



Mid to Long-Term Objectives (Current Version)	Mid to Long-Term Objectives (Proposal under Consideration)	Mid to Long-Term Plan (Current Version)	Mid to Long-Term Plan (Proposal under Consideration)	Major Evaluation Axis (Proposal under Consideration)	Remarks (Related Evaluation and Monitoring Indicators) (Proposal under Consideration)
		<p>In addition, we shall carry out research on the analysis technology of minute environmental samples required for safeguards upon request from NRC.</p> <p>Moreover, having learned lessons from the accident at TEPCO's Fukushima Daiichi Nuclear Power Station, we shall look at external events that may pose a threat to nuclear facilities.</p> <p>Through these research, we shall ensure and maintain the infrastructure necessary for the technical assistance to nuclear safety regulations and administration, contribute to the development of scientific and reasonable regulation standards and safety confirmation of nuclear facilities by actively releasing obtained results and making technical proposals, and aid the improvement of nuclear power safety and the improvement of reliability of nuclear power.</p> <p>In carrying out research, we shall carry out cooperative research and information exchange with domestic and foreign research institutions, reflect the latest wide technical knowledge on nuclear power safety, get a good evaluation from external experts, and continuously improve details of the research based on opinions from NRC. Besides, we shall keep neutral positions and transparency of the operation, effectively and efficiently use personnel and facilities of JAEA divisions and contribute to the development of human resources responsible for future nuclear safety.</p>	<p>In addition, we shall carry out research on the analysis technology of minute environmental samples required for safeguards upon request from NRC.</p> <p>Moreover, having learned lessons from the accident at TEPCO's Fukushima Daiichi Nuclear Power Station, we shall look at external events that may pose a threat to nuclear facilities.</p> <p>Through these research, we shall ensure and maintain the infrastructure necessary for the technical assistance to nuclear safety regulations and administration, contribute to the development of scientific and reasonable regulation standards and safety confirmation of nuclear facilities by actively releasing obtained results and making technical proposals, and aid the improvement of nuclear power safety and the improvement of reliability of nuclear power.</p> <p>In carrying out research, we shall carry out cooperative research and information exchange with domestic and foreign research institutions, reflect the latest wide technical knowledge on nuclear power safety, get a good evaluation from external experts, and continuously improve details of the research based on opinions from NRC. Besides, we shall keep neutral positions and transparency of the operation, effectively and efficiently use personnel and facilities of JAEA divisions and contribute to the development of human resources responsible for future nuclear safety.</p>		
		<p>2) Cooperation for relevant administrative organizations We shall provide scientific data etc., to contribute to the development of regulation standards. In addition, we shall provide human and technical assistance to investigations etc. to investigate the causes of accidents and failures of nuclear facilities upon specific requests from regulatory administrative bodies etc.</p>	<p>2) Cooperation for relevant administrative organizations We shall provide scientific data etc., to contribute to the development of regulation standards. In addition, we shall provide human and technical assistance to investigations etc. to investigate the causes of accidents and failures of nuclear facilities upon specific requests from regulatory administrative bodies etc.</p>		

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<p>(4) Development of nuclear human resources and promotion of service facility uses</p> <p>Based on the Basic Energy Plan, with human resources in a wide range of sectors as a target, the Agency shall develop researchers and engineers with a high problem-solving ability in the nuclear power sector in the R&amp;D sites, human resources via training corresponding to the needs of industries, universities, government agencies etc., human resources who can be active both domestically and abroad, and human resources for nuclear power upon requests etc. from relevant administrative organizations.</p> <p>Based on the Basic Energy Plan, with human resources in a wide range of sectors as a target, the Agency shall develop researchers and engineers with a high problem-solving ability in the nuclear power sector in the R&amp;D sites, human resources via training corresponding to the needs of industries, universities, government agencies etc., human resources who can be active both domestically and abroad, and human resources for nuclear power upon requests etc. from relevant administrative organizations. In particular, facilities such as JRR-3 and the <a href="#">Japan Materials Testing Reactor (JMTR)</a> etc., which have stopped their operations after the earthquake disaster, shall immediately restart the operations after receiving a certification of compliance with new the regulation standards.</p> <p>These efforts shall maintain and develop nuclear technology and human resources at a high level and support nuclear R&amp;D infrastructure.