Evaluation of FY2016 Operating Results for Japan Atomic Energy Agency

August 2017

Minister of Education, Culture, Sports, Science and Technology,

Minister of Economy, Trade and Industry, Nuclear Regulation Authority

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

1. Items related to the evaluation		
Agency	Japan Atomic Energy Agency	
FY for evaluation	FY evaluation	FY2016 (3rd term)
	Mid to long-term objectives period	FY2015 to FY2021

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	Atomic Energy Division, Masaaki Saijo
	Evaluation and inspection dept.	Science and Technology Policy Bureau	Dept. and person in charge	Planning and Evaluation Division, Kenji Matsuoka
The Competent Minister	Minister of Economy, Trade and Industry			
	Incorporated jurisdiction dept.	Electricity and Gas Industry Department, Agency for Natural Resources and Energy	Dept. and person in charge	Nuclear Energy Policy Planning Division, Daisuke Matsuno
	Evaluation and inspection dept.	Minister's Secretariat	Dept. and person in charge	Policy Evaluation and Public Relations Division, Satoshi Miura
The Competent Minister	Nuclear Regulation Authority			
	Incorporated jurisdiction dept.	Secretary-General's Secretariat, Regulatory Standard and Research Department, Secretariat of Nuclear Regulation Authority	Dept. and person in charge	Regulatory Standard and Research Division, Hiroshi Tsujihara
	Evaluation and inspection dept.	Secretary-General's Secretariat, Secretariat of Nuclear Regulation Authority	Dept. and person in charge	Policy Planning and Coordination Division, Kazuhiro Ohkuma

3. Items regarding implementation of evaluation
(1) Listening to opinions and hearings from the National Research and Development Agency Council (hereinafter referred to as the "Council"). As mentioned below, at the time of an evaluation by the competent minister, we heard opinions from the Councils of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), the Ministry of Economy, Trade and Industry (METI), and the Nuclear Regulation Authority (NRA). June 28, 2017: Sub-Committee of Japan Atomic Energy Agency under MEXT and METI (hereinafter referred to as "Sub-Committee") heard opinions concerning Item No. 2 "R&D on countermeasures against the accidents at the TEPCO's Fukushima Daiichi Nuclear Power Station," Item No. 6 "R&D on Fast-Breeder Reactors (FBR)," Item No.7 "R&D of reprocessing related to the nuclear fuel cycle and treatment of fuel fabrication, and disposal of radioactive waste," and Item No. 8 "enhancement of industry‐academia‐government collaboration and gaining trust from society." Hearing opinions from the president of JAEA was conducted. July 11, 2017: Sub-Committee under MEXT heard opinions concerning Item No. 3 "Technical support for the administration of nuclear safety regulation and research on safety" and Item No. 5 "Research on basic nuclear infrastructure and human resource development." July 18, 2017: Sub-Committee under NRA heard opinions concerning Item No. 3 the "Technical support for the administration of nuclear safety regulation and research on safety." July 25, 2017: Sub-Committee under MEXT/METI heard opinions concerning Item No. 1 "Matters concerning securing of safety and nuclear security," Item No.4 "R&D to improve nuclear safety and activities to contribute to nuclear non‐proliferation and nuclear security," Item No. 9 "Streamlining and efficiency of operations," Item No. 10 "Budget (including an estimate of personnel expenses), revenue and expenditure plan and funding plan," and Item No. 11 "Establish an effective and efficient management system." August 3, 2017: The council under MEXT heard opinions concerning competent minister's evaluation on FY2016 operational results of the Japan Atomic Energy Agency (hereinafter referred to as "JAEA"). August 16, 2017: Sub-Committee under NRA heard opinions concerning competent minister's evaluation on FY2016 operational results of JAEA regarding jurisdiction of the committee from document deliberation.

August 18, 2017: Head of the Sub-Committee under NRA reported contents of the resolution to the head of the council of the NRA.

(2) Field visit by Sub-Committee members
June 1, 2017: Field visit by Sub-Committee members of JAEA (Fukushima district)
June 20, 2017: Field visit by Sub-Committee members of JAEA (Nuclear Science Research Institute and the Nuclear Fuel Cycle Engineering Labs)
June 5, 2017: Field visit by Sub-Committee members of JAEA (Nuclear Science Research Institute and the Nuclear Emergency Assistance and Training Center (NEAT)

4. Important items and others relating to the evaluation

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

1. Overall evaluation								
Rating*1 (S, A, B, C, D)	B	(Reference) Overall rating situation for the past FY years compared with the same period during this FY						
			FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021
		Overall Rating	B	B					
Reasons for rating	As shown in the overall evaluation of the agency as a whole, it is recognized that more progress of performance than expected is steadily implemented in the mid to long-term plan and the FY plan.							

