

FY 2016 Entrusted
survey by MEXT

Survey on management by presidents of National Research and Development Agencies in Japan

Report

March 2017

Ernst & Young Shin Nihon LLC

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I. Scope of survey

1. Background and purpose of survey

During the 5th Science and Technology Basic Plan (approved by the Cabinet on January 22, 2016), the national R&D agency, spearheading innovation systems, is called upon to work on organizational reform and functional enhancement, with the president in particular required to demonstrate as many management skills as possible, such as the ability to develop and operate appropriate internal control.

Effective and efficient management by the president of the national R&D agency is one of the important factors for the agency to exhibit excellent performances as the core of open innovations. A survey was conducted for the state of development of the internal control system of the national R&D agency (“agency”) under the jurisdiction of the MEXT and good practices by the president were collected to improve the management power of the president and function of agency to investigate the functional improvement of the agency management system.

The survey was divided into the survey on the management to maximize R&D achievements and the survey on the improvement of internal control and separately conducted with different approaches.

In the survey on the management to maximize R&D achievements, effective management initiatives implemented by the agency president are collected and shared by agencies to improve their management, as well as leveraging survey results in future discussion by the National Research and Development Agency Council for enhancing and reinforcing management at agencies. The survey is not used to evaluate the management system. There are several management approaches and the one chosen depends on the mission of individual agencies or the management style of the president. There are also various good ideas and practices. The survey thus aimed to allow the agencies to share good practices collected in the survey and for the president of each agency to select suitable practices to promote effective use of the same.

Considering the requirements to improve the environment where the president can exhibit the intended leadership to manage efficiently and effectively, the survey on the improvement of internal control aimed to promote understanding of common issues concerning the improvement and management of the environment across the national R&D agency in light of internal control.

2. Survey details and methods

(1) Review by the external expert committee

A committee comprising external experts (Survey on the President’s Management of the National Research and Development Agencies, or hereafter the “Committee”) was set up to provide advice and cooperation.

1) Committee members

Committee members: (Order of Japanese syllabary, honorifics omitted)

Nobuyuki Osakabe, corporate officer, CSO & CTO of Healthcare Business Unit, Hitachi, Ltd.

Chair: Sonosuke Kadonaga, President, Intrinsic

Atsushi Tsunami, Professor, Vice President of National Graduate Institute for Policy Studies

Tsuguya Fukui, President, St. Luke's International University

2) Committee schedules

<Committee schedules>

No.	Date	Subject of discussion	Document
1st committee	Nov. 8	<ul style="list-style-type: none"> • Confirmation of survey planning • Prioritized subjects (management items) • Questionnaire items 	<ul style="list-style-type: none"> • “Survey implementation plan (draft)” • “National R&D agency management items (draft)”
2nd committee	Jan. 20	<ul style="list-style-type: none"> • Questions in interviews by agency 	<ul style="list-style-type: none"> • “Report of questionnaire results (preliminary report)” • “Interview results (draft)”
3rd committee	Feb. 23	<ul style="list-style-type: none"> • Analytical report for survey results • Format of the report 	<ul style="list-style-type: none"> • “Questionnaire results analytical report” • “Interview results analytical report” • Outline of report (draft)
4th committee	March 9	<ul style="list-style-type: none"> • Presentation and inspection of the final report (draft) 	<ul style="list-style-type: none"> • “Final report (draft)”

(2) Survey on the “implementation of a system ensuring proper operations (internal control)”

The control environment (one where the president can exhibit the intended leadership), distribution and awareness of institutional regulations and the current state of evaluations and improvements, etc., as described in the “Development of a system ensuring proper operations of the incorporated administrative agency” were surveyed.

1) Literature survey

The internal control of the agency, i.e., the implementation state of a system ensuring proper operations was surveyed based on regulations provided by the agency.

2) Questionnaires

Mainly management, planning and general affairs divisions of eight national R&D agencies under the jurisdiction of MEXT were surveyed.

The questionnaires were designed to contain various questions relating to the current state of system implementation to ensure proper operations (internal control).

The results of survey were classified by agency and item, etc. to sort out and analyze the tendencies and characteristics of the development of internal control.

3) Interviews

Interviews relating to the development of internal control included the following issues on which many agencies tended to make strenuous efforts, because it is effective to collect and share practices that have already been implemented and preferable to confirm various approaches for the internal control about compliance:

- (3) - 2) Budget distribution mechanism corresponding to research evaluation results
- (4) Securing and nurturing of human resources
- (1) - 7) Measures to promote internal control

Four agencies were chosen for interviews from those having replied “already started” for items (3) - 2) and (4).

(3) Survey on items relating to the “maximization of R&D achievements”

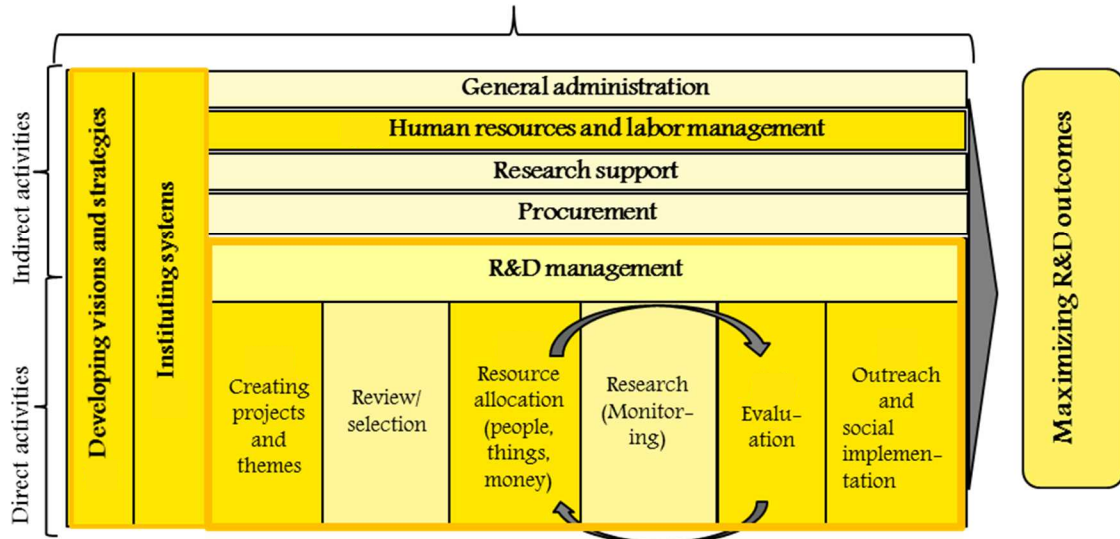
Details of specific methodologies and approaches for management to maximize R&D achievements in the agency were surveyed and sorted and good management practices by the agency president to maximize R&D achievements were collected.

Focusing attention on R&D processes, specific management for individual processes and actual operations were queried by questionnaires.

For the practices that may potentially serve as a useful management benchmark, specific facts, including their background, awareness of problems and issues and approaches to implementation were surveyed.

<Main R&D processes surveyed>

Operations of national R&D agencies
R&D processes focused on in the survey:



1) Literature survey

Publications (e.g. papers, reports and books) about R&D processes and management were used as references in the management survey of R&D achievements. Mid to long-term objectives and plans of the agency were also used as references.

2) Questionnaires

i) Period

December 28, 2016 to January 28, 2017

ii) Methods

Questionnaires were conducted for eight national R&D agencies under the jurisdiction of MEXT.

Questionnaires were intended to narrow down the key points of management and perspectives required for topics to focus on in interviews.

Positioning of management to maximize R&D achievements and the approaches of the president were surveyed by requesting not only details of specific practices, including their background and progress, but also missions of the agency as viewed by the president and approaches to maximize R&D achievements.

3) Interviews

i) Period

February 1 to 16, 2017

ii) Method

Interviews were conducted for eight national R&D agencies under the jurisdiction of MEXT.

Details of the management practices to maximize R&D achievements, identified in questionnaires, were asked and additional information that could not be captured in questionnaires was also collected.

II. Results of surveys on the “implementation of a system ensuring proper operations (internal control)”

1. Purposes of survey

Effective and efficient management by the agency president is one of the important factors for the agency to exhibit excellent performances as the core of open innovations. It is essential to improve the environment where the president can exhibit the intended leadership for efficient and effective management. In this survey, therefore, environmental improvement and operations environment were examined with internal control in mind.

2. Results of literature survey

(1) Outline of internal control

The Committee of Sponsoring Organizations of Treadway Commission (COSO) published its Internal Control - Integrated Framework in 1992, which has since been widely accepted and used worldwide. It is also recognized as a leading framework to evaluate design, applicability, operation and validity of internal controls. A revised version of this framework was released in May 2013.

In this framework, internal control is defined as follows:

Internal control is a process, effected by an entity's board of executives, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in operations, reporting and compliance.

(2) Institutionalization of internal control in incorporated administrative agencies

Provisions on internal control, namely, “provisions on the development of a system ensuring proper operation of the national R&D agency to guarantee compliance of the execution of duties of directors (other than auditors) with this act, individual act or other acts and regulations as well as provisions provided in the ordinance and notification of the competent ministry” shall be added to the business and service documents for the incorporated administrative agency in accordance with the amendment as of June 13, 2014.

The provisions to be contained in the business and service documents are indicated in the notification of the Ministry of Internal Affairs and Communications about the Development of System Ensuring the Proper Operations of the Incorporated Administrative Agency” (“MIC Notification”).

(3) MIC Notification

The MIC Notification introduced the concept of “Internal Control - Integrated Framework” published by the Committee of Sponsoring Organizations of Treadway Commission (COSO). Based on this framework, the internal control of the incorporated administrative agency is defined as follows:

Internal control of the incorporated administrative agency is “a system developed and operated by the agency president for effective and efficient implementation of the missions of the incorporated administrative agency based on mid-term objectives, etc. by executing operations pursuant to applicable laws and regulations.

It also defines the composition (basic elements) of internal control, required to achieve objectives, as follows:

1) *Control environment (improving the environment where the president can exhibit the intended leadership)*

A platform for determining the characteristics of the organization and molding the attitudes of all members of the organization toward control as well as composing other basic elements affecting the risk evaluation and response, control activity, information and communication, monitoring and ICT operation.

2) *Risk evaluation and response*

A set of processes for identifying elements interrupting the missions of the incorporated administrative agency as risk and analyzing and evaluating the risk to ensure an appropriate response.

3) *Control activity (a system ensuring effective and efficient operations by the directors and regular employees of the agency pursuant to related laws and regulations)*

Policies and procedures provided to ensure proper implementation of instructions and directions of the president. Control activities include the allocation of authority and responsibility and wide-ranging policies and procedures for allocating duties, etc. These policies and procedures should be incorporated in work processes and function only when executed by all staff of the organization.

4) *Information and communication (a system for distributing suitable information to members of the organization so that the internal control system functions effectively and retaining and managing information on the execution of directors' duties)*

Identification, understanding and processing of required information to distribute to all parties concerned within and outside the organization. Information required for all members of the organization to fulfill their duties must be identified, understood, processed and distributed properly and promptly. It is important to ensure the required information is not only distributed but also understood by the recipients and shared by all members of the organization who require it.

Generally speaking, a manually operated or automated infocommunication system is used to identify, classify, process and distribute information.

5) *Monitoring (installation of monitoring systems (internal and for auditors))*

A process of continuously evaluating that internal control effectively functions. Internal control is always monitored, evaluated and corrected through monitoring. Monitoring comprises regular monitoring incorporated in work and independent monitoring completely separated from work, both of which can be used independently or in combination.

6) *ICT operation*

Suitable ICT operation within and outside the organization based on appropriate policies and procedures determined in advance to accomplish missions.

ICT operation is not necessarily independent of other basic elements of internal control, but used as criteria to judge the validity of internal control, essential to achieve the objectives of internal control if the organization largely depends on ICT, or advanced ICT is widely used in the infocommunication system. ICT operation comprises the operation of the ICT environment and the application and management of ICT.

In addition, the objectives of improving internal control in the incorporated administrative agency were classified into the following four categories in MIC Notification:

1) *Effective and efficient business operation*

Effective business operation involves accomplishing missions of the incorporated administrative agency while carrying out work based on mid-term objectives, etc. and efficient business operation involves working more efficiently.

2) *Compliance with laws and regulation relating to business activities*

Compliance with laws, regulations applicable to business activities must be maintained.

3) *Safeguarding of assets*

Assets must be acquired, used and disposed of in line with proper procedures and approvals for safeguarding them.

4) *Reliability of financial reports, etc.*

Reliability of information concerning financial and non-financial reports must be ensured for accountability to the public and third-party evaluation.

The MIC Notification requires the agency to provide concrete descriptions (in writing) of a total of 108 items classified into six basic elements of internal control and seven provisions including “others” in the business and service documents.

(4) Survey policies

As stated above, the basic framework for implementing internal control at the incorporated administrative agency is determined by the MIC Notification, where the concept of Internal Control - Integrated Framework published by the Committee of Sponsoring Organizations of Treadway

Commission (COSO) was employed. Accordingly, items in the survey of the development state of a system ensuring proper operations (internal control) were designed based on the MIC Notification.

3. Results of questionnaires

(1) Design of the survey items

As stated in “2. Results of literature survey,” the MIC Notification requires the incorporated administrative agency to include descriptions about 108 items of internal control classified into seven provisions: 1) control environment, 2) risk evaluation and response, 3) control activity, 4) information and communication, 5) monitoring, 6) ICT operation and 7) others in its business and service documents as the provisions on internal control, namely “provisions on the development of a system ensuring the proper operation of the national R&D agency to guarantee the compliance of the execution of duties of directors (other than auditors) with this act, individual act or other acts and regulations as well as provisions provided in the ordinance and notification of competent ministry.”

Hence, the state of internal control can be surveyed with these 108 items, but with the workload of the surveyed agencies in mind, survey items were narrowed down while the survey purposes remained unchanged.

