Evaluation of FY2016 Operating Results for Japan Aerospace Exploration Agency

August 2017

Prime Minister
Minister for Internal Affairs and Communications
Minister of Education, Culture, Sports, Science and Technology
Minister of Economy, Trade and Industry

Form 2-1-1 National Research and Development Agency FY Evaluation / Overview of the Evaluation

1. Items related to the evaluation		
Agency	Japan Aerospace Exploration Agency	
FY for evaluation	FY evaluation	FY2016 (3rd term)
	Mid to long-term objective period	FY 2013-FY2017

2. Items related to the assessor				
The Competent Minister		Prime Minister		
	Incorporated jurisdiction dept.	National Space Policy Secretariat, Cabinet office	Dept. and person in charge	National Space Policy Secretariat, Cabinet office, Counselor, Hidekazu Takakura
	Evaluation and Inspection dept.	Policy Evaluation Public Relations Division, Minister's Secretariat	Dept. and person in charge	Policy Evaluation and Public Relations Division, Director, Hiroki Kawata
The Competent Minister		Minister of Internal Affairs and Communications		
	Incorporated jurisdiction dept.	Global ICT Strategy Bureau	Dept. and person in charge	Space Communications Policy Division, Director, Hisashi Onaga
	Evaluation and Inspection dept.	Policy Evaluation Public Relations Division, Minister's Secretariat	Dept. and person in charge	Policy Evaluation and Public Relations Division, Director, Shinya Hirano
The Competent Minister		Minister of Education, Culture, Sports, Science and Technology		
	Incorporated jurisdiction dept.	Research and Development Bureau	Dept. and person in charge	Space Development and Utilization Division, Director, Hirota Tani
	Evaluation and Inspection dept.	Science and Technology Policy Bureau	Dept. and person in charge	Planning and Evaluation Division, Director, Kenji Matsuoka
The Competent Minister		Minister of Economy, Trade and Industry		
	Incorporated jurisdiction dept.	Manufacturing Industries Bureau	Dept. and person in charge	Space Industry Office, Office Director, Masanori Tsuruda
	Evaluation and Inspection dept.	Policy Evaluation Public Relations Division, Minister's Secretariat	Dept. and person in charge	Policy Evaluation and Public Relations Division, Director, Satoshi Miura

3. Items regarding implementation of the evaluation
June 16, 2017 Field visit by Sub-Committee members of Japan Aerospace Exploration Agency (JAXA) under the Ministry of Education, Culture, Sports, Science and Technology (JAXA Chofu Aerospace Center)
June 22, 2017 Field visit by Sub-Committee members of JAXA under the Ministry of Education, Culture, Sports, Science and Technology (JAXA Sagamihara Campus)
June 23, 2017 Field visit by Sub-Committee members of JAXA under the Ministry of Education, Culture, Sports, Science and Technology (JAXA Tsukuba Space Center)
June 27, 2017 Joint hearings regarding business achievements of JAXA were held by Ministry of Internal Affairs and Communications and Ministry of Education, Culture, Sports, Science and Technology.
June 30, 2017 Hearing about business performance of JAXA by Ministry of Economy, Trade and Industry
July 6, 2017 Hearing about business performance of JAXA by Ministry of Education, Culture, Sports, Science and Technology
July 7, 2017 Hearing about business performance of JAXA by Cabinet Office
July 11, 2017 Hearing about business performance of JAXA by Ministry of Internal Affairs and Communications
July 20, 2017 Hearing in the Sub-Committee of JAXA under the Cabinet Office
July 24, 2017 Hearing in the Sub-Committee of JAXA under the Ministry of Economy, Trade and Industry
July 25, 2017 Hearing in the Sub-Committee of JAXA under the Ministry of Internal Affairs and Communication
July 26, 2017 Hearing in the Sub-Committee of JAXA under the Ministry of Education, Culture, Sports, Science and Technology
August 3, 2017 Hearing in the National Research and Development Agency Council under the Ministry of Internal Affairs and Communications
August 3, 2017 Hearing in the National Research and Development Agency Council under the Ministry of Education, Culture, Sports, Science and Technology
[Sub-Committee members of JAXA, Space Policy Committee under Cabinet Office are: Hiroshi Yamakawa, Member (Professor, Navigation System Engineering Field, Research Institute for Sustainable Humanosphere, Kyoto University) Kuniaki Tanabe, Ad hoc member (Professor, Graduate School for Law and Politics/ Graduate School of Public Policy, University of Tokyo), Setsuko Aoki (Professor, Keio University Law School), Haruhiko Kataoka, Ad hoc

member (ex-Chief of Staff, Air Self Defense Force), Seiko Shirasaka, Ad hoc member (Professor, Graduate School of System Design and Management, Keio University), Toshiko Seki, Special ad hoc member (Representative, Value-added Technology Research Institute)]

