

Evaluation of FY2016 Operating Results for Japan Agency for
Marine-Earth Science and Technology

August 2017

Minister of Education, Culture, Sports, Science and Technology

1. Items related to the evaluation		
Agency	Japan Agency for Marine-Earth Science and Technology	
FY for evaluation	FY evaluation	FY2016 (3rd term)
	Mid to long-term objective period	FY2014 to FY2018

2. Items related to the assessor			
The Competent Minister	Minister of Education, Culture, Sports, Science and Technology		
Incorporated jurisdiction dept.	Research and Development Bureau	Dept. and person in charge	Ocean and Earth Division, Takayuki Aso
Evaluation and inspection dept.	Science and Technology Policy Bureau	Dept. and person in charge	Planning and Evaluation Division, Kenji Matsuoka

3. Items regarding implementation of evaluation
<p>In FY2016 evaluation, Sub-Committee of Japan Agency for Marine-Earth Science and Technology (hereinafter referred to as the “Sub-Committee”), National Research and Development Agency Council under Ministry of Education, Culture, Sports, Science and Technology was held for four times and took the following actions:</p> <p>June 2, 2017: Sub-Committee (8th) deliberated on the procedures for evaluating FY2016 operating results and to hear opinions from members.</p> <p>June 28, 2017: Sub-Committee (9th) conducted a hearing from the president, and executive director in charge of Development and Operation Sector, and the executive director in charge of Administration Sector mainly for Administration Sector and Development and Operation Sector for assessing the self-evaluation results for the Japan Agency for Marine-Earth Science and Technology (hereinafter referred to as “JAMSTEC”) and heard opinions from the members.</p> <p>July 14, 2017: Sub-Committee (10th) conducted a hearing from the president and the executive director in charge of the research sector concerning self-evaluation results by JAMSTE and heard opinions from the members.</p> <p>July 27, 2017: Sub-Committee (11th) received advice in line with scientific knowledge from the members, regarding competent minister’s evaluation (draft).</p> <p>August 3, 2017: National Research and Development Agency Council under MEXT (10th) received advice in line with scientific knowledge from the committee members, regarding implementation of competent minister’s evaluation.</p>

4. Important items and others relating to the evaluation
No special matters to note

1. Overall evaluation						
Rating*1 (S, A, B, C, D)	A	FY2014	FY2015	FY2016	FY2017	FY2018
		B	B	A		
Reasons for rating	As shown in the overall evaluation of the agency as a whole, more progress of performance than expected in the mid to long-term plan and the FY plan is recognized.					

2. Evaluation of the whole agency
<p>○ JAMSTEC implemented the strategic and focused research and development on the basis of national/social needs as a comprehensive/core research institute (hereinafter referred to as the “research and development focusing on the solution of issues”) in the marine-earth science and technology in Japan, as one that is leading among the marine nations.</p> <p>[1] <u>Development of the exploration technology for sulfide deposits under the seabed by remote sensing, independent of the conventional exploration technology, and smooth technology transfer to the private sector</u></p> <p>[2] <u>Showing of model analysis results to display significant difference in CO₂ emission from fossil fuels in East Asia in 2000s and the contribution to administrative needs to improve the accuracy of the greenhouse gas emission inventory</u></p> <p>[3] <u>The knowledge on change in water pressure was acquired with slow slide after the Earthquake off the South-East of Mie Prefecture on April 1, 2016 by using a real-time borehole observation system in the Nankai Trough Seismogenic Zone. Such knowledge cannot be detected by other methods (ocean-bottom GPS and ocean-bottom seismograph). The provision of knowledge concerning the earthquake occurrence mechanism to administrative agencies and other remarkable scientific/academic outcomes were achieved, and ripple effects occurred in a visible manner. We can evaluate the Agency's outcome as the progress beyond the plan to create outcomes of medium-term objectives.</u></p> <p>○ In evaluating research and development focusing on the solution of issues, the self-evaluation has been established by using the “flowchart to achieve medium-term objectives” (hereinafter referred to as the “Flowchart”) and a roadmap created by JAMSTEC itself. This enables visualizing of the progress to achieve the medium-term plan and the establishment of annual specific objectives and the <u>improvement of self-evaluation process</u> is recognized. In order to outline a specific way to create outcomes to “maximization of R&D achievements,” it is important for the agency to continuously examine matching between the Flowchart and the roadmap for further visualizing where each research theme is used in the Flowchart.</p> <p>○ In Development and Operation Sector and Administration Sector, prompt actions toward items in FY2015 evaluation and <u>a great improvement of the self-evaluation process such as objective evaluation wherever possible while comparing the effects of operations/efforts made by JAMSTEC with other institutes’ and showing indicators</u> as well as <u>challenge toward new efforts positively</u> such as challenge towards XPRIZE and strategic publication using SNS and crowd-funding can be evaluated.</p> <p>○ On the other hand, <u>it was revealed in 2016 that the conventional summary count of papers was wrong.</u> There was a mistake in the count of publicized academic papers, one of the important evaluation indicators for research institutes for the past few years. The transmission of wrong information is a big problem. <u>In the future, we ask the agency to take thorough preventive measures, such as manualizing paper counting methods and making such counting methods.</u></p> <p>In taking account of these in a comprehensive manner, the evaluation of the agency as a whole is A because in spite of the mistake in summary count of academic papers in transmitting result information, the agency made efforts to improve the situation and properly responded to items in the previous year’s evaluation to improve the self-evaluation process, and many considerable achievements were attained to achieve outcomes.</p>

