider support by the public address system.
	3	Emergency goods are not stocked.	Occurrence of disasters and accidents is not envisioned.	Centers, International Affairs Dept.	Organize emergency safety confirmation system at international dormitories.	A	This issue should be addressed together with the issue on the unified information management of foreigners.		
Initial support system	4	Information provided at orientation is not adequate.	People conducting orientation do not speak English, or the materials are not in English.	International Affairs Dept. Personnel Dept., Labor Relations Dept.	Prepare English materials for Orientation.	A		【Tokai】International Affairs Department is considering emergency supplies of Masago International Dormitory. (Jan.2013)	Local teams decide their emergency supplies by reference to the contents of emergency supplies of Tokai.
Management of foreigners	5	Management of foreign researchers is not unified.	Information is distributed to Personnel Dept., International Affairs Dept. and there is not unified information management system. (Restriction by personal information protection)	Institutes/Centers	Make English site maps/dormitory information in English (Security matters should be considered.)	A	Institutes/centers need to decide the scope of information to be used in light of security issues.	Addressed. (Mar. 2012) The materials will be posted on English portal site. (Oct. 2012)	(Issue) Revision should be promptly reflected in the English materials.
	6	There is no section to identify needs of foreigners.	Service of International Affairs Dept. is not advertised well, and service desks are not set up at sites.	Personnel Dept., International Affairs Dept.	Explore ways to unify the management of foreign researchers.	A	Scope of information (status, period, etc.) and rules such as how to manage information should be decided.	The system for unified information management is under development. Details are being coordinated toward full-scale operation among related departments.	Full-scale operation will be started in FY2013.
Identification of needs				Institutes/Centers	Intensively advertise the counseling service of International Affairs Dept. (by adding information to handouts of orientation and improving intranet). Set up counseling desks at each site to collaborate with responsible division.		Stick bills on the walls of rooms of Nuclear Science Research Institute and bulletin boards to gather information.	The information of the counseling service is posted on English intranet portal site. (Oct. 2012)	Each local team will consider its counseling service desk.
Job opportunity for families	7	Difficulties for their spouses to get job prevent many researchers from staying in Japan for a long period.	There are language barriers, challenges related to obtaining visa (working visa). There are not job introduction systems.	Local and national governments	Involve Local Governments (support job finding).	A			
Education for families	8			Local Governments	Involve Local Governments (attract international schools).	A		Questionnaire survey was conducted to identify needs among foreigners.	Reach out to municipalities based on the survey result. 【Tokai】The issue will be discussed in the Coordinating committee for TOKAI Internationalization Initiative.
	9	Very few researchers came to Japan with their families due to educational problems of their children.	Japanese international schools are not compatible with foreign education systems.	International Affairs Dept.	Investigate how many researchers brought their children and living with them, and identify the needs for education for their children. (Request local governments based on the findings.)	A		【Tokai】The issue was discussed in the Coordinating committee for TOKAI Internationalization Initiative. *The situation of JAEA (including J-PARC Users) was investigated.	
Accommodation	10	Housing issues prevent some foreign researchers from bringing their families with them to Japan.	The number of JAEA accommodations is not enough. There are not hotels that receive foreigners.	Local Governments	Involve Local Governments (attract hotels).	A			
Research environment	11	CERN has own designers who construct systems for net conference, research database and procurement of materials, without the need for outsourcing. JAEA does not have such a function.	Structural system is not developed and system designers are not fostered.	Center for Computational Science & e-Systems	Integrate systems and foster system designers.	C			
	12	Translation requires caution to prevent improper English.	No department provides native check.	Each division/International Affairs Dept.	Translator teams are not organized.	B	C⇒B Translate signs on site and manuals from what is possible.		
English translation	13	There are not English translations of rules such as “Work Rule for Employees”.	Translator teams are not organized.	Each division/International Affairs Dept.	Translate rules and regulations of JAEA into English (in order of priorities).	C		Partially addressed(See the Progress Report translated in JAEA (the reference material 3))	Depending on the necessity, ask related department to address .
	14	English versions of e-mail address and phone number search systems are not provided.	Translator teams are not organized.	General Affairs Dept.	Organize bilingual search system of email addresses and extension numbers.	B			
	15	Work management system is not available in English.	Translator teams are not organized.	Labor Relations Dept.	Provide English instruction or show example in English.	A	As translation of the entire system is difficult, prepare a description of manual in English.	The work management system has been revised and now is available in bilingual. (See the Progress Report of English translation in JAEA (the reference material 3))	Unaddressed parts and manuals will be addressed. (Issue) Revision should be promptly reflected in the system.