</p>	<p>(4) Development of nuclear human resources and promotion of service facility uses</p> <p>Based on the Basic Energy Plan, with human resources in a wide range of sectors as a target, the Agency shall develop researchers and engineers with a high problem-solving ability in the nuclear power sector in the R&amp;D sites, human resources via training corresponding to the needs of industries, universities, government agencies etc., human resources who can be active both domestically and abroad, and human resources for nuclear power upon requests etc. from relevant administrative organizations.</p> <p>Based on the Basic Energy Plan, with human resources in a wide range of sectors as a target, the Agency shall develop researchers and engineers with a high problem-solving ability in the nuclear power sector in the R&amp;D sites, human resources via training corresponding to the needs of industries, universities, government agencies etc., human resources who can be active both domestically and abroad, and human resources for nuclear power upon requests etc. from relevant administrative organizations. In particular, facilities such as JRR-3 etc., which have stopped their operations after the earthquake disaster, shall immediately restart the operations after receiving a certification of compliance with new the regulation standards.</p> <p>These efforts shall maintain and develop nuclear technology and human resources at a high level and support nuclear R&amp;D infrastructure.</p>	<p>(4) Development of nuclear human resources and promotion of service facility uses</p> <p>Maximizing JAEA's atomic energy basis and fundamentals, we shall develop nuclear researchers and engineers in the R&amp;D sites who have high problem-solving abilities in the nuclear power sector, human resources via training corresponding to the needs of industry, universities, government agencies etc., human resources who are active both domestically and abroad, and human resources for nuclear power upon requests etc. from relevant administrative organizations.</p> <p>In order to develop human resources for atomic energy and create R&amp;D results in science and technology sector, JAEA shall maintain and enhance stable operation and performance of the facilities such as the engineering test reactor and radioactive substance treatment facilities, which are difficult for private operators, universities etc., to maintain, and provide the facilities to many external users in a wide range of sectors domestically and abroad. In particular, we shall restart operations of facilities, which have stopped operation after the earthquake disaster, immediately after receiving the certification of compliance with new regulation standards, and contribute not only to the nuclear power sector but also the creation of innovations in material and medical sectors and academic research etc.</p> <p>1) Securing and developing R&amp;D human resources</p> <p>We shall enhance a human resources development program by using characteristic facilities possessed by JAEA and R&amp;D sites and developing human resources in various infrastructure sectors that support nuclear power development projects and the nuclear power industry among national policies. In addition, we shall develop a system of human resources engaged in research which are rich in originality and creativity from a broad perspective.</p> <p>2) Develop nuclear human resources</p> <p>To develop human resources for nuclear power in Japan, we shall further expand training corresponding to needs of domestic industry, universities, government agencies etc., including responses to the accident at TEPCO's Fukushima Daiichi Nuclear Power Station, use JAEA's characteristic facilities and enhance and promote coordination and collaboration with universities including the Japanese university network. Moreover, we shall promote human resources for nuclear power mainly in Asia upon request etc. from relevant administrative organizations and contribute to the enhancement of international cooperation. We shall promote activities of the network of human resources development for nuclear power such as collecting, analyzing, and releasing information on human resources for nuclear power in coordination and collaboration with domestic and foreign relevant organizations. Our stable efforts in these programs shall contribute to human resources development in the domestic and foreign nuclear power sectors.</p> <p>3) Promote the use of service facilities</p> <p>We shall contribute to the development of human resources for nuclear power and the creation of R&amp;D achievements by promoting the use of service facilities by external institutions such as domestic and foreign industry and universities.</p> <p>For shared use of facilities etc., we shall take opinions and advice on screening and acceptance of issues for use etc. to ensure transparency and fairness related to the use of facilities. In addition, we shall understand user needs of universities and industry to promote wider external use.</p> <p>In addition, we shall create a satisfactory user support system such as providing education on safety and security, driving support etc. to users.