2. Evaluation of the whole agency

◯ As the only comprehensive research and development institute on the atomic energy in Japan, we recognize that, in general, JAEA steadily implemented successful operations according to the stipulations during the mid to long-term plan to maximize R&D results on the whole.

◯ In particular, we highly evaluate the following activities as we recognize the considerable and future achievements are created.

- The “research and development according to the deal of the accident at TEPCO’s Fukushima Daiichi Nuclear Power Station” is highly evaluated because of the creations of the considerable and future achievements are recognized concerning R&D aiming at decommissioning the reactors and for environmental recovery, as well as building the basis of R&D.
- The “technical support for the administration of nuclear safety regulation and research on safety” is highly evaluated because the creations of the considerable and future achievements which are recognized concerning the technical support for the administration of nuclear safety regulation and research on safety, and technical support for nuclear power disaster prevention, etc.
- “R&D on improvement of nuclear safety and activities conducive to nuclear non-proliferation and nuclear security” is highly evaluated as the creations of the considerable and future achievements are recognized concerning R&D etc. on improvement of nuclear safety and activities conducive to nuclear non-proliferation and nuclear security.
- “Research on basic nuclear infrastructure and human resource development” are evaluated, because R&D on high‐temperature gas reactors and associated heat utilization technologies and the development of nuclear human resources and promotion of service facility uses were steadily worked on. At the same time, it is highly evaluated because the creation considerable future achievements is recognized concerning the promotion of fundamental research and advanced nuclear research that underpin nuclear power and act on the promotion of public utilization of the specifically advanced and large research facilities.
- “R&D on reprocessing regarding nuclear fuel cycle, production of fuels and disposal and processing of radioactive wastes” are evaluated, because the technology development for reprocessing the spent fuel and fuel fabrication were steadily worked on, and at the same time, it is highly evaluated because the creation of considerable and future achievements is recognized concerning R&D on reducing the volume and toxicity of radioactive waste, and R&D concerning processing technologies of highly radioactive waste and well‐planned performances and technological developments in decommissioningnuclear facilities, and treatment and disposal of radioactive waste.

◯ On the other hand, further efforts/improvements are expected due to the following activities.

- As for “matters concerning securing safety and nuclear security,” the matters concerning ensuring safety and natters concerning nuclear security were steadily worked on according to the FY plan, while further efforts/improvements on securing safety in response to the radiation exposure of workers at the fuel research building at the Oarai Research & Development Center.
- As for “R&D on fast reactor,” the agency is expected to work on further efforts/improvements in the “management” issues concerning the preservation system, human resource development, and the responsibility system for the interested party, which has been pointed out, to safely and steadily decommission “MONJU” in the future.

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

◯ As for the radiation exposure at the fuel research building of Oarai Research & Development Center, ensuring security should be recognized again and worked on based on reports submitted by JAEA and items pointed out by the Nuclear Regulation Authority.

◯ The security violations of “Fugen” are worked on due to the President's management review, but the system should be improved so that violations may not occur in the future.

4. Other items	
Main opinions of the council on research and development	◯ Though the degree of achievement is different depending on items, we evaluate the FY plan, in general, has been steadily achieved. ◯ The agency conducted research which is directly connected to the reactor where the nuclear accident occurred which is unprecedented in the world. In the future, we want the agency to further contribute to decommissioning safely through smooth communication with the interested parties at the decommissioning site and by proceeding with quality R&D activities to meet requirements at the accident site. ◯ We want the agency to keep the initiative on the priority of safety research in the future, and communicate with the Nuclear Regulation Authority and the site to prevent any inconsistency from