Appendix No.4 Issues to be solved in JAEA Internationalization Initiative(2/2)

【Area】	No	【Current situation】	【Background/Contributing factor】	【Responsible body】	【Specific measure】	Priority	Supplemental remarks	Current situation	Plans and issues
Transportation	16	Transportation is inconvenient.	There are not public transportation services connecting nearest stations and laboratories. (If any, the number is very few.)	Local Governments	Involve Local Governments (review public transportation system).	A		【Tokai】The issue was discussed in the Coordinating committee for TOKAI Internationalization Initiative. *The situation of JAEA (including J-PARC Users) was investigated.	【Tokai】The issue will continue to be discussed.
			Transportation service is not provided for users.	Local Governments	Involve Local Governments (examine the possibility of transportation service for users).	A		【Tokai】The issue was discussed in the Coordinating committee for TOKAI Internationalization Initiative. *The situation of JAEA (including J-PARC Users) was investigated.	【Tokai】The issue will continue to be discussed.
				Institutes/Centers	Increase the accessibility of users to official vehicles and rental cars.	B			
Medical services	17	It is difficult to find medical facilities where English is available.	Getting necessary information is difficult.	International Affairs Department, Centers/Institutes	Provide information on the intranet.	A		Post links to information of medical facilities available on the English intranet portal site. [Aomori]As English is not used in the medical facilities, the local team support foreigners when they go to medical facilities.	International Affairs Department and local teams work together to get and provide more information.
Shipping support	18	Shipping packages before and after research in Japan is time consuming (especially the preparation is time consuming). At CERN, there is a system for shipping by arranging moving companies to be at researchers' houses to receive packages, and delivery of the packages to their new places. JAEA does not provide these services.	JAEA does not have a coherent support system for foreign researchers that is available from arrival to and departure from Japan.	J-PARC, Centers/Institutes, International Affairs Dept.	Review current accepting process and examine the possibility of building diversified acceptance system.	B			
Hospitality	19	At JAEA, holding receptions are not easy due to many restrictions regarding meeting expenses.	There is a strict restriction on conference fund). (Restriction on the use of public fund).	International Affairs Dept, General Affairs Dept.	Examine the possibility of mitigating restriction on conference expenses.	B			
	20	Overseas training institutes often organize weekend events such as sight seeing trips. These are not provided in JAEA's trainings.	There are problems related to budget and manpower.	Local Governments	Involve Local Governments (request support of the local international associations)	A		【Tokai】The issue was discussed in the Coordinating committee for TOKAI Internationalization Initiative. *The situation of JAEA (including J-PARC Users) was investigated.	【Tokai】The issue will continue to be discussed.
	21	As installing Skype is prohibited, TV conferences with overseas invited researchers via Skype are not possible.			Mitigate restriction related to information security, find an alternative and propose it to each division.	B		The situation was surveyed. (Skype is not installed in this prohibited software.)	(Issue) Compliance of security rules.
Information technology	22	Invited foreigners cannot communicate easily with organizations they belong to.	There are restrictions related to information security.	Center for Computational Science & e-Systems	Improve the network system of JAEA and adjust the security levels to allow such communication.	C		The situation was surveyed. (Recommend the network for outside users (Guest Net).)	Examine solutions. (Issues) ①Peripherals such as printers in the workplaces cannot be used ②Journals posted on intranet cannot be read. ③The computing machines connected to the intranet cannot be used. ④Time out comes soon. ⑤Links posted on received e-mails cannot be seen.
	23	There is no place like cafeterias where researchers can exchange information casually.	Budget shortage in the welfare field.	Institutes/Centers	Prepare places for foreigners to exchange information.	B	Provide a place effective for this purpose.		

※A: Issues which are highly urgent or important, and considered to be solved without major obstacles (e.g. restriction of budget, manpower/time and system), and therefore should be addressed preferentially.