First, the “1) control environment” is defined in the MIC Notification as “the environment where the agency president can exhibit the intended leadership.” Since this survey aimed to identify the state of the “development of the environment where the agency president can exhibit the intended leadership,” “1) control environment” was selected as the survey item.

“2) risk evaluation and response” comprises “a set of processes to respond to risks appropriately by identifying, analyzing and evaluating the factors interrupting the accomplishment of missions assigned to the incorporated administrative agency as risk” in the MIC Notification, namely an item requiring the construction of a risk management system. The survey aimed to collect management practices by the president and this item relating to the risk management system, one of the management systems to be established by the president, was chosen as the survey item.

In addition, “an appropriate system ensuring an adequate distribution of budgets based on operating expenses grants (e.g. use of appropriate rules for the review of budget distribution, etc.) and “budget distribution mechanism corresponding to the results of research evaluations,” etc., listed in “7) others” in the MIC Notification, were also chosen considering their importance in the discussion of what the agency’s management system should be.

The items relating to human resources development and provision on monitoring were also added while referencing internal control practices in private companies (“Standard for the evaluation and audit of internal control regarding financial report,” Reference 1 Example evaluation items relating to company-wide internal control relating to financial reports).

(2) Survey method

As the survey aimed to provide ways to strengthen the capability of national R&D agency for their management system, the survey method was selected to identify the current management system status as much as possible.

Specifically, checklists were used to examine existing items and the agency was requested to submit details of existing policies, guidelines and regulations.

Checklists were developed based on the COSO framework, in terms of three perspectives (control activity, information and communication and monitoring) as well as self-evaluation to collect information on the effective functioning of the efforts and problems, if any.

Items concerning unique approaches devised by the agency and issues that were difficult to handle were also included.

The survey items for understanding the state of compliance with the revised accounting standards of the incorporated administrative agency (e.g. review of monetization units of operating expenses grants and disclosure range of segment information), in which a high level of interest was shown in the preceding interviews, were also added.

(Survey design for control activity, information and communication and monitoring)

Control activity (systems and regulations)

- There are regulations
- There are limited regulations
- There is no regulation

Information and communication (distribution and dissemination)

- Provided in organized and planned manner (shared by entire organization)
- Provided to some extent (partially assigned)
- Not provided (not disseminated)

Monitoring (evaluation and improvement)

- Provided in organized and planned manner (periodic, comprehensive)
- Provided to some extent (irregular, partial)
- Not provided

(3) Results of survey

The results of the survey are shown in the attached sheets.

1) Outline of results for “A. Control activity”

All eight national R&D agencies replied that they planned to provide or had already provided policies, guidelines, regulations and/or manuals for 23 out of 33 items in “A. Control activity.”

Details of the items for which policies, guidelines, regulations and/or manuals were “Not provided” or “There are limited regulations” are described in 2) to 9) below.

2) “Budget distribution mechanism corresponding to the results of research evaluations”

Two agencies replied “There is no regulation” for items in “(1) - 6) Measures for research business: Whether a research evaluation system has been established in the Research Management Division.” The following regulations were provided at the agency which responded “There are regulations”:

- Research evaluation system
 - “R&D Theme Evaluation Regulations”: The research theme shall be evaluated by the R&D evaluation committee comprising external experts with sufficient evaluation capability and evaluated in terms of fairness.
 - “Evaluation Regulations”: Mid-term R&D themes shall be evaluated by the mid-term R&D theme promotion committee comprising a director in charge of the relevant research and staff members assigned by the president and operations other than mid-term

- R&D themes by the division manager and further by the president (evaluation by directors, self-evaluation).
- “Operation Evaluation Regulations”: R&D themes shall be evaluated by the evaluator assigned by the president.
 - “Institutional (Self) Evaluation Regulations”: Institutional (self) evaluation shall be done by the self-evaluation committee comprising the president as the chair, directors and staff members commissioned or assigned by the president.
 - “R&D Evaluation Regulations”: Institutional evaluation shall be done by a group of external experts (institutional and self-evaluations are used to evaluate R&D measures).
 - “R&D Evaluation Regulations”: The R&D themes, etc. shall be evaluated by external experts specializing relevant research fields, or the performance evaluator for the chief of a unit organization such as the research group or laboratory which is a unit of R&D.
 - “Formulation of a self-evaluation committee”: A self-evaluation committee comprising the president as the chair, directors, councilors, managers of the corporate planning division, general affairs division and the administrative strategy office of the corporate planning division shall be formulated for the self-evaluation of overall operations.
- Criteria for research budget distribution
 - “Business Management Regulations”: Self-evaluation, external evaluation and evaluation by the competent minister shall be reflected appropriately in mid- to long-term plans and internal resource allocation, etc.
 - “Business Management Regulations”: The evaluation results of operations performed by directors or managers according to the operation plans derived from mid- to long-term or annual plans shall be thoroughly taken into account when managing agencies and allocating management resources.
 - “Business Operation Related Evaluation Regulations”: The evaluation results of (R&D) themes shall be reflected appropriately in the relevant business operations and institutional evaluation.
 - “Institutional (Self) Evaluation Regulations”: The results of institutional (self) evaluation shall be reflected appropriately in operational improvements, including a review of research plans and allocation of budgets and human resources.
 - “R&D Evaluation Regulations”: The evaluation results shall be proactively used for R&D activities, including annual plans and resource allocation policies.
 - “Formulation of the self-evaluation committee”: The president shall reflect the result of self-evaluation and WG evaluation in the review of agency business operations for improvements.

For “(3) - 2) Budget distribution mechanism corresponding to the results of research evaluations,” three agencies replied that “There is no regulation.” The agency which replied that “There are regulations” could base this reply on the above-mentioned “research budget distribution criteria.”

The operation state of this system is described in “4. Results of interviews.”

3)“Promotion of internal control”

For “(1) - 7) Measures for promoting internal control,” only one agency replied “there are limited regulations.” Checking the submitted relevant regulations revealed the absence of directors in charge of internal control, persons responsible to promote internal control and promotional division (the audit office was designated for this role). The following practices were identified in the agency which replied “There are regulations”:

- Case 1

The management responsible for internal control: Director responsible for legal audit and integration of business operation plans (general manager)

Person in charge of promotion: Manager, executive manager or equivalent (person in charge of promotion)

Promotional division: Legal audit and business operation plan integration division

- Case 2

The management responsible for internal control: President (chief executive). Director in charge of management (general manager)

Person in charge of promotion: Administrative manager (general manager for promotion), manager, director or center director, etc. (persons in charge of promotion)

Promotional division: Legal compliance division

- Case 3

The management responsible for internal control: President (chair of the internal control committee), director in charge of general affairs (internal control)

Person in charge of promotion: Administrative manager (in charge of promoting internal control)

Promotional division: General administration division of general affairs department (a section responsible for promoting internal control)

- Case 4

The management responsible for internal control: Director in charge of compliance (general manager)

Person in charge of promotion: Manager, center director or program director, etc. (person in charge of promotion)

Promotional division: Research compliance headquarters (general section)

- Case 5

The management responsible for internal control: Director in charge of internal control
(executive responsible for internal control)

Person in charge of promotion: Manager of internal control promotion office, internal
control promotion headquarters (person in charge of promoting internal control)

Promotional division: Internal control promotion office, internal control promotion
headquarters (internal control promotion division)

4) “Personnel management policies, etc.”

For “(1) - 19) Policies on the personnel management system,” four agencies replied “There is no regulation.” In addition, checking the relevant regulations submitted by other agencies revealed the presence of employment regulations for employment, evaluation and human development, etc.

Based on these regulations, the agencies seemed to believe they have regulations.

Although the term “personnel management policies” has various meanings, the meaning of the overall text would be to prevent coalescent relationships with business partners by dealing with the same business for an extended period.

As precautionary measures, for example, those with a long-term job tenure and periodical job rotation were identified. This seemed to stem from the “basic policies for employment and promotion,” etc. These policies include a guideline for transfer: “Transfer shall be determined by taking into account the provision of various working opportunities, accurate response to wide-ranging administrative issues and busy and quiet times of business occupation and prevention of adverse effects accompanying a long-term tenure at the same post, etc.” When agency regulations were re-examined with this in mind, no such regulations could be found exactly meeting the requirement.

5) “Awareness and clarification of the business flow”

For “(2) - 1) Awareness and clarification to identify risks,” an agency replied “There is no regulation.” The agency which replied “There are regulations” seemed to cite the presence of the following regulations:

- “Rule management regulations” to create, revise and abolish regulations, basic policies and operation manuals
- “Project Plan Management Regulations” to set out the basics of planning relating to operational implementation
- “Business and service documents” to facilitate a business flow by division
- “Comprehensive Risk Management Regulations” to prove basic risk management regulations for activities to prevent the emergence of obstructive factors for conducting R&D and reduce the effects of emerged events.

- “Risk Management Regulations” to clarify business flows and analyze risk factors and the cause of occurrence by process when required in risk management (with additional notes to balance effectiveness and efficiency and use of the potentially most effective method not necessarily limited to operational documentation).
- “Risk Management Regulations” to specify the creation of business flows by business division as one of the risk management systems.
- A set of operation manuals

6) “Emergency measures when an accident/disaster occurs”

For “(2) - 4) Emergency measures when an accident/disaster occurs,” an agency replied “There are limited regulations.” Checking the submitted relevant regulations revealed that the agency decided not to have regulations because there is no training based on the risk management regulations.

7) “Bidding and contract”

For “(2) - 6) Bidding and contract,” four agencies replied “There are limited regulations.” Checking the submitted relevant regulations revealed that three agencies do not have “Measures when the mid-term plans cannot be achieved due to bidding failures,” and an agency does not have affiliate agency and did not see any need to provide “Regulations for contracts with subsidiary agencies” or regulations for “Grasping the information on contracts between the subsidiary agency and the third party.”

The agency which replied “There are regulations” for “Measures when the mid-term plans cannot be achieved due to bidding failures” also inserted a sentence meaning “the person in charge of contract may close a free contract when there is no bidder in bidding, there is no winning bidder in repeated bidding, or the winning bidder does not close a contract” in the contract regulations.

8) “Disclosure of emerging risks”

For “(2) - 8) Disclosure of emerging risks,” an agency replied “There is no regulation.” Those which replied “There are regulations” decided on this reply based on the presence of the following regulations:

- Creation of a PR manual concerning risk management that consolidates how to identify the situation, establish emergency headquarters, create position papers, provide anticipated questions and planned answers, respond to the press, government agencies and the general public and distribute information to the staff.
- Insertion of a section in the PR manual for the response to emergency reporting to consolidate basic policies, the information released to the press and response guidelines.

- Provision of the tasks of a team to respond to the press in the response headquarters as part of the risk management regulations or manual.

9) “Securing and nurturing human resources”

For “(4) Securing and nurturing human resources,” six agencies replied “There are limited regulations.” The development and operation of a system to recruit and nurture human resources are described in “4. Results of interviews.”

4. Results of interviews

(1) Policies of interviews

Interviews concerning the state of improvement in internal control aimed to confirm the agencies having already dealt with problems, considered difficult to solve by many agencies, for the purpose of comparison and sharing.

Accordingly, the questions in interviews included “(3) - 2) Budget distribution mechanism corresponding to the results of research evaluations” and “(4) Securing and nurturing of human resources” in which there are comparatively many responses of “Not provided” or “Partially provided” for policies, guidelines and regulations and manuals in “A .Control activity” and at the same time, stronger relationships with the maximization of R&D achievements. Because detailed confirmation was desired for unique approaches for internal control on compliance, “(1) - 7) Measures for promoting internal control” was also included in interviews.

Four agencies were selected for interviews from those having already dealt with both (3) - 2) and (4), or either of them (B, C, H and F in the attached sheet “Results of questionnaires on the improvement state of internal control, etc.”

(2) Implementation of interviews

Interviews were carried out as follows:

Date	Interviewee
February 14 (Tues.)	B
February 14 (Tues.)	C
February 21 (Tues.)	H
February 24 (Fri.)	F

(3) Interview results

1) Budget distribution mechanism corresponding to the results of research evaluations.

The development and operation of regulations concerning the budget distribution mechanism corresponding to the research evaluation results were examined through a literature survey and interviews.

The following were identified from four agencies (please refer to the table for the characteristics of these agencies):

- (a) In terms of regulations, all the surveyed agencies were found to have provided the basic framework for conducting evaluation (self-evaluation, internal evaluation), planning and progress confirmation in various documents according to the incorporated administrative agency system. Therefore, this may be considered the standard for developing regulations in this category.

- (b) Agency F provided more detailed evaluation procedures compared with other agencies based on the “Guideline for Evaluation of Research and Development in MEXT.” The system is also unique in that external experts participate in the evaluation.

- (c) With regard to the actual operation (state of operation), all four agencies developed and operated self-evaluation regulations to evaluate R&D achievements according to the incorporated administrative agency evaluation system. In addition, agency F provided evaluation methods (institutional evaluation, R&D evaluation) in units of R&D themes and agency H carried out evaluation in units of R&D programs by itself (other agencies commissioned the task to the R&D division).

- (d) Agencies B, C and F allocate a specific budget to the research division based on the budget in the previous fiscal year and the research division allocated budgets to individual R&D projects and subjects. Agency H determined the budget for individual projects by close investigation through interviews of project teams (to which a budget is allocated). Agency F allocated incentive budgets to the research center, etc. based on the evaluation results of incorporated administrative agencies.

- (e) As stated above, each agency employed different concepts and methods of evaluation and the budget distribution differs from other agencies because of differences in the nature of R&D and the scale of the organization.
Agencies B and C had limited methods of achieving their R&D project plans, while agencies F and H used several techniques to achieve their R&D project plans and the choice affected the efficiency and effectiveness.
For these reasons, the former allocated personnel and budgets mainly to ensure ensuring the completion of projects, though taking the evaluation results into account comprehensively. This means the degree of evaluation results used for budget distribution is small.