	breaking loose, and lead the nuclear safety research. ◯ We expect the agency to fully utilize PDCA cycle in matters concerning ensuring safety, and learn lessons from the past accidents and troubles, and develop the organization and human resources that always work on the improvement. ◯ In the future, it is likely that many facilities shall be abolished and the rate of engineers engaged in decommissioning and the budget will be increased. Researchers and engineers should have different personal evaluation systems. The agency should examine measures to enhance motivation of both researchers and engineers. In addition, the agency should review and examine the budget for decommissioning measures, such as providing a different budget, so that the costs required for decommissioning do not exceed the budget limitations. ◯ Not only results (D and C in the PDCA cycle) but also measures/improvements in the process before them should be explained. ◯ This organization's R&D greatly contributes to the society. At the same time, we assume the workload on operations to maintain the facility gets larger as dangers increase. Under the circumstance, care is necessary not to reduce consciousness toward working on site and safety. ◯ Good communication with researchers/developers and facility maintenance workers and better mutual understanding on their own organizations and businesses are important. ◯ Please keep in mind again that one trouble damages the credibility of the results like the radiation exposure accident in Oarai in 2017 and forced a drastic reform. ◯ We evaluate that the FY plan was steadily implemented on the whole, but still, there are three points to be improved: dissemination of information regardless of emergency, cost management for decommissioning in response to the development of mid to long-term facility plan, and further efforts to procure research funds from the third party. ◯ Researches are required to handle changes in socioeconomic circumstances in Japan and abroad. Regardless of long-term research assignments peculiar to the nuclear energy, the research plan should be flexibly reviewed so that the research achievements, such as the use of radiation can satisfy national needs.
Auditor’s special comments	◯ As for “MONJU,” no event in violation of operational safety provision occurred in 2016. We can evaluate that JAEA has achieved some positive results regarding the improvement of operational performance through the quality management system (hereinafter reffered to as “QMS”), which has been worked on. Last December, the government's policy determined the decommissioning, but the current facility will be maintained for the time being. The improvement of operation implementation and maintenance technology remains an important issue and the agency must continuously handle the issue positively. ◯ As for activities for fostering safety culture and safety management activities, an internal radiation-exposure accident occurred in Oarai Research & Development Center in June 2017. The agency, a specialized agency handling radioactive materials, failed to sufficiently foresee the possibility of scattering of the radioactive materials. It is necessary to improve the safety and keep in control the safety in handling radioactive materials, such as development of JAEA standards. ◯ The risk management as the whole JAEA is implemented, focusing on efforts of the risk management committee. The safety management risk in handling radioactive materials should be reduced as a management risk. ◯ The “mid to long-term facility plan” was developed for the facility management. It is important to promptly develop and implement a specific implementation plan. As for aging facilities and equipment, while focusing on the aging situation on the whole, the agency should examine the mid to long-term plan in consideration of updating the large-scale facilities. ◯ As for management of the budget implementation, a limited budget is managed by the operation implementation unit, but the overall management system is not sufficient to manage the whole JAEA. The budgetary request and the implementation management are important in the administration of the organization. It is necessary to build an effective system to oversee the whole JAEA that includes the implementation procedure and appropriateness of its contents (observance of laws and regulations).

* 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, business with mid to long-term objectives due to comprehensive consideration based on some circumstances regarding the agency’s business achievement, and efforts 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 due to comprehensive consideration based on some circumstances regarding the agency’s business achievements, and efforts through its activities, the creation of achievements, further drastic efforts and improvements toward “maximization of R&D achievements” or “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.

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
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021		
I. Maximization of R&D achievements and quality improvement of the other operations									
R&D in response to the accident at Fukushima Daiichi Nuclear Power Station	A	A						2	
Technical support and safety research for nuclear safety regulation and administration	A	A						3	
R&D to improve nuclear safety and activities to contribute to nuclear non - proliferation and nuclear security	A	A						4	
Basic and general research based on nuclear power and human resource development	B	A						5	
R&D on Fast - Breeder Reactors (FBR)	C	C						6	
R&D on reprocessing related to the nuclear fuel cycle and treatment, fuel fabrication, and disposal of radioactive wastes	B	A						7	
R&D on nuclear fusion	A								
Activities to promote industry - academia - government collaboration and gain trust from society	B	B						8	

Mid to long-term objectives (Mid to long-term plan)	FY Ratings							No. of document each item	Remarks
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021		
II. Items regarding the efficiency of business operations									
Streamlining and efficiency of operations	B	B						9	
III. Items regarding improvements in financial related matters									
Budget (Including personnel expenses)/ income and expenditure plan, and funding plan	B	B						10	
IV. Other items									
Items concerning securing of safety and nuclear security	C	C						1	
Establish an effective and efficient management system	B	B						11	

*See the following for details of evaluation criteria.

Formulate technology evaluation criteria
【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), 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).