B: Issues which are highly urgent or important, but considered to be difficult to solve due to minor obstacles (e.g. restriction of budget, manpower/time and system).

C: Issues which are not highly urgent or important, and considered to be difficult to solve due to major obstacles (e.g. restriction of budget, manpower/time and system).

国際単位系 (SI)

表 1. SI 基本単位

基本量	SI 基本単位	
	名称	記号
長さ	メートル	m
質量	キログラム	kg
時間	秒	s
電流	アンペア	A
熱力学温度	ケルビン	K
物質モル	モル	mol
光度	カンデラ	cd

表 2. 基本単位を用いて表されるSI組立単位の例

組立量	SI 基本単位	
	名称	記号
面積	平方メートル	m ²
体積	立方メートル	m ³
速さ, 速度	メートル毎秒	m/s
加速度	メートル毎秒毎秒	m/s ²
波数	毎メートル	m ⁻¹
密度, 質量密度	キログラム毎立方メートル	kg/m ³
面積密度	キログラム毎平方メートル	kg/m ²
比体積	立方メートル毎キログラム	m ³ /kg
電流密度	アンペア毎平方メートル	A/m ²
磁界の強さ	アンペア毎メートル	A/m
量濃度 ^(a) , 濃度	モル毎立方メートル	mol/m ³
質量濃度	キログラム毎立方メートル	kg/m ³
輝度	カンデラ毎平方メートル	cd/m ²
屈折率 ^(b)	(数字の)	1
比透磁率 ^(b)	(数字の)	1

(a) 量濃度 (amount concentration) は臨床化学の分野では物質濃度 (substance concentration) ともよばれる。

(b) これらは無次元量あるいは次元 1 をもつ量であるが、そのことを表す単位記号である数字の 1 は通常は表記しない。

表 3. 固有の名称と記号で表されるSI組立単位

組立量	SI 組立単位			
	名称	記号	他のSI単位による表し方	SI基本単位による表し方
平面角	ラジアン ^(b)	rad	1 ^(b)	m/m
立体角	ステラジアン ^(b)	sr ^(c)	1 ^(b)	m ² /m ²
周波数	ヘルツ ^(d)	Hz		s ⁻¹
力	ニュートン	N		m kg s ⁻²
圧力, 応力	パスカル	Pa	N/m ²	m ⁻¹ kg s ⁻²
エネルギー, 仕事, 熱量	ジュール	J	N m	m ² kg s ⁻²
仕事率, 工率, 放射束	ワット	W	J/s	m ² kg s ⁻³
電荷, 電気量	クーロン	C		s A
電位差 (電圧), 起電力	ボルト	V	W/A	m ² kg s ⁻³ A ⁻¹
静電容量	ファラド	F	C/V	m ⁻² kg ⁻¹ s ⁴ A ²
電気抵抗	オーム	Ω	V/A	m ² kg s ⁻³ A ⁻²
コンダクタンス	ジーメンズ	S	A/V	m ⁻² kg ⁻¹ s ³ A ²
磁束	ウェーバ	Wb	Vs	m ² kg s ⁻² A ⁻¹
磁束密度	テスラ	T	Wb/m ²	kg s ⁻² A ⁻¹
インダクタンス	ヘンリー	H	Wb/A	m ² kg s ⁻² A ⁻²
セルシウス度 ^(e)	セルシウス度 ^(e)	°C		K
光強度	ルーメン	lm		cd sr ^(c)
放射線量の放射能 ^(f)	ルクス	lx	lm/m ²	m ⁻² cd
吸収線量, 比エネルギー分与, カーマ	ベクレル ^(d)	Bq		s ⁻¹
	グレイ	Gy	J/kg	m ² s ⁻²
線量当量, 周辺線量当量, 方向性線量当量, 個人線量当量	シーベルト ^(g)	Sv	J/kg	m ² s ⁻²
酸素活性	カタール	kat		s ⁻¹ mol

(a) SI接頭語は固有の名称と記号を持つ組立単位と組み合わせても使用できる。しかし接頭語を付した単位はもはやコヒーレントではない。

(b) ラジアンとステラジアンは数字の 1 に対する単位の特別な名称で、量についての情報を付たえるために使われる。実際には、使用する時には記号rad及びsrが用いられるが、習慣として組立単位としての記号である数字の 1 は明示されない。