In contrast, the latter selected a technique most likely to maximize R&D achievement from various techniques capable of achieving the goal of the program and restructured projects and teams based on the evaluation results. The degree of evaluation results used for budget distribution is therefore large.

Agency H is comparatively small in scale and its R&D themes are specialized, allowing the management of individual teams (to which a budget is allocated) within the agency. In contrast, other agencies commissioned the management of R&D themes, projects and teams to the research center, etc. due to the large scale and diversified R&D themes.

Agency		B	C	H	F
Item					
Degree of development	Regulations	<ul style="list-style-type: none"> Evaluation regulations Detailed rules of the formulation and operation of the self-evaluation committee Detailed rules of the operation of the mid-term R&D theme promoting committee Business management regulations 	<ul style="list-style-type: none"> Evaluation regulations Business plan management regulations 	<ul style="list-style-type: none"> Regulations to formulate and evaluate mid-term plans Formulation of a self-evaluation committee Regulations for budget management 	<ul style="list-style-type: none"> R&D evaluation regulations
	Outline	<ul style="list-style-type: none"> Provision of a self-evaluation system and procedures IAW the IAA evaluation system Provision of the basic business operation management method IAW the IAA system 	<ul style="list-style-type: none"> Provision of an internal/external evaluation system and procedures IAW the IAA evaluation system Provision of the basic measures for project planning and management IAW the IAA system 	<ul style="list-style-type: none"> Provision of a planning, progress management and evaluation system and procedures IAW the IAA system Provision of measures for budget management including distribution based on evaluation results 	<ul style="list-style-type: none"> Provision of systems and procedures for institutional evaluation and R&D theme evaluation in addition to self-evaluation IAW the IAA evaluation system.
State of operation	R&D evaluation	<ul style="list-style-type: none"> Self-evaluation (IAW the IAA evaluation system) 	<ul style="list-style-type: none"> Self-evaluation (IAW the IAA evaluation system) 	<ul style="list-style-type: none"> (a) Self-evaluation (IAW the IAA evaluation system) (b) R&D program evaluation 	<ul style="list-style-type: none"> (a) Evaluation of measures for R&D (self-/institutional evaluation) (b) R&D theme Evaluation
	Frequency	<ul style="list-style-type: none"> Every year 	<ul style="list-style-type: none"> Every year 	<ul style="list-style-type: none"> (a) Every year (b) Before, during and after R&D programs 	<ul style="list-style-type: none"> (a) Every year (b) Before, during and after R&D themes
	Feedback of evaluation results	<ul style="list-style-type: none"> Reflection of general evaluation results in agency's management and resource allocation IAA evaluation results (e.g. S, A) does not affect the amount of budget. 	<ul style="list-style-type: none"> IAA evaluation results (e.g. S, A) does not affect the amount of budget. 	<ul style="list-style-type: none"> Improvement, elimination or optimization of R&D program teams (to which budget is allocated) 	<ul style="list-style-type: none"> Allocation of incentive budgets to research center, etc. IAW IAA evaluation results (e.g. S,A)
	R&D budget distribution	<ul style="list-style-type: none"> The president allocates to research divisions (center level) IAW mid- to long-term or annual plans. The center director 	<ul style="list-style-type: none"> Allocation to R&D divisions in the same way as the previous fiscal year. The research strategy division allocates budgets to R&D themes. 	<ul style="list-style-type: none"> Allocation based on interview results, etc. of teams (to which budgets are allocated) 	<ul style="list-style-type: none"> Executives allocate centers based on interview results of center directors The center director is responsible for allocation within the

Agency		B	C	H	F
Item		allocates to groups and smaller teams			center.
	Budget distribution type	Frame budget distribution type ¹	Frame budget distribution type	Individual assessment type ²	Frame budget distribution type
Trend	Flexibility of prioritized projects during mid to long-term plans ³	Low	Low	High	High

2) Securing and nurturing human resources

The development and operation of regulations to secure and nurture human resources were surveyed through a literature survey and interviews.

The following were identified from four agencies subject to interviews (please refer to the table for characteristics of these agencies):

- (a) In terms of the development of regulations, although the details depend on agencies, all agencies basically provided the system, procedures and proficiency criteria by job category and job grade for personnel evaluation. Accordingly, this may be considered the standard for developing regulations in this category.
- (b) Agency C provided detailed written criteria for the figure and proficiency required by the agency for its employees. This may be a good example for more strategic human resources development.
- (c) With regard to actual operation (state of operation), some agencies (F and H) analyzed the human resources required and formulated a committee to make strategic recruitment plans; taking into account the research fields to be reinforced at agency and national levels, while an agency (B) had the problem of making mid- to long-term recruitment strategy due to reduced budgets.
- (d) With regard to the evaluation system, approaches used by agency H are unique. The agency has to recruit and foster highly capable players to improve its international competitiveness and accordingly, established an environment suitable for not only an organizational mission accomplishing type research but also research based on free ideas with a system useful for both.

¹ The allowance of budgets from the prospective financial source of the fiscal year is determined for each division and the division makes budgetary planning based on this allowance.

² Each of the means subject to budget distribution is assessed for a zero-base budget review.

³ Flexibility means the diversity of methods (e.g. R&D methods) used to accomplish projects determined in mid- to long-term plans.

As a means to achieve this goal, the evaluation system in the process of installation is such that the leader evaluates by referring to the opinion of leaders of outside organizations to which the agency supplies services so that contributions to organizational mission accomplishing type research projects and externally-funded research projects by other organizations are properly evaluated, allowing the budget (incentive) to be allocated to research based on free ideas.

(e) Agency F reviewed the institution and employed a policy to increase the proportion of permanent research staff. This is partly because 1) fixed-term researchers accounted for 90 percent as a result of matching the project duration and employment period of participating researchers to maintain or improve mobility and operability, but this made the employment significantly unbalanced and 2) researchers could not be re-employed as fixed-term employees once employed under fixed-term conditions in accordance with the amendment of the Labor Standards Act, which jeopardized the continuity of the agency as the research institute.

Agency		B	C	H	F
Degree of development	Regulations	<ul style="list-style-type: none"> Personnel system regulations personnel evaluation regulations 	<ul style="list-style-type: none"> Human resources development policy Graded ability regulations 	<ul style="list-style-type: none"> Regulations for determining initial salary, promotion, etc. Staff management regulations Evaluation regulations of staff in age retirement system 	<ul style="list-style-type: none"> Detailed criteria for initial salary, promotion, pay rise, etc. Detailed regulations, etc. for job classes of clerical staff
	Outline	<ul style="list-style-type: none"> Provision of required ability by job category and class Provision of evaluation methods 	<ul style="list-style-type: none"> Provision of procedures for setting personnel development objectives and development policies in sectional and personal units every fiscal year IAW desired figure and ability as well as relevant policies Provision of required proficiency criteria by grade 	-	<ul style="list-style-type: none"> Provision of required ability by job category and class Provision of evaluation methods
State of operation	Employment	<ul style="list-style-type: none"> The personnel committee (with the president as adviser) discusses replacement and employment of skilled researchers with the achievement of mid to long-term plans in mind, Long-term employment and personnel plan are ideal but nowhere in sight partly because of shrinking budget. 	<ul style="list-style-type: none"> The human resources development committee determines the employment of experienced workers A fixed-term staff (innovation fellow) system was installed for accepting world-class researchers with high pay, but result is not yet produced. Cross-appointments are used. 	<ul style="list-style-type: none"> An employment examination committee, comprising the president, directors, advisors and special advisors, was launched for analyzing required personnel and making new, strategic recruiting plans in consideration of reinforcement of research as an agency and for the nation. 	<ul style="list-style-type: none"> The research personnel council, etc. determines policies and systems to achieve mid- to long-term plans. A new hierarchical system was implemented IAW agency's policies.
	Evaluation	<ul style="list-style-type: none"> Evaluation of the level of achievement for 	<ul style="list-style-type: none"> Promotion and demotion of staff 	<ul style="list-style-type: none"> A personnel evaluation system 	<ul style="list-style-type: none"> Evaluation of degree of accomplishment of

Agency		B	C	H	F
Item		predefined goals and exhibited degree of ability required for individual job classes.	depend on the graded ability criteria.	review commission was launched to evaluate contributions to organizational mission accomplishment type research and allocate incentives to research based on free ideas. • A large difference from the conventional personnel evaluation system is that the leader of agency's research group makes evaluation by referring to the opinion of leaders of various organizations because of potential increases in the simultaneous participation in outside organizational mission accomplishment type research projects and externally funded research projects.	predefined goals and exhibition of ability required for individual job classes • Clerical staff and research staff are separately evaluated in different criteria and the evaluation focus of research staff depends on the center and project.
	Human resources development	• The plan created seven years ago is being reviewed.	• Human resources development IAW policies for development • To prevent enclosure of researchers by project which is likely to occur in R&D division, a cross-divisional system is under discussion.	• Systematic feedback of interviews by superiors after personnel evaluation.	-

3) Measures for promoting internal control

The development of regulations for promoting internal control was surveyed through a literature survey and interviews.

The following were identified from four agencies (please refer to the table for characteristics of these agencies):

- (a) The regulations are developed from “measures for promoting internal control” in the business and service documents, or consolidation of each of six components of internal control contained

in the MIC Notification. In either case, no defects were found in provisions. Therefore, this may be considered as the standard to develop regulations in this category.

(b) With regard to actual operation (state of operation), there were several practices as listed below.

It is recommended to take appropriate approaches by separating efforts from existing risk management efforts.

- a) Regulations were developed in accordance with the basic policies for internal control (provisions for basic issues on internal control contained in the business and service documents) and the state of operation is monitored.
- b) The state of response to potentially critical themes of basic internal control policies (e.g. research expenditure management, information security) is reported to the relevant committee once a year.
- c) Issues required for management judgment are discussed.
- d) Persons in charge of promoting internal control attend the board of directors to ensure all important issues are reported and discussed at the board of directors.
 - e) The risk management, compliance and other committees hold an internal control committee to report on and discuss potentially critical issue each time such issues arise.
- f) All critical defects or flaws detected are reported to the general manager of the governing section to take the necessary measures and this is later reported and discussed at the internal control committee.

(c) With regard to risk management, all agencies identify and evaluate all risks adversely affecting agencies and plan, take and monitor countermeasures for those that management deems critical. Agency F also identifies and evaluates risks and takes countermeasures by division. Therefore, this may be considered the benchmark for developing regulations in this category.

Item \ Agency		B	C	H	F
Degree of development	Regulations	• Internal control promotion regulations	• Internal control implementation policies	• Internal control promotion regulations	• Internal control regulations
	Outline	• Provision of consolidating mainly systems and activities (education, training, monitoring, reports, audits) based on “measures for promoting internal control” in the business and service documents.	• Clarification of guidelines for the notification from the Administrative Management Bureau of MIC classified into a group of six components of internal control (control environment, risk evaluation and response, control activity, information and communication, monitoring and ICT	• Provision of consolidating mainly systems and issues discussed in the internal control committee (setup of an internal control promotion system setup and relating regulations, results of regular monitoring and improvement measures) based on “matters promoting internal control” in	• Provision of consolidating mainly systems and operation (on-the-job training, reports) based on “matters for promoting internal control” in the business and service documents.

Agency		B	C	H	F
Item			operation)	the business and service documents.	
State of operation	Promotion of internal control	<ul style="list-style-type: none"> Development and monitoring of internal control by confirming the development of regulations and governing sections on each article of the basic policy of internal control contained in the business and service documents and examining them at the internal control committee. 	<ul style="list-style-type: none"> The board of directors is responsible for promoting internal control and discussing issues requiring management decision (e.g. association with My Number and other potentially critical themes). The person in charge of promoting internal control must always attend the board of directors to report and examine critical issues without omission and later confirm the adequacy of measures taken. The person in charge of promoting internal control confirms monitoring of a group of six components of internal control specified in the internal control implementation guideline twice a year and reports the result to the board of directors. 	<ul style="list-style-type: none"> The risk management committee, compliance committee, harassment committee, conflicts-of-interest management committee and other committees hold an internal control committee for reporting and discussing a potentially critical issue each time such an issue takes place. 	<ul style="list-style-type: none"> Important themes regarding the basic policy of internal control (e.g. research expense management, information security) and response are reported to the committee once a year. Every one of critical defect or flaw detected is reported to the general manager of the governing section for taking necessary measures and this is later reported and discussed at the internal control committee.
	Internal control committee (the time is an example)	<ul style="list-style-type: none"> A committee which develops regulations IAW the basic policy of internal control and monitors the state of operation. 	<ul style="list-style-type: none"> A committee which examines issues requiring management decision A committee which confirms the report and examination of critical issues. A committee which monitors the basic internal control policies (a group of six components of internal control) 	<ul style="list-style-type: none"> A committee which discusses potentially critical and urgent issues. 	<ul style="list-style-type: none"> A committee which monitors potentially critical themes of basic internal control policies (e.g. research expenditure management, information security). A committee which examines critical defects and flaws detected.
	Risk management	<ul style="list-style-type: none"> The risk management committee identifies and evaluates all risks which may adversely affect the agency and makes a response plan for those which are to be preferentially responded. The risk management committee monitors the progress of the response plan twice a year. 	<ul style="list-style-type: none"> A comprehensive risk management system was installed to respond not only to operational risks but also to compliance related risks. Company-wide critical risks are defined as priority management risks and subject to reduction efforts. A comprehensive risk 	<ul style="list-style-type: none"> All risks potentially affecting the agency were comprehensively identified and evaluated a few years ago. Based on the above results, critical risks were selected from potential operational risks and improvements were conducted. 	<ul style="list-style-type: none"> The risk management committee identifies and evaluates all risks which may adversely affect the agency and makes a response plan for those which are to be preferentially responded. Individual sections also identify and evaluate risks and provide response

Agency		B	C	H	F
Item					
			management team headed by the director for general affairs promotes the efforts.		plans. The risk management committee makes confirmation of these plans.
	Relationships between internal control and risk management	<ul style="list-style-type: none"> Risk management is entirely entrusted to the risk management committee and committee members take partial responsibility. 	<ul style="list-style-type: none"> Critical issues on internal control requiring management decision and risks subject to priority management in the comprehensive risk management system may overlap. 	<ul style="list-style-type: none"> Risks requiring early management decision are handled by the internal control committee and those requiring long-term improvement are dealt by the risk management committee. 	<ul style="list-style-type: none"> Themes monitored by the internal control committee and risks handled by the risk management committee may overlap (information security was the overlap in this fiscal year).