</p>	<p>No change</p>	<p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-Implementation status of R&amp;D human resources development program (evaluation indicator)</li> <li>-Activity status of human resources development network (evaluation indicator)</li> <li>-Status of efforts to restart the operation of test reactor (evaluation indicator)</li> </ul> <p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-Evaluation of training courses in questionnaires by Japanese and overseas training participants (evaluation indicator)</li> <li>-The numbers of service facilities, usages, adopted challenges, and users (evaluation indicator)</li> <li>-The number of trainings on safety and security offered to users (evaluation indicator)</li> <li>-The numbers of accepted students including overseas post-doc and training participants (monitoring indicator)</li> <li>-The number of papers presented by providing facilities (monitoring indicator)</li> <li>-Intellectual property including patents acquired by providing facilities (monitoring indicator)</li> <li>-The number of consultations with candidate users (monitoring indicator)</li> </ul>	<p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-Implementation status of R&amp;D human resources development program (evaluation indicator)</li> <li>-Activity status of human resources development network (evaluation indicator)</li> <li>-Status of efforts to restart the operation of test reactor (evaluation indicator)</li> </ul> <p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-Evaluation of training courses in questionnaires by Japanese and overseas training participants (evaluation indicator)</li> <li>-The numbers of service facilities, usages, adopted challenges, and users (evaluation indicator)</li> <li>-The number of trainings on safety and security offered to users (evaluation indicator)</li> <li>-The numbers of accepted students including overseas post-doc and training participants (monitoring indicator)</li> <li>-The number of papers presented by providing facilities (monitoring indicator)</li> <li>-Intellectual property including patents acquired by providing facilities (monitoring indicator)</li> <li>-The number of consultations with candidate users (monitoring indicator)</li> </ul>
<p>5. R&amp;D on Fast-Breeder Reactors (FBR)</p> <p>In the Basic Energy Plan, Fast-Breeder Reactors (FBR) are expected to undertake new roles, not only by using uranium resources effectively in a conventional way, but also by reducing the volume and toxicity of radioactive waste and technologies related to non-proliferation. The Agency shall contribute to solving these challenges of Japan and diversifying the future energy policy by promoting <a href="#">R&amp;D on "MONJU"</a> and R&amp;D to establish verification technologies for Fast-Breeder Reactors (FBR).</p>	<p>5. R&amp;D on Fast-Breeder Reactors (FBR)</p> <p>In the Basic Energy Plan and <a href="#">"Fast-Breeder Reactors (FBR) Development Policy" (determined by decision of the Council of Ministers Related to Nuclear Energy in December 2016)</a>, fast-breeder reactors (FBR) are required not only to use uranium resources effectively in a conventional way but also are expected to play a new role of reducing the volume and toxicity of high-level radioactive waste and improving technologies related to non-proliferation. For this purpose, while giving the highest priority to safety and promoting international cooperation, we shall carry out R&amp;D to establish verification technologies for FBR, and contribute to the formulation and realization of energy policies of Japan in the future.</p> <p><a href="#">In addition, as for "MONJU," based on the Government's "Policy on Handling of "MONJU," (determined by decision of the Council of Ministers Related to Nuclear Energy in December 2016) efforts are made to implement the safe and steady measures for decommissioning.</a></p>	<p>5. R&amp;D on Fast-Breeder Reactors (FBR)</p> <p>In the Basic Energy Plan, fast-breeder reactors (FBR) are required not only to use uranium resources effectively in a conventional way but also are expected to play a new role of reducing the volume and toxicity of high-level radioactive waste and improving technologies related to non-proliferation. For this purpose, while giving the highest priority to safety and promoting international cooperation, we shall carry out R&amp;D on <a href="#">the prototype fast-breeder reactor "MONJU"</a> and R&amp;D to establish verification technologies for FBR, and contribute to the formulation and realization of energy policies of Japan in the future.</p>	<p>5. R&amp;D on Fast-Breeder Reactors (FBR)</p> <p>In the Basic Energy Plan and <a href="#">"Fast-Breeder Reactors (FBR) Development Policy" (determined by decision of the Council of Ministers Related to Nuclear Energy in December 2016)</a>, fast-breeder reactors (FBR) are required not only to use uranium resources effectively in a conventional way but also are expected to play a new role of reducing the volume and toxicity of high-level radioactive waste and improving technologies related to non-proliferation. For this purpose, while giving the highest priority to safety and promoting international cooperation, we shall carry out R&amp;D to establish verification technologies for FBR, and contribute to the formulation and realization of energy policies of Japan in the future.</p> <p><a href="#">In addition, as for "MONJU," based on the Government's "Policy on Handling of "MONJU," (determined by decision of the Council of Ministers Related to Nuclear Energy in December 2016) efforts are made to implement the safe and steady measures for decommissioning.</a></p>	<p>[1]Are efforts made to give top priority to the enhancement of operation management system?</p>	<p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-Status of efforts to prevent human disasters, accidents, and troubles (evaluation indicator)</li> <li>-Implementation status of quality assurance activities and creation of safety culture, and compliance with laws and regulations (evaluation indicator)</li> <li>-Status of handling troubles until restoration (evaluation indicator)</li> <li>-Status of accumulation and transmission of operation and maintenance management technology (monitoring indicator)</li> </ul> <p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-The number of human disasters, accidents, and troubles (monitoring indicator)</li> <li>-The number of matters indicated in security checks (monitoring indicator)</li> </ul>