(c) 測光学ではステラジアンという名称と記号srを単位の表し方の中に、そのまま維持している。

(d) ヘルツは周期現象についてのみ、ベクレルは放射性核種の統計的過程についてのみ使用される。

(e) セルシウス度はケルビンの特別な名称で、セルシウス温度を表すために使用される。セルシウス度とケルビンの単位の大きさは同一である。したがって、温度差や温度間隔を表す数値はどちらの単位で表しても同じである。

(f) 放射性核種の放射能 (activity referred to a radionuclide) は、しばしば誤った用語で"radioactivity"と記される。

(g) 単位シーベルト (PV,2002,70,205) についてはCIPM勧告2 (CI-2002) を参照。

表 4. 単位の中に固有の名称と記号を含むSI組立単位の例

組立量	SI 組立単位		
	名称	記号	SI 基本単位による表し方
粘度	パスカル秒	Pa s	m ⁻¹ kg s ⁻¹
力のモーメント	ニュートンメートル	N m	m ² kg s ⁻²
表面張力	ニュートン毎メートル	N/m	kg s ⁻²
角速度	ラジアン毎秒	rad/s	m m ⁻¹ s ⁻¹ =s ⁻¹
角加速度	ラジアン毎秒毎秒	rad/s ²	m m ⁻¹ s ⁻² =s ⁻²
熱流密度, 放射照度	ワット毎平方メートル	W/m ²	kg s ⁻³
熱容量, エントロピー	ジュール毎ケルビン	J/K	m ² kg s ⁻² K ⁻¹
比熱容量, 比エントロピー	ジュール毎キログラム毎ケルビン	J/(kg K)	m ² s ⁻² K ⁻¹
比エネルギー	ジュール毎キログラム	J/kg	m ² s ⁻²
熱伝導率	ワット毎メートル毎ケルビン	W/(m K)	m kg s ⁻³ K ⁻¹
体積エネルギー	ジュール毎立方メートル	J/m ³	m ⁻¹ kg s ⁻²
電界の強さ	ボルト毎メートル	V/m	m kg s ⁻³ A ⁻¹
電荷密度	クーロン毎立方メートル	C/m ³	m ⁻³ sA
表面電荷	クーロン毎平方メートル	C/m ²	m ⁻² sA
電束密度, 電気変位	クーロン毎平方メートル	C/m ²	m ⁻² sA
誘電率	ファラド毎メートル	F/m	m ³ kg ⁻¹ s ⁴ A ²
透磁率	ヘンリー毎メートル	H/m	m kg s ⁻² A ⁻²
モルエネルギー	ジュール毎モル	J/mol	m ² kg s ⁻² mol ⁻¹
モルエントロピー, モル熱容量	ジュール毎モル毎ケルビン	J/(mol K)	m ² kg s ⁻² K ⁻¹ mol ⁻¹
照射線量 (X線及びγ線)	クーロン毎キログラム	C/kg	kg ⁻¹ sA
吸収線量率	グレイ毎秒	Gy/s	m ² s ⁻³
放射強度	ワット毎ステラジアン	W/sr	m ² m ⁻² kg s ⁻³ =m ² kg s ⁻³
放射輝度	ワット毎平方メートル毎ステラジアン	W/(m ² sr)	m ² m ⁻² kg s ⁻³ =kg s ⁻³
酵素活性濃度	カタール毎立方メートル	kat/m ³	m ⁻³ s ⁻¹ mol

表 5. SI 接頭語

乗数	接頭語	記号	乗数	接頭語	記号
10 ²⁴	ヨタ	Y	10 ⁻¹	デシ	d
10 ²¹	ゼタ	Z	10 ⁻²	センチ	c
10 ¹⁸	エクサ	E	10 ⁻³	ミリ	m
10 ¹⁵	ペタ	P	10 ⁻⁶	マイクロ	μ
10 ¹²	テラ	T	10 ⁻⁹	ナノ	n
10 ⁹	ギガ	G	10 ⁻¹²	ピコ	p
10 ⁶	メガ	M	10 ⁻¹⁵	フェムト	f
10 ³	キロ	k	10 ⁻¹⁸	アト	a
10 ²	ヘクト	h	10 ⁻²¹	ゼプト	z
10 ¹	デカ	da	10 ⁻²⁴	ヨクト	y