5. Summary of survey results

All eight agencies developed and implemented their policies, guidelines, regulations and manuals for 23 internal control items out of 33 such items subject to this survey. This may be interpreted that some means have been taken for this theme.

The budget distribution mechanism corresponding to the results of research evaluations has been established by taking into account the nature of R&D and scale of agencies, etc. This is an important suggestion when considering suitable management models for the national R&D agency.

To secure and nurture human resources, policies for recruiting internationally competitive talent through a flexible salary system are indicated in the national R&D agency system, but this is difficult due to limited budgets. Accordingly, a review of the personnel system was mainly discussed with the employment and development of brilliant young researchers in mind.

In promoting internal control, good practices alone are insufficient because the efforts of private companies cannot be used as a benchmark, but each agency has instead devised unique approaches. With regard to risk management activities, some agencies provide comprehensive response measures by founding governing committees to identify and evaluate all risks which may adversely affect agencies and making response plans for risks divided into the priority management (“priority management risks”). An agency combines risk identification and evaluation by division for more sophisticated management.

Response to risks and improvement in management issues are characterized by a tradeoff with the requirements for budgets and personnel as well as measures such as improvements in regulations and increases in awareness. In this sense, comprehensive risk management, such as risk evaluation agreed by committee members, including directors and plans to respond to priority management risks may be a good approach to reduce significant risk.

At the same time, the comprehensive approach will also reduce the scope for divisions not related to priority management risks to participate in dealing with risk management. Accordingly, risk management is likely to become closed activities of only the parties concerned. An individual

approach, in which all related divisions take part in risk management, is good in that it allows more people to participate and raise awareness. The downside of this approach is that the risk response tends to be limited to measures open to individuals and divisions, reducing the risk mitigation level.

As stated above, the pros and cons of risk management depend on the method selected. It is desirable for each agency to design a risk management system which can best contribute to maximizing R&D achievements by taking the nature of R&D and scale of the organization into account and selecting an appropriate risk management method.

This survey aimed to understand the present state of regulations provided by agencies and self-evaluation of operation. It is preferable for each agency to determine the requirements for internal control by taking the scale of organization and nature of R&D into account as well as examining the adequacy of regulations and actual operations to improve internal control in future.

III. Results of Survey on “Maximization of R&D Achievements”

1. Purpose of survey

In the 5th Science and Technology Basic Plan, etc., the national R&D agency is expected to be an engine for innovation systems. Management that maximizes R&D achievements is crucial to best meet expectations, which was also pointed out in the discussions at the National Research and Development Agency Committee.

Under these circumstances, effective examples (good practices) of management, an area in which the president of each national R&D agency had always striven, were collected for sharing by agencies to improve their management and reflected in discussions to enhance the management of future national R&D agency at the National Research and Development Agency Committee.

2. Results of literature survey

In surveying the management of R&D achievements, the documents listed in the table below were referenced. The literature survey allowed us to identify the R&D processes used in private companies and R&D institutes and sort the management items required for each of the processes.

<List of Documents Surveyed>

- Management of Research Institutes, Kenji Kurata and Kotaro Kawajiri
- Management of Research and Development, Koichiro Imano
- Innovation and R&D Strategies, Kiminori Genba
- Innovation and Organization, Tadashi Shuto, Tomoaki Ito, Hidenari Henzan
- Enhancement of R&D Management, R&D Management Innovation Project
- Practical R&D Management, Takuya Urakawa
- Industry-Academia-Government Collaborative Management, written and edited by Akio Nagahira, Koji Nishio
- R&D as Engine of Growth Strategy, Hisao Kimura
- Report of Surveys on Goals and Evaluation of National Research and Development Agencies, Ernst & Young Shin Nihon LLC
- Survey and Analytical report for R&D Evaluation Systems in Overseas Governmental R&D Institutes, Institute for Future Technology
- Survey and Analytical report for Evaluation Examples Applied to Research Management of R&D Institutes, Mitsubishi Research Institute, Inc.
- Mid- to long-term objectives, mid- to long-term plans and business performance evaluation on National Research and Development Agencies, etc.

(Only titles and authors were translated.)

3. Results of questionnaires for presidents

Questionnaires for the presidents of eight agencies under the jurisdiction of MEXT were conducted.

The survey focused on the requirements and key points of management that must be clarified in interviews to maximize R&D achievements.

Positioning of management to maximize R&D achievements and policies of presidents were also identified by not only asking about specific management examples to maximize R&D achievements, including their background and progress, but also presidents' opinions about the missions of agencies and concept of maximizing R&D achievements. The survey items are listed below.

<Survey Items>

Question 1: How to understand the mission of the National Research and Development Agency

- (1) Your opinion about the Agency's mission:
- (2) Achievements you want to realize at present:

Question 2: Specific management efforts and how to realize them

- (1) Management you focus on at present
 - Management targets and processes
 - Specific management efforts
- (2) Management and its implementation mechanism on which you wish to focus in future

Question 3: Management efforts that you want to introduce to and share with other agencies

If you want to introduce your management approach to other agencies and share your ideas with them, please write down.

4. Interview results of presidents

The presidents of agencies were asked to answer questionnaires about their actual efforts and approaches, including the meaning and background of these efforts.

Details of interviews are shown below.

<Outline of interviews>

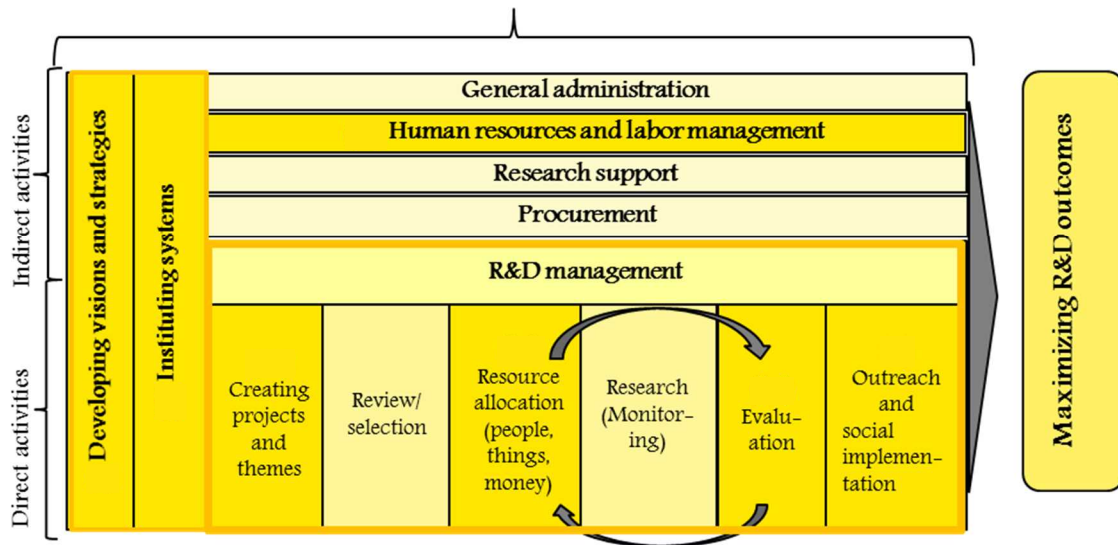
Date	Interviewee	Committee member
February 1 (Wed.)	National Institute for Materials Science (NIMS) President Kazuhito Hashimoto	N. Nagakabe
February 2 (Thu.)	[Private sector] Mitsubishi Electric Corp. Special adviser Tamotsu Nomakuchi	
February 3 (Fri.)	RIKEN President Hiroshi Matsumoto	T. Fukui
February 9 (Thu.)	The Japan Science and Technology Agency (JST) President Michinari Hamaguchi	A. Tsunami
	[Private sector] The Japan Science and Technology Agency (JST) Adviser Michiharu Nakamura	
February 10 (Fri.)	Japan Aerospace Exploration Agency (JAXA) President Naoki Okumura	
February 14(Tue.)	National Institutes for Quantum and Radiological Science and Technology (QST) President Toshio Hirano	T. Fukui
February 15 (Wed.)	National Research Institute for Earth Science and Disaster Prevention (NIED) President Haruo Hayashi	
	Japan Agency for Marine-Earth Science and Technology (JAMSTEC) President Asahiko Taira	
February 16 (Thu.)	Japan Atomic Energy Agency (JAEA) President Toshio Kodama	

5. Summary of survey results

Focusing attention on R&D processes in summarizing survey results, management practices by the presidents of national R&D agencies for items of management and implementation were consolidated based on the main R&D processes subject to survey as shown below:

<Main R&D processes subject to survey>

R&D processes focused on in the survey:



R&D process	Definition	Operation
Vision strategy development	A vision as an agency or organization, future progress and direction are clarified and plans and operating methods determined to achieve the vision and goals.	<ul style="list-style-type: none"> • Development of general visions and general strategies • Development of individual visions and strategies • Decision of priority areas and topics • Association to national policies and inspection of social needs
System development	Approaches to implement visions and strategies are developed and reviewed and a system or framework for implementation is created.	<ul style="list-style-type: none"> • Improvement of planning capability • Approaches for a decision-making mechanism • Formulation, change and abolition of research organizations, development of R&D environment • Transfer of authority to recruit, develop and allocate human resources
Project & theme creation	Plans for implementing strategies and visions are made and various ideas and issues are set for creating R&D Achievements and problem-solving.	<ul style="list-style-type: none"> • Development of strategies and policies of individual research organizations • Development of new research fields, inspection of exploratory research • Market research and application study • R&D state of foreign and other organizations on

R&D process	Definition	Operation
		individual research themes <ul style="list-style-type: none"> • Inspection and planning of individual themes <ul style="list-style-type: none"> - Inspection of goals and milestones - Inspection of research implementation methods and systems - Inspection of budget and schedule • Inspection of perspectives of social return
Review & selection	Ideas and issues for creating R&D achievements and solving problems are prioritized based on competitive superiority, feasibility and potential.	<ul style="list-style-type: none"> • Selection criteria and method • Inspection of planning IAW selection criteria and method (preliminary evaluation) • Theme selection meeting • Decision of selection conditions and budget estimate
Resource allocation (people, items, money)	Human resources, budget, equipment and facilities required for creating and solving R&D achievements and issues are allocated to prioritized R&D themes.	<ul style="list-style-type: none"> • Research theme meeting • Decision of research plans and systems • Resource allocation
Research (monitoring)	Laws and principles are clarified by observing, searching and analyzing events and the truth of events is extensively pursued (or actual application or exit is materialized (R&D)).	<ul style="list-style-type: none"> • Process management, output and milestone management • Cost management, effort management • Development of research environment • Motivation of researchers and assurance of degree of freedom • Involvement of superiors (e.g. R&D manager) • Feedback meeting
Evaluation	Future direction of truth or achievements found and materialized during research is determined by justifying the resources and processes used for research to define values, for example, from good or bad characteristics and capability.	<ul style="list-style-type: none"> • Interim evaluation <ul style="list-style-type: none"> - Confirmation of progress and goal achievement • Feedback of research evaluation results <ul style="list-style-type: none"> - Review of plans, research and resource allocation • Ex-post facto evaluation <ul style="list-style-type: none"> - Confirmation of goal achievement state - Analysis of cause of unachievable R&D • Inspection of methods for social return of R&D achievements
Outreach & social implementation	R&D achievements are extensively returned to society and the usefulness and significance of achievements are published and disseminated.	<ul style="list-style-type: none"> • Outreach (PR) activities to improve public awareness of R&D • Comprehensible press release, information disclosure • Promotion of increasing the use of R&D achievements • Inspection of methods for utilizing R&D

R&D process	Definition	Operation
		achievements in human resources development • Follow-up evaluation - State of progress and utilization of R&D achievements - Economic benefit and availability, etc., ripple effect
General administration	Financing, legal, accounting and information services activities	-
Human resources & labor management	Personnel, employment, education and payment activities	-
Research support	Technical assistance, data management and statistical work for supporting R&D as a whole	-
Procurement	Supply and purchase things and services from outside sources	-
R&D management	A series of activities to maximize R&D achievements (planning and theme creation - inspection, selection and resource allocation (people, things, money) - research (monitoring) - evaluation)	-

The survey results on the management to maximize R&D achievements are arranged as follows:

- (1) Consolidated table for management examples of national R&D agencies
- (2) Case study in management examples by the president
- (3) Differences in management between national R&D agencies and private companies
- (4) Usage of management examples to maximize R&D achievements