[Sub-Committee members of JAXA, the National Research and Development Agency Council under the Ministry of Internal Affairs and Communications are: Masahiro Umehiko, Member (Professor, Department of Media and Telecommunications Engineering, Ibaraki University), Keiko Chino, Member (Senior Staff Writer, Yomiuri Newspaper Tokyo Head Office), Hideki Mizuno, Member (Professor, School of Engineering, Tokai University) Yuta Irisawa, Expert advisor (Partner, Avantia GP), Yumi Ogose, Expert advisor (Professor, Professional Graduate School, Tokyo University of Science), Souichirou Kozuka, Expert advisor (Professor, Department of Law, Faculty of Law, Gakushuin University), Noriharu Suematsu, Expert advisor (Professor, Research Institute of Electrical Communication, Tohoku University), Shinichi Nakasuka, Expert advisor (Professor, School of Engineering, University of Tokyo), Yoshiyuki Fujino, Expert advisor (Professor, Department of Electrical and Electronic Engineering, Toyo University), Masayo Fujimoto, Expert advisor (Partner, Fuji Xerox Co., Ltd.) Ikuko Yairi, Expert advisor (Associate Professor, Faculty of Science and Technology, Sophia University)]

[Sub-Committee members of JAXA, the National Research and Development Agency Council under Ministry of Education, Culture, Sports, Science and Technology are: Tokuyuki Takahashi, Member (President, Toyofuji Shipping Co., Ltd.), Yoshiko Kojo, Member (Professor, Graduate School of Arts and Sciences, College of Arts and Sciences, University of Tokyo), Seiko Shirasaka, Special member (Professor, Graduate School of System Design and Management, Keio University), Steve Squyres, Special member (Professor, Cornell University), Arisa Kuroda, Special member (CEO, Antares Corporation Co., Ltd.), Yuko Nagahara, Special member (Deputy Director, Research Center for Science Systems, Japan Society for the Promotion of Science), Masao Hirano, Special member (Professor, Faculty of Commerce, Waseda University)]

[Sub-Committee members of JAXA, the National Research and Development Agency Council under Ministry of Economy, Trade and Industry are: Hiroshi Ashibe, Special member (Advisor, GCA Corporation) Misuzu Onuki, Special member (Space Business Consultant, Space Frontier Foundation), Takashi Goto, Special member (President and CEO, Seibu Holdings, Inc.) Tetsuya Sakashita, Special member (Director, Utilization of Digital Information Research Department, JIPDEC), Yoshiko Taya, Special member (Professor, Japan Woman's University) Takashi Yoshimura, Special member (Director, Industrial Technology Bureau, Japan Business Federation)]

4. Important items and others relating to the evaluation
On December 13, 2016, JAXA approved the revision of the mid to long-term plan to specify the use of the supplementary budget for FY2016

Form 2-1-2 National Research and Development Agency FY Evaluation / Overall Rating

1. Overall evaluation							
Rating*1 (S, A, B, C, D)	A	(Reference) Overall rating situation for the past FY years compared with the same period during this FY *2					
			FY2013	FY2014	FY2015	FY2016	FY2017
		Quality improvement business	A	A	B	A	
		Efficiency of business operations	A				
		Improvement of financial conditions	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

At the “Subcommittee on Japan Aerospace Exploration Agency” under the Cabinet Office and the “National Research and Development Agency Council” under the Ministry of Internal Affairs and Communications, the Ministry of Education, Culture, Sports, Science and Technology and the Ministry of Economy, Trade and Industry, the work performance details for FY2016, which falls on the fourth fiscal year of JAXA's third mid to long-term objective period, were deliberated in accordance with social insight, scientific knowledge and international standards based on the report for work performance submitted by JAXA, and advice was duly provided.

In FY2016, all the items were rated B or above on an item-by-item basis, indicating steady progress in all fields. Among other things, there were 3 items rated S and 10 items rated A and remarkable outcome was also observd for the item entitled, “Matters concerning maximization of results of research and development, and improvement of the quality for other operations” as well as for other items in each field. Therefore, by and large, it is concluded that the progress on performance beyond the mid to long-term plan and FY plan has been recognized.