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		<p>and advancement of operation/maintenance and management technologies. We shall receive an intermediate evaluation on these efforts from an external expert by the midst of the objectives period and reflect it in a future plan.</p> <ul style="list-style-type: none"> <li>• We shall summarize safety improvement measures obtained through responses to new regulation standards and enhance the technical system to ensure safety in consideration of characteristics of sodium cooling fast reactors.</li> <li>• While accumulating knowledge learned through operations, we shall continuously reflect it in maintenance experiences, operation procedures, maintenance plans etc., and build the operation and FBR maintenance management technology system.</li> <li>• To form an international unique FBR R&amp;D center around "MONJU," we shall carry out sodium handling tests to further improve the safe and stable operation of MONJU by using the sodium engineering research facility.</li> </ul>			

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<p>(2) Global strategy planning aiming at the establishment of verification technologies for Fast-Breeder Reactors (FBR) and maximization of R&amp;D achievements</p> <p>To establish verification technologies for FBR, the Agency shall use experiences learned from R&amp;D on “MONJU” and the fast breeder laboratory reactor “Joyo,” which is used as an irradiation facility (hereinafter referred to as “Joyo”) and carry out R&amp;D on FBRs through participation in international projects such as the ASTRID reactor in France which is in the verification stage.</p> <p>In order to smoothly carry out these R&amp;Ds, the Agency shall obtain a confirmation of conformity with new regulation standards for Joyo, resume its operation, and implement irradiation tests etc.</p> <p>Furthermore, through the participation in international projects such as the ASTRID reactor in France, it is necessary to sufficiently reflect past research results and accumulated technologies into the projects. The Agency shall use the necessary human resources and develop human resources with international negotiation skills. At the same time, the Agency shall make use of the project results in future R&amp;D. The Agency shall receive an intermediate evaluation for the R&amp;D achievements from external experts by the midst of objectives period and reflect it in future plans.</p> <p>To proceed (1) and above-mentioned R&amp;D, the Agency shall consider technical, economic and social risks in view of the efficient use of resources, reduction of high-level radioactive waste and toxicity etc., and maximize the results of safe and efficient R&amp;D of FBR. To achieve this, in light of the international trends in FBR R&amp;D, the Agency shall plan a global strategy for R&amp;D on FBR in consideration of a smooth transition to the verification process, effective and efficient resource allocation, maintaining and development of FBR technologies and human resources in Japan, agree policies with interested parties such as the government, and contribute to policy planning etc.</p> <p>In addition, the Agency shall formulate a policy of FBR safety design standard draft and lead the international standardization of FBR safety design standards by using the Generation-IV International Forum (GIF) and ASTRID cooperation between Japan and France.</p>	<p>(2) Global strategy planning aiming at the establishment of verification technologies for Fast-Breeder Reactors (FBR) and maximization of R&amp;D achievements</p> <p>To establish verification technologies for FBR, the Agency shall use experiences learned from R&amp;D on “MONJU” and the fast breeder laboratory reactor “Joyo,” which is used as an irradiation facility (hereinafter referred to as “Joyo”) and carry out R&amp;D on FBRs through participation in international projects such as the ASTRID reactor in France which is in the verification stage.</p> <p>In order to smoothly carry out these R&amp;Ds, the Agency shall obtain a confirmation of conformity with new regulation standards for Joyo, resume its operation, and implement irradiation tests etc.</p> <p>Furthermore, through the participation in international projects such as the ASTRID reactor in France, it is necessary to sufficiently reflect past research results and accumulated technologies into the projects. The Agency shall use the necessary human resources and develop human resources with international negotiation skills. At the same time, the Agency shall make use of the project results in future R&amp;D. The Agency shall receive an intermediate evaluation for the R&amp;D achievements from external experts by the middle of objectives period and reflect it in future plans.</p> <p>To proceed (1) and above-mentioned R&amp;D, the Agency shall consider technical, economic and social risks in view of the efficient use of resources, reduction of high-level radioactive waste and toxicity etc., and maximize the results of safe and efficient R&amp;D of FBR. To achieve this, in light of the international trends in FBR R&amp;D, the Agency shall plan a global strategy for R&amp;D on FBR in consideration of a smooth transition to the verification process, effective and efficient resource allocation, maintaining and development of FBR technologies and human resources in Japan, agree policies with interested parties such as the government, and contribute to policy planning etc.