(1) Consolidated table for management examples of national R&D agencies

Consolidated table for management examples of national R&D agencies

Purpose	Issue	Solution	No.	Management example
Developing visions and strategies	Developing visions and strategies	Evidence-based, objective and scientific visions and strategies	1	Installation of the information analysis office
		Involvement of staff in empathy buildup to develop visions and strategies	2	Solicitation of views of others through internal comment system
	Disseminating visions and strategies	Continuous distribution of information visions and strategies and collection of opinions in organization	3	Discussion and feedback
Instituting systems	Systems for managing R&D within the organization	Prompt decision-making and connection between management and field staff	4	Assignment of the president's assistant
			5	Assignment of the "assistants" to support directors
		Establishment of a research implementation system to ensure accomplishment of organizational missions	6	Reassessment of organizational structures to address issues and set up working groups
			7	Installation of a research support division
			8	Foundation of R&D centers for mission accomplishment
		Replacement of decision making in sectionalism with integrated R&D management	9	Assignment of a full-time director to the R&D division
			10	Abolition of the headquarter system and use of a divisional system
			11	Director and division manager meetings
	Establishing connections with outside organizations	Extensive networks with various stakeholders	12	Management advisory meetings with outside institutes
			13	Diverse interchanges and relationship with foreign countries (science and technology diplomacy)
		Promotion of collaborative research with private companies	14	Collaborative research with private companies through meetings of industry-academia-government stakeholders meetings
			15	Establishment of open labs with private companies
			16	Financing of local universities and technical colleges for regional vitalization
		Hiring and utilizing researchers	Recruitment of young, talented researchers	17

Purpose	Issue	Solution	No.	Management example
			18	Establishment of a program fostering next-generation research leaders
		Recruitment of diverse research talent	19	Cross-sectoral study meetings
			20	Acceptance of post-docs from abroad
		Research by eliminating barriers in the organization	21	Cross-sectoral study meetings
Creating plans and themes	Creating new fields of research	Encouragement and maintenance of diversified ideas and inventions	22	Establishment of awards for innovation
		Use of open platforms to solicit research subjects	23	New projects by setting up a special administrative structure
		Initiatives suitable for the direction of R&D	24	Operation of strategic president's fund
	Merging existing fields of research	Cooperation of researchers	25	Establishment of virtual labs
		Connection between different fields	26	Establishment of a system fostering next-generation leaders
Evaluation & resource allocation	Efficient and effective resource allocation	Well-considered budget distribution	27	Establishment of an incentive system using expenses at president's discretion
	Fair and equitable evaluation	Proper evaluation of R&D achievements	28	Evaluation of performance with unique characteristics of research in mind (mission-driven research vs. individual research)
		Fair evaluation with diversity in mind	29	Collection of data on evaluation indexes
Outreach and social implementation	Proper information distribution	Adequate relationships with media	30	Continuous response to media such as tours and study meetings
		Restoration of trust in science and technology	31	Various support for earthquake disaster reconstruction
Personnel & labor management	Efficiently producing results	Creation of incentives	32	President's prizes by job category
		Improvement of motivation	33	Means to improve motivation depending on the type of operation
			34	Evaluation to increase motivation
			35	Proper personnel evaluation based on accomplishment
			36	Extension of terms for fixed-term researchers
	Adequate employment and personnel management	Establishment of a system suitable for accomplishing missions	37	Introduction of a system of evaluation by the president
			38	Work-based personnel rotation
		Assurance of the stability and flexibility of employment	39	Increase in proportion of permanent research staff

Purpose	Issue	Solution	No.	Management example
	Developing human resources and talent	Opportunities to develop capability of research staff	40	Introduction of human resource development sheet
General administration	Administration	Establishment of an operation system	41	Operation of resource management PDCA cycle
		Confirmation of administrative results	42	Visualization of operation using corporate techniques (introduction or creation of MVS and BSC)
	Risk reduction	Indexing of management risks	43	Follow-up with management slips
		Assurance of advisory system	44	Third party perspectives of advisors
	Improving project management	Vitalization of improvement activities	45	Deployment of “organizational diet project activities”

(2) Case study in management examples by the president

Case study in management examples by the president, identified in the relevant interviews, is presented in this section in accordance with the “Consolidated table for management examples of national R&D agencies.”

1) Developing visions and strategies

1)-1 Developing visions and strategies

1) -1-1 Evidence-based, objective and scientific visions and strategies

[1. Installation of the information analysis office]

We need to reinforce our ability to understand and analyze R&D trends in Japan and abroad over time, based on evidence to develop future R&D strategies.

To meet analytical needs within and outside organizations, an office specialized in information analysis was set up to improve information analysis and strategy planning capabilities. The information analysis office provides information analysis services for government, universities and private companies and has developed a system to promptly analyze and visualize research-related evidence accordingly. The reinforced information analysis capability allows us to understand the present circumstances of domestic science and technology more accurately.

1)-1-2 Involvement of staff for empathy buildup in the development of visions and strategies

[2. Solicit views of others through internal comment system]

After taking office, I immediately began developing future strategies to achieve the organization’s philosophy and aspiration. First of all, I tried to understand the present circumstances of the organization (for about three months) and completed a draft for future strategies by adding ways to achieve the organization’s philosophy and aspirations as well as what the agency was supposed to be in future based on its present state while taking existing mid- to long-term objectives and plans into account.

To achieve the philosophy and aspiration, the agency must not only solve immediate issues facing the organization, but also adopt a long-term perspective.

To develop future strategies, I asked the directors to take partial charge of various themes, including personnel, financial and patent strategies for selecting and accomplishing specific research themes and decided to provide a draft for future strategies from scratch within a month.

The draft was formed after consultation with the directors, but successful evolution of the agency is contingent on all members sharing the same philosophy and aspirations, which each of them must be aware of achieving and all must give all-out effort to carrying out the assigned tasks. It is important not only to share “philosophies” and “aspirations” but also to combine strategies and initiatives to achieve them.

The draft of future strategies, made up by directors, was published on the agency website for a month and comments from all members of the agency were requested. Around 140 were ultimately gathered in the end and constructive comments were reflected in future strategies as much as possible, while providing feedback for the comments which were not adopted. Future strategies were eventually published about six months after the president took office. They will be updated annually as required.

1) -2 Disseminating visions and strategies

1) -2-1 Continuous distribution of information on visions and strategies and collection of opinions in organization

[3. Discussion and feedback]

When transferring my belief about innovation as the president, the basic requirements included providing and publishing a summary of innovation. I held meetings for discussion many times as president to disseminate the innovation, within units of divisions, division managers and other job hierarchies and also fed back their opinions while measuring their potential.

2) Instituting systems

2)-1 Systems for managing R&D within the organization

2)-1-1 Prompt decision-making and connections between management and field staff

[4. Assignment of the president's assistant]

An assistant (president's assistant) was assigned to support the president's management work. This position was provided so that the president could grasp situations in the field promptly and accurately. A sense of speed is important for decision-making and procedure and we must go out to fetch the necessary reports and field information instead of awaiting their arrival. The president can instruct the assistant to obtain desired information on the field promptly to facilitate transition to the next action.

[5. Assignment of "assistants" to support directors]

The assistant supports the director who is responsible for operating the organization to make closer connections with field staff for effective management. I decided to assign the director's assistant.

The director's assistant should be a person familiar with particular issues to support the director in liaising between management and field staff to accomplish the missions. Placing the director's assistant is intended to enable researchers to concentrate their efforts on research and take action while considering the overall organization.

2)-1-2 Establishment of a research implementation system to ensure accomplishment of organizational missions

[6. Reassessment of organizational structures to address issues and set up working groups]

To realize visions, implement management plans and support national strengths through R&D, researchers must act to understand overall circumstances in addition to their research fields. Accordingly, issue-based organizations that address issues spanning multiple research fields rather than individual fields were set up and systems to cover the whole range of research, from basics to application and implementation, were installed to reflect wide-ranging research perspectives in research to achieve mid-term objectives.

Each of the issue-based organizations should create a roadmap for mid-term plans to manage the progress of the plan under the tuition of the responsible director. Cross-sectoral collaboration seemed to be improved by evaluating individual researchers' performance as well as identifying and evaluating overall results for each R&D theme.

[7. Installation of a research support division]

A conflict would take place between the division managing the organization and that conducting research regarding the required clerical procedure and free progress of research. To eliminate structural friction, a research support division was installed.

This division undertakes operations previously assigned to the management personnel of each research field in a one-stop process for the entire organization.

This division is also dedicated to supporting research by about 20 members. Including staff for supporting research fields, a total of around 80 persons support the research implementation system.

[8. Foundation of R&D centers for mission accomplishment]

This term, the agency requires R&D achievements to be maximized as the core institute for organizational innovation in specialized fields.

Accordingly, a number of centers were established to meet the requirement to promote "industry-academia-government collaboration as the core institute," "operating and sharing of observation and research facilities," "dissemination of R&D achievements and utilization of intellectual property," "international deployment of R&D" and "human resources development" to accomplish the relevant objectives. The organization was restructured to activate these centers at the beginning of this term in accordance with the mid- to long-term plan, which took a calendar year to materialize.

2)-1-3 Abolition of vertical decision-making and the use of integrated R&D management

[9. Assignment of a full-time director to the R&D division]

The director concurrently held the supervisory post for R&D in the conventional headquarter system, but after restructuring the organization, no one was assigned to supervise the R&D function. A full-time director was therefore assigned to the R&D division to facilitate its operations.

[10. Replacement of headquarters system with a divisional system]

The agency previously employed a headquarters system, but this resulted in sectionalism, restricting the extent of executive power.

The headquarter system was replaced with a divisional system when the missions of the organization were clarified. While projects were managed by the research field in the former system, budget implementation and inspection/approval processes were changed as the divisional system was introduced.

In the latter system, the division responsible for managing projects controls all projects in all research fields while all research functions, formerly tied with specific fields, were integrated into the company-wide R&D division and the scattered R&D functions and skill development levels were restructured accordingly.

[11. Director and divisional manager meetings]

The directors and division managers meet regularly to pursue more efficient and effective operations and the meeting helps integrate and adjust their awareness.

Meetings are held approximately monthly and discussions range from organizational operation and increasing efficiency to maximizing research outcomes.

2)-2 Connections with outside organizations

2)-2-1 Extensive networks with various stakeholders

[12. Management advisory meetings with outside institutes]

A management advisory committee is provided in the agency and using a personnel network involving those who were acquainted at external meetings, etc., requests are made for them to join the committee to obtain unrestrained opinions from representative stakeholders in various fields in Japan.

[13. Diverse interchanges and relationships with foreign countries (science and technology diplomacy)]

Significant funds are required to operate and maintain facilities owned by the agency and a significant portion of the operating expenses grants are allocated accordingly. Utilization of these facilities, therefore, must be extended to overseas institutes through interchanges, as well as those within Japan.

When the agency's operation mainly comprises search activities involving foreign governments, the government-related theme selection is tied to country-to-country relationships or diplomacy through science and technology. In this sense, the role of the president in building relationships with foreign institutes is important.

There have been a number of science and technology diplomacy cases to date, eliciting fruitful outcomes from various perspectives, including revitalization of research itself and the acquisition of research funds and fields.

2)-2-2 Promotion of collaborative research with private companies

[14. Collaborative research with private companies through meetings of industry-academia-government stakeholders]

Although the market of this research field in industry is modest, we have emphasized other industrial meetings involving other ministries and agencies and pursue various collaborative research projects while collaborating with them from an academic perspective.

Recently, the agency has established a comprehensive partnership agreement with a private company and started industry-academia funding, rather than one-sided funding by the agency. The private company collects information, which is then analyzed by the agency. This work combination does not result in cost sharing, and we consider it a new model for collaborative work.

A consortium on the research field, created by the agency, has been actively utilized by industry with common objectives, allowing startup companies to seek business opportunities. We recognize the need to continue such approaches to pull various stakeholders together in future.

[15. Establishment of open labs with private companies]

The promotion of open innovation with industry was clearly indicated as part of mission-driven research in this term based on mid- to long-term objectives and plans. Although multiple private companies in Japan are conducting similar research, there is no competition in this research field and the cooperation of many companies in the same line of business will make R&D investments more effective and efficient. Under these circumstances, the agency intends to take up certain functions of the basic research labs owned by private companies to form an open platform with the agency as the core for dream teams comprising the industry and universities.

The key to success is for the president to take the initiative in negotiating with companies, while accurately identifying the needs of private companies to set research themes in which private companies could participate.

[16. Financing of local universities and technical colleges for regional vitalization]

Convinced that the agency should also act as a hub for universities, I installed a system to offer traveling and accommodation fees to professors and students of local universities and technical colleges using expenses at the president's discretion.

2)-3 Hiring and utilizing researchers

2)-3-1 Recruitment of young and talented researchers

[17. Provision of an environment to recruit and develop outstanding international talent]

There are many obstacles to invite outstanding international talent to work full-time. Accordingly, the agency has recruited promising young researchers from all over the world and provided them with unique education programs. What matters most to researchers is the research environment. As a positive result of these international efforts, the agency is now viewed as a destination for post-doc courses on par with top-tier universities abroad. In fact, the agency now boasts outstanding global talent from China, India, Russia and elsewhere

[18. Establishment of a system fostering next-generation research leaders]

In the next-generation leader development program, scheduled to recruit participants from an early stage, the fundamental requirement, "choose the theme and do the research yourself" must be absolutely assured. In using this system, the applicant need not have earned a Ph.D. Themes are not limited and can be selected from various research fields based on the mission, "study every field of natural science." The minimum obligation of the participant may be to meet other participants who specialize in different research fields, at least once a week.

The goal of this system would include the establishment of "an environment allowing researchers to challenge new fields of science that can only be accomplished when researchers from various fields cooperate."

Confident researchers will transcend their real strengths. Anyone can apply to this program, regardless of nationality and those who win intense competition will gain huge confidence. The successful applicant will be instilled with a sense of responsibility, rather than a feeling of elitism and encouraged to build an environment to collaborate with researchers in different fields. Given a seven-year term, the initial allowance could be comparatively large for young researchers.

As the program is designed to encourage researchers' independence, participants are recommended to have management skills. When they gather for discussions, each of them should take the initiative in starting the debate, rather than joining a debate started by someone else. Because young researchers need mentors, it is suggested that experienced and leading education-minded researchers should be asked to serve as such.

2)-3-2 Recruitment of diverse research talent

[19. Cross-sectoral study meeting]

Small but ongoing study meetings have been held in the agency and a study meeting could be organized by gathering people from various divisions, or soliciting themes. Traveling expenses are paid as part of support for the meeting. The most recent study meeting was held at a satellite city in the Kanto region, with presentation in the banquet hall, poster presentation and get-togethers.