3. Issues to be solved and /or improved for each subject

[Item I-1 Promoting strategic/focused research development on a basis of national/social needs]

- As for this item specifying the progress of a research and development focusing on the solution of issues, self-evaluation utilizing flow chart and roadmap is continuously required in and after the next year. At the time, further improvement is required for the roadmap utilization methods. Specifically, the agency should use the roadmap effectively to show JAMSTEC's efforts for achieving medium-term objects and results in a easily understandable manners such as:
 - The agency should further clarify corresponding relations with the Flowchart, clarify the achievement rate after showing how annual results connect to the next year in the roadmap compatible with the Flowchart in an easily understandable manner (matching between the Flowchart and the roadmap, and specification of the outline and the progress level in the roadmap).
 - The roadmap is reviewed on a year to year basis, and the agency clarifies changes and why they are made, and effects expected by the change (visualizing changes in the roadmap).
- The research and development focusing on the solution of issues does not deny the importance of basic research. The management as a research institute aiming at the “maximizing results of research and development focusing on the solution of issues” as the entire organization is strongly desirable while ensuring consistency among basic researches, medium-term objectives, and medium-term plan especially by young researchers and maintaining/improving the morale of researchers on site.
- The “promotion of research and development” means the research is accompanied by “PR” and “dissemination of information.” We strongly require that the information on research results should be adequately disseminated not only in academic papers and conference presentation but also through interactive dialogue including press conference etc. In particular, researchers responsible for results and efforts that exert remarkable scientific and academic results and strong social influence gives a press conference to clearly explain research results and significance to the public.

[Items I-2 - I-5 and II and later]

- As for this item regarding activities in Development and Operation Sector and Administration Sector, we continuously require the agency to clarify specific targets as outcomes and establish indicators for the effects of the implemented actions over the required outcomes and make objective self-evaluations in comparison with other institutes. In the FY2016 self-evaluation, various indicators for quantitative evaluation are almost properly established, but for example, the “rate from the previous year” is not a proper indicator in evaluating the long-term result levels. It is necessary to continuously devise and review indicators appropriate to evaluate continuing operations.
- In disseminating information on results, we strongly require the agency to take thorough preventive measures so that the number of academic papers, one of important result indicators as research institutes, can be correctly summarized and released. (See page 116)