</p> <p>In addition, the Agency shall formulate a policy of FBR safety design standard draft and lead the international standardization of FBR safety design standards by using the Generation-IV International Forum (GIF) and ASTRID cooperation between Japan and France.</p>	<p>(2) Global strategy planning aiming at the establishment of verification technologies for Fast-Breeder Reactor (FBR) and maximization of R&amp;D results</p> <p>1) R&amp;D aiming at the establishment of verification technologies for Fast-Breeder Reactors (FBR)</p> <p>To establish verification technologies for FBR, while using achievements gained in “MONJU” R&amp;D such as equipment/system design technologies etc., and the breeder laboratory reactor “Joyo,” the irradiation field of fuels and materials (hereinafter, “Joyo”), we shall carry out FBR R&amp;D through participation in international projects such as the ASTRID reactor in France, which is in the verification stage.</p> <p>As for “Joyo,” we shall restart it after receiving confirmation of conformity to the new regulation standards and gain data to improve fuel performance including irradiation data of fuel-cladding pipe material that is resistant to breaking.</p>	<p>(2) Global strategy planning aiming at the establishment of verification technologies for Fast-Breeder Reactor (FBR) and maximization of R&amp;D results</p> <p>1)R&amp;D aiming at the establishment of verification technologies for Fast-Breeder Reactors (FBR)</p> <p>To establish verification technologies for FBR, while using achievements gained in “MONJU” R&amp;D such as equipment/system design technologies etc., and the breeder laboratory reactor “Joyo,” the irradiation field of fuels and materials (hereinafter, “Joyo”), we shall carry out FBR R&amp;D through participation in international projects such as the ASTRID reactor in France, which is in the verification stage.</p> <p>As for “Joyo,” we shall restart it after receiving confirmation of conformity to the new regulation standards and gain data to improve fuel performance including irradiation data of fuel-cladding pipe material that is resistant to breaking.</p> <p><u>As for the supply of mixed oxide fuel (MOX), we shall take necessary measures to meet regulatory standards.</u></p>	<p><del>4</del><sup>5</sup>[4] Do results and efforts obtained through the participation of international projects such as ASTRID reactor in France contribute to the establishment of the verification technologies for Fast-Breeder Reactor (FBR)?</p>	<p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-Status of developing and securing human resources with international negotiation skills and effective and efficient resource allocation (evaluation indicator)</li> <li>-Status of efforts to restart the operation of “Joyo” (evaluation indicator)</li> <li>-Implementation status of irradiation tests by using “Joyo” (evaluation indicator)</li> <li>-Implementation status of Japan-France ASTRID cooperation (evaluation indicator)</li> <li>-Status of the reflection of our country's strategy in ASTRID furnace in France</li> <li>-Progress of designs and R&amp;D of FBR technology and use of results of Japan-France ASTRID cooperation in Japanese empirical researches</li> <li>-Progress of tests required to establish a heat removal technology for severe accidents by using AtheNa and others and analyze behaviors when the core is damaged (evaluation indicator)</li> <li>-Status of leading the international standardization of FBR safety design standard by using the Generation-IV International Forum (GIF)(evaluation indicator)</li> <li>-implementation status of preparing documents and information transmission necessary to clearly explain the significance of FBR R&amp;D such as reduction of radioactive wastes and the reduction of toxicity (monitoring indicator)</li> <li>-Status whether PBR R&amp;D is effectively and flexibly advanced based on the latest global developments, regardless of past circumstance (monitoring indicator)</li> </ul>
				<p><del>6</del><sup>5</sup>[5] Were necessary contributions made so that the government can frame the policy through planning the global strategy leading to the maximization of results of FBR R&amp;D?</p>	<p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-Status of constant grasp of the international trend on FBR R&amp;D (monitoring indicator)</li> <li>-The status of creating usage plans on the facilities possessed by the agency such as “Joyo,” “MONJU,” and “AtheNa” (evaluation indicator)</li> <li>-Reflection of the past R&amp;D results and accumulated technologies in the strategy planning (monitoring indicator)</li> <li>-The status of strategic planning where vital technologies, which should be possessed by Japan, can be possessed and reasonably promoted in the international cooperation in consideration of technological, economical, and social risks (evaluation indicator)</li> <li>-Status of proposals with proper timing to the interested parties including the government and agreement on policy with the interested parties including the government based on the schedule related to Japanese and overseas FBR R&amp;D (evaluation indicator)</li> </ul> <p>[Qualitative Viewpoint]</p> <ul style="list-style-type: none"> <li>-The number of strategic involvement cases in international conferences (monitoring indicator)</li> </ul>