The president himself joined these study meetings, helping eliminate barriers within the organization. These efforts have been promoted in an attempt to involve as many companies as possible.

[20. Acceptance of post-docs from abroad]

The agency has published many papers coauthored with researchers from abroad. Even when papers are coauthored, however, they may have no impact beyond the immediate research community if the coauthors are in the same field of research. Intending to provide new ideas that contribute to the research community, an international post-doc program has been implemented to accept researchers from abroad as fixed-term researchers.

About five international post-docs are invited annually through the invitation program, with no limit on research themes, nationality, gender, age and research fields. For research themes in particular, recruiting and employing researchers, including those with no obvious relationships with the organizational missions, are expected to improve the organization's metabolism and enhance its capabilities. However, the employment after the expiration of the term is not assured.

In the program for sending staff researchers abroad, research fields and age are not limited and researchers can stay in the relevant countries for a year.

2)-3-3 Research without barriers in the organization

[21. Cross-sectoral study meetings]

See case No. 19.

3) Creating plans and themes

3)-1 Creating new fields of research

3)-1-1 Encouragement and maintenance of diversified ideas and inventions

[22. Establishment of awards for innovation]

A competitive resource distribution system is used for vitalizing research activities by allowing various ideas and innovation to be studied in the agency and contributing to the accomplishment of its missions. The promotion headquarters headed by the president is established to inspect research themes.

The budget is allocated from the president's discretionary expenses so that the topics unlikely to be selected in usual funding can be determined by the president. The most recently selected topics

include six for exploratory research and five for promotional research. The number of applications was around five times the number selected and about 30 as a whole; mainly from young researchers.

This program helped ferment new ideas and clarify the research trajectory in the agency, as well as helping create seeds for unique research.

Poster sessions are included in the invitation and announcement of results to promote sharing of outcomes. Through regular debriefing and poster sessions for supporting companies, which offer research funds to the agency, outcomes are also disclosed in various ways and in various places.

3)-1-2 Use of open platforms to solicit research subjects

[23. New projects by setting up a special administrative structure]

The direction of organizational restructuring was announced last year, but research management must be reformed based on open innovation perspectives.

An open platform was provided for setting R&D topics in the recent new project and R&D topics are widely sought from society. The concept is such that topics are subject to evidence-based refinement and researchers and companies are asked to present research ideas for solution.

To build a scheme for the early launch of a new project, a special administrative structure was established and young staff with strong motivation for restructuring efforts were actively recruited to allow more challenging programs to be implemented.

To ensure the operation remained viable and realistic, research into practical applications must be conducted by widely employing feasibility studies, accepting wide-ranging research proposals and diversified human resources, using stage gates for selection, concentrating research resources and reaching POC (proof of concept).

3)-1-3 Initiatives suitable for the direction R&D

[24. Operation of the strategic president's fund]

The virtual labs managed by the agency include a bottom-up device. It should be noted that exploratory research and innovative research are common to virtual labs; based on the concept of eliminating barriers within the organization in a cross-sectoral manner, but more specific than virtual labs. Solicitation from the field was intended as a bottom-up approach, but the organization of sectionalism began cooperating in a cross-cutting manner, reflecting the original condition that these must be cross-sectoral efforts.

When I took office as president, the president lacked any discretion regarding research project budgets and when exploratory or innovative research was planned, expenses allocable at the president's discretion were scooped up from indirect costs. 1 million yen was allocated to each of 20 exploratory research projects, designed for young researchers and 7 to 8 million yen to each of seven innovative research projects.

The advantage of these research projects is that they can be based on future strategies; sparking a positive cycle of investment, budget allocation and talent assignment for research topics that might be “seeds” for the future.

3)-2 Merging existing fields of research

3)-2-1 Promotion of merging among researchers

[25. Establishment of virtual labs]

The agency has considered the need to merge researchers from different fields in new scientific fields promoted by the agency. It has also considered the significance of conducting research into new scientific fields in a specific, visible and integrated manner and established virtual labs.

Researchers interested in new scientific fields have scattered in various areas of analysis. Virtual labs were created to enable researchers to engage in their research in new scientific fields, even when they live in different locations and required expenses, including for travel and accommodation, were supplied from the president’s strategic fund. Although the labs are currently virtual, they could be real if efforts progress sufficiently in future.

There are currently five base cross-cutting virtual labs. They are devised for inducing or creating virtually integrated research and could be disposed of if unsuccessful. None of the researchers with primary duties have been laid off.

Given the small number of staff researchers and the lack of hierarchy at the agency, virtual labs are made available for researchers nationwide and a virtual community has already been established at the workshop level to encourage them to come together. Cross appointment may also be considered in future. 10 to 20 key researchers have participated in a lab as core members of, for example study meetings in the agency, with around ten external researchers (professor/associate professor grade) involved as lecturers.

The selection of themes for virtual labs does not take outcomes into account. Each research project is unique in nature and the exit is visible in some, but not others. A selection committee was established by the directors and president and has issued a total of two calls for research themes. This is considered to have helped widen the overall selection of themes.

3)-2-2 Connection between different fields

[26. Establishment of a system fostering next-generation leaders]

See case No. 18.

4) Evaluation and resource allocation

4)-1 Efficient and effective resource allocation

4)-1-1 Well-considered budget distribution

[27. Establishment of an incentive system using expenses at the president’s discretion]

There are two types of research in national R&D agencies, research based on free ideas of researchers and mission-driven research based on requests from government. It is important to balance these two types of research and the agency has tackled efforts to improve awareness of researchers on this matter.

For mission-driven research in particular, formulating an optimum research team is key to success. Accordingly, the agency established a system of allocating incentives to researchers, who then utilize expenses at the president's discretion.

4)-2 Fair and equitable evaluation

4)-2-1 Proper evaluation of R&D achievements

[28. Evaluation of performance with unique characteristics of research in mind (mission-driven research vs. individual research)]

The mission-driven research and individual research are equally weighted in personnel evaluations. Since individual evaluations are not comprehensible due to different research span, innovation in an academic sense is taken into account for evaluations by including items such as applications to and acquisition of Grants-in-Aid in contributions to the organization for generous marks allocations.

Meanwhile, contributions to the field are evaluated in terms of active participation in promoting organizational policies.

Accordingly, the issues to be highlighted in the evaluation may be conveyed to staff.

4)-2-2 Fair evaluation with diversity in mind

[29. Collection of past data on evaluation indexes]

Diversity of researchers is far ahead of others and evaluation indexes differ case by case. As every researcher has unique evaluation points, researchers are asked to submit desired evaluation points to accumulate data for individual researchers. For example, papers, contributions to academic societies, activities in committees and the chair of an international conference all come under this category. An evaluation system allowing simple calculation by adding weights based on the accumulated data is desired. It is not intended to determine all evaluations via simple calculations, but this must be the starting point for evaluation.

The proportion still needs to be discussed, but it is thought the objective evaluation should comprise 70 to 80 percent of all evaluation and the evaluation which does not represent actual achievement should account for the remaining 20 to 30 percent. The content of research differs depending on the research center, with some easy for writing papers but others not. Accordingly every center needs to use a different evaluation axis.

5) Outreach and social implementation

5)-1 Proper information distribution

5)-1-1 Adequate relationships with the media

[30. Continuous media services such as tours and study meetings]

The response to the media is particularly focused on the external distribution of information, while the PR division basically deals with the media.

The agency has consistently held tours and study meetings for media and ensured adequate information is distributed.

5)-1-2 Restoration of trust in science and technology

[31. Various forms of support for earthquake disaster reconstruction]

Recent efforts for earthquake disaster reconstruction in the Tohoku region have been impressive. It is controversial when scientific and technological activities are incorporated into public life as a matter of course, but company sales increase when the agency links the company with a university and the company's energy exceeds the pre-quake level. It is desirable for the staff to realize the value of tasks by sharing such outcomes.

6) Personnel and labor management

6)-1 Efficient production of business results

6)-1-1 Creation of incentives

[32. President's prizes by job category]

Human resources development is considered to be an issue. While conducting exploratory research, etc., the agency is not an educational institute but puts its missions into practice. In this sense, human resources development must be done through research activities.

As far as human resources development is concerned, although researchers within the organization are the main target, it is also important to provide funds for young researchers outside the organization and budget distribution is considered to be required accordingly. The number of talented researchers should be increased in this field.

It is difficult for organizations to survive and evolve unaided. Both those engaged in research and those supporting researchers would prosper only when they circulate in the society which supports both of them. As a national R&D agency, it intends to contribute to society with the function of supporting young researchers and would be unable to survive without the same.

Regarding the review of personnel evaluation, outstanding research would be subject to evaluation, or the president's prizes or a lump-sum payment would be given, for example, when a difficult qualification test is passed. It is important to have an evaluation of some kind or another.

The president's prizes are awarded annually based on criteria for researchers, engineers and clerical staff. It is also meaningful for the president to have the opportunity to hear from these people about what they usually do.

6)-1-2 Improvement of motivation

[33. Means to improve motivation depending on the type of operation]

The agency thinks that the method of increasing motivation differs by division having different missions and how best to increase motivation is always kept in mind.

There are many approaches, for example, salary increases or promotions for those achieving objectives. It also seems important for superiors to engage in communication with staff positively, to nurture their feeling of being helpful.

Approaches taken to increase organization's motivation are crucial. Motivation will not last when only long-term objectives exist. It is also acknowledged that short-term objectives are important and would be a common issue for all research institutes.

[34. Evaluation to increase motivation]

Willingness to work will be increased when an environment encouraging motivation is provided, or employment, transfer, evaluation and treatment are taken into account. Accordingly, evaluation methods have been discussed with the staff.

I have heard of complaints whereby the conventional evaluation system over-emphasized visible contributions and achievements and real contributions were not taken into consideration. Discussions have been continued for changes in the evaluation system to date. The positive points in these discussions should be employed and dissatisfactory portions corrected.

The staff briefing session was held twice to outline changes. Staff participated in the meeting eagerly and allowed us to explain the purpose of the changes.

[35. Proper personnel evaluation based on accomplishment]

Visible evaluation was focused on in the conventional personnel evaluation with detailed weighting, but data-based analysis revealed that evaluations were only based on "academic outcomes," "social contributions" and "organization contribution." Accordingly, the evaluation method was modified by abolishing the conventional weighting system and employing twice to half weighting system.

For example, the first authorship of papers is weighted twice as much as second or subsequent authorships and contributions to qualified journals are worth twice as much as the first authorship. The staff in age retirement system is subject to evaluation and a curve evaluation is used in accordance with the evaluation objectives.

It emerged that what used to be unknown from visible evaluation became clear in the comprehensive evaluation by the immediate manager after the evaluation method and items were improved. A comprehensive evaluation by a number of managers was therefore introduced.

[36. Extension of terms for fixed-term researchers]

When taking office, I visited research centers nationwide and asked the opinions of young researchers. Many replied that “Fixed-term researchers cannot conduct their research at a reasonable pace because they must leave in five years.” It takes one year to determine research themes, three years to conduct research and one year to consolidate the research results, while job searches to other institutes are required throughout this period. Many researchers seem to feel extremely stressed under these circumstances. When the research period is seven years, one year can be spent determining research themes, five years for conducting research and one year for consolidating the results. Many research centers set the contract term according to the period of mid- to long-term plans, but the agency changed the period for conducting research to seven years in principle.

Some researchers complained about the lack of paths to stay at the agency. Even though age-retirement employment is not applied, employment close to the age retirement system should be used for talented researchers who are expected to lead the organization in future. Considering the fact that permanent employment is available when a certain standard is met, according to the revision of the Labor Contract Act, opportunities are provided for permanent employment contracts for talented researchers who may contribute to the future progress of the agency by actively leveraging the revised act. Seven years for conducting research was determined by setting a maximum employment term for fixed-term researchers at 10 years and considering a certain level of achievements could be reached given 7 years for conducting research.

6)-2 Adequate employment and personnel management

6)-2-1 Establishment of a system suitable for accomplishing missions

[37. Introduction of an evaluation system by the president]

As president, although I refrained from setting objectives, I pondered how best to revitalize the organization and what had to be achieved internationally as a research system, rather than the details of research itself, as part of discussions to revitalize the organization.

To evaluate those assigned to management positions, I decided to evaluate their qualification from a management perspective.

[38. Work-based personnel rotation]

It is considered difficult to work on basic and foundation R&D and project-related operations simultaneously. Therefore, selecting and focusing on one of them is important. When the staff is assigned to a project, the period is strictly determined and the organization is changed.

6)-2-2 Assurance of the stability and flexibility of employment

[39. Increase in proportion of permanent research staff]

The agency operates according to the plan to increase the proportion of permanent research staff (from the current 1:9 to 4:6 for permanent vs, fixed-term ratio) to operate the institute stably and with flexibility of employment. Generally speaking, increases in permanent employment keep research stable, but the organization grows stagnant due to the lack of personnel change. Around 60 percent of all staff is fixed-term researchers and stagnation is not a large concern at present, but there is a worry that good research results would not be produced because researchers in permanent employment get too comfortable and lose motivation. Accordingly, permanent employment is guaranteed but not as researchers. Namely researchers may be transferred to clerical work depending on circumstances.

A big decision should be made to increase the ratio of permanent employment from 10 to 40 percent, which is the responsibility of the president. Personnel system reform was decided because of the voice calling for restructuring of the field. The decision depends on the needs of the time and voices of improvement.

6)-3 Developing human resources and talent

6)-3-1 Opportunities to develop the capability of research staff

[40. Introduction of a human resource development sheet]

The evaluator and evaluated communicate via the human resource development sheet on a quarterly basis. Absolute evaluation is used to evaluate researchers. Evaluation mainly comprises common evaluation items, regardless of the scale or job category of the organization.