表 6. SIに属さないが、SIと併用される単位

名称	記号	SI 単位による値
分	min	1 min=60 s
時	h	1 h=60 min=3600 s
日	d	1 d=24 h=86 400 s
度	°	1°=(π/180) rad
分	′	1′=(1/60)°=(π/10800) rad
秒	″	1″=(1/60)′=(π/648000) rad
ヘクタール	ha	1 ha=1 hm ² =10 ⁴ m ²
リットル	L, l	1 L=1 l=1 dm ³ =10 ³ cm ³ =10 ⁻³ m ³
トン	t	1 t=10 ³ kg

表 7. SIに属さないが、SIと併用される単位で、SI単位で表される数値が実験的に得られるもの

名称	記号	SI 単位で表される数値
電子ボルト	eV	1 eV=1.602 176 53(14)×10 ⁻¹⁹ J
ダルトン	Da	1 Da=1.660 538 86(28)×10 ⁻²⁷ kg
統一原子質量単位	u	1 u=1 Da
天文単位	ua	1 ua=1.495 978 706 91(6)×10 ¹¹ m

表 8. SIに属さないが、SIと併用されるその他の単位

名称	記号	SI 単位で表される数値
バール	bar	1 bar=0.1 MPa=100 kPa=10 ⁵ Pa
水銀柱ミリメートル	mmHg	1 mmHg=133.322 Pa
オングストローム	Å	1 Å=0.1 nm=100 pm=10 ⁻¹⁰ m
海里	M	1 M=1852 m
バイン	b	1 b=100 fm ² =(10 ⁻¹² cm) ² =10 ⁻²⁸ m ²
ノット	kn	1 kn=(1852/3600) m/s
ネーパ	Np	SI単位との数値的な関係は、対数量の定義に依存。
ベベル	B	
デジベル	dB	

表 9. 固有の名称をもつCGS組立単位

名称	記号	SI 単位で表される数値
エルグ	erg	1 erg=10 ⁻⁷ J
ダイン	dyn	1 dyn=10 ⁻⁵ N
ボアズ	P	1 P=1 dyn s cm ⁻² =0.1 Pa s
ストークス	St	1 St=1 cm ² s ⁻¹ =10 ⁻⁴ m ² s ⁻¹
スチルブ	sb	1 sb=1 cd cm ⁻² =10 ⁻⁴ cd m ⁻²
フォトル	ph	1 ph=1 cd sr cm ⁻² 10 ⁴ lx
ガリ	Gal	1 Gal=1 cm s ⁻² =10 ⁻² ms ⁻²
マクスウェル	Mx	1 Mx=1 G cm ² =10 ⁻⁸ Wb
ガウス	G	1 G=1 Mx cm ⁻² =10 ⁻⁴ T
エルステッド ^(c)	Oe	1 Oe ≐ (10 ³ /4π) A m ⁻¹

(c) 3 元系のCGS単位系とSIでは直接比較できないため、等号「 ≐ 」は対応関係を示すものである。

表 10. SIに属さないその他の単位の例

名称	記号	SI 単位で表される数値
キュリー	Ci	1 Ci=3.7×10 ¹⁰ Bq
レントゲン	R	1 R = 2.58×10 ⁻⁴ C/kg
ラド	rad	1 rad=1 cGy=10 ⁻² Gy
レム	rem	1 rem=1 cSv=10 ⁻² Sv
ガンマ	γ	1 γ=1 nT=10 ⁻⁹ T
フェルミ	f	1 フェルミ=1 fm=10 ⁻¹⁵ m
メートル系カラット		1メートル系カラット = 200 mg = 2×10 ⁻⁴ kg
トル	Torr	1 Torr = (101 325/760) Pa
標準大気圧	atm	1 atm = 101 325 Pa
カロリ	cal	1 cal=4.1858 J (「15°C」カロリ), 4.1868 J (「IT」カロリ) 4.184 J (「熱化学」カロリ)
ミクロン	μ	1 μ =1 μm=10 ⁻⁶ m