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<p>(1) Technology development for reprocessing spent fuel and fuel fabrication Based on the Basic Energy Plan, the Agency shall promote the following R&amp;D: The Agency shall develop basic technologies toward the advancement of reprocessing technology and reprocessing of light water reactor MOX fuel etc., and provide technical support to nuclear fuel cycle operations based on these results. In addition, the Agency shall develop basic technologies keeping the production process and reprocessing of FBR MOX fuel in mind and gain results helpful for determining which technologies are promising to establish MOX fuel fabrication and reprocessing technologies in the future. In addition, the Agency shall have stopped some facilities of Tokai Reprocessing Plant, which resolves and shears spent fuels, and plan to apply for a decommissioning plan, clarify the process and the period until decommissioning, re-organize the R&amp;D system of spent fuel reprocessing technology after decommissioning, utilize of facilities for the time being, and formulate a decommissioning plan etc. after that, and contribute to the establishment of a technical system concerning prospected decommissioning of reprocessing facilities. Moreover, the Agency shall properly work on <a href="#">complying</a> with new standards to safely manage stored spent fuel and waste and solidify and stabilize plutonium solution and high-level radioactive waste liquid in <a href="#">accordance to the plan</a> to reduce causes for potential danger.</p> <p>The Agency shall receive an intermediate evaluation on results of technology development from external experts by the middle of the target period and reflect it in future plans.</p>	<p>(1) Technology development for reprocessing spent fuel and fuel fabrication Based on the Basic Energy Plan, the Agency shall promote the following R&amp;D: The Agency shall develop basic technologies toward the advancement of reprocessing technology and reprocessing of light water reactor MOX fuel etc., and provide technical support to nuclear fuel cycle operations based on these results. In addition, the Agency shall develop basic technologies keeping the production process and reprocessing of FBR MOX fuel in mind and gain results helpful for determining which technologies are promising to establish MOX fuel fabrication and reprocessing technologies in the future. In addition, the Agency shall have stopped some facilities of Tokai Reprocessing Plant, which resolves and shears spent fuels, and plan to apply for a decommissioning plan, clarify the process and the period until decommissioning, re-organize the R&amp;D system of spent fuel reprocessing technology after decommissioning, utilize of facilities for the time being, and formulate a decommissioning plan etc. after that, and contribute to the establishment of a technical system concerning prospected decommissioning of reprocessing facilities. Moreover, the Agency shall give <a href="#">top priority to securing safety and reducing risks</a> and properly work on improving safety based on new standards to safely manage stored spent fuel and waste and steadily implement the plan etc. <a href="#">to decommission Tokai Reprocessing Plant, which was submitted under the direction from NRA</a>, to complete solidifying and stabilizing plutonium solution and high-level radioactive waste liquid <a href="#">in 2028</a> to reduce causes for potential danger. The Agency shall receive an intermediate evaluation on results of technology development from external experts by the midst of the objectives period and reflect it in future plans.</p>	<p>(1) Technology development for reprocessing spent fuel and fuel fabrication We shall develop basic technologies toward the advancement of reprocessing technology and reprocessing of light water reactor MOX fuel etc., and offer technical support to nuclear fuel cycle projects based on these results. In addition, we shall develop basic technologies, keeping the production process of MOX fuel for FBR and reprocessing of MOX fuel for FBR in mind, and enhance basic data (separation characteristics, fuel physical properties etc.) necessary for maximization of the design to improve reliability and productivity. These help future reprocessing and the establishment of the fuel fabrication technology system and contribute to ensuring the energy security of Japan. We have stopped some facilities of Tokai Reprocessing Plant, which resolve and shear spent fuels, and shall clarify the process and the period until decommissioning, re-organize the R&amp;D system of spent fuel reprocessing technology after decommissioning, utilize facilities for the time being, and create a decommissioning plan etc. after that as a preparation for the decommissioning, and systematically formulate a decommissioning plan. Moreover, to safely manage stored spent fuel and waste, we shall <a href="#">properly work on complying</a> with new regulation standards and solidify and stabilize plutonium solutions and high-level radioactive waste liquid to reduce causes for potential danger. We shall contribute to the establishment of decommissioning technology systems including reprocessing facilities etc., with these efforts. In carrying out these activities, we shall effectively use technological knowledge in coordination among divisions, develop human resources to support future nuclear fuel cycle technology and reduce risks of nuclear materials at facilities etc. In addition, we shall receive an intermediate evaluation on the results of technology development from an external specialist by the midst of the objectives period and reflect it in future plans.