7) General administration

7)-1 Administration

7) -1-1 Establishment of an operation system

[41. Operation of the resource management PDCA cycle]

A management PDCA cycle is used to operate the organization efficiently in accordance with decisions made by the board of directors and interviews with the president (based on administrative regulations).

The PDCA cycle was introduced and implemented, reflecting the fact that “results are proportionate to follow-up.” Above all, the need for substantial follow-up to run C and A successfully is emphasized.

Time is not retrievable, as reflected in the proverbial phrase “time is money.” C and A in PDCA are considered critical for successful operation of the PDCA cycle.

7)-1-2 Confirmation of administrative results

[42. Visualization of operation using corporate techniques (introduction or creation of MVS and BSC)]

“Visualization” of operation is promoted. The unquantifiable cannot be managed and things must be quantified for “visualization.” I recommend using graphs rather than tables, for more visible and understandable representation.

The indexes of nine items are always “visualized” so that the president can see the indexes for management and posted in the president office. If it is proved that operational progress is easy to determine with these visualized indexes, visualization will be promoted throughout the organization.

7)-2 Risk reduction

7)-2-1 Indexing of management risks

[43. Follow-up with management slips]

For staff researchers handling basic and fundamental research in the organization, for example, creativity is essential as well as the spirit of new challenges. Because of these factors, different indexing is used for each division. For example, the number of presented peer-reviewed papers or patents granted may be used for evaluation indexing.

In contracts, proper management to reduce the number of occupational accidents or prevent the violation of security regulations is the index for the management division. Risks are generally managed in two axes, urgency and influence rate and the degree of risk is classified into A to D according to this concept. The risk management categories are determined in terms of safety, information leakage, people, organization and budget and it should be noted whether they are properly under control.

Each division sets targets for research and risk management for optimum indexing. Targets for individuals are also set based on the targets of the division.

7)-2-2 Assurance of an advisory system

[44. Third party perspectives of advisors]

The introduction of an advisory system by overseas experts is partially intended to obtain references of advanced and planned efforts of foreign countries, or advice based on these efforts. As an example, expenses for remodeling or disposing of research facilities are funded according to the plan in foreign countries and this is useful information for operating research facilities in Japan.

The importance of things to be done now is recognized for the disposition of research facilities, via increasing sensitivity for related information, including overseas information on the number of research themes requiring the use of research facilities in future, etc.

7)-3 Improving project management

7)-3-1 Revitalization of improvement activities

[45. Development of “organizational diet project activities”]

This project is conducted as an organization project and intended to revitalize operational improvement activities, reduce costs and increase cost awareness, etc.

The project recruits (young) instructors who announce their candidacy and when selected, promote assumed activities at various sites and division. They manage, for example, to reduce copying expenses and other costs through visualization at relevant divisions. They also confirm cost reductions at meetings, or disclose it via the internal website for visualization.

They also voluntarily distribute good practices across the organization. The point is that the young staff takes the initiative in these activities and a badge is supplied to each of instructors to enhance their motivation.

The names of qualified persons are also posted to boost the motivation of the staff in the division.

(3) Differences in management between national R&D agencies and private companies

Private companies implement various management techniques to maximize R&D achievements. For the presidents of the national R&D agencies, who are responsible for managing their agencies from various perspectives, the perspectives and management examples in private companies, particularly the difference in perspectives between private companies and national R&D agencies, may be an important indicator for the talented people from various backgrounds to engage in management of national R&D agencies.

The following sections present differences and common denominators in the management of private companies and national R&D agencies obtained from interviews of people having experienced both management of private companies as the top and national R&D agencies as the president.

<Difference in R&D objectives>

One of the differences between national R&D agencies and private companies is the R&D objectives. Private companies emphasize the “continuity of management” while national R&D agencies aim to “contribute to the sustainability and progress of society as a whole.”

[Excerpt from interview results]

Difference in R&D between national R&D agencies and private companies

- My first impression as the president of the national R&D agency was the completely different concept of R&D from private companies. R&D in the industry is intended to promote management sustainability, while R&D of the national R&D agency is for producing innovation as humans, not for the convenience of the organization. The degree to which new insight is acquired is the achievement and researchers from the national R&D agency simply focus on this matter.
- As for the spirit of researchers in conducting their research, social sustainability and sustainable development prevail in public research institutes, particularly the national R&D agency for which I used to work and they are engaged in R&D to guarantee the same. They should help maintain the global position of Japan with certainty.

<Planning ability in R&D>

Planning ability in R&D, namely the ability to plan what has to be done, is important for both national R&D agencies and private companies and increases and reinforcement of planning ability may be common issues.

[Excerpt from interview results]

Planning ability of private companies

- Diversity (e.g. gender, work assignment) of personnel in the planning division is important for planning. In many days in the company, a new project planning division was installed whenever the president changed.
- Ace-class persons in the company are assigned to the planning division and they are allowed to make plans at their will. A conference including the president is regularly held for review their plans. Some plans may be rejected, but something good are presented because of the significant planning ability of the members. The planning division is completely independent of the other divisions.
- Plans are not produced in the field, because field people are interested in how to continue the present operation.

<Differences in evaluation perspectives and concepts for research themes and achievements >

Concepts to evaluate R&D achievements largely differ between national R&D agencies and private companies. The time axis and perspectives of evaluation are considered contributions to the “short to mid-term corporate performance” while long-term results are an issue for private companies. In contrast, the time axis to evaluate the outcome is diversified in national R&D agencies.

Differences in perspectives and concepts for evaluation may arise from the missions and characteristics of national R&D agencies and private companies.

[Excerpt from interview results]

<Concepts to evaluate achievements between national R&D agencies and private companies>

- Research achievements in private companies are easy to evaluate and contributions to business are subject to evaluation. The time axis of universities and national R&D agencies is diversified ranging from short, mid- to long-term. Short to mid-term is the main target for the private companies. In this sense, I intentionally took a long view in the company. Taking a long view produces “self-purification function.” The best term should be chosen by voluntary comparison.
- Private companies do not approve basic research only, but actively promote basic research leading to commercial viability. National R&D agencies could implement long-term projects, say, even 10 or 20 years.
- The company for which I worked evaluated only based on sales, profit ratio and social contributions. Sales in companies are budgets for national R&D agencies. It is very troublesome for the president to acquire budgets. He does not only count budgets, but is much concerned about social outcomes. There are also evaluations by Thomson and universities as objective evaluations. I decided to evaluate the items with a management

index of 30 to 40 and disclosed the results of the previous year (number of papers, budgets, expenses, etc.) prior to the budget meeting.

- Perspectives of companies to evaluate their research include not only contributions to the corporate performance but also usefulness to the future society. There are researchers who have been engaged all the time in the study of prototype meter and prototype kilogram.
- The motivation of these researchers is to present their opinion as representatives of Japan in international meetings. Their papers are evaluated, or their participation and presentation at international meetings as main players are also evaluated. Tangible evaluations are better. Additional comprehensive evaluation are all the better.
- Judging what to be subject to long-term view is difficult for the management of a company. When having served as the president of a company, I noted the research task force. I supported their approaches as an engine to drive the company and making the strong stronger. Then the members of other task forces volunteered for their involvement.
- I tried to actively evaluate nails that stand rather than selection and concentration.

(4) Usage of management examples to maximize R&D achievements

Throughout this survey, the opinion of members of the survey committee generally showed a good understanding of the seriousness of the president about how to manage relevant national R&D agencies and many good practices to be referred to and shared by national R&D agencies. In light of their recognition, considerations required to examine ways to functionally improve the management system of the national R&D agency in future are listed below.

1) Continuous monitoring of efforts of the president found in this survey

Many efforts of the president concern initiatives which have already started or future initiatives. The president wanted to closely monitor the specific results. It is believed desirable to accumulate management examples to which agencies can refer by continuing a case study in management examples by national R&D agencies and the private sector. In addition, it is also considered important to continue management efforts in the organization and identify issues, actions and precautions for the horizontal deployment of these efforts.

2) Institutional issues interrupting the maximization of R&D achievements (including misconceptions) and possible solutions

In questionnaires on management to maximize R&D achievements, institutional issues that interrupt measures to maximize some R&D achievements were identified. During interviews, the comment was confirmed that these issues had been consolidated in the national R&D agency committee. MEXT may be able to support the efforts of each national R&D agency by sorting out and examining recognized institutional issues interrupting measures to maximize R&D achievements and helping solve these issues.

3) Continuous examination of associations between management and results

To operate the management PDCA cycle properly, it is important to build a system to confirm the results of management efforts by the agency itself, namely, a system to visualize the association between management efforts and outputs or outcome and allowing the agency to develop management indexes (evidence) for monitoring. It is difficult but desirable to continuously verify the association between management and the results for reviewing management.

4) Venues and opportunities for exchanging opinion between the president and directors

Perspectives for the horizontal deployment of best practices and institutional bottleneck may be developed by setting venues and opportunities for exchanging opinion between the

president and directors for mindsets and management efforts and internal control using the National Research and Development Agency Committee launched in January 2016.

Reference: Results of Questionnaire on Improvement of Internal Control

■ Legend symbols

◎: (Control activity) Provided, etc. (Information & communication, monitoring) Implemented in an organized and planned manner (Self-evaluation) Visibly effective

○: (Control activity) Partial, limited regulations, etc. (Information & communication, monitoring) Implemented to some extent (Self-evaluation) No problem

—: (Control activity) No regulations, etc. (Information & communication, monitoring) Not implemented (Self-evaluation) There are problems

Questions	A. Control activity								B. Information & communication								C. Monitoring								D. Self-evaluation														
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H							
(1) Business environment control																																							
1) Basic operating philosophy and policies of the Agency	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎		
2) Ethical and behavioral guidelines for executives and regular employees	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
3) Formulation method for mid-term plans (procedures and criteria)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
4) Progress management system for mid-term plans (roles and responsibilities, implementation procedures, criteria)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
5) Business evaluation system as per mid-term plans (roles and responsibilities, implementation procedures, criteria)	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
6) Measures for research business •Whether a research evaluation system has been established in the Research Management Division •Whether the research budget distribution criteria have been clarified	◎	◎	—	◎	◎	◎	—	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
7) Measures for promoting internal control a) Establishment of an internal control committee headed by President and appointed executives responsible for internal control b) Appointment of a leader who promotes internal control (over the entire organization or office) c) Establishment of a promotional department d) Rules dealing with antisocial forces e) Reporting rules for outsiders*, and establishment of a consultation desk f) Reporting rules for insiders, and establishment of a consultation desk g) Training	◎	◎	◎	◎	◎	◎	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
8) System of allocation of duties by the Director	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
9) A meeting structure supporting the President's decision-making	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
10) Meetings in the Headquarters and office	◎	/	◎	◎	◎	◎	◎	◎	◎	/	◎	◎	◎	◎	◎	◎	◎	/	◎	◎	◎	◎	◎	◎	◎	◎	◎	/	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
11) Rules for decision making by the president as the top	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

12) Measures for auditor’s auditing work a) Involvement of the auditor in improving the audit rules b) A system in which the president can always communicate with the auditor c) Items on independence of supporters (the auditor’s right to issue orders and instructions, and his/her involvement in evaluation of employees and disciplinary actions taken) d) Proper reflection on the results of audit in business e) Clarification of authority designated in the regulations meant for the corporate organization f) Reporting audit results to the competent minister and president	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13) Document management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14) Information security	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15) Risk management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16) Risk management committee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17) Disaster prevention plan and business continuity plan (BCP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18) Personal information protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19) Policies on personnel (including part-timers) management system (periodic personnel reshuffle for appropriateness of business, personnel exchanges among subsidiary Agencies, and grasp of activities by long-term incumbent officers [to prevent collusive relationships])	-	<input type="radio"/>	<input type="radio"/>	-	-	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20) Criteria on disciplinary actions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(2) Risk assessment and response																												
1) Awareness and clarification (grasp of duties) of the business flow by the business department using WBS (work breakdown structure) to identify risks	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2) Risk factors by process in the business flow, and analysis of causes of risks (risk identification)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	-	○	○	○	○	○	○	○	○	○
3) Risk appraisal (assessment) and risk reduction measures	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4) Emergency measures in the event of an accident/disaster a) Drills as per the disaster prevention plan and the business continuity plan (BCP) b) Establishment of emergency headquarters and appointment of responsible members c) Establishment of an initial response and rapid information collection system	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
5) Inspections of facilities and necessary repairs	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
6) Bidding and contract a) Proper paperwork for contracts and a mutual check and balance system b) Establishment of a contract supervisory board comprising auditors and external experts (including academic experts) c) Urgent response to bid-rigging d) Clarification when free contracts need to be concluded e) Measures when the mid-term plans cannot be achieved due to bidding failures f) Regulations for contracts with subsidiary agencies g) Grasping the information on contracts between the subsidiary agency and the third party	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
7) Specific research measures a) Awareness and clarification of the risk factors in research requiring strict rules (such as clinical trials) b) Proper accounting practice for research funds c) Internal check and balance system on expenses d) Prevention of illegal research activities, such as fabrication of papers e) Prevention of research information leakage (protection of IPR)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
8) Disclosure of emerging risks	○	○	○	○	○	○	○	-	○	○	○	○	○	○	○	○	○	○	-	○	-	○	○	○	○	○	○	○
9) Publicity of specific contents of research requiring expert knowledge	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	-	-	○	○	○	○	○	○	○	○
(3) A System for appropriate budget distribution and a mechanism for budget distribution corresponding to the results of research evaluations																												
1) An appropriate budget (operating expenses grant) distribution system (roles and responsibilities, implementation procedures, criteria, etc.)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2) Budget distribution mechanism corresponding to the results of research evaluations (based on cost data obtained from monetization units and established criteria, and on achievements resulting from the progress of the research operation and its internal evaluation)	○	○	-	○	-	○	-	○	○	-	○	○	○	○	○	○	-	○	-	○	○	○	○	○	○	○	○	○