4. Other items

Main opinions of the council on research and development	<p>[Responses to items in the previous year's evaluation]</p> <ul style="list-style-type: none">○In general, JAMSTEC should fully examine actions against items in the previous year's evaluation and reflected the results in new trials and improvement of business operations. This should be evaluated. As for research and development projects, the setting of objectives and self-evaluation process by using the Flowchart and the roadmap were implemented and the outline to create outcomes is being specified. In addition, quantitative and objective evaluation is introduced to operations in Development and Operation Sector and Administration Sector such as the analysis to acquire details of outcomes brought by actions.○On the other hand, the positioning and acquisition of outcomes are required to be further clarified and specified to directly reduce JAMSTEC research activities into the society and Japanese living. For example, it is important to control JAMSTEC and clarify the role to play and goals of research and development of seabed resources (the “estimation of potential location of mineral deposit” and the “establishment of environmental impact assessment method”), covering the commercial manufacturing in consideration of economic costs and environmental risks as well as the suggestion levels based on scientific knowledge. <p>[Issues for effective implementation of PDCA cycle by using the Flowchart]</p> <ul style="list-style-type: none">○Some research and development projects lay out very challenging goals and objectives, where JAMSTEC results do not always directly result in the creation of outcomes, and there are various factors that do not depend on JAMSTEC results for realization. It is important to evaluate these objectives, not depending on whether specific outcomes are created in a single step but to evaluate the progress by clarifying the scope of jurisdiction of JAMSTEC in creating outcomes and clarifying the medium-term plan goals and annual goals. On the other hand, the agency should strictly check if its research contents and results are really proper to create outcomes. Thus, not only by objectively evaluating outcomes but by taking the evaluation method incorporating the process evaluation leading to outcomes, the agency can lead the evaluation to the establishment of challenging objectives, proper efforts to realize them, and maintaining motivations for improving failures, and effectively implement the PDCA cycle.○As the evaluation method for the whole agency with a roadmap and the Flowchart is widespread the agency conducting the self-evaluation and the evaluator understand the summary and use the Flowchart and others better. This is a good point. At the same time, there are concerns: the agency may conduct operations in accordance with the Flowchart; and it may be difficult to make unexpected progress or changes in plans, which drop off from the Flowchart. In the future, if both sides consciously discuss the meaning of and how to use the development not shown in the Flowchart and differences in the plan, it is likely that the activities to evaluate the whole agency are more meaningful.○ In utilizing the roadmap, we want the agency to be more conscious of the connection with the Flowchart and show the modifications of the roadmap and their effects according to the annual
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	<p>progress. The simple summary will do. The modifications themselves may be equivalent to the “specification of the outline to create outcomes.”</p> <p>[With regard to the president’s management]</p> <ul style="list-style-type: none"> ○The full diversity of the organization including the gender balance is extremely important for the development of the organization. This can be evaluated: JAMSTEC examines and implements unique approaches of human resource development of young researchers including the International Post-doc schemes. The future verification, which shows what effects occur, is expected. On the other hand, from the global viewpoint, JAMSTEC does not sufficiently satisfy the requirements of a first-class research organization. We think it necessary to establish specific numerical objectives and examine the acceptance system. ○The Lord Howe Rise project under the leadership of the president is likely to attract attentions and interests from the general public. It is necessary to promote the project toward realization and disseminate information. ○ “JAMSTEC Innovation Award” was created as a part of the leadership of the president and promotes the publicly offered issues including themes with high originality, creativity, and field fusion, where it was difficult to obtain sponsored funds. In the future, the specific achievements should be clarified. ○JAMSTEC made proactive efforts on the industry-university-government cooperation related to the dissemination of research seeds. In the future, the organization should examine measures to enhance the interactive activities (needs/seeds matching) with the industry and specific measures to connect research outcomes with the innovation. In particular, the further leadership of the president is required for the latter, which has different characteristics from the past research and development. ○The agency recognizes that the summary count of academic papers was wrong and modified the self-evaluation for this item is modified into C. The number of papers is an indicator to judge achievements and is important for the national research institutes. The agency takes the leadership to recognize and modify errors. We evaluate this.
Auditor’s special comments	No special matters to note