As a noteworthy development, it was recognized that the significantly remarkable results were obtained. World's highest level of operational performance was repeatedly observed in space transportation system, such as the success rates of on-time launching, and multi-machine short-term launching was conspicuous, and the social implementation of aviation science technology was achieved and a device for detecting world's lightest and highest level of clear-sky turbulence was successfully developed, whereby a device for the Disaster Relief Aircraft Information Sharing Network (D-NET) was amounted on nearly all fire and disaster prevention helicopters in Japan, which contributed to properly responding to the Kumamoto earthquake. The creation of remarkable results was also recognized in remote sensing of satellite, space science/exploration and manned space activities, such as promotion of satellite data by external institutions mainly in disaster response, and offering world’s first-class academic achievements, and operation and expansion of active use of “Konotori” (HTV), a space station refueling machine, and “Kibo” (JEM), a Japanese experiment module.

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

○ In the field of space transportation system, the H3 rocket, which is currently being developed under the prime contractor system, is unlike the conventional development scheme. There exists a prime information processing company working between JAXA and other relevant companies and, therefore, there is a concern that JAXA may need to get information indirectly. In particular, “bad news should be first” thoroughly processed, and it represents a challenge whether the necessary information will be shared quickly among all parties concerned including the stakeholders and the management. To ensure that all parties can share information on design, manufacture and operation processes reliably, which is the key to any success, preparations should be made thoroughly enough to ensure that all parties can share the detailed information, and avoid overlooking or prevent unexpected events from occurring. (See pages 13 and 28)

○ In the field of space science and exploration, given that training of young talents is essential for producing superior academic achievements, it is a concern that degree holders are decreasing in number. From the viewpoint of expanding the range of research fields, the training of young people is also considered to be very important. (See page 31)

○ In the field of information disclosure and publication, was it not possible to publicize a little bit more of the details of the useful information being gathered before the outage of the function of the X-ray astronomical satellite “Hitomi” (ASTRO-H)? Even if it represents a short-time observation, it should be made public proactively if it includes information on any beneficial achievement that requires to be propagated on a timely basis. (See page 67)

4. Other items	
Major opinions of National Research and Development Agency Committee	No special matters to note
Auditor's special comments	No special matters to note

*1 S: Based on the National Research and Development Agency's aims, businesses, 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, 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, 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, business, mid to long-term objectives and so on, as a result of comprehensive consideration based on some circumstances regarding the agency's business achievement, efforts and others, 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, 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, as a result of 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.

*2 Evaluations up to FY 2013 were not made based on the evaluation committee for incorporated administrative agency under MEXT's jurisdiction, since evaluation was made at each step for the major items of item by item evaluation, this evaluation shall be described in the reference as the previous period's evaluation.

Form 2-1-3 National Research and Development Agency FY Evaluation / Ratings Summary Table by Each Item

Mid to long-term objectives (Mid to long-term plan)	FY Ratings					No. of document each item	Remarks
	FY2013	FY2014	FY2015	FY2016	FY2017		
I. Maximization of R&D achievements and quality improvement of the other operations							
1. Securing space safety and security							
(1) Positioning satellites	A	B	B	B		I-1-1	-
(2) Remote sensing satellites	S	S	B	B		I -1-2	-
(3) Satellite communication/satellite broadcasting	A	B	B	B		I -1-3	-
(4) Space transportation systems	S	A	S	S		I -1-4	-
(5) Other efforts	-	-	B	B		I -1-5	-
2. Promoting space utilization in the private sector							
(1) Positioning satellites	A	B	B	A		I -2-1	-
(2) Remote sensing satellites	S	S	A	A		I -2-2	-
(3) Satellite communication/satellite broadcasting	A	B	B	B		I -2-3	-
(4) Other efforts	-	-	B	B		I -2-4	-
3. Maintaining and enhancing the foundations of the space industry and scientific technology							
(1) Space transportation systems	S	A	S	S		I -3-1	-
(2) Space science/exploration	A	A	C	A		I -3-2	-

Mid to long-term objectives (Mid to long-term plan)	FY Ratings					No. of document each item	Remarks
	FY2013	FY2014	FY2015	FY2016	FY2017		
II. Items concerning the efficiency of the administration of the operations							
1. Enhancement of internal controls and governance			C	A		II-1	-
(1) Security of information	A	B					
(2) Project management	A	B					
(3) Appropriateness of contract	A	B					
2. Flexible and efficient organization management	A	B	B	B		II -2	-
3. Streamlining and efficiency of operations			B	B		II -3	-
(1) Streamlining and efficiency of operational expenses	A	B					
(2) Streamlining and efficiency of personnel expenses	A	B					
4. Application of information technology	S	B	B	B		II -4	-
III. Items regarding improvements in financial related matters							
III. Budget (Including personnel expenses)/ income and expenditure plan, and funding plan	A	-	B	B		III - VII	Evaluation is made in III. Items regarding improvements in financial related matters.
IV. Limit amount of short-term borrowing	-	-					
V. If the agency has any unnecessary property or any property that is expected to be unnecessary property, a plan for disposal of such property	-	-					
VI. If the agency intends to transfer or provide as collateral any important	-	-					