</p>	<p>(1) Technology development for reprocessing spent fuel and fuel fabrication We shall develop basic technologies toward the advancement of reprocessing technology and reprocessing of light water reactor MOX fuel etc., and offer technical support to nuclear fuel cycle projects based on these results. In addition, we shall develop basic technologies, keeping the production process of MOX fuel for FBR and reprocessing of MOX fuel for FBR in mind, and enhance basic data (separation characteristics, fuel physical properties etc.) necessary for maximization of the design to improve reliability and productivity. These help future reprocessing and the establishment of the fuel fabrication technology system and contribute to ensuring the energy security of Japan. We have stopped some facilities of Tokai Reprocessing Plant, which resolve and shear spent fuels, and shall clarify the process and the period until decommissioning, re-organize the R&amp;D system of spent fuel reprocessing technology after decommissioning, utilize facilities for the time being, and create a decommissioning plan etc. after that as a preparation for the decommissioning, and systematically formulate a decommissioning plan. Moreover, we shall give <a href="#">top priority to securing safety and reducing risks</a> and work on improving safety based on new regulation standards to safely manage stored spent fuel and waste while steadily implementing a <a href="#">plan to decommission Tokai Reprocessing Plant, which was submitted under the direction from NRA</a>, and plans to reduce risks related to high-level radioactive waste liquid and to shorten vitrification of high-level radioactive liquid waste in order to complete solidifying and stabilizing plutonium solutions and high-level radioactive waste liquid <a href="#">by 2028</a> to reduce causes for potential danger. We shall contribute to the establishment of decommissioning technology systems including reprocessing facilities etc., with these efforts. In carrying out these activities, we shall effectively use technological knowledge in coordination among divisions, develop human resources to support future nuclear fuel cycle technology and reduce risks of nuclear materials at facilities etc. In addition, we shall receive an intermediate evaluation on the results of technology development from an external specialist by the midst of the objectives period and reflect it in future plans.</p>	<p>[3] Do efforts for enhancement of reprocessing technology development (glass solidification technology), development of core manufacturing technology to reprocess light-water reactor MOX fuel, develop MOX fuel producing technology for FBR, and the establishment of decommissioning technology system for reprocessing facilities meet needs of the industries, and are results and efforts created/implemented to lead to solve challenges?</p> <p>[4] Are technical supports offered to the nuclear fuel cycle project through results of glass solidification of high-level radioactive waste liquid?</p>	<p>[Qualitative Viewpoint] -Progress of the development and the enhancement of glass solidification technology (evaluation indicator) -Progress of fundamental technology development to reprocess light-water reactor MOX fuel (evaluation indicator) -The creation status of results of MOX fuel producing technology development for FBR (evaluation indicator) -Progress of efforts to establish reprocessing facility decommissioning technology system (evaluation indicator) -Status of developing/ applying for decommissioning plan (evaluation indicator) -Status of announcing results outside (monitoring indicator)</p> <p>[Qualitative Viewpoint] -Status of technical supports to the nuclear fuel cycle project (evaluation indicator) -Status of announcing results outside (monitoring indicator)</p>

Mid to Long-Term Objectives (Current Version)	Mid to Long-Term Objectives (Proposal under Consideration)	Mid to Long-Term Plan (Current Version)	Mid to Long-Term Plan (Proposal under Consideration)	Major Evaluation Axis (Proposal under Consideration)	Remarks (Related Evaluation and Monitoring Indicators) (Proposal under Consideration)
		<p>1) Reprocessing technology development For further advancement of glass solidification technology as the advancement of reprocessing technology, we shall gain and evaluate data concerning behaviors of platinum group elements, design and develop new types of reactors for a facility for vitrification technology (TVF: Tokai Vitrification Facility), contribute to the early completion of vitrification of high-level radioactive liquid waste, work on the development of basic technologies for reprocessing of light water reactor MOX fuel, and provide technical support to the nuclear fuel cycle project based on these achievements. In addition, we shall study elemental technology development and plant concepts to reprocess FRB MOX fuel and obtain achievements to contribute to determining how promising technologies are to establish reprocessing technology in the future.</p> <p>2) Development of MOX fuel fabrication technology We shall develop technologies for advancement of the pellet manufacturing process of FRB MOX fuel and elemental technology related to a simplified pellet method. Besides, we shall develop dry recycling technologies to reuse scrap generated in MOX fuel fabrication as a raw material. Moreover, we shall improve the reliability and maintainability of automatic fuel fabrication equipment and gain data contributing the study of remote automation of MOX fuel fabrication plants.