*1

- S: Based on the National Research and Development Agency’s aims, businesses with mid to long-term objectives due to comprehensive consideration based on some circumstances regarding the agency’s business achievements, and efforts through its activities, especially the creation of considerable achievements, anticipated creation of special achievements in the future and so on toward “maximization of R&D achievements” under the conditions of appropriate, effective and efficient operations are recognized.
- A: Based on the National Research and Development Agency’s aims, businesses with mid to long-term objectives due to comprehensive consideration based on some circumstances regarding the agency’s business achievements, and efforts through its activities, especially the creation of considerable achievements, anticipated creation of special achievements in the future and so on toward “maximization of R&D achievements” under the conditions of appropriate, effective and efficient operations are recognized.
- B: Based on the National Research and Development Agency’s aims with business, mid to long-term objectives due to comprehensive consideration based on some circumstances regarding the agency’s business achievement, efforts and so on through its activities, a certain degree of expectation for the creation of achievement and creation of achievement in the future toward “maximization of R&D achievements” were recognized, and steady business operations have been also recognized.
- C: Based on the National Research and Development Agency’s aims, businesses with mid to long-term objectives and so on, as a result of comprehensive consideration based on some circumstances regarding the agency’s business achievements, efforts and so on through its activities, the creation of achievements, further drastic efforts and improvements toward “maximization of R&D achievements” or “the appropriate, effective and efficient operations” are anticipated.
- D: Based on the National Research and Development Agency’s aims, businesses with mid to long-term objectives due to comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts and so on through its activities, special efforts and improvements including a fundamental drastic review, toward “maximization of R&D achievements” or “the appropriate, effective and efficient operations” are required.

Mid to long-term objectives (Mid to long-term plan)	FY Ratings*					No. of document each item	Remarks
	FY2014	FY2015	FY2016	FY2017	FY2018		
I. Maximization of R&D achievements and quality improvement of the other operations							
1.Promoting strategic/focused research development on a basis of national/social needs	-	-	-				
(1) Seabed resources R&D	B	B	A			I-1-(1)	
(2) Marine and global environmental change R&D	B	A	A			I-1-(2)	
(3) Waters seismogenic zone R&D	B	A	A			I-1-(3)	
(4) Marine life science and engineering R&D	B	B	B			I-1-(4)	
(5)①Promotion of comprehensive offshore drilling science utilizing advanced drilling technology	B	A	A			I-1-(5) -①	
(5)②Development for R&D of leading-edge fusion information science	B	A	B			I-1-(5) -②	
(5)③Construction of R&D infrastructure to open up the ocean frontier	B	B	B			I-1-(5) -③	
2. Building the basis of R&D	-	-	-				
(1) Ships and deep-sea research systems etc.	B	B	A			I-2-(1)	
(2) “Earth simulator”	A	B	A			I-2-(2)	
(3) Operation of other facilities and equipment	B	B	B			I-2-(3)	
3. Provision and promotion of usage of the information related to the marine-earth science	-	-	-				
(1) Providing and promoting the use of data and samples	B	B	A			I-3-(1)	

Mid to long-term objectives (Mid to long-term plan)	FY Ratings*					No. of document each item	Remarks
	FY2014	FY2015	FY2016	FY2017	FY2018		
II. Items concerning the efficiency of the administration of the operations							
1. Flexible and efficient system operations	-	-	-				
(1) Enhancement of internal controls and governance	B	B	B			II-1-(1)	
(2) Rational and efficient allocation of resources	B	B	B			II-1-(2)	
(3) Implementation of evaluation	B	B	B			II-1-(3)	
(4) Promotion of information security measures	B	B	B			II-1-(4)	
(5) Information disclosure and personal information protection	B	B	B			II-1-(5)	
(6) Ensuring business safety	B	B	B			II-1-(6)	
2.Streamlining and efficiency of operations	-	-	-				
(1) Streamlining and efficiency of operations	B	B	B			II-2-(1)	
(2) Appropriateness of salary levels	B	B	B			II-2-(2)	
(3) Review of office work business	B	B	B			II-2-(3)	
(4) Appropriateness of contract	B	B	B			II-2-(4)	
/							
III. Items regarding improvements in financial related matters							