(4) Securing and nurturing of human resources	
1) Securing and nurturing human resources a) Identification and definition of necessary abilities of staff members b) Recruitment, allocation, nurturing and evaluation of human resources as per definition of abilities	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
(5) Internal audit	
1) Internal audit a) Conducting an internal audit b) Definition of the scope and frequency of internal audits according to the importance of risk factors and internal control and the effectiveness of routine monitoring (formulation of an internal audit plan) c) Reporting audit results to the president	<input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/> <input checked="" type="radio"/>
(6) Revision of the accounting standards of the National Independent Administrative Agency	
1) Please describe how your Agency reviewed the monetization units based on the operating expenses grant and the disclosure classification of the segmented information, in response to the revision of the National Independent Administrative Agency's accounting standards (March 2015). (Write freely on the details and difficulties you faced.)	
<p>[Agency A] The operating expenses grant and the disclosure classification of the segmented information were newly setup based on R&D items specified in the 3rd mid to long-term plans.</p> <p>[Agency B] Interim measures about the disclosure classification of segment information are approved in the preamble of the accounting standards of national independent administrative agencies, and the disclosure is scheduled to be applied from the next mid to long-term objectives period. This will remain unchanged at present. As for the monetization units based on the operating expenses grant, because the association between research operations and operation support funds has not been clarified to date and a new concept "certain grouping of research operations" has been introduced while revising the accounting standards, new monetization units had to be set up, instead of review. This is made easier with examples taken into specific shape by the re-revision of Q&A in February 2016 (Q&A81-28-3). Even though the Q&A was updated, however, uncertainties remain when a more detailed setting is discussed (for example, "action" mentioned in Q&A81-31-2 would be the component of "research operation" but depends on presumption due to the lack of definition of individual terms). Some estimates can be made by advice from the audit firm, but the accounting standards and Q&A are recognized as unsatisfactory absolute indicators.</p> <p>[Agency C] • The conventional monetization research operation units were used as monetization units based on the operating expenses grant and according to coordination with accounting auditors, etc. • The existing segment classification remains unchanged by applying interim measures pursuant to Article 8 of the Supplementary Provisions of the Act for Partial Revision of the Act on General Rules for Incorporated Administrative Agencies (Act No. 66 of 2014).</p> <p>[Agency D] <Monetization units> The agency has implemented monetization in research operation units before the amendment, and changes due to the amendment are unlikely. <Disclosure classification of segment information> The agency set segments as certain grouping of research operations before the amendment, and changes due to the amendment are unlikely. However, research operation units were conventionally used, not segment units, i.e., groupings of operations, etc. to set out and evaluate the plan setting. The objectives of the plan will be set and evaluated in segment units for the new mid to long-term objectives period.</p> <p>[Agency E] The segments to be disclosed are the certain grouping of research operation, etc., approved by the government in the mid to long-term plans from FY 2016, and the monetization units are the minimum units of composing research operations.</p> <p>[Agency F] The decision has been made to use the existing segment classification, tied to the organization as the unit best suited to budget distribution and management at the board of directors, as the organization base for budget distribution in the budget implementation plan. Monetization units are set for individual segments when multiple segments are operated in a research organization. Common expenses at facilities, etc. are managed as expenses of facilities, etc. without allocation to individual projects, and general administrative expenses are uniformly managed at the headquarters, etc. The interim measure is applied to segment information from the next mid to long-term plans.</p> <p>[Agency G] In light of "maximizing R&D achievements," the segments associated with large items in the 4th Mid to Long-term Objectives were defined, and segments for research operation in the management division, etc., of a cross-sectoral nature, were separately set. Research operation in monetization units was decided in light of the maximization of R&D achievements by managing allocated costs appropriately and optimum operation of the PDCA cycle in unit operation, on the premise that each segment classification is further divided. All activities in the agency are often correlated. Much energy has been used for realignment and categorization of research activities as "the minimum operation unit for managing allocated costs" because of the need for coordination and their consent with related divisions in the agency.</p> <p>[Agency H] Monetization units were set up for the business operation of the research area, division activities and the general management division from FY 2016. The managers of relevant areas and divisions reviewed the budget management system to which PDCA is applicable. For information disclosure, three disclosure classifications were defined with a segment of multiple research fields, a segment of multiple division activities and the general management division as the "common" segment.</p>	

2) Please describe how your Agency reviewed the monetization criteria based on the operating expenses grant created in response to the revision of the National Independent Administrative Agency's accounting standards (March 2015). (Write freely on the details and the difficulties you faced)

[Agency A]

Periodic progress criteria is used for management divisions (general affairs, personnel, etc.), multiple-year research achievement criteria for "R&D" that indicates achievement objectives, etc. in mid to long-term plans, and single-year research achievement criteria for others (e.g. industry-academia collaboration, etc.) for monetization based on the National Independent Administrative Agency's accounting standards, etc.

[Agency B]

Monetization criteria for operating expenses were revised from conventional "cost progress criteria" to "research achievement criteria" and "period progress criteria" by monetization units. The results could be confirmed with research plans and roadmaps materialized with examples taken into specific shape by the re-revision of Q&A in February 2016 (Q&A81-22-4 - 5, 81-28-3). Even though Q&A was updated, however, uncertainties remain when a more detailed setting is discussed (for example, whether the range of "multiple years required for completion" in Q&A81-22-4 - 5 can be applied to "multiple years required for completion" for the case in which the mid-term plan is accomplished only when a certain number of routine type research operations are conducted for multiple years (the mid-term plan is accomplished by [same research operation α - 5 years = 5α]). Some estimates can be made by advice from the audit firm, but the accounting standards and Q&A are recognized as unsatisfactory as absolute indicators. The R&D projects are characterized as having uncertainty and unpredictability, and require flexible operations depending on circumstances, but flexible implementation and carryover of operating expenses have become difficult due to the recent revision of accounting standards, use of research achievement criteria in principle and the inhibition of changes in 4Q budgets in principle. Meanwhile, the agency's first priority, "to maximize R&D achievement" has to be accomplished. The ways of fulfilling both bother the agency.

[Agency C]

• According to the revision of the National Independent Administrative Agency's accounting standards, monetization criteria were changed to "research achievement criteria" in principle from 2016 from "cost progress criteria" till 2015.

• The agency spent considerable time confirming and coordinating with accounting auditors, and discussing issues within the agency concerning how best to apply accounting standards, etc. and specific operations in changing monetization criteria to the research achievement criteria.

[Agency D]

The agency has already used the research achievement criteria to monetize operating costs before amendment, and must review only the following two: 1) budgets of this fiscal year were reviewed at the end of 3Q and classified as allocations of operating expenses. However, we are concerned about • inconsistency from the evaluation of achievements because research with outstanding results is treated as a loss in financial terms due to diversion of budgets after fixing the amount of operating expenses allocated at the end of 3Q, and • the research operation potentially extending over a few years will not be approved as multiple-year research depending on the interpretation because research plans, roadmaps or progress schedules, indicated in the accounting standards Q&A, are not necessarily present; and 2) indirect operating expenses conventionally classified into expenses common to agencies may be allocated in segment units, rather than monetization units. • The agency will not allocate budgets in monetization units, because the beneficial proportion of business ranging to multiple research operations is not always clear at present, and if indirect operating expenses are allocated to research operations, namely monetization units, the effect of profits and losses that cannot be managed in each research operation on the evaluation of research operation is unclear.

[Agency E]

The research achievement criteria will be used in general except that periodic progress criteria will be employed for operation of the headquarters which are the administrative management division. Roadmaps are provided for the R&D area in which projects are applied over multiple years in principle.

[Agency F]

Of the indicators listed in the accounting standards, the most objective indicator for estimating the progress of the agency's operating expenses grant operation will be the expenses allocated to business operation because each center executes budgets distributed to the center to promote business according to the research plan. Hence, the "Proportion of allocated costs (fund) to the allocated amount of operating expenses grant as the proportion of allocated resource in business operation" which is input information of the research achievement criteria as an indicator.

[Agency G]

Based on the revision of the National Independent Administrative Agency's accounting standards, the agency will use the research achievement criteria in principle on April 1, 2016 as monetization criteria for operating the expenses grant. It took considerable time to compute the estimated amount of allocation since the allocation of operating expenses grant needs to be determined in monetization units by 3Q.

[Agency H] Monetization units were set up for business operation in research area, division activities and general management division, and the general management division from FY 2016. The managers of the relevant areas and divisions reviewed the budget management system to which PDCA applies. For information disclosure, three disclosure classifications were defined with a segment of multiple research fields, a segment of multiple division activities and the general management division as the "common" segments.

(7) General matters

1) If there is anything that you might have devised as for the internal control, please select an option you might have devised from the items on the right (multiple answers allowed).

[Agency B]

■ Items on risk management (risk management, disaster prevention, business continuity, emergency management publication)

Risk management is implemented by the competent section as a year-round activity with the help of an external supporter (audit firm). The risks to be focused on are selected as “priority risks,” the progress is managed by the secretariat (competent section, audit firm), improvement measures are promoted by the relevant on-site sections and progress and completion are reported to the risk management committee.

[Agency C]

■ Item on internal control platforms (policies, promotional system, discussion and decision-making, personnel system, monitoring, etc.)

■ Items on appropriate bidding and contract

• As replied in the above (1) and (2), items on internal control are included in regulations, and regularly carried out.
• Training is conducted to disseminate proper and efficient paperwork for contracts, including the presentation of improper examples
• Misconduct is prevented using checklists during the settlement of payment in budget implementation for free contacts with small sums, and education of newly assigned person in charge of settlement concerning the details of work is conducted.

[Agency D]

■ Items on information security (including the protection of personal information)

■ Items on risk management (risk management, disaster prevention, business continuity, emergency management publication)

• A risk subcommittee dealing with research misconduct and an information security subcommittee were set up in the risk management committee for evaluating, responding to and monitoring individual risks in addition to other risk management.

• A contract was concluded with a safety confirmation service for earthquake disaster, and delivery training is conducted twice yearly for effective operation during emergencies.

[Agency E]

■ Items on mid-term plan, etc. (formulation, progress management, evaluation, budget distribution)

“President’s interviews,” in which the president asks general managers and center directors, etc. about business progress, etc., are important opportunities for agency’s business management and internal control, and the results are reflected in the plans for the following fiscal year.

[Agency F]

■ Items on risk management (risk management, disaster prevention, business continuity, emergency management publication)

■ Items on appropriate research (research integrity, proper accounting practice for research funds, proper research activities, etc.)

• Organization-wide, cross-sectoral risk response plan (reduction and prevention of organization-wide, cross-sectoral risks tackled by divisions) and individual risk response plan (reduction and prevention of risks inherent in individual divisions) are formulated and implemented.

• A section managing research compliance was set up, and a general manager and persons in charge of research integrity education were assigned. The person in charge of research integrity at each center inspects the efforts to prevent research misconduct every year, reports the results to the general manager for research integrity education, and conducts interviews as required.

[Agency G]

■ Items on appropriate bidding and contract: A procurement streamlining plan, including internal control, has been formulated and published since FY 2015 in 2015, and operations conducted according to the plan. Contract procedures are explained in the guidance mainly for newly recruited staff (twice yearly), and in the research misconduct prevention guidance.

[Agency H]

■ Items on appropriate research (research integrity, proper accounting practice for research funds, proper research activities, etc.)

E-learning is improved for research integrity. Research integrity education of researchers, staff supporting researchers and clerical staff was made mandatory in an attempt to raise awareness agency-wide to prevent misconduct in research expenses and activities.

2) If there are any difficulties in internal control that you might have faced, please select those potentially applicable from the items on the right (multiple answers allowed).

[Agency B]

■ Items on internal control platforms (policies, promotional system, discussion and decision-making, personnel system, monitoring, etc.)

Regulations relating to internal control were formulated, and an internal control committee was set up according to MIC notification. The agency has a risk management system which has already been established and operated regularly, and risks of compliance, including the observation of regulations, are included in the system. Therefore, the issue is one of allocating internal and risk management, and adequate approaches and specific operating methods are currently analyzed by the internal control promoting division with the help of an external supporter (audit firm), and discussed by the committee.

[Agency C]

■ Items on mid-term plan, etc. (formulation, progress management, evaluation, budget distribution)

• More prompt and effective PDCA is desirable by adjusting joint hosting to determine schedules, etc. of interviews by various research councils accompanying the joint management of multiple ministries and agencies.

[Agency D]

■ Items on internal control platforms (policies, promotional system, discussion and decision-making, personnel system, monitoring, etc.)

• The agency has two committees; internal control and risk management committees, and is currently seeking to improve the allocation of responsibility and structure of the internal control promoting system.

[Agency F]

■ Items on information security (including the protection of personal information)

The agency gives researchers maximum freedom on information security in their research, and needs to raise their awareness that the current situation is common state of information security. The awareness of researchers has been changed due to recent internal and external changes. Restructuring will be carried out mainly in the divisions responsible for information security at an early stage to clarify which divisions are responsible, and reinforce the CISO function. There is a pressing need to educate and recruit personnel for information security to overcome current staff shortages.

[Agency H]

■ Items on appropriate research (research integrity, proper accounting practice for research funds, proper research activities, etc.)

Criteria for the range of internal control differ depending on agencies, and standardization is difficult. Although this may be true for all items, the discussion has not yet advanced to examining the effect of labor and expenses on measures and implementation.

3) If you have unique approaches for sharing information and awareness of internal control in the agency, please explain them (multiple answers allowed).

[Agency B]

Because the system was just started, briefing (training) on the internal control committee (comprising directors and division managers) and basic requirements for the system is being conducted at present.

[Agency D]

- Efforts to raise awareness in the organization are made by training directors and division managers.
- Training for newly recruited staff is carried out using a compliance handbook.

[Agency H]

A system for prompt transfer to the staff of topics and decisions at the managing meetings, etc. is under development. Opportunities to convey the concepts of management to staff are also provided through lectures given by the president about three times a year.