</p> <p>3) Tokai Reprocessing Plan We shall work on the Tokai Reprocessing Plan to <u>comply</u> with new regulation standards, continue the control of stored used fuel and waste and responses based on aging of facilities, and make the following efforts: We shall give the highest priority to safety securement, complete solidification and stabilization by MOX powderization, construct/maintain facilities in a well-planned manner, and ensure vitrification of high-level radioactive liquid waste. In addition, to manage high-level radioactive waste, we shall study storage methods of vitrified waste packages etc., and take proper measures. <u>We shall design the recycling equipment test facility (RETF) to apply for permission as a facility to pack vitrified waste packages into containers to transport to a final waste disposal site.</u></p> <p>We shall also prepare for decommissioning of the Tokai Reprocessing Plant, apply for permission for the decommissioning plan, and start efforts to establish the decommissioning technology system of the reprocessing facility. As for high radioactive solid waste, we shall develop technologies concerning remote extraction to contribute to proper storage management. As for the low-level radioactive waste treatment facility (LWTF), we shall steadily develop and maintain a cement solidification facility and a nitrate radical analysis facility to carry out construction improvements to the incineration facility and start operation within the target period.</p>	<p>1) Reprocessing technology development For further advancement of glass solidification technology as the advancement of reprocessing technology, we shall gain and evaluate data concerning behaviors of platinum group elements, design and develop new types of reactors for a facility for vitrification technology (TVF: Tokai Vitrification Facility), contribute to the early completion of vitrification of high-level radioactive liquid waste, work on the development of basic technologies for reprocessing of light water reactor MOX fuel, and provide technical support to the nuclear fuel cycle project based on these achievements. In addition, we shall study elemental technology development and plant concepts to reprocess FRB MOX fuel and obtain achievements to contribute to determining how promising technologies are to establish reprocessing technology in the future.</p> <p>2) Development of MOX fuel fabrication technology We shall develop technologies for advancement of the pellet manufacturing process of FRB MOX fuel and elemental technology related to a simplified pellet method. Besides, we shall develop dry recycling technologies to reuse scrap generated in MOX fuel fabrication as a raw material. Moreover, we shall improve the reliability and maintainability of automatic fuel fabrication equipment and gain data contributing the study of remote automation of MOX fuel fabrication plants.</p> <p>3) Tokai Reprocessing Plan We shall work on the Tokai Reprocessing Plan by <u>improving safety based on</u> new regulation standards, continue the control of stored used fuel and waste and responses based on aging of facilities, and make the following efforts: We shall give the highest priority to safety securement and <u>risk reduction</u>, complete solidification and stabilization by MOX powderization, construct/maintain facilities in a well-planned manner, and take necessary actions, <u>aiming at disposal of about 40 % of high-level radioactive liquid waste, and ensure to implement a plan to decommission Tokai Reprocessing Plant, which was submitted under the direction from NRA, and plans to reduce risks related to high-level radioactive waste liquid and to shorten vitrification of high-level radioactive liquid waste in order to complete vitrification of high-level radioactive liquid waste in 2028.</u> In addition, to manage high-level radioactive waste, we shall study storage methods of vitrified waste packages etc., and take proper measures. We shall also prepare for decommissioning of the Tokai Reprocessing Plant, apply for permission for the decommissioning plan in <u>the first half of 2017</u>, and start efforts to establish the decommissioning technology system of the reprocessing facility. As for high radioactive solid waste, we shall develop technologies concerning remote extraction to contribute to proper storage management. As for the low-level radioactive waste treatment facility (LWTF), we shall steadily develop and maintain a cement solidification facility and a nitrate radical analysis facility to carry out construction improvements to the incineration facility and start operation within the target period. <u>We shall study how to use the recycle equipment test facility (RETF).</u></p>	<p>[5] Are plutonium solution and high-level radioactive waste liquid solidified and stabilized in accordance to the plan to safely manage stored spent fuels and wastes?</p>	<p>[Qualitative Viewpoint] -Implementation status of solidification and stabilization of high-level radioactive waste liquid and plutonium solution with MOX powder (evaluation indicator) <u>-Implementation status of compliance with new regulation standards (evaluation indicator)</u> <u>-Implementation status of improving safety based on new regulation standard (evaluation indicator)</u> -Effort impementation status of RETF usage evaluation indicator) -LWTF development status (evaluation indicator)</p> <p>[Qualitative Viewpoint] <u>-Processing rate of high-level radioactive waste liquid (evaluation indicator)</u> <u>-The number of glass solidification of high-level radioactive waste liquid (monitoring indicator)</u> -Storage capacity of plutonium solution (monitoring indicator)</p>