(2) PR activities	B	A	A			I-3-(2)	
(3) Dissemination of achievements	B	B	C			I-3-(3)	
4. Promotion of the international cooperation and human resources development as a base of brain circulation progresses on a global scale	-	-	-				
(1) International cooperation and the project promotion	B	A	A			I-4-(1)	
(2) Improvement of human resource development and qualities	B	B	B			I-4-(2)	
5. Innovation creation and promotion of the return of results to the society through the industry-academia cooperation	-	-	-				
(1) Research cooperation through joint research and institutional cooperation	B	B	A			I-5-(1)	
(2) Right size and appropriate management of R&D achievements	B	B	B			I-5-(2)	
(3) Practical application and commercialization of R&D achievements	B	B	B			I-5-(3)	
(4) Promotion of research by external funds	B	B	B			I-5-(4)	

Budget (Including personnel expenses)/ income and expenditure plan, and funding plan	B	B	B				III-1-3
Limit amount of short-term borrowing	-	-	-				IV
If the agency intends to transfer or provide as collateral any important property, a plan therefor;	-	B	-				V
Purpose of using accumulated profit	-	-	-				VI
IV. Other items							
Plans for equipment and facilities	B	B	B				VII-1
Plans for personnel	B	B	B				VII -2
Debt burden over the mid to long-term objective period	-	-	-				VII -3
Use of a reserve fund	-	-	-				VII -4

* The evaluation is based on “Standards concerning the evaluation of independent administrative agencies under the jurisdiction of the Ministry of Education, Culture, Sports, Science and Technology” (determined by the Minister of Education, Culture, Sports, Science and Technology on June 30, 2015). The details are as follows.

[Administrative and projects related to research and development (I)]

S: Based on the National Research and Development Agency’s aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency’s business achievements, efforts and so on through its activities, especially the creation of considerable achievements, anticipated creation of special achievements in the future and so on toward “maximization of R&D achievements” under the conditions of appropriate, effective, and efficient operations are recognized.

- A: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts and so on through its activities, the creation of considerable achievements, anticipated creation of achievements in the future and so on toward "maximization of R&D achievements" under the conditions of appropriate, effective, and efficient operations are recognized.
- B: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency's business achievement, efforts and so on through its activities, a certain degree of expectation for the creation of achievement and creation of achievement in the future toward "maximization of R&D achievements" were recognized, and steady business operations have been also recognized.
- C: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts and so on through its activities, the creation of achievements, further drastic efforts and improvements toward "maximization of R&D achievements" or the "appropriate, effective, and efficient operations" are anticipated.
- D: Based on the National Research and Development Agency's aims, businesses, mid to long-term objectives and so on, and as a result of comprehensive consideration based on some circumstances regarding the agency's business achievements, efforts through its activities, special efforts and improvements including a fundamental drastic review, toward "maximization of R&D achievements" or the "appropriate, effective, and efficient operations" are required.

[Other than administrative work and projects regarding research and development (After II)]

- S: Through the activities of a corporation, remarkable performance exceeding the intended objectives is recognized quantitatively and qualitatively in the medium-term plan (in terms of quantitative indicators, 120% or more vis-à-vis planned medium-term value (or planned FY value), and remarkable performance is also recognized qualitatively)
- A: Through the activities of a corporation, remarkable performance exceeding the intended objectives is recognized in the medium-term plan (in terms of quantitative indicators, 120% or more vis-à-vis planned medium-term value (or planned FY value).
- B: Performance exceeding the intended objectives is recognized in the medium-term plan (in terms of quantitative indicators, 100% or more but less than 120% vis-à-vis planned medium-term value (or planned FY value).
- C: Performance falls below the intended objectives in the medium-term plan, requiring improved performance (in terms of quantitative indicators, 80% or more but less than 100% vis-à-vis planned medium-term value (or planned FY value).
- D: Performance falls below the intended objectives in the medium-term plan, requiring drastic improvement of business including its abolition (in terms of quantitative indicators, less than 80% vis-à-vis planned medium-term values (or planned FY value), or it is recognized that the competent Minister is required to ask for improving business operations or taking other necessary measures).