(3) Manned space	S	B	A	A		I -3-3	-
(4) Space solar power	A	B	B	B		I -3-4	-
(5) Measures for strengthening industrial base and science/technology base that support individual projects	-	-	B	A		I -3-5	-
4. Aeronautical science and technology			S	S		I -4	-
(1) Research and development focused on environment and safety	B	A					
(2) Promotion of usage of aviation aeronautical science and technology	A	B					
(3) Contribution to strengthening technology base and industrial competitiveness	-	-					
5. Cross-cutting issues							
(1) Comprehensive efforts to expand use	A	B	B	B		I -5-1	-
(2) Strengthening of research analysis and strategic planning functions	A	B	B	B		I -5-2	-
(3) Development of fundamental facilities/equipment	A	B	B	B		I -5-3	-
(4) Comprehensive enhancement of domestic human resource base, promotion of public understanding	A	A	A	B		I -5-4	-
(5) Realization/enhancement of rule of law in outer space	A	A	A	A		I -5-5	-
(6) Strengthening of international space cooperation	A	A	A	A		I -5-6	-
(7) Promotional activities to meet country infrastructure needs overseas	A	B	A	A		I -5-7	-
(8) Information disclosure and public relations	A	A	A	A		I -5-8	-
(9) Business assessment	A	B	B	B		I -5-9	-

property other than the property provided for in the preceding item, a plan therefor;							
VII. Purpose of using accumulated profit	-	-					
IV. Other matters							
1. Facilities and equipment related issues	A	B	B	B		VIII-1	-
2. Plans for personnel	A	B	A	B		VIII -2	-
3. Safety and reliability related issues	A	B	C	B		VIII -3	-

* For items that are set to “high” level of importance, a “circle” shall be marked next to each comment.
For items that are set to “high” level of difficulty, each comment shall be underlined.

* Evaluations up to FY 2013 were made based on “the basic guideline regarding business results evaluation for Incorporated Administrative Agency under MEXT’s jurisdiction” (The evaluation committee for incorporated administrative agency under MEXT’s jurisdiction on March 22, 2002).

Evaluations after FY2014 are made based on “Guidelines for evaluation of Incorporated Administrative Agency” (as determined by the Minister for Internal Affairs and Communications on September 2, 2014). The details are as follows.

Ratings up to FY2013	Ratings after FY2014
S: Outstanding achievements are fulfilled (Without providing a cross-cutting objective standard for the agency in advance, S is rated according to the characteristics of the agency’s business operations.). A: Achievements are in line with the plan for medium-term, or beyond, or are steadily being implemented toward a medium-term objective, or beyond (achievement rate for the medium-term objective should be over 100% in a given FY.). B: In some ways the plan is not being implemented in line with medium-term-objectives, however, the plan may be achieved by means of ideas and efforts (achievement rate for the medium-term objective should be 70% to 100%.). C: The implementation of the plan is behind the medium-term objective, therefore, improvement of business is necessary in order to realize the achievement of the medium-term objective (achievement rate for the medium-term objective in a given FY is less than 70%.). F: The Evaluation Committee needs to warn an agency concerning the improvement of its business management and others (Without providing an objective standard in advance, F is rated as a result of judgement that a warning concerning business improvement is necessary.).	【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: Based on the activities of a corporation, remarkable performance exceeding the intended objectives is recognized quantitatively and qualitatively in the mid to long-term plan (in terms of quantitative indicators, 120% or more vis-à-vis planned mid to long-term values (or planned FY value), and remarkable performance is also recognized qualitatively. A: Based on the activities of a corporation, remarkable performance exceeding the intended objectives is recognized in the mid to long-term plan (in terms of quantitative indicators, 120% or more vis-à-vis planned mid to long-term values (or planned FY value). B: Performance exceeding the intended objectives is recognized in the mid- to long-term plan (in terms of quantitative indicators, 100% or more but less than 120% vis-à-vis planned mid to long-term values (or planned FY value). C: Performance falls below the intended objectives in the mid- to long-term plan, requiring improved performance (in terms of quantitative indicators, 80% or more but less than 100% vis-à-vis planned mid to long-term values (or planned FY value). D: Performance falls below the intended objectives in the mid to long-term plan, requiring drastic improvement of business including its abolishment (in terms of quantitative indicators, less than 80% vis-à-vis planned mid to long-term values (or planned FY value), or it is recognized that the competent Minister is required to make an order for improving business operation or taking other necessary measures).